



# CONDENSING GAS QUADPOISE FURNACE INSTALLATION AND OPERATION MANUAL

SINGLE STAGE  
CLQS1-050T36N  
CLQS1-075T42N  
CLQS1-100T48N  
CLQS1-125T60N

## **⚠ WARNING**

### FIRE OR EXPLOSION HAZARD

Failure to follow safety warnings exactly could result in serious injury, death, or property damage.

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

#### - WHAT TO DO IF YOU SMELL GAS

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

- Installation and service must be performed by a qualified installer, service agency or the gas supplier.

## **⚠ AVERTISSEMENT**

### RISQUE D'INCENDIE OU D'EXPLOSION

Le non-respect des avertissements de sécurité pourrait entraîner des blessures graves, la mort ou des dommages matériels.

- Ne pas entreposer ni utiliser de l'essence ni d'autres vapeurs ou liquides inflammables dans le voisinage de cet appareil, ni de tout autre appareil.

#### - QUE FAIRE S'IL Y A UNE ODEUR DE GAZ

- Ne pas tenter d'allumer aucun appareil.
- Ne toucher à aucun interrupteur électrique; n'utiliser aucun téléphone dans le bâtiment.
- Évacuer l'immeuble immédiatement.
- Appeler immédiatement le fournisseur de gaz en employant le téléphone d'un voisin. Respecter à la lettre les instructions du fournisseur de gaz.
- Si personne ne répond, appeler le service des incendies.

- L'installation et l'entretien doivent être effectués par un installateur qualifié, un organisme de service ou le fournisseur de gaz.

PLEASE READ THESE INSTRUCTIONS PRIOR TO INSTALLATION, INITIAL FIRING, AND BEFORE PERFORMING ANY SERVICE OR MAINTENANCE. THESE INSTRUCTIONS MUST BE LEFT WITH THE HOMEOWNER AND SHOULD BE RETAINED FOR FUTURE REFERENCE BY QUALIFIED SERVICE PERSONNEL.



THERMO PRODUCTS, LLC.  
P.O. BOX 237  
DENTON, NC 27239



MG-1052  
ECN 5660-MA 210104

MADE IN USA



All installations and services must be performed by qualified service personnel.

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All installations and services must be performed by qualified service personnel.

## I. SAFETY INFORMATION

This and the following page contain reproductions of the various warning and instruction labels placed on the Thermo Pride Condensing Gas Furnaces. Please read and comply with the contents of these labels.

MODEL NO.	CLOS1-125T60N
SERIAL NO.	00000000

**ALRI CERTIFIED**  
www.alricertified.org

DIRECT VENT FORCED AIR FURNACE  
FOR INDOOR INSTALLATION IN BUILDING  
CONSTRUCTED ON SITE.  
CONFORMS TO  
ANS Z21.47-CSA 2.3-2012 CENTRAL FURN  
CATEGORY IV TYPE FSP  
115V 1PH 60CY MAX TOTAL INPUT AMPS 15.0  
BTUH INPUT OUTPUT  
125,000 120,000

**ETL**  
LISTED US  
Intertek  
2000980

FACTORY EQUIPPED WITH #42 ORIFICES FOR NAT GAS.  
SUITABLE FOR LP GAS WHEN EQUIPPED WITH #54 ORIFICES  
NORMAL MANIFOLD PRESS 3.5 IN WC(NAT) 10.0 IN WC(LP)  
MIN GAS SUPPLY PRESS FOR INPUT ADJUSTMENT 4.5 IN WC(NAT)  
MAX GAS SUPPLY PRESS 14.0 IN WC 11.0 IN WC(LP)  
AIR TEMPERATURE RISE 45°F TO 75°F  
MAX EXTERNAL STATIC PRESSURE 0.50 INCHES WC  
MAXIMUM OUTLET AIR TEMPERATURE 175°F  
CERTIFIED FOR CLOSET INSTALLATION AT MINIMUM CLEARANCES  
TO COMBUSTIBLE CONSTRUCTION AS SHOWN.

(INCHES)	TOP	FRONT	BACK	LS/RS	FLUE PIPE
	1	6	0	0	0

FOR INSTALLATION ON COMBUSTIBLE FLOORING (UPFLOW/HORIZONTAL)  
FOR INSTALLATION ON COMBUSTIBLE FLOORING ONLY WHEN INSTALLED  
ON SPECIAL BASE PART NO. 125CLQ-BASE. (DOWNFLOW)  
LINE CONTACT ONLY PERMISSIBLE BETWEEN LINES FORMED BY  
INTERSECTIONS OF THE TOP AND TWO SIDES OF THE FURNACE CASING  
AND BUILDING JOISTS, STUDS, OR FRAMING.  
THIS FURNACE REQUIRES A SPECIAL VENTING SYSTEM. REFER TO  
INSTALLATION INSTRUCTIONS NO. MG-1052 FOR PARTS LIST AND  
METHOD OF INSTALLATION.  
MAX VENT LENGTH 75 FEET EQUIVALENT WHEN TERMINATED PER  
INSTRUCTION MANUAL. MIN VENT LENGTH 15 FEET.  
MIN WALL THICKNESS THROUGH WHICH THE VENT/AIR INTAKE  
PIPES MAY PASS IS 2 INCHES AND THE MAX IS 18 INCHES.  
FILTERS MUST BE INSTALLED EXTERNAL TO THE FURNACE CASING.

**THERMO PRODUCTS, LLC.**  
P.O. BOX 217 - NORTH JUDSON, IN 46366

390425-10-5426-00  
1024-1015474-0A

THIS FURNACE MUST BE INSTALLED IN ACCORDANCE WITH THERMO PRODUCTS INSTRUCTIONS AND LOCAL CODES. IN ABSENCE OF LOCAL CODES, FOLLOW THE NATIONAL FUEL GAS CODE - ANSI Z223.1

CETTE FOURNAISE DOIT ÊTRE INSTALLÉE SELON LES INSTRUCTIONS SUR LES PRODUITS THERMO ET LES CODES LOCAUX. EN L'ABSENCE DE CODES LOCAUX, RESPECTER LE NATIONAL FUEL GAS CODE - ANSI Z223.1 - ANSI Z223.1

390003

THIS FURNACE MUST BE INSTALLED SO THERE ARE PROVISIONS FOR VENTILATING AIR.

CETTE CHAUDIÈRE DOIT ÊTRE INSTALLÉE DE MANIÈRE À ASSURER UN AIR DE VENTILATION.

390555

OUTSIDE POWER SOURCE  
CONNECT 115v 60Hz TO  
L1 HOT AND L2 COMMON.

390229

**All installations and services must be performed by qualified service personnel.**

This and the previous page contain reproductions of the various warning and instruction labels placed on the Thermo Pride Condensing Gas Furnaces. Please read and comply with the contents of these labels.

**⚠ WARNING**

This compartment must be closed except when servicing.

**⚠ AVERTISSEMENT**

Ce compartiment doit être fermé sauf pendant l'entretien.

390290

**⚠ WARNING**

Hazardous flue gas.

Can cause personal injury or loss of life.

Inspect rubber hose connecting inducer outlet to PVC tee and all vent system joints for leak free connections before furnace operation.

**⚠ ATTENTION**

Gaz de combustion dangereux.

Peut blesser ou tuer des personnes.

Avant de démarrer la chaudière, inspecter le tuyau en caoutchouc reliant la boîte de sortie de l'évacuateur au T en PVC et tous les joints du système de ventilation pour éliminer les fuites aux raccords.

390586

**CAUTION**

Moving parts. Can cause severe personal injury. Shut off furnace before removing this panel.

Filter maintenance: When it becomes necessary to replace or wash filter remove the dirty filter from the racks provided and wash or replace with identical new filters.

Do not remove this label

**⚠ WARNING**

**FIRE, EXPLOSION AND ASPHYXIATION HAZARD**

Improper adjustment, alteration, service, maintenance or installation can cause serious injury or death. Read and follow instructions and precautions in User's Information Manual provided with this furnace. Installation and service must be performed by a qualified service agency or the gas supplier.

**SPECIAL HOMEOWNERS INSTRUCTIONS**

- For safe operation It is the responsibility of the owner and/or user that the burner, chimney/vent pipe, heat exchanger and controls should be inspected every year by a qualified heating contractor.
- The owner and/or user should also conduct periodic visual inspections. Refer to the users Information manual provided with this furnace for details.
- Any deficiencies noted must be corrected at once by a qualified heating contractor. Do not attempt to make repairs yourself!
- For assistance or additional information consult a qualified installer, service agency or the gas supplier.

**FOR YOUR SAFETY**

- WHAT TO DO IF YOU SMELL GAS:**
1. Do not try to light any appliance.
  2. Do not touch any electrical switch; do not use any phone in your building.
  3. Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
  4. If you cannot reach your gas supplier, call the fire department.

**⚠ WARNING**

**FIRE AND EXPLOSION HAZARD**  
Can result in serious injury or death. Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance. Storage of or use of gasoline or other flammable vapors or liquids in the vicinity of this or any appliance can result in serious injury or death.

**AVERTISSEMENT**

Les pièces mobiles peuvent blesser gravement des personnes. Arrêter la chaudière avant d'enlever ce panneau.

Maintenance des filtres : Quand il le faut, retirer les filtres encrassés de leurs boîtiers, les laver ou les remplacer par des filtres neufs identiques.

No pas enlever cette étiquette

**⚠ ATTENTION**

**RISQUES D'INCENDIE, D'EXPLOSION ET D'ASPHYXIE**

Un mauvais réglage, modification, révision, entretien ou installation peuvent causer des blessures sérieuses ou la mort. Lisez et respectez les instructions et précautions du Manuel d'Information de l'utilisateur fourni avec cette chaudière. L'installation et la révision doivent être réalisées par une agence de service qualifiée ou le fournisseur de gaz.

**INSTRUCTIONS SPÉCIALES POUR LES PROPRIÉTAIRES**

- Pour un fonctionnement en toute sécurité il est de la responsabilité du propriétaire et/ou de l'utilisateur que le brûleur, le tuyau de l'évent ou de la cheminée, l'échangeur de chaleur et les commandes soient inspectés chaque année par un chauffagiste qualifié.
- Le propriétaire et/ou l'utilisateur doivent aussi effectuer des inspections visuelles périodiques. Pour les détails, ils doivent consulter le manuel d'instructions fourni avec la chaudière.
- Toutes les déficiences doivent être corrigées immédiatement par un chauffagiste qualifié. Ne pas essayer de réparer soi-même!
- Pour toute aide ou informations supplémentaires, consulter un chauffagiste qualifié, une entreprise de service ou le fournisseur de gaz.

