

# GMS9/GCS9 GAS-FIRED WARM AIR FURNACE INSTALLATION INSTRUCTIONS

*Installer: Affix all manuals adjacent to the unit.*

(Type FSP CATEGORY IV Direct or Non Direct Vent Air Furnace)

These furnaces comply with requirements embodied in the American National Standard / National Standard of Canada ANSI Z21.47-CSA-2.3 Gas Fired Central Furnaces.



**RECOGNIZE THIS SYMBOL AS A SAFETY PRECAUTION.**

## ATTENTION INSTALLING PERSONNEL

As a professional installer you have an obligation to know the product better than the customer. This includes all safety precautions and related items.

Prior to actual installation, thoroughly familiarize yourself with this Instruction Manual. Pay special attention to all safety warnings. Often during installation or repair it is possible to place yourself in a position which is more hazardous than when the unit is in operation.

Remember, it is your responsibility to install the product safely and to know it well enough to be able to instruct a customer in its safe use.

Safety is a matter of common sense...a matter of thinking before acting. Most dealers have a list of specific good safety practices...follow them.

The precautions listed in this Installation Manual are intended as supplemental to existing practices. However, if there is a direct conflict between existing practices and the content of this manual, the precautions listed here take precedence.

\*NOTE: Please contact your distributor or our website for the applicable product data book referred to in this manual.

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5. When directly communicating with the outdoors, the single opening shall have a minimum free area of 1 square inch per 3,000 BTU per hour of total input rating of all equipment in the enclosure.

### 5.3.4 Specially Engineered Installations:

The requirements of 5.3.3 shall not necessarily govern when special engineering, approved by the authority having jurisdiction, provides an adequate supply of air for combustion, ventilation, and dilution of flue gases.

### 5.3.5 Louvers and Grilles:

In calculating free area in 5.3.3, consideration shall be given to the blocking effect of louvers, grilles or screens protecting openings. Screens used shall not be smaller than 1/4 inch mesh. If the area through a design of louver or grille is known, it should be used in calculating the size of opening required to provide the free area specified. If the design and free area is not known, it may be assumed that wood louvers will have 20-25 percent free area and metal louvers and grilles will have 60-75 percent free area. Louvers and grilles shall be fixed in the open position or interlocked with the equipment so that they are opened automatically during equipment operation.

### 5.3.6 Special Conditions Created by Mechanical Exhausting or Fireplaces:

Operation of exhaust fans, ventilation systems, clothes dryers, or fireplaces may create conditions requiring special attention to avoid unsatisfactory operation of installed gas utilization equipment. Air from Inside Building. See 5.3.3-a.

## VI. INSTALLATION POSITIONS

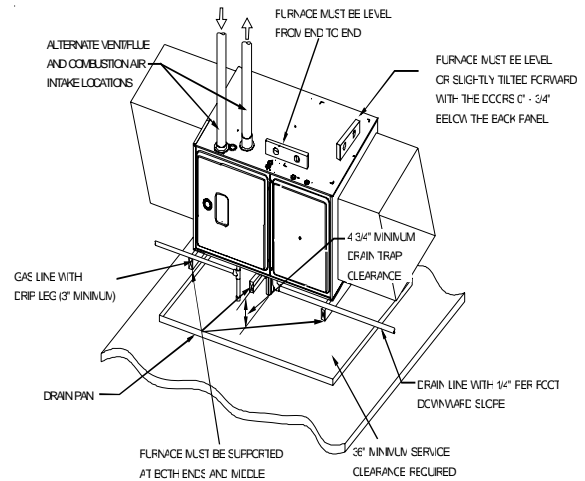
This furnace may be installed in an upright position or horizontal on either the left or right side panel. Do not install this furnace on its back. For *upright upflow* furnaces, return air ductwork may be attached to the side panel(s) and/or basepan. For *horizontal upflow* furnaces, return air ductwork must be attached to the basepan. For both *upright or horizontal counterflow* furnaces, return ductwork must be attached to the basepan (top end of the blower compartment).

