**WARNING**

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

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.

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.

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

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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. Extinguish any open flame.
6. Leave the building.
7. Immediately call your local gas supplier after leaving the building. Follow the gas supplier’s instructions.
8. If you cannot reach your gas supplier, call the Fire Department.

---

**Model HEV**

Gas-Fired, Low Intensity Unitary Heater for Harsh Environments

Installation, Operation & Service Manual

HEV-40
HEV-60
HEV-80
HEV-100
HEV-125
HEV-150
HEV-175

Roberts-Gordon LLC
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P.O. Box 44
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www.robertsgordon.com
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or copied in any form or by any means - graphic, electronic, or mechanical, including
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written permission of Roberts-Gordon LLC.
SECTION 1: HEATER SAFETY

Your Safety is Important to Us!
This symbol is used throughout the manual to notify you of possible fire, electrical or burn hazards. Please pay special attention when reading and following the warnings in these sections.

Installation, service and annual inspection of heater must be done by a contractor qualified in the installation and service of gas-fired heating equipment. Read this manual carefully before installation, operation or service of this equipment.

This heater is designed for heating nonresidential indoor spaces. Do not install in residential spaces. This heater is not certified to meet the requirements of NFPA30A-2012 Section 7.6.6. (maximum tube temperature of 750 °F (399 °C)). Do not install this heater in facilities where compressed natural gas (CNG) or liquid natural gas (LNG) are present. These instructions, the layout drawing, local codes and ordinances, and applicable standards that apply to gas piping, electrical wiring, venting, etc. must be thoroughly understood before proceeding with the installation.

Protective gear is to be worn during installation, operation and service in accordance to the Occupational Safety and Hazard Administration (OSHA). Gear must be in accordance to NFPA 70E, latest revision when working with electrical components. Thin sheet metal parts 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.

Before installation, check that the local distribution conditions, nature of gas and pressure, and adjustment of the appliance are compatible.

This heater must be applied and operated under the general concepts of reasonable use and installed using best building practices. This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do no play with the appliance.

For additional copies of the Installation, Operation and Service Manual, please contact Roberts-Gordon LLC.

1.1 Manpower Requirements
To prevent personal injury and damage to the heater, two persons will be required for installation.

1.2 Safety Labels and Their Placement
Product safety signs or labels should be replaced by the product user when they are no longer legible. Please contact Roberts-Gordon or your ROBERTS GORDON® independent distributor to obtain replacement signs or labels. See Page 2, Figure 1 through Page 3, Figure 2.

1.3 California Proposition 65
In accordance with California Proposition 65 requirements, a warning label must be placed in a highly visible location on the outside of the equipment (i.e., near equipment’s serial plate). See label placement drawing on Page 2, Figure 1 for label location. Avoid placing label on areas with extreme heat, cold, corrosive chemicals or other elements. To order additional labels, please contact Roberts-Gordon LLC or your ROBERTS GORDON® independent distributor.
FIGURE 1: Top and Bottom Panel Label Placement

<table>
<thead>
<tr>
<th>Description</th>
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<tr>
<td>Logo Label</td>
<td>91013221</td>
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<tr>
<td>Rating Plate Label</td>
<td>91010401</td>
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<td>Gas Connection Label</td>
<td>91018122</td>
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<td>Proposition 65 Label</td>
<td>91070016</td>
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<td>Burner Status Label</td>
<td>91033301</td>
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</table>
### FIGURE 2: Side and Back Panel Label Placement

#### Control Side Panel

#### Control Side Panel (Inside)

#### Clearances to Combustibles Label

#### Wiring Label

#### Vent Length Label

#### Lighting Instruction Plate Label

<table>
<thead>
<tr>
<th>Description</th>
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<tr>
<td>Lighting Instruction Plate Label</td>
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<tr>
<td>Wiring Label</td>
<td>91030310</td>
</tr>
<tr>
<td>Clearances to Combustibles Label</td>
<td>91013436</td>
</tr>
<tr>
<td>Vent Length Label</td>
<td>91039500</td>
</tr>
</tbody>
</table>
SECTION 2: INSTALLER RESPONSIBILITY

The installer is responsible for the following:

- To install the heater, as well as the gas and electrical supplies, in accordance with applicable specifications and codes. Roberts-Gordon recommends the installer contact a local Building Inspector or Fire Marshal for guidance.
- To use the information given in a layout drawing and in the manual together with the cited codes and regulations to perform the installation.
- To install the heater in accordance with the clearances to combustibles.
- To furnish all needed materials not furnished as standard equipment.
- To plan location of supports.
- To provide access to burners for servicing on all sides for burner removal.
- To provide the owner with a copy of this installation, operation and service manual.
- To never use heater as support for a ladder or other access equipment and never hang or suspend anything from heater.
- To ensure there is adequate air circulation around the heater and to supply air for combustion, ventilation and distribution in accordance with local codes.
- To safely and adequately install heater using materials with a minimal working load of 75 lbs (33 kg).
- To ensure the heater is placed in a approved application.

2.1 Wall Tag

A laminated wall tag is available for the heater as a permanent reminder of the safety instructions and the importance of the required clearances to combustibles. Please contact Roberts-Gordon or your ROBERTS GORDON® independent distributor to obtain the wall tag. Affix the tag by peeling off the backing of the adhesive strips on the rear surface and position the tag on a wall near the heater (e.g. thermostat or ROBERTS GORDON® Controller).

A copy of the wall tag (P/N 91037912) is illustrated on the back cover. For an immediate solution, you may affix this copy on the wall near the heater.

Know your model number and installed configuration. Model number and installed configuration are found on the burner and in the Installation, Operation and Service Manual. See Page 5, Figure 3 through Page 8, Figure 12. Write the proper clearance dimensions in permanent ink according to your model number and configuration in the open spaces on the tag.

2.2 Corrosive Chemicals

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Damage Hazard</td>
</tr>
<tr>
<td>Do not use heater in area containing corrosive chemicals.</td>
</tr>
<tr>
<td>Refer to appropriate Material Safety Data Sheets (MSDS).</td>
</tr>
<tr>
<td>Failure to follow these instructions can result in product damage.</td>
</tr>
</tbody>
</table>

Roberts-Gordon cannot be responsible for ensuring that all appropriate safety measures are undertaken prior to installation; this is entirely the responsibility of the installer. It is essential that the contractor, the sub-contractor, or the owner identifies the presence of combustible materials, corrosive chemicals or halogenated hydrocarbons* anywhere in the premises.

* Halogenated Hydrocarbons are a family of chemical compounds characterized by the presence of halogen elements (fluorine, chlorine, bromine, etc.). These compounds are frequently used in refrigerants, cleaning agents, solvents, etc. If these compounds enter the air supply of the burner, the life span of the heater components will be greatly reduced. An outside air supply must be provided to the burners whenever the presence of these compounds is suspected. Warranty will be invalid if the heater is exposed to halogenated hydrocarbons.

2.3 National Standards and Applicable Codes

All appliances must be installed in accordance with the latest revision of the applicable standards and national codes. This refers also to the electric, gas and venting installation. Note: Additional standards for installations in Public Garages, Aircraft Hangars, etc. may be applicable.
SECTION 3: CLEARANCES TO COMBUSTIBLES

3.1 Required Clearances to Combustibles

Clearances are the required distances that combustible objects must be away from the heater to prevent serious fire hazards. Combustibles are materials that may catch on fire and include common items such as wood, paper, rubber, fabric, etc. Maintain clearances to combustibles at all times for safety.

Clearances for all heater models are located on the burner of the heater and on Page 5, Figure 3 through Page 8, Figure 12 in this manual. Check the clearances on each burner for the model heater being installed to make sure the product is suitable for your application and the clearances are maintained. Read and follow the safety guidelines below:

- Keep gasoline or other combustible materials including flammable objects, liquids, dust or vapors away from this heater or any other appliance.
- The stated clearances to combustibles represents a surface temperature of 90° F (32°C) above room temperature. Building materials with a low heat tolerance (such as plastics, vinyl siding, canvas, triply, etc) may be subject to degradation at lower temperatures. It is the installer’s responsibility to assure that adjacent materials are protected from degradation.
- Maintain clearances from heat sensitive equipment and workstations.
- Maintain clearances from vehicles parked below the heater.
- Maintain clearances from swinging and overhead doors, overhead cranes, vehicle lifts, partitions, storage racks, hoists, building construction, etc.

NOTE: 1. All dimensions are from the surfaces of all tubes, couplings and elbows.
   2. Clearances B, C and D can be reduced by 50% after 25’ (7.5 m) of tubing downstream from where the burner and burner tube connect.

<table>
<thead>
<tr>
<th>FIGURE 3: LEVEL REFLECTOR</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Model</th>
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<th>C</th>
<th>D</th>
<th>(inches)</th>
<th>(centimeters)</th>
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NOTE: 1. All dimensions are from the surfaces of all tubes, couplings and elbows.
2. Clearances B, C and D can be reduced by 50% after 25' (7.5 m) of tubing downstream from where the burner and burner tube connect.

---

**FIGURE 4: LEVEL SIDE REFLECTOR**

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**FIGURE 5: TWO SIDE REFLECTORS**

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**FIGURE 6: 45° TILT REFLECTOR**

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<th>Model</th>
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<th>C</th>
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<th>(inches) A</th>
<th>B</th>
<th>C</th>
<th>D</th>
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</table>
NOTE: 1. All dimensions are from the surfaces of all tubes, couplings and elbows.
2. Clearances B, C and D can be reduced by 50% after 25' (7.5 m) of tubing downstream from where the burner and burner tube connect.