**POUR VOTRE SÉCURITÉ**

- QUOI FAIRE SI VOUS SENTEZ UNE ODEUR DE GAZ**
1. N'allumez aucun appareil.
  2. Ne touchez aucun interrupteur électrique. N'utilisez aucun téléphone du bâtiment.
  3. Appelez immédiatement votre fournisseur de gaz à partir du téléphone d'un voisin. Suivez les directives de votre fournisseur.
  4. Si vous ne pouvez pas joindre votre fournisseur, appelez les pompiers.

**⚠ AVERTISSEMENT**

**RISQUES D'INCENDIE ET D'EXPLOSION**  
Peuvent entraîner des blessures sérieuses ou la mort. Ne pas stocker ou utiliser d'essence ni autres vapeurs ou liquides inflammables à proximité de cet appareil ou tout autre dispositif. Le stockage ou l'utilisation d'essence ou autres vapeurs ou liquides inflammables à proximité de cet appareil ou tout autre dispositif peut entraîner des blessures sérieuses ou la mort.

390553



**WARNING:** This product can expose you to chemicals, including Chromium, which are known to the state of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).



**AVERTISSEMENT:** Ce produit peut vous exposer à des produits chimiques, y compris le chrome, qui sont connus dans l'état de Californie pour causer le cancer et des malformations congénitales ou d'autres problèmes de reproduction. Pour plus d'informations, visitez [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

390341

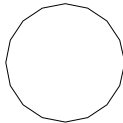
## All installations and services must be performed by qualified service personnel.

This and the previous page contain reproductions of the various warning and instruction labels placed on the Thermo Pride Condensing Gas Furnaces. Please read and comply with the contents of these labels.

### FOR YOUR SAFETY READ BEFORE OPERATING

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

- A. This appliance does not have a pilot. It is equipped with a hot surface igniter that automatically lights the burner. Do **not** try to light the burner by hand.
- B. **BEFORE OPERATING** smell all around the appliance area for gas. Be sure to smell next to the base of unit because some gas is heavier than air and will settle on the floor or ground.  
**WHAT TO DO IF YOU SMELL GAS**  
? Do not try to light any appliance.  
? Do not touch any electric switch; do not use any phone in your building.  
? Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.  
? If you cannot reach your gas supplier, call the fire department.
- C. Use only your hand to move the gas control switch. Never use tools. If the switch will not move by hand, don't try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.
- D. Do not use this appliance if any part has been underwater. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been underwater.



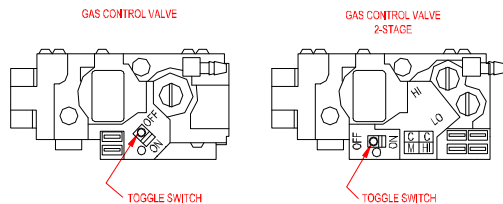
### À LIRE, POUR VOTRE SÉCURITÉ, AVANT DE DÉMARRER LA CHAUDIÈRE

**ATTENTION !** Si vous ne respectez pas exactement les instructions ci-dessous, un incendie ou une explosion pourraient endommager la propriété, blesser ou tuer des personnes.

- A. Cet appareil n'a pas de veilleuse. Il comporte une surface d'allumage chaude qui allume automatiquement le brûleur. **N'essayez pas** d'allumer le brûleur manuellement.
- B. **AVANT DE DÉMARRER** la chaudière, humez l'air autour de l'appareil pour détecter une éventuelle odeur de gaz. Humez aussi l'air près de la base de la chaudière puisque le gaz étant plus lourd que l'air, il pourrait s'accumuler près du sol ou du plancher.  
**QUOI FAIRE SI VOUS SENTEZ UNE ODEUR DE GAZ**  
? N'allumez aucun appareil.  
? Ne touchez aucun interrupteur électrique; n'utilisez aucun téléphone dans l'immeuble.  
? Appelez immédiatement votre fournisseur de gaz à partir du téléphone d'un voisin. Suivez ses instructions.  
? Si vous ne pouvez pas joindre votre fournisseur de gaz, appelez les pompiers.
- C. Manipulez l'interrupteur de commande de gaz seulement à la main. N'utilisez jamais des outils pour cela. Si vous ne pouvez pas manipuler cet interrupteur manuellement, n'essayez pas de le réparer, appelez un technicien de service qualifié. Forcer l'interrupteur ou tenter de le réparer, pourrait provoquer un incendie ou une explosion.
- D. N'utilisez pas la chaudière si l'une de ses pièces a été sous de l'eau. Appelez immédiatement un technicien de service qualifié pour qu'il inspecte la chaudière et remplace toute pièce du système de commande et tout interrupteur de commande de gaz qui ont été sous de l'eau.

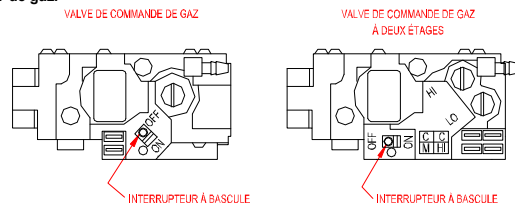
### OPERATING INSTRUCTIONS

1. **STOP!** Read the safety information above on this label.
2. Set the thermostat to the lowest setting.
3. Turn off all electric power to the appliance.
4. This appliance is equipped with a hot surface igniter that automatically lights the burner. Do **not** try to light the burner by hand.
5. Move the gas control switch to the "OFF" position.
6. Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor or ground. If you smell gas, **STOP!** Follow "B" in the safety information above on this label. If you don't smell gas, go to the next step.
7. Move the gas control switch to the "ON" position.
8. Turn on all electric power to the appliance.
9. Set thermostat to desired setting, and, if equipped, set the operating mode to "HEAT".
10. If appliance will not operate, follow the instructions "To Turn Off Gas To Appliance" and call your service technician or gas supplier.



### INSTRUCTIONS POUR LE FONCTIONNEMENT

1. **STOP !** Lisez l'information sur la sécurité au haut de cette étiquette.
2. Réglez le thermostat à sa position la plus basse.
3. Coupez toute l'alimentation électrique la chaudière.
4. Cette chaudière est équipée d'une surface d'allumage chaude qui allume automatiquement le brûleur. **N'essayez pas** d'allumer le brûleur manuellement.
5. Placez l'interrupteur de commande de gaz à la position «OFF».
6. Attendez cinq (5) minutes pour que tout le gaz soit évacué. Humez l'air pour détecter une éventuelle odeur de gaz, sans oublier de l'humer aussi près du sol ou du plancher. Si vous sentez une odeur de gaz, **STOP !** Suivez le point «B» de l'information sur la sécurité au haut de cette étiquette. Si vous ne sentez aucune odeur de gaz, passez à l'étape suivante. Move the gas control switch to the "ON" position.
7. Placez l'interrupteur de commande de gaz à la position «ON».
8. Appliquez toute l'alimentation électrique à la chaudière.
9. Réglez le thermostat à la position désirée et, le cas échéant, mettez le mode de fonctionnement à la position «HEAT».
10. Si la chaudière ne fonctionne pas, suivez les instructions de « **POUR COUPER L'ALIMENTATION EN GAZ DE LA CHAUDIÈRE** » et appelez votre technicien de service ou votre fournisseur de gaz.



### TO TURN OFF GAS TO APPLIANCE

1. Set thermostat to lowest setting, and, if equipped, set the operating mode to "COOL" or "OFF".
2. If service is to be performed, turn off all electric power to the appliance.
3. To turn off gas control valve, remove the burner compartment cover.
4. Move the gas control switch to the "OFF" position.
5. Replace the burner compartment cover.

### POUR COUPER L'ALIMENTATION EN GAZ DE LA CHAUDIÈRE

1. Réglez le thermostat à sa position la plus basse et, le cas échéant, réglez le mode de fonctionnement à la position «COOL» ou «OFF».
2. S'il faut accomplir une certaine tâche, coupez toute alimentation en électricité de la chaudière.
3. Pour fermer la valve de commande de gaz, enlevez le couvercle du compartiment du brûleur.
4. Mettez l'interrupteur de commande de gaz à la position «OFF».
5. Remplacez le couvercle du compartiment du brûleur.

390568

This page contains various warnings and cautions found throughout this Furnace Manual. Please read and comply with the statements below.

**All installations and services must be performed by qualified service personnel.**

The following safety information should be read, understood, and followed by the installer.

1. Use only with type of gas approved for this furnace. Refer to furnace rating plate.
2. Connect this furnace to an approved vent system only. Combustion products must be discharged outdoors. Connect this furnace to an approved vent system only, as specified in section III parts D through H of these instructions.

**⚠WARNING:** *This furnace is not to be used for temporary heating of buildings or structures under construction.*

**⚠CAUTION:** *These high efficiency condensing furnaces are not certified for and shall not be vented into a standard or any type of chimney.*

**⚠WARNING:** *These furnaces may not be common vented with any other appliance.*

**⚠CAUTION:** *The vent and air intake elbows must be kept away from bushes, shrubs or any vegetation that may restrict the flow of flue products. It must also be kept clear of any leaves, weeds or other combustible materials. Keep the vent hood clear of snow. Avoid locating the terminals in areas where standing water or condensate drippage may be a problem.*

**⚠CAUTION:** *Outside combustion air must not come from an area that is directly adjacent to a pool, hot tub or spa. Measures should be taken to prevent the entry of corrosive chemicals or vapors to the combustion and ventilation air supply. Such chemicals include but are not limited to chlorinated and/or fluorinated hydrocarbons such as found in refrigerants, aerosol propellants, dry cleaning fluids, degreasers, bleaches, air fresheners or solvents. Vapors from such products can form acid compounds when burned in a gas flame. Should acid compounds form in your furnace; it may reduce the life of the furnace.*

**⚠WARNING:** *Because of the potential of odorant fade, a gas leak may not be detected by smell. If this furnace is installed below grade, contact your gas supplier for a gas detector.*

**⚠WARNING:** *Turn off power to furnace before it is placed into service. The gas piping system must have been leak tested by a qualified heating contractor.*

**⚠WARNING:** *It may be necessary to purge the air out of the gas line for initial start-up of the furnace after installation. This should be done by a qualified heating contractor. If excessive gas escapes when purging the gas supply at the union, allow the area to ventilate for at least 15 minutes before attempting to start the furnace. LP gas is especially dangerous because the specific gravity of LP gas allows it to accumulate at floor level at a dangerous concentration. For remainder of operating instructions, reference Users Information Manual.*

**⚠WARNING:** *Heat exchanger oil will burn off on initial firing creating an unpleasant odor. To prevent this odor from occurring more than once, it is suggested that:*

1. *A window(s) be opened.*
2. *The thermostat set at highest setting.*



All installations and services must be performed by qualified service personnel.