**NOTE:** Ductwork must never be attached to the back of the furnace. Contact your distributor for proper airflow requirements and number of required ductwork connections. Refer to "Recommended Installation Positions" figure for appropriate installation positions, ductwork connections, and resulting airflow arrangements.

## VII. HORIZONTAL APPLICATIONS & CONSIDERATIONS

### GENERAL

Horizontal applications, in particular, may dictate many of the installation's specifics such as airflow direction, ductwork connections, flue and combustion air pipe connections, etc. The basic application of this furnace as a horizontal furnace differs only slightly from an upright installation. When installing a furnace horizontally, additional consideration must be given to the following:



**Horizontal Furnace**

### DRAIN TRAP AND LINES

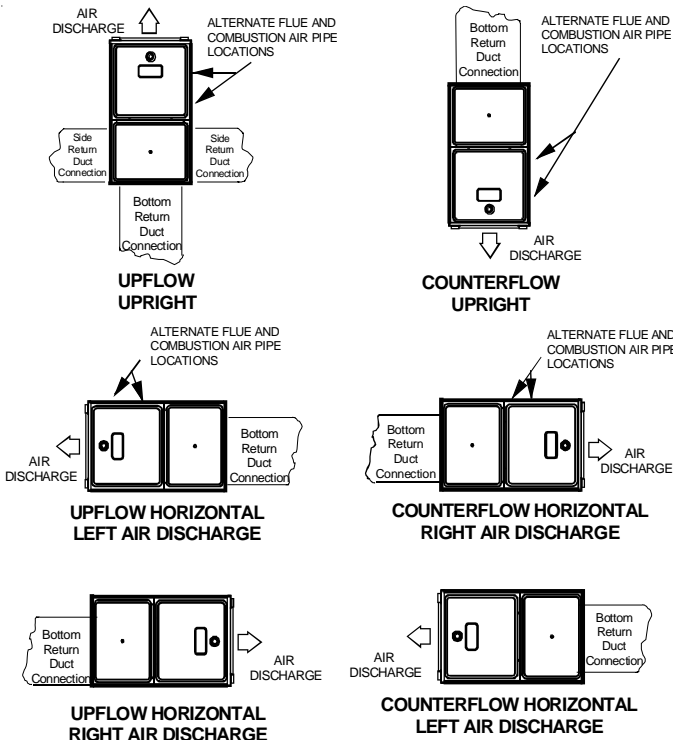
In horizontal applications the condensate drain trap is secured to the furnace side panel, suspending it below the furnace. A minimum clearance of 4 3/4 inches below the furnace must be provided for the drain trap. Additionally, the appropriate downward piping slope must be maintained from the drain trap to the drain location. Refer to *Section X, Condensate Drain Trap and Lines* for further details. If the drain trap and drain line will be exposed to temperatures near or below freezing, adequate measures must be taken to prevent condensate from freezing.

### LEVELING

Leveling ensures proper condensate drainage from the heat exchanger and induced draft blower. For proper flue pipe drainage, the furnace must be level lengthwise from end to end. The furnace should also be level from back to front or have a slight tilt with the access doors downhill (approximately 3/4 inches) from the back panel. The slight tilt allows the heat exchanger condensate, generated in the recuperator coil, to flow forward to the recuperator coil front cover.

### ALTERNATE VENT/FLUE AND COMBUSTION AIR CONNECTIONS

In horizontal installations provisions for alternate flue and combustion air piping are available for upflow furnaces with left discharge and counterflow furnaces with right air discharge. This configuration allows the flue and combustion air piping to be run vertically through the furnace. Refer to the "Recommended Installation Positions" figure for further detail. The standard piping connections may also be used in these positions. Refer to *Section IX, Vent/Flue Pipe and Combustion Air Pipe* for details concerning the conversion to the alternate vent/flue and combustion air connections.



**Recommended Installation Positions**

**NOTE:** Alternate “vertical” piping connections can not be used when an upflow furnace is installed with supply air discharging to the right, or when a counterflow furnace is installed with supply air discharging to the left. In either case, use the standard flue and combustion air piping connections.