**FIGURE 7: U-TUBE, LEVEL REFLECTOR**

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**FIGURE 8: U-TUBE, 45°**

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**FIGURE 9: U-TUBE, OPPOSITE 45° REFLECTOR**

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NOTE: 1. All dimensions are from the surfaces of all tubes, couplings and elbows.
2. Clearances B, C and D can be reduced by 50% after 25’ (7.5 m) of tubing downstream from where the burner and burner tube connect.

FIGURE 10: 2-FOOT DECO GRILLE AND PROTECTIVE GRILLE

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FIGURE 11: LOWER CLEARANCE SHIELD*

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*When installed in the first 10' (3 m).

FIGURE 12: VENTING

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## SECTION 4: NATIONAL STANDARDS AND APPLICABLE CODES

### 4.1 Gas Codes

The type of gas appearing on the nameplate must be the type of gas used. Installation must comply with national and local codes and requirements of the local gas company.

- **Canada**: Refer to Natural Gas and Propane Installation Code CSA B149.1 - latest revision.

### 4.2 Aircraft Hangars

Installation in aircraft hangars must be in accordance with the following codes:

- **United States**: Refer to Standard for Aircraft Hangars, NFPA 409 - latest revision.
- **Canada**: Refer to Natural Gas and Propane Installation Code CSA B149.1 - latest revision.

In aircraft storage and servicing areas, heaters shall be installed at least 10' (3 m) above the upper surface of wings or of engine enclosures of the highest aircraft which may be housed in the hangar. The measurement shall be made from the wing or engine enclosure (whichever is higher from the floor) to the bottom of the heater.

- In shops, offices and other sections of aircraft hangars communicating with aircraft storage or servicing areas, heaters shall be installed not less than 8' (2.4 m) above the floor.
- Suspended or elevated heaters shall be so located in all spaces of aircraft hangars that they shall not be subject to injury by aircraft, cranes, movable scaffolding or other objects. Provisions shall be made to assure accessibility to suspended heaters for recurrent maintenance purposes.

### 4.3 Public Garages

Installation in garages must be in accordance with the following codes:

- **Canada**: Refer to Natural Gas and Propane Installation Code CSA B149.1 - latest revision.

- Heaters must not be installed less than 8' (2.4 m) above the floor. Minimum clearances to combustibles must be maintained from vehicles parked below the heater.
- When installed over hoists, minimum clearances to combustibles must be maintained from the upper most point of objects on the hoist.

### 4.4 Electrical

The heater must be electrically grounded in accordance with the following codes:

- **United States**: Refer to National Electrical Code®, NFPA 70 - latest revision. Wiring must conform to the most current National Electrical Code®, local ordinances and any special diagrams furnished.
- **Canada**: Refer to Canadian Electrical Code, CSA C22.1 Part 1 - latest revision.

### 4.5 Venting

The venting must be installed in accordance with the requirements within this manual and the following codes:

- **Canada**: Refer to Natural Gas and Propane Installation Code CSA B149.1 - latest revision.

### 4.6 High Altitude

These heaters are approved for installations up to 2000' (610 m)(US), 4500' (1370 m)(Canada) without modification. Consult factory if US installation is above 2000' (610 m) or Canadian installation is above 4500' (1370 m).
SECTION 5: MAJOR COMPONENTS

FIGURE 13: Major Component Descriptions - Standard Reflector

- **Burner with Tube Gasket**
  Must be installed with the flame observation window facing down.

- **Burner Tube**
  Supplied in 10' (3 m) lengths. Burner tube is always the first tube after the burner.

- **Standard Reflector (Aluminum or Stainless Steel)**
  Alternate overlap as shown on overview and on Page 19, Figure 18. Minimum overlap is 6" (16 cm).

- **Combustion Air Weather Vent**
  Attach at flue end and air inlet where required.

- **Tube**
  Hot rolled or heat treated aluminized tube supplied in 10' (3 m) lengths.

- **Tube and Reflector Hanger with Clamp Package**
  Position this hanger no more than 4" (10 cm) away from the burner.

- **Tube and Reflector Hanger**
  Suspend system from these hangers.

- **Coupling Assembly with Lock**

- **Reflector End Cap**
  Punch out center section to accommodate tube.

- **Flex Gas Line with Shut Off Cock**

- **Reflector Support Strap & Wire Form**

- **Vent Adapter**

- **Turbulator**
  Install turbulator as specified in the "Turbulator Installation" chart.
  See Page 23, Step 6.5. Turbulator is not required on the HEV-125/150/175.
FIGURE 14: Major Component Descriptions - High Efficiency Reflector

**Burner with Tube Gasket**
Must be installed with the flame observation window facing down.

**Burner Tube**
Supplied in 10’ (3 m) lengths. Burner tube is always the first tube after the burner.

**High Efficiency Reflector (Aluminum)**
Alternate overlap as shown on overview and on Page 19, Figure 18. Minimum overlap is 6” (16 cm).

**Tube**
Hot rolled or heat treated aluminized tube supplied in 10’ (3 m) lengths.

**Combustion Air Weather Vent**
Attach at flue end and air inlet where required.

**Flex Gas Line with Shut Off Cock**

**Coupling Assembly with Lock**

**Reflector End Cap-EF**
Punch out center section to accommodate tube.

**Reflectors Support Strap & Wire Form**

**Turbulator**
Install turbulator as specified in the "Turbulator Installation" chart. See Page 23, Step 6.5. Turbulator is not required on the HEV-125/150/175.
### 5.1 Standard Parts List

#### Table 1: Contents of the Burner Carton

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<th>HEV-150</th>
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</table>

*Canadian Models: Rubber (Type 1) Gas Hoses available as an accessory. See Page 46, Section 9.*

#### Table 2: Contents of Standard Core and Extension Packages

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
<th>10' (3 m)</th>
<th>20' (6 m)</th>
<th>30' (9 m)</th>
<th>40' (12 m)</th>
<th>10' (3 m)</th>
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<td>91409408</td>
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<tr>
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<td>S-Hook</td>
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<td>91107720</td>
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</table>

*Optional with the aluminized core package.*
### Table 3: Contents of High Efficiency Core and Extension Packages

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
<th>Core Packages</th>
<th>Extension Packages</th>
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<tbody>
<tr>
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<td></td>
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<td>Aluminized</td>
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<tr>
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<td></td>
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<tr>
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<tr>
<td>91409408</td>
<td>Tube, HT Aluminized, 10’ (3 m)</td>
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<td>1 2 3 4</td>
</tr>
<tr>
<td>03051101</td>
<td>Burner Tube, ALUMI-THERM® Steel, 10’ (3 m)</td>
<td>- - 1 1</td>
<td>- - - -</td>
</tr>
<tr>
<td>03051601</td>
<td>Burner Tube, HT ALUMI-THERM® Steel, 10’ (3 m)</td>
<td>1 1 - -</td>
<td>- - - -</td>
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<tr>
<td>01312700</td>
<td>Coupling Assembly</td>
<td>- 1 2 3</td>
<td>1 2 3 4</td>
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<tr>
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<td>High Efficiency Reflector, 8’ (3.5 m)</td>
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<tr>
<td>02750802</td>
<td>End Cap, High Efficiency</td>
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<tr>
<td>03090102</td>
<td>Tube and Reflector Hanger, High Efficiency</td>
<td>2 3 4 5</td>
<td>1 2 3 4</td>
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<tr>
<td>91907302</td>
<td>S-Hook</td>
<td>2 3 4 5</td>
<td>1 2 3 4</td>
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<tr>
<td>03050012</td>
<td>Reflector Support Package (Strap, Wire Form, Screws)</td>
<td>1 2 3 5</td>
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<td>U-Clip Package</td>
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<th>EXP20ALUMEF</th>
<th>EXP30ALUMEF</th>
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**NOTE:** High efficiency core and extension packages are available with aluminum reflectors only. High efficiency reflectors should NOT be used in applications exposed to wind.
Table 4: Component Package Guide

<table>
<thead>
<tr>
<th>Model</th>
<th>Tubing Length</th>
<th>Standard Core Packages</th>
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<tr>
<td></td>
<td>Minimum</td>
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<tr>
<td>HEV-40</td>
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<td>HEV-60</td>
<td>20’ (6m)</td>
<td>CP20ALUM</td>
</tr>
<tr>
<td>HEV-80</td>
<td>20’ (6m)</td>
<td>CP20ALUM</td>
</tr>
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<td>HEV-100</td>
<td>30’ (9m)</td>
<td>CP30ALUM</td>
</tr>
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<td>HEV-125</td>
<td>40’ (12m)</td>
<td>CP40ALUM</td>
</tr>
<tr>
<td>HEV-150</td>
<td>50’ (15m)</td>
<td>CP30ALUM + EXP20ALUM</td>
</tr>
<tr>
<td>HEV-175</td>
<td>60’ (18m)</td>
<td>CP30ALUM + EXP30ALUM</td>
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Table 5: Component Package Guide

<table>
<thead>
<tr>
<th>Model</th>
<th>Tubing Length</th>
<th>High Efficiency Core Packages</th>
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<tr>
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<td>Minimum</td>
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</tr>
<tr>
<td>HEV-40</td>
<td>10’ (3m)</td>
<td>CP10ALUMEF</td>
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<tr>
<td>HEV-60</td>
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<td>CP20ALUMEF</td>
</tr>
<tr>
<td>HEV-100</td>
<td>30’ (9m)</td>
<td>CP30ALUMEF</td>
</tr>
<tr>
<td>HEV-125</td>
<td>40’ (12m)</td>
<td>CP40ALUMEF</td>
</tr>
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<td>HEV-150</td>
<td>50’ (15m)</td>
<td>CP30ALUMEF + EXP20ALUMEF</td>
</tr>
<tr>
<td>HEV-175</td>
<td>60’ (18m)</td>
<td>CP30ALUMEF + EXP30ALUMEF</td>
</tr>
</tbody>
</table>

Although not recommended, additional tube lengths may be added to the heater. Tubing must be aluminized (heat-treated), or porcelain coated. Additional tube lengths beyond the specified minimum tubing length are considered vent pipe for length determination. Maximum vent length allowed is 45’ (13.7 m) total.
To ensu re your safety, and comply with the terms of the warranty, all units must be installed in accor-
dance with these instructions.