3. The furnace remain running at conditions 1&2 for 30 minutes or until odor has dissipated

**⚠CAUTION:** These furnace models are a sealed combustion design, which does not require an air shutter adjustment (air shutters are not used) for proper flame characteristics. Burner door must always be closed before operating furnace.

**⚠WARNING:** Personal injury or property damage could result from repair or service of this furnace by anyone other than a qualified heating contractor. Only the homeowner/user routine maintenance described in the Users Information Manual may be performed by the user.

**⚠ WARNING**

ELECTRICAL SHOCK, FIRE OR EXPLOSION HAZARD

Failure to follow safety warnings exactly could result in dangerous operation, serious injury, death, or property damage.

Improper servicing could result in dangerous operation, serious injury, death or property damage.

- Before servicing, disconnect all electrical power to furnace.
- When servicing controls, label all wires prior to disconnecting. Reconnect wires correctly.
- Verify proper operation after servicing.

**⚠ AVERTISSEMENT**

RISQUE DE CHOC ÉLECTRIQUE, D'INCENDIE OU D'EXPLOSION

Le non-respect des avertissements de sécurité pourrait entraîner un fonctionnement dangereux de l'appareil, des blessures graves, la mort ou des dommages matériels.

Un entretein incorrect pourrait entraîner un fonctionnement dangereux de l'appareil, des blessures graves, la mort ou des dommages matériels.

- Couper toute alimentation électrique au générateur d'air chaud avant de prodéder aux travaux d'entretrein.
- Au moment de l'entretrein des commandes, étiquetez tous les fils avant de les débrancher. S'assurer de les raccorder correctement.
- S'assurer que l'appareil fonctionne adéquatement après l'entretrein.

**FURNACE MODEL NO. NOMENCLATURE**

Model Number Digit	1	2	3	4	5	6	7	8	9	10	11	12	13
	Category	Profile	Configuration	Staging	Version		Input	Input	Input	Motor Type	Clg Airflow Cap	Clg Airflow Cap	Gas Type
Gas Furnace Model Nomenclature Example Model Numbers	C	L	Q	S	1	-	0	5	0	T	3	6	N
C = Condensing	C												
L = Low-profile		L											
Q = Quadpoise			Q										
Stage: S = Single, X = 2-Stage				S									
Version (Rev)					1								
Input Capacity in MBTUH (1000)						-	0	5	0				
Motor Type: T = CTM, E = ECM										T			
Cooling Airflow Capacity in MBTUH (1000)											3	6	
Gas Type: N = Natural, P = Liquid Propane													N

All installations and services must be performed by qualified service personnel.

## II. FURNACE SPECIFICATIONS

### A. CLQS1 SERIES (Single Stage, Constant Torque Blower Motor)

MODEL NO.	CLQS1-050T	CLQS1-075T	CLQS1-100T	CLQS1-125T
<b>BTU/Hr INPUT</b>	50,000	75,000	100,000	125,000
<b>BTU/Hr OUTPUT</b>	48,000	73,000	96,000	120,000
<b>HT. OF CASING</b>	34-1/2"	34-1/2"	34-1/2"	34-1/2"
<b>WIDTH OF CASING</b>	17-1/2"	21"	21"	24-1/2"
<b>DEPTH OF CASING</b>	28-1/2"	28-1/2"	28-1/2"	28-1/2"
<b>WARM AIR OUTLET</b>	16-1/2 x 20	20 x 20	20 x 20	20 x 20
<b>RETURN AIR INLET</b>	25 x 16	25 x 16	25 x 16	25 x 16
<b>DIA. OF FLUE</b>	2"	2"	3"	3"
<b>DIA. OF COMBUSTION AIR INTAKE</b>	2"	2"	3"	3"
<b>CFM @ 0.2" &amp; 0.5" w.c. STATIC</b>	0.2" - 0.5"	0.2" - 0.5"	0.2" - 0.5"	0.2" - 0.5"
<b>@HI SPEED (BLACK)</b>	1360 - 1193	1531 - 1368	1762 - 1547	2047 - 1882
<b>@MH SPEED (YELLOW)</b>	1167 - 1000	1379 - 1210	1558 - 1391	1813 - 1617
<b>@MED SPEED (BLUE)</b>	987 - 797	1189 - 982	1416 - 1229	1710 - 1513
<b>@ML SPEED (PURPLE)</b>	827 - 610	1133 - 933	1357 - 1186	1553 - 1330
<b>@LO SPEED (RED, HEATING)</b>	672 - 420	1025 - 800	1178 - 976	1444 - 1180
<b>TEMPERATURE RISE</b>	60	60	60	60
<b>BLOWER MOTOR HP</b>	1/2	1/2	3/4	3/4
<b>NO. OF SPEEDS</b>	5	5	5	5
<b>LARGEST RECOMMENDED AIR CONDITIONER</b>	3 Ton	3.5 Ton	4 Ton	5 Ton
<b>SIZE OF FILTERS</b>	24-3/4" x 15-3/4"	24-3/4" x 15-3/4"	24-3/4" x 15-3/4"	24-3/4" x 19-3/4"

NOTES:

1. BTU output based on annual fuel utilization efficiency rated by manufacturer.
2. On all outlet and inlet dimensions, the first dimension is width.
3. Electrical characteristics at 120 volts, 60 Hz., 1 phase (less than 15 amps. for all models).

NOTES:

1. BTU output based on annual fuel utilization efficiency rated by manufacturer.
2. On all outlet and inlet dimensions, the first dimension is width.
3. Electrical characteristics at 120 volts, 60 Hz., 1 phase (less than 15 amps. for all models).
4. All specifications are subject to change without notice.

All installations and services must be performed by qualified service personnel.

**B. INSTALLATION PARTS PACKAGES - CLOS1**

<b>PARTS PACKAGE #S00S4566/4567/ 4568/4569</b>	<b>DESCRIPTION</b>	<b>PART #</b>	<b>QUANTITY</b>
	#10-32 x 1/2 green ground screw	300109	1
	#10-32 hex nut	300110	1
	Wire nut	300132	2
	#8 x 1/2 TEK screws for mounting J-box	300208	18
	3/16" dia. star washer	300270	1
	#8 x 3/4 TEK screws for mounting trap	300283	2
	Spring clamp, 11/16"	300299	6
	Adapter, 1/2" CPVC X PVC	320833	1
	Trap Assembly	320928	1
	Grommet for 2" PVC flue pipe	350007	1
	Grommet for 1/2" gas pipe	350009	1
	J-box wire bushing	350016	1
	2 x 4 electrical J-box cover	350020	1
	2 x 4 electrical J-box	350024	1
	Hose clamp for coil outlet tubing	300306	1
	Thermostat wire busing	350750	1
	Flange for 2" PVC air intake	614524	1
S00S4566	LP Gas Conversion Kit (050)	AOPS7746	1
S00S4567	LP Gas Conversion Kit (075)	AOPS7747	1
S00S4568	LP Gas Conversion Kit (100)	AOPS7748	1
S00S4569	LP Gas Conversion Kit (125)	AOPS7749	1
	Installation notice	MG-966	1
S00S4568/4569	Tubing 5/16 OD	410061	20"
	Tubing 11/16 OD	410060	44"
	Barbed elbow 1/2"	320285	2
	Washer gasket, adhesive backed	330395	2
	Formed drain hose, 3" (Tube-A)	410102	1
	Formed drain hose, 18" (Tube-B)	410103	1
	Formed drain hose, 20" (Tube-C)	410104	1
S00S4567	Limit shield, 1.00"	614567	1

<b>PLENUM ANGLE PACKAGE</b>	<b>S00S4580 (050)</b>	<b>S00S4581 (075)</b>	<b>S00S4582 (100)</b>	<b>S00S4583 (125)</b>
<b>DESCRIPTION</b>				
Plenum angle, front	14587 1	14587 1	14587 1	14587 1
Plenum angle, side	14586 2	14586 2	14586 2	614611 2
Plenum angle, rear	14586 1	14586 1	14610 1	14610 1
Plenum angle, side (counterflow)	-	-	-	614612 2
Plenum adapter angle (coil cabinet)	614618 2	-	-	-
Instruction sheet	MG-1058 1	MG-1058 1	MG-1058 1	MG-1058 1

**All installations and services must be performed by qualified service personnel.**

### **III. GENERAL INSTALLATION**

Install this furnace only in a location and position as specified in Section III of these instructions.

This furnace may be installed in an Upflow, Downflow or Horizontal configuration. However it is critically important to make the prescribed changes for each configuration as detailed in this manual for safe and proper operation.

This furnace is equipped with orifices size for operation with natural gas. For conversion to Propane Gas see instruction in Gas Conversion Section of this manual.

These Category Type IV furnaces are shipped completely assembled and wired (internally). See the Dealer Receiving and Freight Claim Procedure Section of the price guide for parts shortage or damage. The furnace and duct system must be adjusted to obtain a temperature rise of 45°F to 75°F through the furnace after installation. The recommended minimum return air temperature is 55°F. Always install furnace to operate within the furnace's intended temperature rise range with a duct system which has an external static pressure within the allowable range, as specified in Section III of these instructions. See furnace rating plate. The installation must conform with local codes, or in the absence of local codes, with the National Fuel Gas Codes (ANSI Z223.1 or latest edition), and these instructions.

***⚠WARNING: This furnace is not to be used for temporary heating of buildings or structures under construction.***

Many of the chemicals used during construction, when burned, form acid bearing condensate that can substantially reduce the life of the heat exchanger.

It is recommended that a commercially available CO alarm be installed in conjunction with any fossil fuel burning appliance. The CO alarm shall be installed according to the alarm manufacturer's installation instructions and be listed in accordance with the latest edition of the UL Standard for Single and Multiple Station Carbon Monoxide Alarms, UL 2034, or the CSA International Standard, Residential Carbon Monoxide Alarming Devices, CSA 6.19.

**NOTICE:** The Thermo Pride emblem is shipped loose with the Installation and Operation manual. The installer should affix the emblem to the burner door as shown in Figure-101.

#### **A. CODES AND CLEARANCES**

The following items must be considered when choosing the size and location of the furnace.