**ALTERNATE ELECTRICAL AND GAS LINE CONNECTIONS**

This furnace has provisions allowing for electrical and gas line connections through either side panel. In horizontal applications the connections can be made either through the “top” or “bottom” of the furnace.

**DRAIN PAN**

A drain pan must be provided if the furnace is installed above a conditioned area. The drain pan must cover the entire area under the furnace (and air conditioning coil if applicable).

**FREEZE PROTECTION**

Refer to *Section VII, Horizontal Applications and Conditions - Drain Trap and Lines.*

**FURNACE SUSPENSION**

If the furnace is installed in a crawl space it must be suspended from the floor joist or supported by a concrete pad. Never install the furnace on the ground or allow it to be exposed to water. Refer to *Section IV, Location Requirements and Considerations - Furnace Suspension* for further details.

**VIII. PROPANE GAS /HIGH ALTITUDE INSTALLATIONS**

**WARNING**

**POSSIBLE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH MAY OCCUR IF THE CORRECT CONVERSION KITS ARE NOT INSTALLED. THE APPROPRIATE KITS MUST BE APPLIED TO INSURE SAFE AND PROPER FURNACE OPERATION. ALL CONVERSIONS MUST BE PERFORMED BY A QUALIFIED INSTALLER OR SERVICE AGENCY.**

This furnace is shipped from the factory configured for natural gas at standard altitude. Propane gas installations require an orifice change to compensate for the energy content difference between natural and propane gas.

High altitude installations may require both a pressure switch and an orifice change. These changes are necessary to compensate for the natural reduction in the density of both the gas fuel and the combustion air at higher altitude.

For installations above 7000 feet, please refer to your distributor for required kit(s).

HIGH ALTITUDE GAS ORIFICE CHART					
Altitude	Gas	Kit	Orifice	Manifold Pressure	Pressure Switch
0-7000	Natural	None	#43	3.5" w.c.	None
	Propane	LPT-00A	#55	10.0" w.c.	

**NOTE:** In Canada, gas furnaces are certified to 4500 feet.

Contact the distributor for a tabular listing of appropriate manufacturer’s kits for propane gas and/or high altitude installations. The indicated kits must be used to insure safe and proper furnace operation. All conversions must be performed by a qualified installer, or service agency.

**IX. VENT/FLUE PIPE & COMBUSTION AIR PIPE**

**GENERAL**

**WARNING**

**FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN BODILY INJURY OR DEATH. CAREFULLY READ AND FOLLOW ALL INSTRUCTIONS GIVEN IN THIS SECTION.**

**WARNING**

**UPON COMPLETION OF THE FURNACE INSTALLATION, CAREFULLY INSPECT THE ENTIRE FLUE SYSTEM BOTH INSIDE AND OUTSIDE THE FURNACE TO ASSURE IT IS PROPERLY SEALED. LEAKS IN THE FLUE SYSTEM CAN RESULT IN SERIOUS PERSONAL INJURY OR DEATH DUE TO EXPOSURE TO FLUE PRODUCTS, INCLUDING CARBON MONOXIDE.**

A condensing gas furnace achieves its high level of efficiency by extracting almost all of the heat from the products of combustion and cooling them to the point where condensation takes place. Because of the relatively low flue gas temperature and water condensation requirements, PVC pipe is used as venting material.

This furnace must not be connected to Type B, BW, or L vent or vent connector, and must not be vented into any portion of a factory built or masonry chimney except when used as a pathway for PVC as described later in this section. Never common vent this appliance with another appliance or use a vent which is used by a solid fuel appliance. Do not use commercially available “no hub connectors” other than those shipped with this product.

It is the responsibility of the installer to follow the manufacturers’ recommendations and to verify that all vent/flue piping and connectors are compatible with furnace flue products. Additionally, it is the responsibility of the installer to ensure that all piping and connections possess adequate structural integrity and support to prevent flue pipe separation, shifting, or sagging during furnace operation.

**DUAL CERTIFICATION: NON-DIRECT/DIRECT VENT**

This furnace is dual certified and may be installed as a non-direct vent (single pipe) or direct vent (dual pipe) appliance. A *non-direct*