The gas or the electrical supply lines must not be
used to support the heater.

Do not locate the gas or electric supply lines directly
over the path of the flue products from the heater.

The heater must be installed in a location that is
readily accessible for servicing.

The heaters must be installed in accordance with
clearances to combustibles as indicated on the rating
plate and in this instruction manual.

The minimum and maximum gas inlet pressures
must be maintained as indicated on the rating plate.

Typical installation configurations are shown in
Figure 15.

Expansion and contraction of the tube dictates that
the minimum suspension lengths in the table on
Page 16, Figure 15 be maintained.

### WARNING

#### Severe Injury Hazard

Secure burner to burner tube with nuts and
lockwashers.

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

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

#### Cut/Pinch Hazard

Wear protective gear during installation,
operation and service.

Edges are sharp.

Failure to follow these instructions can result
in injury.
FIGURE 15: Critical Hanger Placement

**Typical Suspension Details**

- Beam Clamp
- Anchor Screw Hook 3/8"
- Concrete Beam Wood Beam
- Chain Size 3/16" Minimum
- Washers
- Turnbuckle Not Included
- "X" allows for thermal expansion of system

**Description** | **Part Number**
--- | ---
S-Hook | 91907302
Tube/Reflector Hanger | 030901XX

**Run Length** | **Typical Expansion** | **Minimum "X" Length**
--- | --- | ---
10' (3 m) - 50' (15 m) | ±1" (3 cm) | 12" (305 mm)
51' (15 m) - 60' (18 m) | ±2" (5 cm) | 18" (457 mm)
61' (18 m) - 70' (24 m) | ±3" (8 cm) | 24" (609 mm)

**Notes:**
- Rod 3/8"
- 24" min.* (61 cm)
- Run Lengths:
  - 10' (3 m) - 50' (15 m)
  - 51' (15 m) - 60' (18 m)
  - 61' (18 m) - 70' (24 m)
- Must Be Within 4" (10 cm)
- "X" Lengths:
  - 12" (305 mm)
  - 18" (457 mm)
  - 24" (609 mm)

* Allows for thermal expansion of system
6.1 Outdoor Mounting
The heater is meant for stationary mounting in all situations and should not be suspended from any structure which may become mobile or from any organic structures such as trees. Clearances to combustibles must be maintained in all cases; do not install heaters in a location such as a parking area, where a vehicle with a painted or non-metallic upper surface, may be parked within the clearances to combustibles. See Page 17, Figure 16.
The bottom of the combustion air inlet shall not be less than 12" (30 cm) above a surface which could support snow, ice, or debris.

**FIGURE 16: Critical Hanger Placement (Outdoor Installation)**

**NOTE:** High efficiency reflectors should NOT be used in applications exposed to wind.
FIGURE 17: Linear Heater Assembly Overview
FIGURE 18: Linear Heater Layout Overview

**LEGEND**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
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<tbody>
<tr>
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<td>Burner</td>
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<tr>
<td></td>
<td>Reflector</td>
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<tr>
<td></td>
<td>Tube</td>
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<tr>
<td></td>
<td>Tube/Reflector Hanger</td>
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<td></td>
<td>Coupling Assembly</td>
</tr>
<tr>
<td></td>
<td>Vent Adapter</td>
</tr>
</tbody>
</table>

- **a** = 14" (36 cm) reflector width (not shown)
- **b** = 2" (5 cm) end cap to burner
- **c** = 2" (5 cm) end cap to hanger
- **d** = 7'6" (229 cm) distance first hanger
- **e** = 10' (305 cm) distance between hangers
- **f** = 9.5" (24 cm) burner height
- **g** = 11.5" (29.2 cm) burner length

10' Tube Length

20' Tube Length

30' Tube Length

40' Tube Length
FIGURE 19: Linear Heater Layout Overview (Continued)
Step 6.2 Burner Tube Installation

NOTE:
Tubing requires a downward slope of 1/2" (1.3 cm) per 20' (6 m) away from burner.

Offset mounting hole must be to the top.

Weld seam must be to the bottom of the tube.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
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<tbody>
<tr>
<td>Burner Tube</td>
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<td>S-Hook</td>
<td>91907302</td>
</tr>
<tr>
<td>Tube/Reflector Hanger</td>
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</tr>
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</table>

Step 6.3 Tube Clamp Package Installation

<table>
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</thead>
<tbody>
<tr>
<td>Tube Clamp Package</td>
<td>013189XX</td>
</tr>
</tbody>
</table>
Step 6.4 Coupling and Tube Assembly

A Close coupling and slide opposite end into tab. Position tab underneath guide rail.

B Insert wide end of slide bar/coupling lock into guide rail on opposite end of tabs. Slide the slide bar/coupling lock up the guide rail until snug (approximately 3" (8 cm) to 4" (10 cm)).

C Insert tubes into coupling until end of each tube rests against internal pins.

D Strike slide bar/coupling lock with mallet or hammer until tight.

<table>
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<th>Description</th>
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<td>Slide Bar/Coupling Lock</td>
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<tr>
<td>Tube</td>
<td>91409XXX</td>
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</tbody>
</table>

Repeat Step 6.4 A - D until all tubes are assembled. See Page 23, Section 6.4.2.
Step 6.4.2 Coupling and Tube Assembly (Continued)

![Diagram of heater coupling and tube assembly]

<table>
<thead>
<tr>
<th>Model</th>
<th>Tube Length Minimum</th>
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<tbody>
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<td>10' (3 m)</td>
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<tr>
<td>HEV-60</td>
<td>20' (6 m)</td>
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<td>HEV-80</td>
<td>20' (6 m)</td>
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<tr>
<td>HEV-100</td>
<td>30' (9 m)</td>
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<tr>
<td>HEV-125</td>
<td>40' (12 m)</td>
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<tr>
<td>HEV-150</td>
<td>50' (15 m)</td>
</tr>
<tr>
<td>HEV-175</td>
<td>60' (18 m)</td>
</tr>
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</table>

Step 6.5 Turbulator Installation

Install turbulator as specified in the "Turbulator Installation" charge below. Turbulator is not required on the HEV-125, 150, 175.

<table>
<thead>
<tr>
<th>Turbulator Installation</th>
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<tbody>
<tr>
<td>Model</td>
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<td>HEV-40</td>
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<tr>
<td>HEV-60</td>
</tr>
<tr>
<td>HEV-80</td>
</tr>
<tr>
<td>HEV-100</td>
</tr>
<tr>
<td>HEV-125</td>
</tr>
<tr>
<td>HEV-150</td>
</tr>
<tr>
<td>HEV-175</td>
</tr>
</tbody>
</table>

Fold tab around outside of tube nearest to the vent to hold turbulator in place. Where a vent sleeve is used, do not fold tab.

**Description** | **Part Number**
--- | ---
Turbulator Adapter | 03051501
Turbulator Section | 03051502
Turbulator Section (stainless) | 03051505
Tube | 91409XXX
Step 6.6 Reflector Installation

**WARNING**

Fire Hazard

Support reflector with reflector hanger and support strap.

Reflector must not touch tube.

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

---

**NOTE:** All tube surfaces must be covered by a reflector, except for a U-Tube.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tube/Reflector Hanger</td>
<td>030901XX</td>
</tr>
<tr>
<td>Burner Tube</td>
<td>03051XXX</td>
</tr>
<tr>
<td>Reflector - 96&quot; (244cm)</td>
<td>027503XX</td>
</tr>
</tbody>
</table>
Step 6.6.1 Reflector, U-Clip and Reflector Support Installation

The pictorial drawings of the heater construction in Section 6 are schematic only and provide a general guideline of where hangers, reflector supports and U-clips are to be installed.

To ensure proper expansion and contraction movement of the reflectors, a combination of U-clips and reflector supports are used. The positioning of reflector supports and U-clips depends on the individual installation. Use either pop rivets or sheet metal screws instead of u-clips when installing end caps and joint pieces in areas where impact and high wind may be a factor. The following rules must be observed.

1. Slide first reflector after burner a minimum 2" (4 cm) through first hanger and ensure reflector end cap is securely fastened via U-clips, pop rivets, or sheet metal screws. Position reflector support with tight screws in middle of first reflector.

2. The overlap at the first and second reflector is a slip overlap. Thereafter, every third reflector joint is a slip overlap. A slip overlap is achieved by either:
   a.) both reflectors lay inside a hanger.
   b.) using a reflector support with loose screws at the reflector overlap.

3. The remaining reflector overlaps require a non-slip overlap connection. To affix the reflectors together in a non-slip overlap either:
   a.) use reflector support and tight screws.
   b.) if both reflectors lay inside a hanger, u-clips or sheet metal screws may be used.