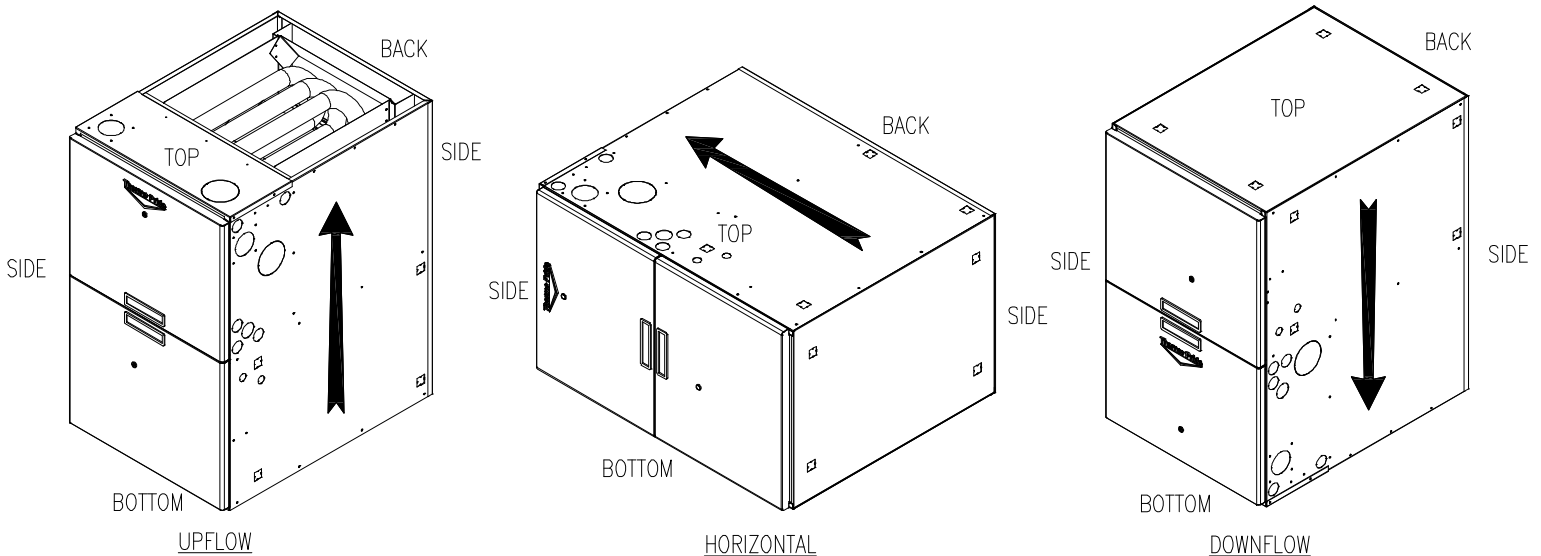
1. All local codes and/or regulations take precedence over the instructions in this manual and should be followed accordingly. In the absence of local codes, installation must conform with these instructions, regulations of the National Fire Protection Association, provisions of National Electrical Code (ANSI/NFPA70 or latest edition), and the National Fuel Gas Code (ANSI Z223.1 or latest edition).

**All installations and services must be performed by qualified service personnel.**

2. The BTU output capacity of the furnace proposed for installation should be based on a heat loss calculation made according to the manuals provided by the Air Conditioning Contractors of America (ACCA) or ASHRAE.
3. MINIMUM CLEARANCES TO COMBUSTIBLE MATERIALS

	UPFLOW	DOWNFLOW	HORIZONTAL
CABINET TOP	1 IN	0 IN	0 IN
CABINET SIDES	0 IN	0 IN	1 IN
CABINET BACK	0 IN	0 IN	0 IN
CABINET BOTTOM	0 IN	NON-COMBUSTIBLE BASE REQUIRED	0 IN
CABINET FRONT	6 IN	6 IN	6 IN
PLENUM TOP	1 IN	0 IN	5/8 IN
PLENUM SIDES	5/8 IN	5/8 IN	1 IN
PLENUM BACK	5/8 IN	5/8 IN	5/8 IN
PLENUM BOTTOM	0 IN	1 IN	5/8 IN
PLENUM FRONT	5/8 IN	5/8 IN	5/8 IN
VENT	0 IN	0 IN	0 IN

**TABLE 1**



**Figure 101**

The furnaces may be installed on combustible flooring as an Upflow or Horizontal a Non-combustible base is required in the Downflow configuration. The furnace shall not be installed directly on carpeting or other combustible material other than wood flooring. These furnaces may be installed in an alcove or in a closet if the minimum clearances to combustible construction (listed previously) are met. The minimum clearances are listed for fire protection. Clearance for servicing the front of the furnaces and to all points on the furnace requiring access must be 24”.

**Equipment must be installed in accordance with regulations of the National Board of Fire Underwriters. Authorities having jurisdiction should be consulted before installations are made.**

**All installations and services must be performed by qualified service personnel.**

## **B. FURNACE LOCATION**

***⚠CAUTION:*** *These high efficiency condensing furnaces are not certified for and shall not be vented into a standard or any type of chimney.*

The following shall be considered for locating the furnace:

1. For best performance locate the furnace so that it is centralized with respect to the duct system and as near as possible to a floor drain since condensate drainage must be provided.
2. Place the unit so that proper venting can be achieved, with a minimum number of elbows, in accord with the instructions in this manual.
3. The furnace must be located on a level, dry surface. The furnace must be installed so that the electrical components are protected from water. If the area becomes wet or damp at times, the furnace should be raised above the floor using a concrete base, bricks, patio blocks, etc.

**NOTICE:** **Ensure furnace is level after installation to ensure proper drainage and operation.**

4. This furnace must be connected to a drain in accordance with these instructions. If it is not practical to connect the unit to a drain, a condensate pump must be used and can be ordered as an accessory, part number 350224. If an acid neutralizer kit is required by local code or the customer, it is available under part number 320095.
5. A Furnace installed in a residential garage must be installed so the burner and ignition source are located higher than 18 inches above the floor. Also, the furnace must be located or protected to avoid physical damage by vehicles.
6. A gas fired furnace for installation in a residential garage must be installed as specified in Section III of these instructions.

## **C. REPLACING EXISTING FURNACE FROM A COMMON VENT**

***⚠WARNING:*** *These furnaces may NOT be common vented with any other appliance.*

## **D. GENERAL REQUIREMENTS FOR QUADPOISE CONFIGURATIONS**

1. UPFLOW (as delivered)
  - a. Install plenum adapters (4) provided.
2. DOWNFLOW
  - a. Do not install plenum adapters to the warm air outlet of the furnace. They will not be used.

**All installations and services must be performed by qualified service personnel.**

- b. Dual pressure switch assembly **MUST** be relocated to the blower deck using screws/holes provided.
- c. If furnace is installed on a combustible floor, a non-combustible base must be used.
- d. Pressure switch tubing to the coil outlet **MUST** be moved to the bottom ¼” port of the coil outlet. On CLQS1-100T48N & CLQS1-125T60N models the 16” long tubing installed from the factory **MUST** be replaced with the 20” piece provided in the parts package. Move ¼” cap to the unused coil outlet port.
- e. Limit shield for CLQS1-075T42N **MUST** be changed from factory installed 1.1875” length to 1.00” length shield provided in the parts package.

**3. HORIZONTAL LEFT**

- a. Install plenum adapters (4) provided.
- b. Aux limit on the blower housing **MUST** be moved to the motor side using the short bracket pre-installed on blower housing.
- c. Dual pressure switch assembly **MUST** be relocated to the blower deck using screws/holes provided.
- d. Pressure switch tubing to the coil outlet **MUST** be moved to the bottom ¼” port of the coil outlet. On CLQS1-100T48N & CLQS1-125T60N models the 16” long tubing installed from the factory **MUST** be replaced with the 20” piece provided in the parts package. Move ¼” cap to the unused coil outlet port.

**4. HORIZONTAL RIGHT**

- a. Install plenum adapters (4) provided.
- b. Inducer **MUST** be removed, rotated 180° & re-installed so that vent pipe exits cabinet thru the top.

5. If inducer is to be rotated, first remove front channel into which the doors snap. Then remove inducer, rotate 180° and reinstall. Then reinstall the front door channel being sure to align the front edge with the front edge of the side casings. Remove yellow cap from rubber drain and move to its top port. Remove the clear internal support from rubber drain and move to its bottom port.

6. Apply adhesive backed foam washers onto condensate tubing at the exit of the cabinet to seal the gap created between tubing and knockout.

**E. GENERAL REQUIREMENTS FOR VENTING**

The furnace venting system must be installed by a qualified service person in accordance with local installation codes and these instructions. In the absence of applicable local codes, conform to the National Fuel Gas Code, NFPA 54 /ANSI Z223.1-2002, or latest edition thereof.

**All installations and services must be performed by qualified service personnel.**

Provide adequate combustion and ventilation air to the furnace space as specified in Section III parts D through H.

Installation shall, at least, conform to the following requirements.

1. The exhaust vent / combustion air intake terminations specified by Thermo Products, in this manual, shall be used. Both exhaust vent / combustion air intake are to be taken from out of doors.
2. All plastic pipe and pipefittings sourced to complete the exhaust vent and air intake systems shall be constructed of rigid PVC (polyvinyl chloride) thermoplastic. All components shall have a wall thickness equivalent to Schedule 40 series materials.

In addition, all sourced PVC components shall be listed by a nationally recognized testing agency (e.g. NSF, UL, etc.) as conforming to one (1) or more of the following design standards.

<u>PVC Pipe Designation</u>	<u>Design Standard</u>
Cellular Core	ASTM-F891
DWV (Drain-Waste-Vent)	ASTM-D2665
Schedule 40	ASTM-D1785

3. The exhaust vent pipe and combustion air pipe shall be at least as large as the exhaust vent / air intake pipe specified by Thermo Products. **Size reduction is never permissible.** The required exhaust vent / air intake pipe sizes are:
  - **2-inch PVC thermoplastic pipe, for models CLQS1–050/075**
  - **3-inch PVC thermoplastic pipe, for models CLQS1–100/125**
4. All horizontal runs of exhaust vent pipe shall slope upward at least ¼ inch per foot from the internal connection inside the furnace to the vent termination, beyond the outside wall. This slope will permit proper drainage of the condensate.

Horizontal runs of air intake pipe shall slope downward at least ¼ inch per foot from the outlet of the last elbow or last horizontal run, before exiting the wall, to the intake termination beyond the outside wall. This slope will permit proper drainage of any precipitation that enters the intake pipe.

5. The exhaust vent pipe shall be supported at every joint (no more than 4-feet between supports) to prevent pipe blockage due to condensate trapped at a local low point, or sag, in the vent system.
6. The **maximum permissible length of piping** (consisting of a combination of straight pipe and a corresponding number of elbows) permitted is:



All installations and services must be performed by qualified service personnel.

**Venting Thru Side Wall**

	Flue Terminated w/Elbow	Flue Terminated w/Tee	Concentric Vent	Side Wall Cap
CLQS1-050T36N	50'	75'	50'	50'
CLQS1-075T42N	50'	75'	50'	50'
CLQS1-100T48N	50'	75'	50'	50'
CLQS1-125T60N	50'	75'	50'	50'

**Venting Thru Roof**

	Flue Terminated - Vertical Pipe	Flue Terminated w/Tee	Concentric Vent	Side Wall Cap
CLQS1-050T36N	75'	x	75'	x
CLQS1-075T42N	75'	x	75'	x
CLQS1-100T48N	75'	x	75'	x
CLQS1-125T60N	75'	x	75'	x

x = Not Used

**TABLE 2**

- When counting pipe elbows, this includes all elbows, or equivalent pipefittings, used inside the furnace jacket in addition to those used to construct the termination. Each 90° elbow is the equivalent of 5 feet of pipe length. Furthermore, two (2) 45° elbows can be substituted for one (1) 90° elbow.

Care should be taken to design the shortest possible intake and exhaust systems. Each system should contain as few elbows as possible to insure the satisfactory operation of the furnace. However, system length should never be less than 5 ft of pipe with two (2) 90 deg. elbows. This is separate from the elbows used at the termination and those inside the furnace cabinet.

- Use a saw designed to cut thermoplastic pipe. All cuts should be made at right angles to the pipe wall. Smooth jagged edges and remove all burrs and strings. **All pipe joints must utilize standard PVC Schedule 40 series, DWV type elbows, couplings, and fittings.** Clean all pipe surfaces at connections using a fine abrasive material or approved PVC cleaner (primer). Secure all pipe joints using suitable permanent PVC pipe solvent cement. Joints are **NOT** to be made by simply gluing raw edges of butted together vent pipe.

Piping joints inside the furnace vestibule should be sealed with silicone caulk, rather than pipe cement, to allow for disassembly and removal of piping, if necessary, during maintenance.

**All installations and services must be performed by qualified service personnel.**

Seal the vent installation by caulking the gap around the two (2) holes where the thermoplastic pipes pass through the wall.

**NOTICE: Use silicone caulk to seal the Combustion Air pipe as it passes through the 2” Intake Air Flange.**

9. Vent connections shall be checked for leakage with the furnace running. Use a mild soap and water solution to check for leaks.
10. Vent pipe passing through an unheated space shall be insulated with 1-inch thick, foil-faced fiberglass insulation, or equivalent, to prevent freezing of condensate within the pipe.
11. No clearance is required from the outer surface of the thermoplastic piping to combustible materials for fire hazard prevention.
12. Thermo Products does not require screens be installed in the exhaust vent and air intake piping. However, optional stainless steel screens are available from Thermo Products, under part no. 320226 for 3” vent and 320219 for 2” vent.

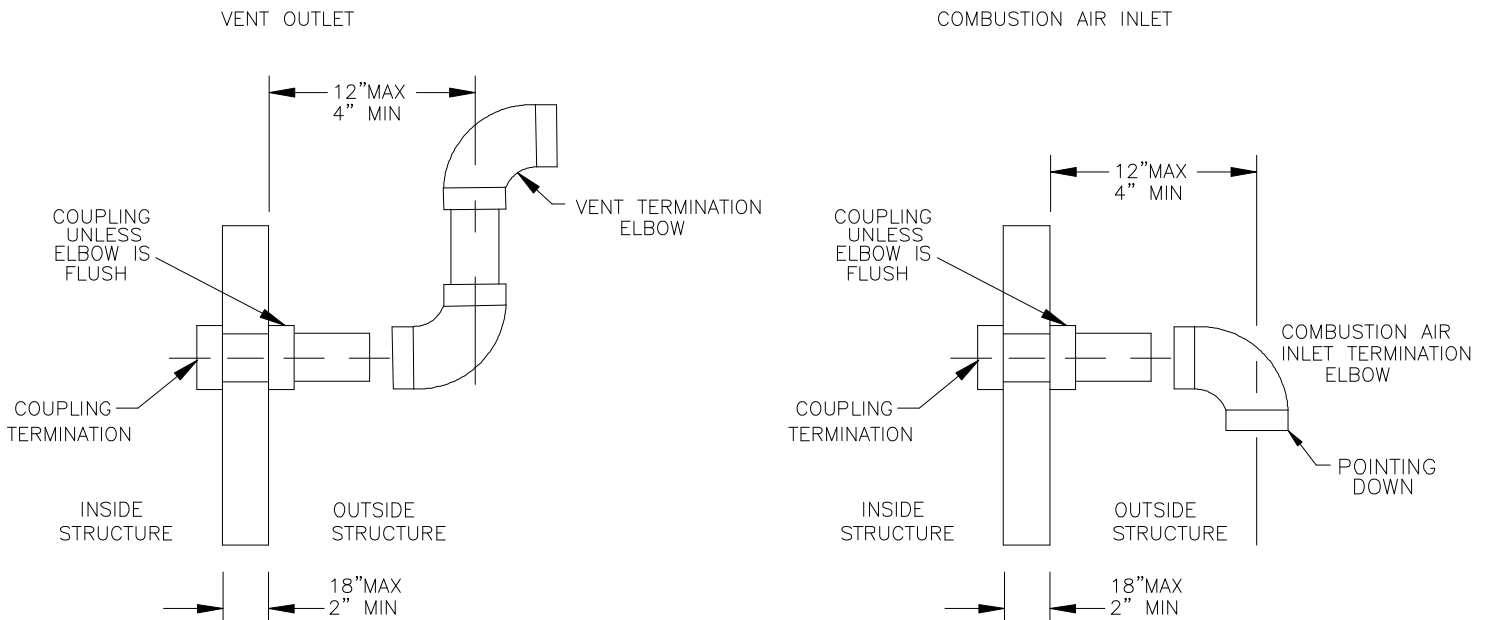
**NOTICE: The furnace may be vented either through the sidewall or the roof.** For sidewall instructions, continue to the following section. For roof venting, refer to Section III G, of this manual

All installations and services must be performed by qualified service personnel.

## F. SIDEWALL VENTING

**NOTICE:** If the furnace has an overall equivalent vent length of 50 feet or less, it may use the sidewall termination described in Section 1. If the vent length is greater than 50 feet, up to the max length allowed, these units should use the termination described in Section 5 for a sidewall termination.

1. Vent and combustion air pipes may pass through a maximum wall thickness of 18 inches. The minimum wall thickness is 2 inches. Referring to Figure 1, the maximum distance from the outer wall to the center of the elbow is 12 inches.



**Figure 1: Proper Direct Vent Terminations**

**NOTICE:** If exterior sidewall building materials are subject to degradation from contact with flue gases or moisture, a minimum 24-inch diameter shield shall be fabricated from stainless steel or UV-resistant plastic sheet. The protective shield shall be installed around the vent pipe on the outside wall.

2. The exhaust vent termination elbow shall be installed in accordance with these instructions and any applicable local codes. Refer to Figures 1 and 2 for typical examples of proper terminations.
  - a. The exhaust vent termination must be installed in the same atmospheric pressure zone (i.e. on the same wall) as the air intake termination.
  - b. The bottom edge of the vent termination elbow must be installed at least 12-inches above the outlet of intake termination elbow.
  - c. The horizontal distance between the inlet and exhaust terminations should be minimized, when possible, and should never exceed 24-inches.

All installations and services must be performed by qualified service personnel.

- d. The vent and intake systems should utilize the same numbers of elbows and approximately the same length of straight pipe to reach the outside termination.