This section of three reflectors joined together must be affixed to the tube with at least one reflector support with tight screws.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
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<tbody>
<tr>
<td>Reflector Support Package</td>
<td>030500XX</td>
</tr>
<tr>
<td>Wire Form</td>
<td>91908004</td>
</tr>
<tr>
<td>Reflector Support Strap</td>
<td>0305000X</td>
</tr>
<tr>
<td>Screw #8 x 3/4</td>
<td>94320812</td>
</tr>
<tr>
<td>U-Clip Package</td>
<td>91107720</td>
</tr>
<tr>
<td>Reflector End Cap</td>
<td>027508XX</td>
</tr>
</tbody>
</table>

NOTE: High efficiency reflectors should NOT be used in applications exposed to wind.
Step 6.7 Burner Installation

![Diagram of Burner Installation]

**NOTE:** To ensure proper orientation, attached burner tube with tube weld facing downward.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burner</td>
<td>038XXXXX</td>
</tr>
<tr>
<td>Lock Washer</td>
<td>96411600</td>
</tr>
<tr>
<td>Gasket</td>
<td>02568200</td>
</tr>
</tbody>
</table>
SECTION 7: OPTIONAL HEATER ACCESSORIES

7.1 U-Tube Configuration

Heaters (except HEV-40) are approved for optional U-Tube configurations.

The U-Tube may be installed in either a standard horizontal position, a 45° position or in an opposite 45° position as shown on Page 7, Figure 7 through Figure 9. When using a U-Tube configuration, the following additional rules must be adhered to:

- A minimum of 10' (3 m) on HEV-60/80 and a minimum of 15' (4.5 m) on HEV-100/125/150/175 is required between the burner and the U-Tube.
- The correct turbulator (See Page 23, Figure 6.5) must be installed in the last standard section of tube.
- The burner must never be operated in a tilted position.
- The heater must be properly supported at all locations. See Page 29, Figure 21.

WARNING

Cut/Pinch Hazard

Wear protective gear during installation, operation and service.

Edges are sharp.

Failure to follow these instructions can result in injury.
FIGURE 20: U-Tube Heater Assembly Overview

Mounting hardware shown is for indoor installation only. See Page 17, Figure 16 for outdoor suspension details.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>U-Tube Package</td>
<td>03011XXX</td>
</tr>
<tr>
<td>180° U-Tube</td>
<td>013359XX</td>
</tr>
<tr>
<td>Tube and Reflector Hanger</td>
<td>030901XX</td>
</tr>
<tr>
<td>Coupling</td>
<td>01312700</td>
</tr>
<tr>
<td>Reflector End Cap</td>
<td>027508XX</td>
</tr>
<tr>
<td>U-Tube Support Bracket</td>
<td>030205XX</td>
</tr>
<tr>
<td>4&quot; (10 cm) U-Bolts</td>
<td>91912500</td>
</tr>
<tr>
<td>Reflector Support Set</td>
<td>030500XX</td>
</tr>
<tr>
<td>S-Hook</td>
<td>91907302</td>
</tr>
<tr>
<td>Hex Nut</td>
<td>92113000</td>
</tr>
<tr>
<td>Lock Washer</td>
<td>96411500</td>
</tr>
</tbody>
</table>
FIGURE 21: U-Tube Heater Layout Overview

LEGEND

- Burner
- Reflector
- Tube 10’
- Tube 5’ **
- Tube/Reflector Hanger
- Coupling Assembly
- U-Tube

\[ a = 14” (36 \text{ cm}) \]  
reflecter width (not shown)

\[ b = 2” (5 \text{ cm}) \]  
end cap to burner

\[ c = 2” (5 \text{ cm}) \]  
end cap to hanger

\[ d = 7’6” (229 \text{ cm}) \]  
distance first hanger

\[ e = 10’ (305 \text{ cm}) \]  
distance between hangers

\[ f = 5’ (153 \text{ cm}) \]  
distance between last full tube hanger and half tube hanger

\[ g = 11.5” (29.2 \text{ cm}) \]  
burner length

\[ h = 9.5” (24 \text{ cm}) \]  
burner height

*Requires the last reflector before the U-Tube to be cut in half for use on both sides.

**Requires the last tube before the U-Tube to be cut in half for use on both sides.
FIGURE 22: U-Tube Heater Layout Overview (Continued)
## SECTION 7: OPTIONAL HEATER ACCESSORIES

### 7.2 Elbow Package Configuration

#### Step 7.2.1 Elbow Installation

**Diagram**: Illustration of an elbow configuration with a tube, coupling, and a 90° elbow. The diagram shows the parts involved in the installation.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elbow Package</td>
<td>027187XX</td>
</tr>
<tr>
<td>90° Elbow</td>
<td>01335801</td>
</tr>
<tr>
<td>Coupling</td>
<td>01312700</td>
</tr>
<tr>
<td>Reflector End Cap</td>
<td>0275080X</td>
</tr>
<tr>
<td>Reflector Joint Piece</td>
<td>0275090X</td>
</tr>
<tr>
<td>U-Clip Package</td>
<td>91107720</td>
</tr>
</tbody>
</table>

#### Minimum Distance Required Between Burner and Elbow

<table>
<thead>
<tr>
<th>Model</th>
<th>Minimum Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEV-40</td>
<td>N/A</td>
</tr>
<tr>
<td>HEV-60</td>
<td>10' (3 m)</td>
</tr>
<tr>
<td>HEV-80</td>
<td>10' (3 m)</td>
</tr>
<tr>
<td>HEV-100</td>
<td>15' (4.5 m)</td>
</tr>
<tr>
<td>HEV-125</td>
<td>15' (4.5 m)</td>
</tr>
<tr>
<td>HEV-150</td>
<td>15' (4.5 m)</td>
</tr>
<tr>
<td>HEV-175</td>
<td>15' (4.5 m)</td>
</tr>
</tbody>
</table>

#### Step 7.2.2 Elbow Installation

**Diagram**: Illustration of an elbow configuration with a tube and a coupling. The diagram shows the parts involved in the installation.

#### Step 7.2.3 Reflector Joint Installation

**Diagram**: Illustration of a reflector joint with scribe contour, flatten edge, and reflector joint. The diagram shows the parts involved in the installation.

1" (2.5 cm) Maximum
Step 7.2.4 Reflector Joint Installation

Cut away contour with tin snips.

Punch/drill six 3/32” (2 mm) holes.

Step 7.2.5 Reflector Joint Detail

Install reflector end cap.

Attach reflector joint with six #8 sheet metal screws.

FIGURE 23: Reflectors Joint Detail

Reflector

Reflector Joint
7.3 Reflector Side Extension (Not for outdoor use or areas exposed to wind)

Step 7.3.1 Bracket Installation

Use additional supports in high air movement applications.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reflector Side Extension Package</td>
<td>0271270X</td>
</tr>
<tr>
<td>Reflector Side Extension - 96” (244cm)</td>
<td>0136800X</td>
</tr>
<tr>
<td>Retainer Clips</td>
<td>02751200</td>
</tr>
<tr>
<td>Sheet Metal Screws</td>
<td>94118106</td>
</tr>
<tr>
<td>Order Separately</td>
<td></td>
</tr>
<tr>
<td>Reflector Side Extension Bracket</td>
<td>01329911</td>
</tr>
</tbody>
</table>

Step 7.3.2 Side Reflector Installation

Cut relief notches for supports and hangers.
7.4 Lower Clearance Shield Installation

Step 7.4.1 Shield Support Strap Assembly

7.5 Two-Foot Decorative Grille Installation

Step 7.5.1 Grille Installation
Step 7.5.2 Frame Shield Installation

![Frame Shield Diagram]

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deco Grille Shield - 24&quot; (61cm)</td>
<td>01365900</td>
</tr>
</tbody>
</table>

Step 7.5.3 Reflector Side Extension Installation for Decorative Grilles

**NOTE:** If the decorative grille system is to be installed in an area with considerable air movement, it is recommended that one #8 x 3/8" sheet metal screw be installed per reflector extension to prevent it from blowing over.

![Reflector Side Extension Diagram]

<table>
<thead>
<tr>
<th>Distance “A”</th>
<th>Extension</th>
<th>Part No.</th>
<th>Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
<td>Maximum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2” (4 cm)</td>
<td>6” (15 cm)</td>
<td>013704XX</td>
<td>8” (20 cm)</td>
</tr>
<tr>
<td>6” (15 cm)</td>
<td>10” (25 cm)</td>
<td>013704XX</td>
<td>12” (30 cm)</td>
</tr>
<tr>
<td>10” (26 cm)</td>
<td>14” (37 cm)</td>
<td>013704XX</td>
<td>16” (40 cm)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reflector Side Extension</td>
<td>013704XX</td>
</tr>
</tbody>
</table>
7.6 Protective Grille Installation
Step 7.6.1 Silicone Cap Installation

![Diagram of Silicone Cap Installation](image)

**NOTE:** Protective grille available for use with standard reflector ONLY.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grille Section</td>
<td>08050001</td>
</tr>
<tr>
<td>Grille End Cap</td>
<td>08050002</td>
</tr>
<tr>
<td>Silicone Cap</td>
<td>91915951-6P</td>
</tr>
</tbody>
</table>

Step 7.6.2 Grille End Cap Installation

![Diagram of Grille End Cap Installation](image)

A) Grille and Grille End Cap
B) Bend up 90°.
C) Pull outward.
Step 7.6.3 Grille Installation

[Diagram of grille installation with labels for reflector, final grille section, grille, and grille end cap.]

40" (101 cm)
**SECTION 8: VENTING**

**WARNING**

Carbon Monoxide Hazard

Heaters installed unvented must be interlocked with sufficient building exhaust.

Heaters must be installed according to the installation manual.

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

**WARNING**

Cut/Pinch Hazard

Wear protective gear during installation, operation and service.

Edges are sharp.

Failure to follow these instructions can result in injury.

8.1 General Venting Requirements

This heater must be vented in accordance with the rules contained in this manual and with the following national codes and any state, provincial or local codes which may apply:

**United States:** Refer to National Fuel Gas Code NFPA 54/ANSI Z223.1 - latest revision.

**Canada:** Refer to Natural Gas and Propane Installation Code CSA B149.1 - latest revision.

Exhaust end of heater will accept a 4' (10 cm) vent pipe using the vent adapter (P/N 90502700). To prevent leakage of condensation, install the vent adapter with the seam on top and seal the joint using a high temperature silicone sealant.

Any portion of vent pipe passing through a combustible wall must have an approved thimble to conform with the above listed codes.

Vent pipe must be sloped downward away from the burner 1/2" (1 cm) for every 20' (6 m).

The heater may be individually vented or common vented. When venting horizontally, a maximum of two heaters can be commonly vented. See Page 42, Section 8.10. When venting vertically, a maximum of four heaters can be commonly vented. See Page 43, Section 8.11.

The heater may also be installed unvented in certain circumstances according to building ventilation codes. Refer to the above codes and Page 38, Section 8.2 for further information. Unvented operation also requires compliance with the clearances to combustibles given on Page 8, Figure 12.

The bottom of the vent or air intake terminal shall not be located less than 1' (.3 m) above grade level.

The vent shall not terminate less than 7' (2.1 m) above grade where located adjacent to public walkways.

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

Secure all joints with #8 x 3/8 sheet metal screws.

Seal all joints with high temperature silicone sealant.

Vent terminal must be beyond any combustible overhang.

8.1.1 United States Requirements

Vent must terminate at least 3' (.9 m) above any forced air inlet located within 10' (3.1 m).

Vent must terminate at least 4' (1.2 m) below, 4' (1.2 m) horizontally from, or 1' (.3 m) above any door, operable window, or gravity air inlet into any building.

8.1.2 Canadian Requirements

The vent shall not terminate within 6' (1.8 m) of a mechanical air supply inlet to any building.

The vent shall not terminate within 3' (.9 m) of a window or door that can be opened in any building, any non-mechanical air supply inlet to any building, or of the combustion air inlet of any other appliance.

8.2 Unvented Operation

Sufficient ventilation must be provided in the amount of 4 cfm per 1000 Btu/h firing rate (United States); 3 cfm per 1000 Btu/h firing rate (Canada).

Use of optional outside combustion air is not recommended with unvented heaters.

If exhaust fans are used to supply ventilation air, an interlock switch must be used to prevent the heater from coming on when the fans are off. This may be done using a pressure switch.
8.3 Horizontal Venting
In noncombustible walls only, vent terminal (P/N 02537801-1P) may be used.

For 4” (10 cm) vents in either combustible or noncombustible walls, use Tjernlund VH1-4 (P/N 90502100) or equivalent insulated vent terminal. Follow the manufacturer’s instructions for proper installation.

For 6” (15 cm) common vents in either combustible or noncombustible walls, use Tjernlund VH1-6 (P/N 90502101) or equivalent insulated vent terminal. Follow the manufacturer’s instructions for proper installation.

8.4 Vertical Venting
For 4” (10 cm), an approved vent cap (P/N 90502300) must be used.
For 6” (15 cm) common vent, an approved vent cap (P/N 90502302) must be used.
For common vertical venting of more than two heaters, See Page 43, Section 8.11.
A vent shall not extend less than 2’ (.6m) above the highest point where it passes through a flat roof of a building.

8.5 Unvented Operation Tube Termination
Turndown type vent terminal with a screen must be installed at the exhaust end of the tube. Vent terminal design shall not incorporate backdraft flap.

FIGURE 24: Tube Termination

8.6 Length Requirements
The maximum vent length allowed is 45’ (13.7 m). The maximum outside air supply duct length allowed is 45’ (13.7 m).

The total vent length, plus outside air duct length, plus any extensions to minimum heat exchanger lengths, cannot exceed 65’ (19.8 m).

Vent length should be limited to less than 20’ (6 m). If using vent lengths greater than 20’ (6 m), condensation will form in the vent pipe. Insulation and additional sealing measures (high temperature silicone at all seams) are required. Optional heat exchanger beyond minimum lengths is considered as vent length for length determination.

Subtract 15’ (4.6 m) of maximum allowed vent or duct length per vent elbow if more than two are used.

8.6.1 Vent Material Recommendations

Vent recommendations:
1. Porcelain coated tubing 4” (10 cm) O.D. (P/N 9141030D)
2. Heat treated aluminized tubing 4” (10 cm) O.D. (P/N 91409408)
   Heat treated aluminized tubing 6” (15 cm) O.D. (P/N E0009105)
   (Supplied by others)

NOTE: 4” (10 cm) O.D. Porcelain coated tubing (P/N 9141030D), 4” (10 cm) O.D. Heat treated aluminized tubing (P/N 91409408), and 6” (15 cm) O.D. Heat treated aluminized tubing (P/N E0009105) are equivalent to single wall flue pipe.
FIGURE 25: Combustion Air Weather Vent (P/N 03700009)

To be installed in place of flue collar for installations without fresh air vent pipe.

**Step A:** Remove blower side access door from burner by unscrewing the 7 screws as shown. Carefully remove door to gain access to combustion blower.

**Step B:** Unscrew 3 lock nuts along with 6 set screws from rear of unit as shown. Pull combustion blower from burner and remove flue collar. While keeping blower gasket and bird screen in place, replace combustion blower and tighten locknuts previously removed in step A.

**Step C:** Apply silicone sealant around Combustion Air Weather Vent flange. Carefully align 6 pre-drilled holes on weather vent flange to 6 holes on burner. Tighten 6 set screws previously removed in step 2 to secure weather vent to burner.

**Step D:** Reinstall access door and tighten screws.
8.7 Venting Options

Indoor Harsh/Corrosive Environments

- Fresh Air In
- Vent Cap
- 4" (10 cm) Single Wall Pipe
- Burner Tube
- Vent Adapter
- Vent Out
- Vent Terminal

Indoor Vented and Unvented

- Burner Tube
- Vent Adapter
- Vent Terminal

Outdoor

- Burner Tube
- Vent Adapter (seam down)
- Vent Cap

8.8 Horizontal Ventilation 4" (10 cm) Pipe

Combustible or Non-Combustible Wall

- Vent Adapter
- 4" (10 cm) Single Wall Pipe
- Vent Terminal

Non-Combustible Wall Only

- 18" (46 cm) Min.
- Vent Adapter
- 4" (10 cm) Single Wall Pipe
- Vent Terminal

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vent Terminal (Comb. Wall)</td>
<td>90502100</td>
</tr>
<tr>
<td>Vent Terminal</td>
<td>02537801-XX</td>
</tr>
</tbody>
</table>
### 8.9 Vertical Ventilation 4” (10 cm) Pipe

**Requirements:**

- Maximum of two heaters can be commonly vented through a side wall.
- Heaters must be of the same BTU output.
- Heaters must be controlled by a common thermostat.

**Table: Description and Part Numbers**

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vent Cap 4” (10 cm)</td>
<td>90502300</td>
</tr>
<tr>
<td>Vent Terminal 6” (15 cm)</td>
<td>90502101</td>
</tr>
</tbody>
</table>

**Diagram:**

- 4” (10 cm) Type “B” vent cap
- 4” (10 cm) Type “B” vent pipe
- 2’ (0.61 m) Min.
- Approved Thimble (If Applicable)
- The last section of vent pipe passing through the roof or wall may be Type “B” vent pipe. All other vent materials in the building must be single wall vent pipe.

**Step 8.10 Common Sidewall Venting**

**Table: Description and Part Numbers**

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vent Terminal 6” (15 cm)</td>
<td>90502101</td>
</tr>
</tbody>
</table>

**Diagram:**

- Vent Terminal Tjernlund VH1-6 or Equivalent
- Sweeping ‘T’ Connection (By Others)
- 4” (10 cm) Single Wall Pipe
- Vent Adapter

- Vent Terminal Tjernlund VH1-6 or Equivalent
- Sweeping ‘Y’ Connection (By Others)
- 6” (15 cm) Single Wall Pipe
- Vent Adapter
8.11 Common Vertical Venting

**Requirements:**
- Maximum of four heaters can be commonly vented through the roof.
- Heaters must be of the same BTU output.
- Heaters must be controlled by a common thermostat.
- Connections to a common stack must be positioned to avoid direct opposition between streams of combustion gases.
8.12 Outside Combustion Air Supply

IMPORTANT: If the building has a slight negative pressure or corrosive contaminants, such as halogenated hydrocarbons, are present in the air, an outside combustion air supply to the heater is required. Seal all combustion air pipe joints.

Use of optional outside combustion air is not recommended with unvented heaters.

8.12.1 Length Requirements

Follow the constraints listed on Page 39, Section 8.6.

8.12.2 Vertical Outside Air Supply for Single Heater Installation

The air supply duct may have to be insulated to prevent condensation on the outer surface. The outside air terminal must not be more than 1' (31 cm) above the vent termination while maintaining a minimum distance of 3' (93 cm) for both vertical and horizontal venting.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vent Cap 4&quot; (10 cm)</td>
<td>90502300</td>
</tr>
</tbody>
</table>

8.12.3 Horizontal Outside Air Supply for Single Heater Installation

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vent Cap 4&quot; (10 cm)</td>
<td>90502300</td>
</tr>
</tbody>
</table>
8.12.4 Vertical Outside Air Supply for Double Heater Installation

Requirements:
- Heaters must be controlled by a common thermostat.

8.12.5 Horizontal Outside Air Supply for Double Heater Installation

Requirements:
- Heaters must be controlled by a common thermostat.
SECTION 9: GAS PIPING

**WARNING**

Fire Hazard

Tighten gas hose fittings to connect gas supply according to Figure 23.

Gas hose can crack when twisted.

Gas hose moves during normal operation.

Use only 36" (91 cm) long connector of 1/2" or 3/4" nominal ID.

Connector supplied with heater for U.S. models (not with Canadian models).

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

**WARNING**

Explosion Hazard

Leak test all components of gas piping before operation.