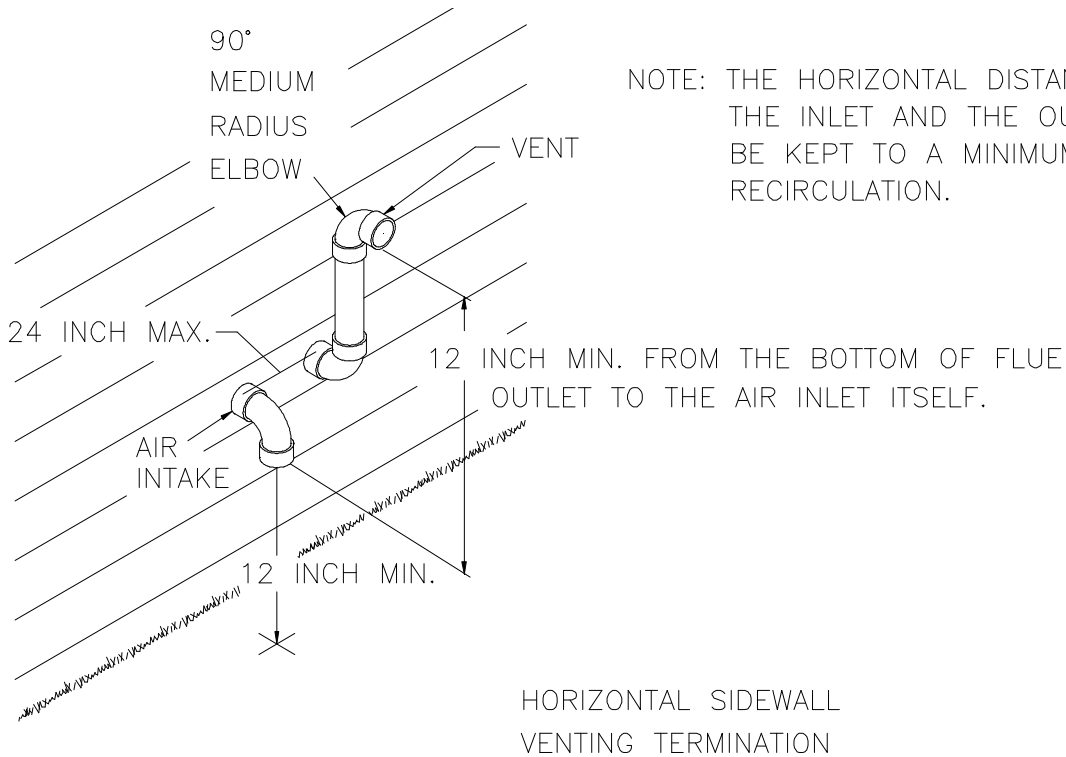
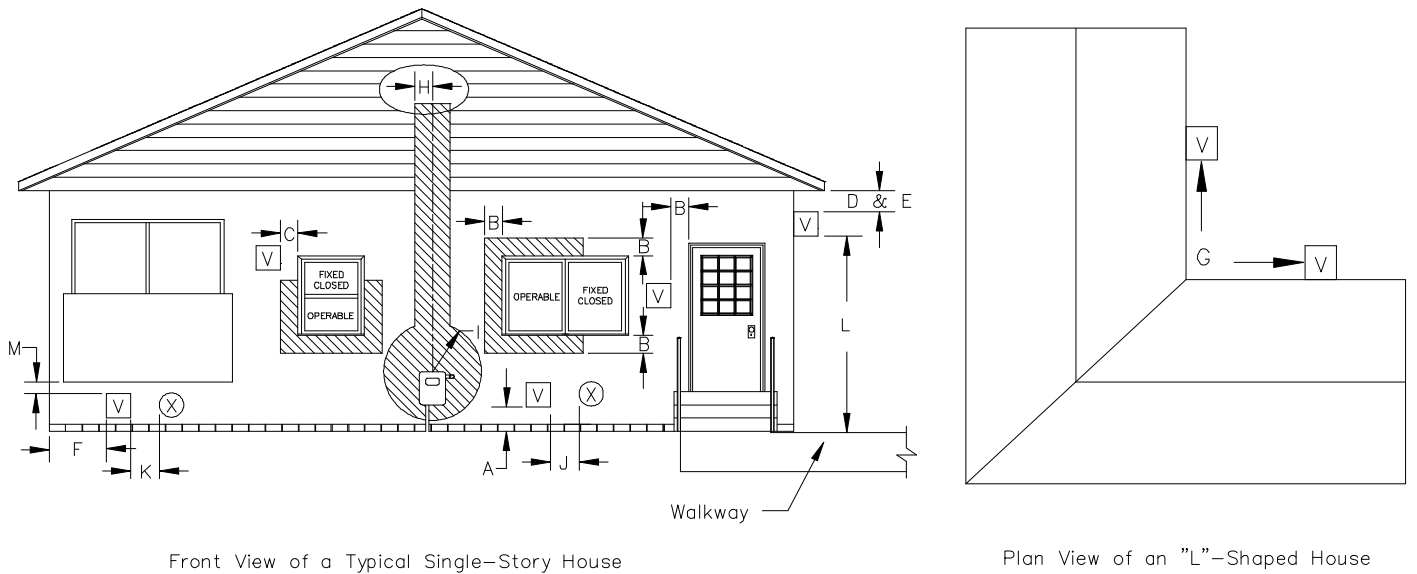


Figure 2: Typical Relative Locations of Direct Vent Terminations When Sidewall Venting

### 3. Exhaust Vent Terminal Location Clearance Requirements

- a. The vent terminal shall be located at least 3-feet above any forced air inlet located within 10-feet. Refer to Figure 3 for a depiction of the minimum required clearances between vent terminations and building features according to the National Fuel Gas Code (NFGC).
- b. The vent terminal shall be at least 12-inches below, 12-inches horizontally from, or 12-inches above, any door, window, or gravity air inlet into a building. The bottom of the vent terminal shall be located at least 12-inches above grade.
- c. The vent terminal shall **not** be located:
- over public walkways or over an area where wetting of surfaces by condensate, or water vapor, could create a nuisance or hazard,
  - near soffit vents, crawl space vents, or other areas where condensate or water vapor could create a nuisance, hazard, or cause property damage,
  - where wetting of components by condensate, or water vapor, could be detrimental to the operation of pressure regulators, relief valves, or any other equipment.
- d. The vent terminal shall be installed a minimum of 14-inches from any obstruction and 3-feet from an inside corner of an L-shaped structure.

**All installations and services must be performed by qualified service personnel.**



**LEGEND**

V = Vent terminal  
X = Air supply inlet  
  = Vent terminal installation prohibited within this region

<u>Dimension</u>	<u>Clearance Definition</u>	<u>Requirement for US Installations*</u>
A	Distance above grade, veranda, porch, deck, or balcony	12 inches
B	Distance to window or door that may be opened	12 inches
C	Distance to permanently closed window	12 inches ***
D	Distance to ventilated soffit located above the terminal within a horizontal distance of 2 feet from the centerline of the terminal	24 inches ***
E	Distance to unventilated soffit	24 inches ***
F	Distance to outside corner	24 inches ***
G	Distance to inside corner	3 feet ***
H	Distance to each side of centerline extended above meter/regulator assembly	4 feet ***
I	Distance to service regulator vent outlet	4 feet ***
J	Distance to nonmechanical air supply inlet to building or the combustion air inlet to any other appliance	12 inches
K	Distance to mechanical air supply inlet	3 feet above, if within 10 feet horizontally
L	Distance above paved sidewalk or paved driveway located on public property	7 feet ****
M	Distance below veranda, porch, deck, or balcony	24 inches ***

\* In accordance with the current edition of the National Fuel Gas Code, ANSI Z223.1/NFPA 54.

\*\*\* Clearance in accordance with local installation codes, the requirements of the gas supplier, and the manufacturer's installation instructions.

\*\*\*\* In direct vent applications, clearance in accordance with local installation codes, the requirements of the gas supplier, and the manufacturer's installation instructions.

**Figure 3: NFGC Minimum Clearances Between the Vent Terminal and Various Building Features**

All installations and services must be performed by qualified service personnel.

#### 4. Vent Terminal Location Guidelines

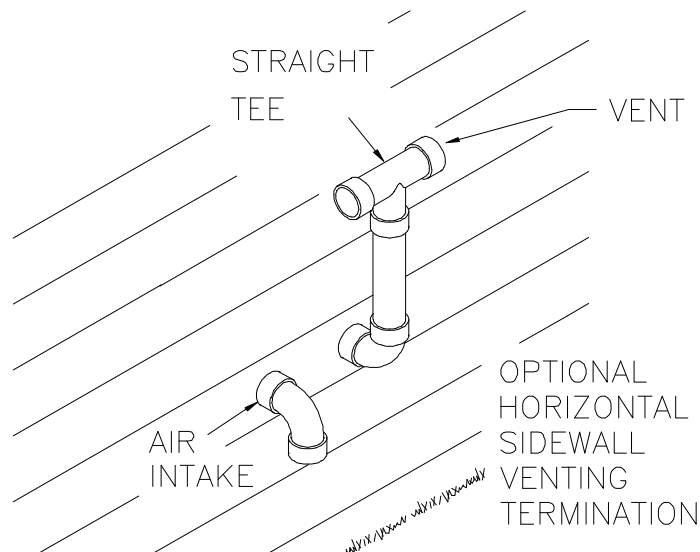
**⚠CAUTION:** *Bushes, shrubs, or any vegetation that may restrict the flow of flue products must be kept away from vent and air intake terminations. Terminations must also be kept clear of any leaves, weeds, combustible materials, snow, and ice build-up. Avoid locating the vent terminal over areas where dripping of condensate, or small pools of acidic condensate, could create a problem.*

In addition to following any local code requirements, when possible, utilize the guidelines below in locating the vent terminal to help insure trouble-free operation of a sidewall vented furnace:

- Avoid locating the vent terminal on a wall facing prevailing winds and wide-open areas. When impractical, choose a location that protects the vent from strong winds, such as behind a fence or hedge.
- In geographical areas with considerable snowfall, it is advisable to locate the vent terminal much higher than the minimum 12-inches above ground to prevent blockage by snow accumulation or drifting.
- The vent and combustion air terminations shall be checked periodically, at least at the start of each heating season, for restriction or blockage from foreign material in the exhaust vent or in the air intake piping. Clean the air intake and vent terminations when necessary.

**NOTICE:** When using this termination method the furnace is susceptible to a nuisance shut off due to high winds blowing directly into the vent and changing the internal pressure enough to activate a safety pressure switch. It is best practice to locate the vent so that prevailing winds do not blow directly into the open vent termination.

#### 5. Alternate Vent Termination for Wind Gusts in Excess of 25 MPH



**Figure 4: Optional Termination**

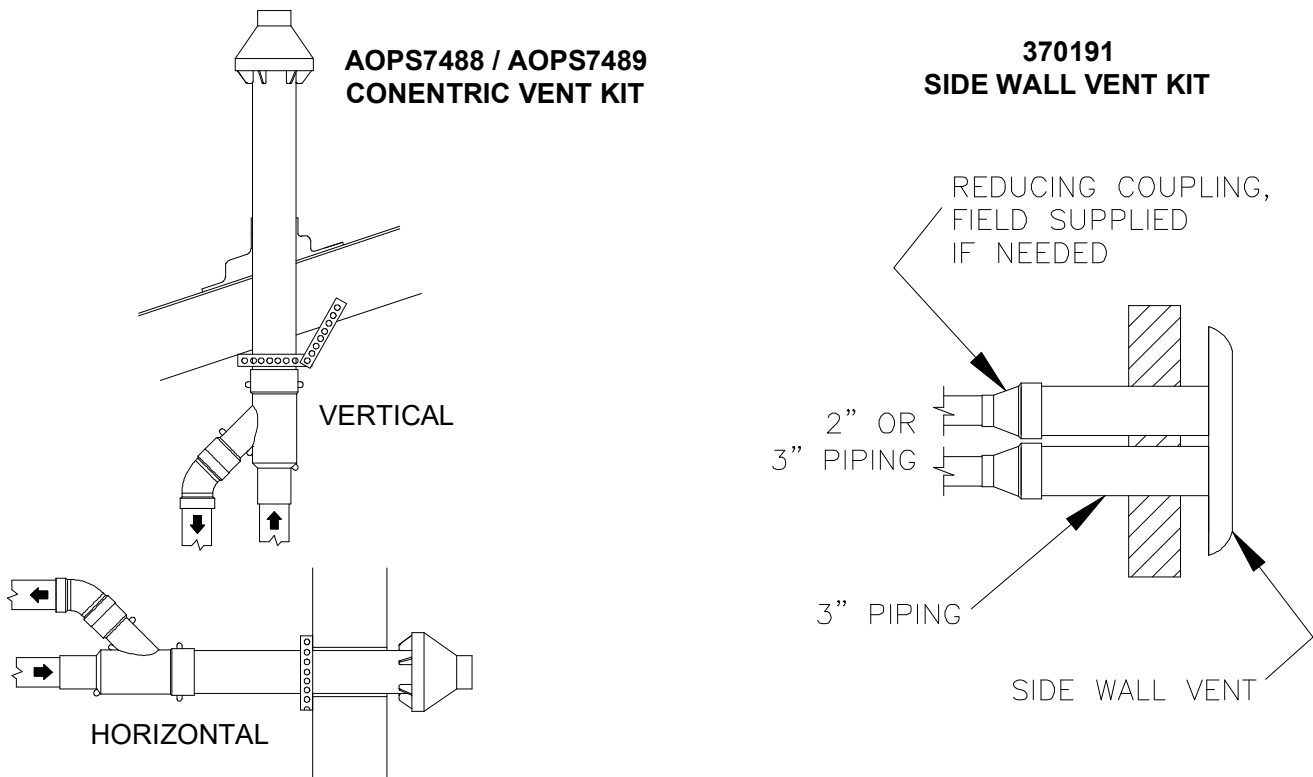
**All installations and services must be performed by qualified service personnel.**

If the exhaust vent is to be installed in a location which may be exposed to winds blowing directly at the vent termination, this alternate configuration should be used. All previous venting instructions still apply, with the exception that the elbow on the exhaust vent termination is replaced with a straight tee. A sanitary tee may be used if a straight tee is unavailable, but optimal performance is achieved with a straight tee. The air intake remains unchanged.