Gas can leak if piping is not installed properly.

Do not high pressure test gas piping with heater connected.

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

There is an expansion of the tube with each firing cycle. This will cause the burner to move with respect to the gas line. This can cause a gas leak resulting in an unsafe condition if the gas connection is not made in strict accordance with *Figure 26*.

Meter and service must be large enough to handle all the burners 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" wc. When gas piping is not included in the layout drawing, the local gas supplier will usually help in planning the gas piping.

Gas lines must meet applicable codes:

**United States:** The Flexible Stainless Steel Gas Hose (US models) supplied with the heater is certified per the Standard for Connectors for Gas Appliances, ANSI Z21.24/CSA 6.10 - latest revision.

**Canada:** The Rubber Type 1 Gas Hose (Canadian models) optional with the heater is certified as being in compliance with the Standard for Elastomeric Composite Hose and Hose Couplings for Conducting Propane and Natural Gas, CAN/CGA 8.1 - Latest revision.

- Check the pipe and tubing ends for leaks before placing heating equipment into service. When checking for gas leaks, use a soap and water solution; never use an open flame.

Install the gas hose as shown in *Figure 26*. The gas hose accommodates expansion of the heating system and allows for easy installation and service of the burner. Before connecting the burners to the supply system, verify that all high pressure testing of the gas piping has been completed.
FIGURE 26: Gas Connection with Flexible Gas Hose

**CORRECT POSITIONS**

Shut-Off Valve (included with gas hose) must be parallel to burner gas inlet. The 3" (8 cm) displacement shown is for the cold condition. This displacement may reduce when the system is fired.

Flexible Gas Hose 36" (91 cm) length

**High Gas Pressure Regulator** to be installed upstream of flexible gas hose if inlet pressure exceeds maximum allowance.

**CAUTION**

Product Damage Hazard

Hold gas nipple securely with pipe wrench when attaching gas hose.

Failure to follow these instructions can result in product damage.

**Description**

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Pressure Regulator - 2 psi</td>
<td>90207600</td>
</tr>
<tr>
<td>High Pressure Regulator - 5 psi</td>
<td>90207601</td>
</tr>
</tbody>
</table>

**INCORRECT POSITIONS (WRONG INSTALLATION)**

**Description**

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4&quot; Flexible Stainless Steel Coated Gas Hose (US Models)</td>
<td>91412203</td>
</tr>
<tr>
<td>3/4&quot; Rubber Type 1 Gas Hose (Canadian Models)</td>
<td>91412207</td>
</tr>
</tbody>
</table>
Heaters can be controlled using several methods. Normally thermostats are used to control the heaters but they can also be controlled by an Energy Management System. Section 10.1 below illustrates the connection for heaters controlled by a line voltage thermostat. NOTE: In order to use line voltage thermostats, the low voltage terminal located at the back of each burner must be connected as shown in the detail. For a single heater on a low voltage thermostat, See Section 10.2 below. To control multiple heaters on one low voltage thermostat, See Page 49, Section 10.3. NOTE: In order to control multiple heaters on one low voltage thermostat, the low voltage terminals on each heater must be connected as shown in detail. Heater must be grounded in accordance with applicable codes: United States: refer to National Electrical Code® NFPA 70 - latest revision Canada: refer to Canadian Electrical Code, CSA C22.1 Part I - latest revision. If any of the original internal wiring must be replaced, it must be replaced with wiring materials having a temperature rating of at least 105° C and 600 V.

### 10.1 Line Voltage Thermostat Wiring

![Diagram of Line Voltage Thermostat Wiring](image)

- **Diagram Details:**
  - 120 V-60 Hz Supply Circuit
  - Line Voltage Thermostat
  - Low voltage black jumper wire connected inside all burners between Purple and Blue wire; Yellow not used.

### 10.2 Low Voltage Thermostat with One Burner

![Diagram of Low Voltage Thermostat with One Burner](image)

- **Diagram Details:**
  - 120 V-60 Hz Supply Circuit
  - Low voltage terminal detail:
    - Thermostat: R to Purple wire; W to Blue wire; C to Yellow wire
    - NOTE: Yellow and Purple wires provide 24 VAC to power thermostat
### 10.3 Low Voltage Thermostat Wiring with Multiple Burners

#### Transformer Relay

- **Front View**
  - Black
  - Purple
  - Black
- **Back View**
  - White
  - Red
- **Burner 1**
  - Gnd.
- **Burner 2**
  - Gnd.
- **Burner 3**
  - Gnd.
- **Burner 4**
  - Gnd.

#### Diagram Description

- **120V-60 Hz supply circuit**
  - L1
  - L2
  - Gnd.
- **1-2 burners**, use **SPST Transformer Relay**.
- **3-4 burners**, use **SPDT Transformer Relay**.

#### Notes

- Low voltage black jumper wire connected inside all burners between Purple and Blue wire; Yellow not used.
- **NOTE:**
  - 24VAC thermostat powered by others when controlling multiple burners.

#### Description Table

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermostat Relay-SPST</td>
<td>90417600K</td>
</tr>
<tr>
<td>Transformer Relay-SPDT</td>
<td>90436300</td>
</tr>
</tbody>
</table>

### 10.4 Internal Wiring

#### Diagram

**NOTES:**

- NO TERMINAL BUSHING ON HARSH ENVIRONMENT HEATERS, THERMOSTAT CONNECTIONS MADE INTERNAL.
- TERMINAL BUSHING REPLACED BY OTHERS (SEE NOTE 1).

- **24V STAT**
  - BY OTHERS

- **LED**
  - +

- **Electrode**
  - DOOR SWITCH

- **Motor/Blower**
  - PRESSURE SWITCH

- **GAS VALVE**
  - ELECTRODE

- **Ignition Module**
10.5 Ladder Diagram

10.6 Electrical Connection to the Burner Box using Line Voltage Thermostat on Control

Connect wires together with suitable approved wire connections.

Green to Gnd.
White to L2
Black to L1
10.7 Electrical Connection to Burner Box using Low Voltage Thermostat on Control

Connect Wires together with suitable approved wire connections.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grommet - Liquid Tight</td>
<td>91309701</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Thermostat Bundle</th>
</tr>
</thead>
<tbody>
<tr>
<td>R to Purple wire</td>
</tr>
<tr>
<td>W to Blue wire</td>
</tr>
<tr>
<td>C to Yellow Wire</td>
</tr>
</tbody>
</table>

Burner Box

Liquid Tight Flexible Conduit for Outdoor Use or Equivalent

From External Thermostat

Liquid Tight Conduit Connector
This heater is equipped with a direct spark ignition system.

11.1 Sequence of Operation
4. Turn the thermostat up. When the thermostat calls for heat, the blower motor will energize.
5. When the motor approaches nominal running RPM, the pressure switch closes and activates the ignition module.
6. After a 45 second prepurge, the ignition module then opens the gas valve and energizes the spark igniter.
7. When the flame is established, the sparking sequence ceases.
8. If the flame is not established during the ignition sequence, the ignition module closes the gas valve and purge begins. Module will try 2 additional times for ignition (with purges in between trials). If ignition is not established, the module will lockout.
9. If the flame extinguishes during operation, the ignition module will attempt the multiple trial sequence described in step 5. If ignition is not re-established, the module will lockout for one hour or until reset.
10. After lockout, the control can be reset by turning down thermostat for five seconds, and then raising it again to desired temperature, or by disconnecting power and then reconnecting.
11. When thermostat is satisfied, all power to the unit is shut off.

11.2 To Shut Off Heater
Set thermostat to lowest setting.
Turn OFF electric power to heater.
Turn OFF manual gas valve in the heater supply line.

11.3 To Start Heater
Turn gas valve and electric power OFF and wait five minutes for unburned gases to vent from heater.
Turn ON main gas valve.
Turn ON electric power.
Set thermostat to desired temperature. Burner should light automatically.

11.4 Pre-Season Maintenance and Annual Inspection
To ensure your safety and years of trouble-free operation of the heating system, service and annual inspections must be done by a contractor qualified in the installation and service of gas-fired heating equipment.

Turn off gas and electric supplies before performing service or maintenance. Allow heater to cool before servicing.

Before every heating season, a contractor qualified in the installation and service of gas-fired heating equipment must perform a thorough safety inspection of the heater.

For best performance, the gas, electrical, thermostat connections, tubing, venting, suspensions and over-
section 11: operation and maintenance

all heater condition should be thoroughly inspected.

NOTE: Gas flow and burner ignition are among the first things that should be inspected.
Please see page 53, section 11.5 for suggested items to inspect.

11.5 maintenance checklist

11.5.1 maintenance checklist

installation code and annual inspections:
all installation and service of ROBERTS GORDON® equipment must be performed by a contractor qualified in the installation and service of equipment sold and supplied by Roberts-Gordon LLC and conform to all requirements set forth in the ROBERTS GORDON® manuals and all applicable governmental authorities pertaining to the installation, service, operation and labeling of the equipment.

To help facilitate optimum performance and safety, Roberts-Gordon LLC recommends that a qualified contractor conduct, at a minimum, annual inspections of your ROBERTS GORDON® equipment and perform service where necessary, using only replacement parts sold and supplied by Roberts-Gordon LLC.

The vicinity of the heater
Do not store or use flammable objects, liquids or vapors near the heater.
Immediately remove these items if they are present.
See page 5, section 3.

Vehicles and other objects
Maintain the clearances to combustibles.
Do not hang anything from, or place anything on, the heater.
Make sure nothing is lodged underneath the reflector, in between the tubes or in the decorative or protective grilles (included with select models).
Immediately remove objects in violation of the clearances to combustibles.
See page 5, section 3.

Reflector
Support reflector with reflector hanger and support strap.
Reflector must not touch tube.
Make sure there is no dirt, sagging, cracking or distortion.
Do not operate if there is sagging, cracking or distortion.
Make sure reflectors are correctly overlapped. See page 25, section 6.6.1.
Clean outside surface with a damp cloth.

Vent pipe
Venting must be intact. Using a flashlight, look for obstructions, cracks on the pipe, gaps in the sealed areas or corrosion.
The area must be free of dirt and dust. Clean as required.
Remove any carbon deposits or scale using a wire brush.
See page 38, section 8.

Outside air inlet
Inlet must be intact. Look for obstructions, cracks on the pipe, gaps in the sealed areas or corrosion.
The area must be free of dirt and dust. Clean and reinstall as required.

Tubes
Make sure there are no cracks.
Make sure tubes are connected and suspended securely.
See page 15, section 6.
Make sure there is no sagging, bending or distortion.
Clean or replace as required.

Gas line
Check for gas leaks. See page 46, section 9.

Burner observation window
Make sure it is clean and free of cracks or holes.
Clean and replace as required.
<table>
<thead>
<tr>
<th>Component</th>
<th>Maintenance Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blower Scroll, Wheel and Motor</td>
<td>Compressed air or a vacuum cleaner may be used to clean dust and dirt.</td>
</tr>
<tr>
<td>Burner Cup and Orifice</td>
<td>Clear of obstructions (even spider webs will cause problems). Carefully remove any dust and debris from the burner.</td>
</tr>
<tr>
<td>Electrode</td>
<td>Replace if there are cracked ceramics, excessive carbon residue, or erosion of the electrode. The electrode gap should be 1/8&quot; (3.2 mm).</td>
</tr>
<tr>
<td>Thermostat</td>
<td>There should be no exposed wire or damage to the thermostat.</td>
</tr>
<tr>
<td></td>
<td>See Page 48, Section 10.</td>
</tr>
<tr>
<td>Suspension Points</td>
<td>Make sure the heater is hanging securely. Look for signs of wear on the chain or ceiling.</td>
</tr>
<tr>
<td></td>
<td>See Page 16, Figure 15.</td>
</tr>
<tr>
<td>Decorative and Protective Grille (optional)</td>
<td>The grille must be securely attached. Check that the side reflector extensions are installed correctly and secured in place if necessary. (Decorative grille only.) See Page 34, Section 7.5 and Page 36, Section 7.6. Make sure shield is installed correctly and secured in place if necessary. (Decorative grille only.) See Page 35, Section 7.5.2.</td>
</tr>
<tr>
<td>Lower Clearance Shield (optional)</td>
<td>The lower shield must be securely attached. Inspect shield support straps and lower clearance shield anchor points. See Page 34, Section 7.4. Make sure shield is installed correctly and secured in place if necessary. See Page 34, Section 7.4.</td>
</tr>
<tr>
<td>Wall Tag</td>
<td>If wall tag is present, make sure it is legible and accurate. Please contact Roberts-Gordon LLC or your ROBERTS GORDON® independent distributor, if you need a wall tag. See Page 4, Section 2.1.</td>
</tr>
<tr>
<td>Safety Labels</td>
<td>Product safety signs or labels should be replaced by the product user when they are no longer legible. Please contact Roberts-Gordon LLC or your ROBERTS GORDON® independent distributor to obtain replacement signs or labels. See Page 2, Figure 1 through Page 3, Figure 2.</td>
</tr>
</tbody>
</table>
SECTION 12: TROUBLESHOOTING

⚠️ DANGER

Electrical Shock Hazard

Disconnect electric before service.

Heater must be properly grounded.

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

⚠️ WARNING

Fire Hazard
Keep all flammable objects, liquids and vapors the minimum required clearances to combustibles away from heater.

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

Explosion Hazard
Turn off gas supply to heater before service.

Burn Hazard
Allow heater to cool before service.

Burns may still be hot after operation.

Cut/Pinch Hazard
Wear protective gear during installation, operation and service.

Edges are sharp.

Failure to follow these instructions can result in death, injury or property damage.
12.1 Troubleshooting Flow Chart

**Module Diagnostic Codes:**

<table>
<thead>
<tr>
<th>LED</th>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 second steady flash at start of cycle</td>
<td>Normal</td>
<td>Wait for valve to open</td>
</tr>
<tr>
<td>Steady on</td>
<td>Microprocessor failure within module</td>
<td>Replace module</td>
</tr>
<tr>
<td>Three flashes</td>
<td>Ignition lockout</td>
<td>Recycle unit: check for</td>
</tr>
<tr>
<td></td>
<td>Lockout of module</td>
<td>spark and valve opening and</td>
</tr>
<tr>
<td></td>
<td>after 3 tries</td>
<td>replace: if none, replace module</td>
</tr>
</tbody>
</table>

Flow Chart:

1. **Turn up thermostat. Does the blower turn on?**
   - NO: *Is there a spark at the igniter?*
   - YES: *Place a jumper across the thermostat terminals. Does the blower turn on?*
     - NO: *Check thermostat wiring and replace thermostat if necessary.*
     - YES: *Is there power 120 V at the burner?*
       - NO: *Disconnect power to burner. Does the blower turn freely?*
         - NO: *Is the blower obstructed?*
         - YES: *Replace module.*
       - YES: *Check relay wiring (if applicable) and wiring to the burner.*
       - Replace blower.
     - YES: *Replace module within module.*

2. **Place a jumper across the thermostat terminals. Does the blower turn on?**
   - NO: *Is there a spark at the igniter?*
   - YES: *Yes, proceed to the next step.*

3. **Is there a spark at the igniter?**
   - NO: *Disconnect power from burner and check igniter and ignition wire. Are they damaged?*
     - NO: *Check wiring between the blower motor and transformer.*
       - NO: *With the blue and yellow wires still removed, is the voltage at the transformer black and white leads 120 V?*
         - YES: *Reconnect transformer wires. Place a jumper wire across the pressure switch. Is there a spark?*
         - NO: *Remove the blue and yellow wires from the transformer. Is there 24 V at the transformer secondary?*
           - YES: *Replace transformer.*
           - NO: *Reconnect transformer wires. Place a jumper wire across the pressure switch. Is there a spark?*
             - YES: *Replace pressure switch.*
             - NO: *Replace ignition module.*
       - YES: *Carefully reset spark gap to 1/8".*
     - YES: *Replace igniter and ignition wire as needed.*

4. **Is the igniter gap set at 1/8"?**
   - NO: *Are the air hoses to the pressure switch secure and leak free?*
     - NO: *Repair, replace, or tighten hoses as necessary.*
     - YES: *Replace igniter and ignition wire as needed.*
   - YES: *Replace igniter and ignition wire as needed.*

5. **Is the vent pipe or the inlet of the burner obstructed?**
   - NO: *Remove obstruction.*
   - YES: *Replace igniter and ignition wire as needed.*

6. **Remove obstruction.**

**LED Problem Solution**

- **4 second steady flash at start of cycle:** Normal, Wait for valve to open.
- **Steady on:** Microprocessor failure within module, Replace module.
- **Three flashes:** Ignition lockout, Lockout of module after 3 tries, Recycle unit: check for spark and valve opening and replace: if none, replace module.
SECTION 12: TROUBLESHOOTING

1. Does the burner light?
   - NO: Were the gas lines purged of air?
     - NO: Purge lines.
     - YES: Is the inlet gas pressure during ignition correct? (Natural 4.6", LP should be 11")
       - NO: Check gas line stop cock. Contact gas company.
       - YES: Measure voltage on valve terminals. Is there 24V during ignition time?
         - NO: Replace/correct wires.
         - YES: Are the wires connecting the ignition module OK?
           - NO: Replace ignition module.
           - YES: Inspect the ignition/flame sense electrodes. Are they in good condition?
             - Yes: Measure the flame current between the F+ and F- terminals on the ignition module using a 0-10 direct current microamp meter.
               - Is the flame above 2µA?
                 - No: Replace electrode.
                 - Yes: Replace ignition module.
             - No: Replace/correct wires.
             - NO: Clean or replace electrode.

2. Does the burner stay on?
   - NO: Are the wires connecting the module and electrode OK?
     - NO: Replace/correct wires.
     - YES: Inspect the ignition/flame sense electrodes. Are they in good condition?
       - Yes: Measure the flame current between the F+ and F- terminals on the ignition module using a 0-10 direct current microamp meter.
         - Is the flame above 2µA?
           - No: Replace electrode.
           - Yes: Replace ignition module.
       - No: Clean or replace electrode.

3. Does the burner turn off when the call for heat ends?
   - NO: Check the thermostat and check the continuity of the ground wire.
12.2 Manifold Gas Pressure Setting
SECTION 13: REPLACEMENT PARTS

⚠️ DANGER ⚠️ WARNING

Electrical Shock Hazard    Explosion Hazard    Fire Hazard    Carbon Monoxide Hazard

Use only genuine ROBERTS GORDON® replacement parts per this installation, operation and service manual.