**6. Optional Direct Vent Terminations**

Three optional vent kits are available for direct vent terminations, refer to Figure 5.

- The concentric vent kits (Thermo Products p/n AOPS7488 & AOPS7489) provide a means for the vent and intake to be installed through a single opening in the roof or exterior wall. Kit p/n AOPS7488 is used on furnace models CLQS1-50 & 75. Kit p/n AOPS7489 is used on furnace models CLQS1-100 & 125.
- The sidewall vent cap (Thermo Products part no. 370191) is a cover installed over the exhaust vent and air intake pipes on the exterior of the building. For horizontal sidewall vent applications only. This kit may be used on any size furnace in the CLQS1 family.



**Figure 5: Optional Direct Vent Kits for the CLQS1 Model Series of Furnaces**

**All installations and services must be performed by qualified service personnel.**

Install these optional kits according to the instructions provided with each kit. In horizontal or side wall installations. The location and clearance requirements are identical to those of the standard vent terminations described in this manual.

**NOTICE:** When using these alternate termination kits the furnace is more susceptible to a nuisance shut off due to high winds blowing directly into the vent and changing the internal pressure enough to activate a safety pressure switch. It is best practice to locate the vent so that prevailing winds do not blow directly into the open vent termination.

**G. CONNECTING FURNACE TO ROOF VENT / INTAKE TERMINATIONS**

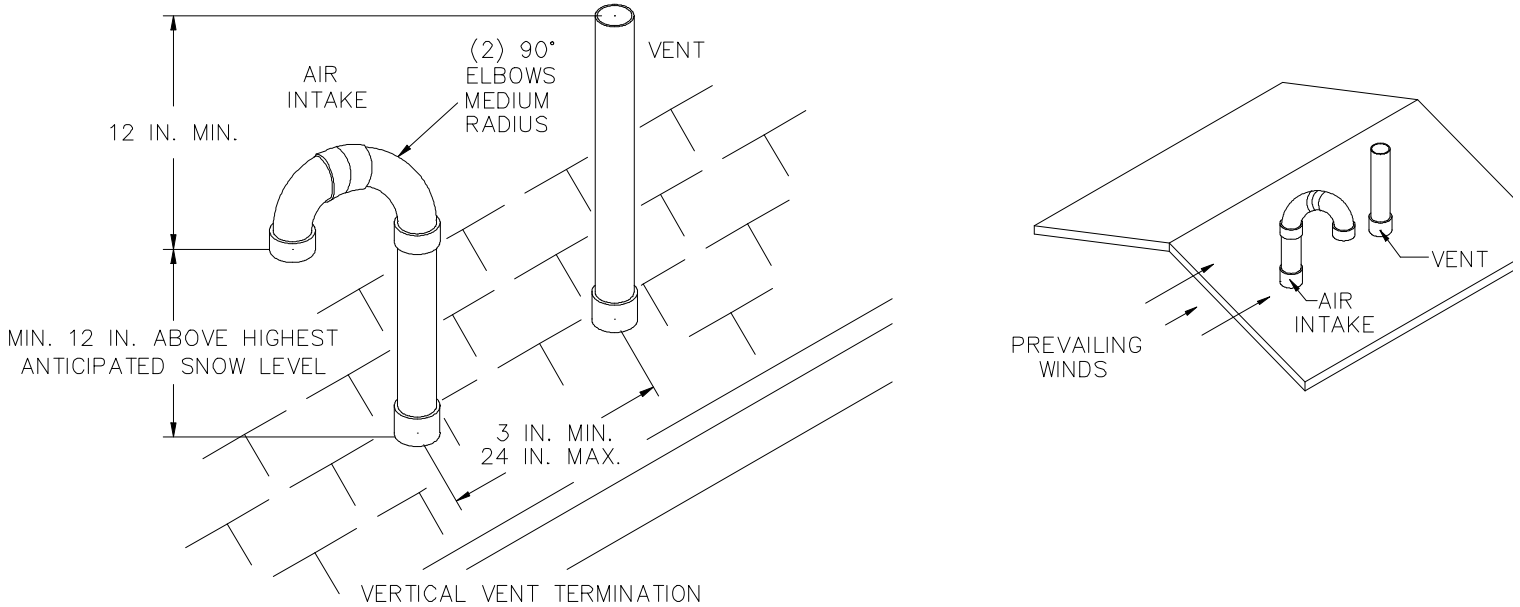
If it is not desirable, or feasible, to vent the furnace through a sidewall, it may be vertically vented through the roof. Installation shall conform to the following guidelines, which are illustrated in Figure 6, below.

1. The outlet of the exhaust vent and the inlet of the combustion air intake, i.e. the terminations, shall be a minimum of 12-inches above highest anticipated snow level.
2. The exhaust vent outlet must be installed a minimum of 12-inches above the air intake inlet.
3. Where exposed to prevailing winds, the combustion air intake shall be installed upwind of the vent outlet.
4. The exhaust vent and combustion air intake shall be a minimum of 3-inches and a maximum of 24 inches apart.



All installations and services must be performed by qualified service personnel.

**NOTICE:** When the vent termination is installed correctly, a draft should NOT be present in the system during the furnace off-cycle.



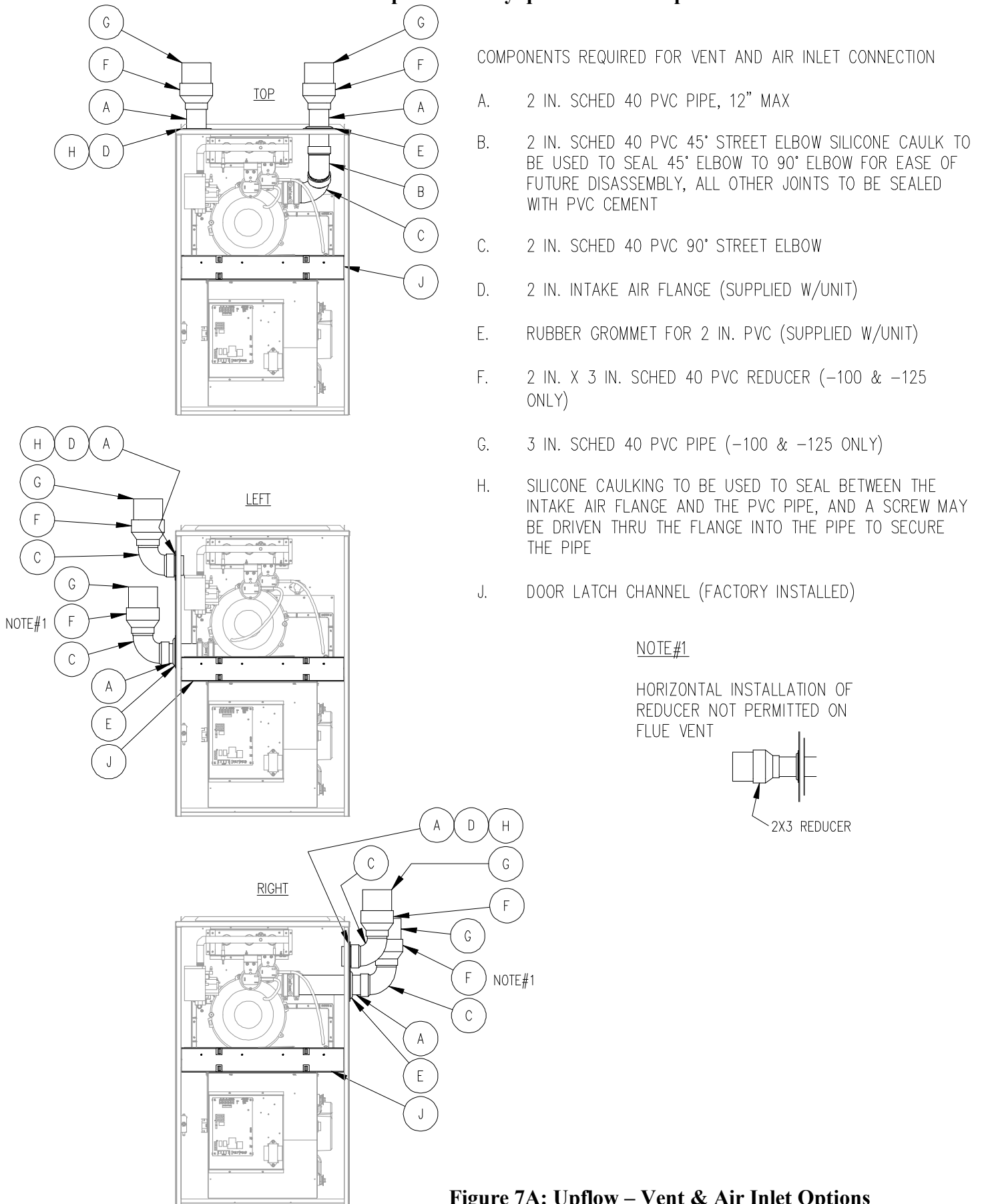
**Figure 6: Typical Rooftop Vent and Air Intake Termination Construction Details**

## H. CONNECTING FURNACE TO VENT / INTAKE TERMINATIONS

1. Figure 7A-D depict typical exhaust vent and air intake connections for the furnace model series CLQS1, as well as a list of required parts to correctly install each system.