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

See warnings and important information before removing or replacing parts. After any maintenance or repair work, always test fire the heater in accordance with the start-up instructions on Page 52, Section 11 to help ensure all safety systems are in working order before leaving the heater to operate. Minor faults may be traced by using the troubleshooting charts on Page 55, Section 12 through Page 58, Figure 12.2.
### FIGURE 27: Burner Exploded View

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Gas Valve (Natural)</td>
<td>90032510</td>
</tr>
<tr>
<td>1 Gas Valve (LP)</td>
<td>90032512</td>
</tr>
<tr>
<td>Tube Gasket (Not Shown)</td>
<td>02568200</td>
</tr>
<tr>
<td>Blower Inlet Gasket (Not Shown)</td>
<td>03050900</td>
</tr>
<tr>
<td>2 Motor and Blower Assembly</td>
<td>90708600-P</td>
</tr>
<tr>
<td>Air Adapter Collar</td>
<td>91911704</td>
</tr>
<tr>
<td>Combustion Air Weather Vent (Not Shown)</td>
<td>03700009</td>
</tr>
<tr>
<td>3 Burner Cup Assembly</td>
<td>03020100</td>
</tr>
<tr>
<td>4 Electrode Assembly</td>
<td>90427400</td>
</tr>
<tr>
<td>Mica Window Assembly (Not Shown)</td>
<td>02553203</td>
</tr>
<tr>
<td>5 Transformer</td>
<td>90436900K</td>
</tr>
<tr>
<td>7 Pressure Switch:</td>
<td></td>
</tr>
<tr>
<td>(175)</td>
<td>90439802K</td>
</tr>
<tr>
<td>(100)</td>
<td>90439803K</td>
</tr>
<tr>
<td>(40, 60, 125)</td>
<td>90439805K</td>
</tr>
<tr>
<td>(80, 150)</td>
<td>90439810K</td>
</tr>
<tr>
<td>8 24 Vac Relay</td>
<td>90447140</td>
</tr>
<tr>
<td>9 DSI Ignition Module</td>
<td>90439500K</td>
</tr>
<tr>
<td>10 LED Burner Status Light</td>
<td>91316103</td>
</tr>
</tbody>
</table>
### SECTION 14: GENERAL SPECIFICATIONS

#### 14.1 Material Specifications

14.1.1 Reflectors

.024 Aluminum (Standard or High Efficiency Reflectors)

(optional .024 Stainless Steel Type 304, Standard Reflectors Only)

#### 14.2 Heater Specifications

14.2.1 Ignition

Fully automatic, three-try, direct spark, electronic ignition control, 100% safety shut-off.

---

**General Specifications for the heaters are as follows:**

<table>
<thead>
<tr>
<th>Model</th>
<th>Heat Input Rate (Btu/h) x (1000)</th>
<th>Length “A”</th>
<th>Recommended Minimum Mounting Height*</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEV-40</td>
<td>40</td>
<td>Minimum</td>
<td>Space</td>
</tr>
<tr>
<td>HEV-60</td>
<td>60</td>
<td>10’ (3m)</td>
<td>8’-10’ (2.4 - 3m) 8’ (2.4m)</td>
</tr>
<tr>
<td>HEV-80</td>
<td>80</td>
<td>20’ (6m)</td>
<td>10’-12’ (3 - 3.6m) 9’ (2.7m)</td>
</tr>
<tr>
<td>HEV-100</td>
<td>100</td>
<td>30’ (9m)</td>
<td>12’-15’ (3.6 - 4.5m) 11’ (3.3m)</td>
</tr>
<tr>
<td>HEV-125</td>
<td>125</td>
<td>40’ (12m)</td>
<td>15’-20’ (4.5 - 6m) 15’ (4.6m)</td>
</tr>
<tr>
<td>HEV-150</td>
<td>150</td>
<td>50’ (15m)</td>
<td>20’-25’ (6 - 7.6m) 20’ (6.1m)</td>
</tr>
<tr>
<td>HEV-175</td>
<td>175</td>
<td>60’ (18m)</td>
<td>25’ (7.6m)            23’ (7m)</td>
</tr>
</tbody>
</table>

*See Page 5, Section 3 for clearances to combustibles.

---

**GAS PRESSURE AT MANIFOLD:**

Natural Gas: 3.5” wc  
LP Gas: 10.5” wc

**PIPE CONNECTION:**

1/2” NPT (for 40, 60, 80, 100, 125)  
3/4” NPT (for 150 & 175)

**DIMENSIONS:**

Vent Connection Size: 4” (10 cm)  
Outside Air Connection Size: 4” (10 cm)  
Refer to figure above for dimensional information.

---

**GAS INLET PRESSURE:**

Natural Gas:

- for 40, 60, 80, 100, 125, 150: 4.6” wc Minimum  
- for 175: 5.0” wc Minimum  
- 14.0” wc Maximum

LP Gas:

- 11.0” wc Minimum  
- 14.0” wc Maximum

**ELECTRICAL RATING (ALL MODELS):**

120 V - 60 Hz., 1.0 A

---

14.3 Suspension Specifications

Hang heater with materials with a minimum working load of 75 lbs (33 kg). See Page 16, Figure 15.

14.4 Controls Specifications

Time switches, thermostats, etc. can be wired into the electrical supply. External controls supplied as an optional extra.
SECTION 15: THE ROBERTS GORDON® VANTAGE® HEV WARRANTY

ROBERTS-GORDON WILL PAY FOR:

Within 36 months from date of purchase by buyer or 42 months from date of shipment by Roberts-Gordon LLC (whichever occurs first), 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 LLC will require the part in question to be returned to the factory. Roberts-Gordon LLC 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 12 months from date of shipment from Roberts-Gordon LLC or the remaining ROBERTS GORDON® VANTAGE® HEV 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® VANTAGE® HEV in any way.
- Use of the ROBERTS GORDON® VANTAGE® HEV 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® VANTAGE® HEV as directed in the Installation, Operation and Service manual.

- Relocation of the ROBERTS GORDON® VANTAGE® HEV after initial installation
- The use of the ROBERTS GORDON® VANTAGE® HEV in a corrosive atmosphere containing contaminants.
- The use of the ROBERTS GORDON® VANTAGE® HEV in the vicinity of a combustible or explosive material.
- Any defect in the ROBERTS GORDON® VANTAGE® HEV 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® VANTAGE® HEV is not installed by a contractor qualified in the installation and service of gas fired 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® VANTAGE® HEV 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 LLC
1250 William Street
P.O. Box 44
Buffalo, New York 14240-0044
Telephone: +1.716.852.4400
Fax: +1.716.852.0854
Toll Free: 800.828.7450
www.robertsgordon.com

Roberts-Gordon LLC’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 LLC 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® VANTAGE® HEV. 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 LLC, 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 LLC’s duly authorized Executive Officer.
OWNER WARRANTY REGISTRATION CARD

Mail or Fax to:
Roberts Gordon LLC • 1250 William Street, P.O. Box 44 • Buffalo, NY 14240-0044 • Phone: 716-852-4400 • Fax: 716-852-0054
Toll Free: 800-828-7450 • www.robertsgordon.com

About the Owner:
Name: ________________________________ City: __________________ State: ____________ Zip Code: ____________
Phone: ______________________________ Fax: __________________ E-mail: __________________

About the Installer:
Name: ________________________________ City: __________________ State: ____________ Zip Code: ____________
Phone: ______________________________ Fax: __________________ E-mail: __________________

Purchased From (if different than installer):
Name: ________________________________ City: __________________ State: ____________ Zip Code: ____________
Phone: ______________________________ Fax: __________________ E-mail: __________________

About your Heater:
Model #: __________________________ Serial #: ___________________________ Fuel: _______ Installation Date: _______

Type of Installation (check one):
- 0 Automotive
- 0 Manufacturing
- 0 Warehouse
- 0 Recreational
- 0 Aircraft
- 0 Public Building
- 0 Office
- 0 Retail
- 0 Agricultural
- 0 Other

Installation Code and Annual Inspections: All installation and service of ROBERTS GORDON® equipment must be performed by a contractor qualified in the installation and service of equipment sold and supplied by Roberts-Gordon LLC and conform to all requirements set forth in the ROBERTS GORDON® manuals and all applicable governmental authorities pertaining to the installation, service, operation and labeling of the equipment.

To help facilitate optimum performance and safety, Roberts-Gordon LLC recommends that a qualified contractor conduct, at a minimum, annual inspections of your ROBERTS GORDON® equipment and perform service where necessary, using only replacement parts sold and supplied by Roberts-Gordon LLC.

These products are not for residential use.

This product is intended to assist licensed professionals in the exercise of their professional judgment.

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Attach this information to a wall near the ROBERTS GORDON® heater.

### OPERATING INSTRUCTIONS

1. **STOP!** Read all safety instructions on this information sheet.
2. Open the manual gas valve in the heater supply line.
3. Turn on electric power to the heater.
4. Set the thermostat to desired setting.

### WARNING

**Fire Hazard**

Keep all flammable objects, liquids and vapors the minimum required clearances to combustibles away from heater.

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.

### TO TURN OFF THE HEATER

1. Set the thermostat to off or the lowest setting.

### IF THE HEATER WILL NOT OPERATE, TO ENSURE YOUR SAFETY, FOLLOW THESE INSTRUCTIONS TO SHUT DOWN YOUR HEATER

1. Set the thermostat to off or the lowest setting.
2. Turn off electric power to the heater.
3. Turn off the manual gas valve in the heater supply line.
4. Call your registered installer/contractor qualified in the installation and service of gas-fired heating equipment.

Maintain clearance to the side and clearance below the heater from vehicles and combustible materials.

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Installation Code and Annual Inspections:
All installation and service of ROBERTS GORDON® equipment must be performed by a contractor qualified in the installation and service of equipment and supplied by Roberts-Gordon and conform to all requirements set forth in the ROBERTS GORDON® manuals and all applicable governmental authorities pertaining to the installation, service, operation and labeling of the equipment. To help facilitate optimum performance and safety, Roberts-Gordon recommends that a qualified contractor conduct, at a minimum, annual inspections of your ROBERTS GORDON® equipment and perform service where necessary, using only replacement parts sold and supplied by Roberts-Gorden.

Further Information: Applications, engineering and detailed guidance on systems design, installation and equipment performance is available through ROBERTS GORDON® representatives. Please contact us for any further information you may require, including the Installation, Operation and Service Manual.

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