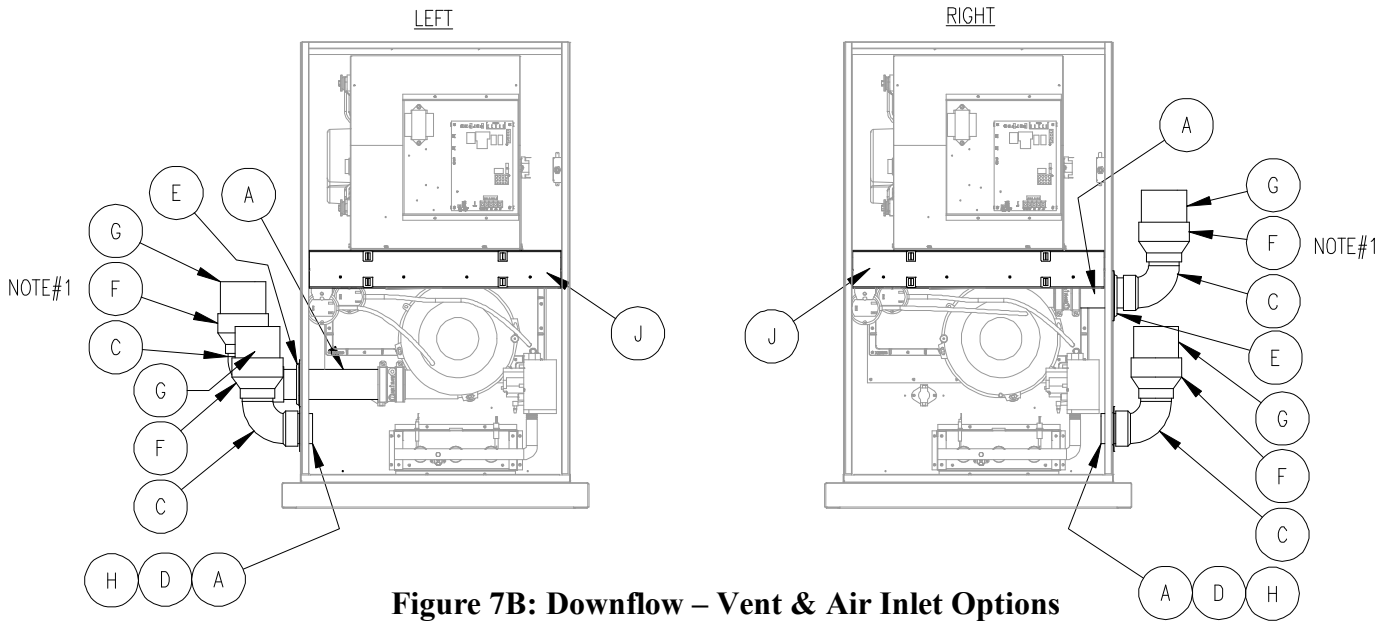
For the -100 & -125 models, which require 3-inch PVC pipe, there will still be a short section of 2-inch PVC pipe & fittings at the furnace, as the grommet and intake flange are both sized for 2-inch. The length of 2-inch PVC pipe between the furnace cabinet and the 2-inch x 3-inch reducer fitting must be kept to a minimum. The maximum length of that 2-inch PVC pipe should be 12 inches.

**All installations and services must be performed by qualified service personnel.**

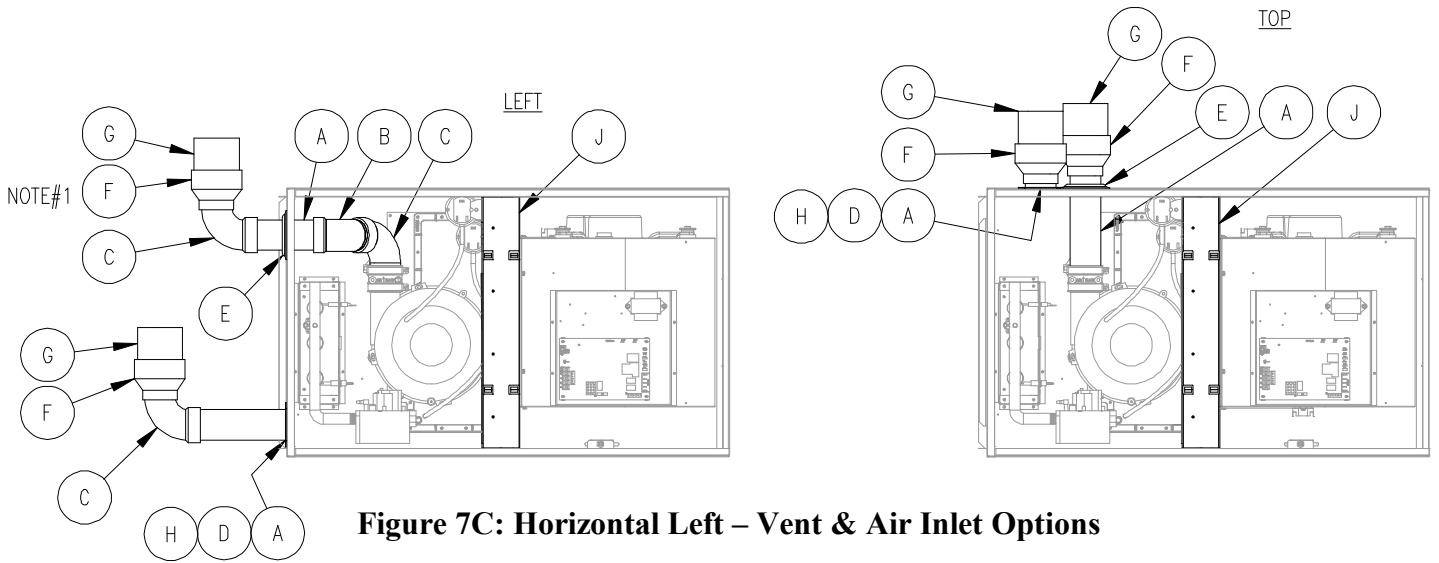


**Figure 7A: Upflow – Vent & Air Inlet Options**

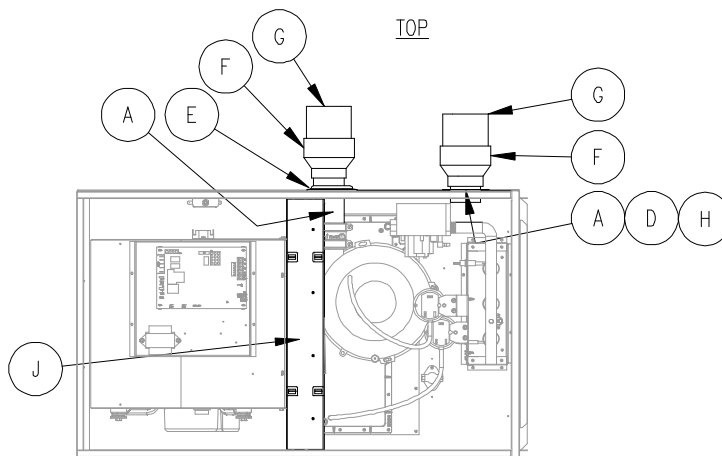
**All installations and services must be performed by qualified service personnel.**



**Figure 7B: Downflow – Vent & Air Inlet Options**



**Figure 7C: Horizontal Left – Vent & Air Inlet Options**



**Figure 7D: Horizontal Right– Vent & Air Inlet Options**

**All installations and services must be performed by qualified service personnel.**

2. Connecting The Exhaust Vent To The Inducer

- a. The Exhaust Vent piping may exit the furnace thru either of several locations as depicted in Figures 7A-D. Upon selection of the location to exit the furnace, cut out the appropriate knock-out and install the rubber grommet provided. The grommet should be installed from the inside so that the insulation is captured between the flange of the grommet and the metal panel. All PVC connections inside the cabinet should be sealed with silicone caulk to enable easy disassembly for future repairs.
- b. If the Vent is going through the Top panel in an Upflow configuration, connect a 2-inch 90° PVC street elbow to the flexible drain adapter already installed on the inducer blower. Tilt the street elbow so it is installed at a 45° angle from the vertical. Tighten the worm clamp on the flexible drain adapter to seal and hold the elbow in place. Then connect a 2-inch 45° PVC street elbow to the previously installed elbow so that it points up toward the top panel. Now a section of 2-inch PVC pipe can be installed through the rubber grommet in the top panel into the 45° street elbow. A similar configuration may be used with a Horizontal Left configuration to allow the flue to exit the cabinet toward the side.
- c. If the Vent is going thru the Left side panel of an Upflow configuration, remove the Door Latch Channel and its 4 screws. Then remove the Inducer Blower and the 4 nuts & washers which attach it. The Inducer Blower should then be rotated 180° and re-installed. Do not over-tighten the 4 nuts which attach the inducer, as that may cause the inducer's internal blower wheel to rub. Replace the 5/16" ID tubing which ran from the inducer to the pressure switch. Now re-install the Door Latch Channel and its mounting screws. The flexible drain adapter that was factory installed on the exit of the inducer must be retained at the exit of the inducer. Now a section of 2-inch PVC pipe can be installed through the rubber grommet in the left panel into the flexible drain adapter. Tighten the worm clamp on the flexible drain adapter to seal and hold the PVC pipe in place. Rotation of the inducer is similar in Downflow and Horizontal configurations, if it is necessary to redirect the flue piping.

**NOTICE:** The flexible drain adapter has an arrow indicating the direction of flow. It must be installed with the arrow pointing toward the PVC pipe for the drain function to work properly.

- d. If the Vent is going thru the Right side panel of an Upflow configuration, merely install a section of 2-inch PVC pipe through the rubber grommet in the right panel into the flexible drain adapter. Tighten the worm clamp on the flexible drain adapter to seal and hold the PVC pipe in place. Connection is similar in Downflow or Horizontal configurations

3. Connecting The Combustion Air Intake Piping

**⚠CAUTION:** *Outside combustion air must NOT be drawn from an area directly adjacent to a pool, hot tub or spa. Measures should be taken to prevent the entry of corrosive chemicals or vapors into the combustion air supply. Such chemicals include but are not limited to chlorinated and/or fluorinated hydrocarbons such as found in refrigerants, aerosol propellants, dry cleaning fluids, degreasers, bleaches, air fresheners or solvents. Vapors from such products can form reactive acid producing chemical species when burned in a gas flame.*

**All installations and services must be performed by qualified service personnel.**

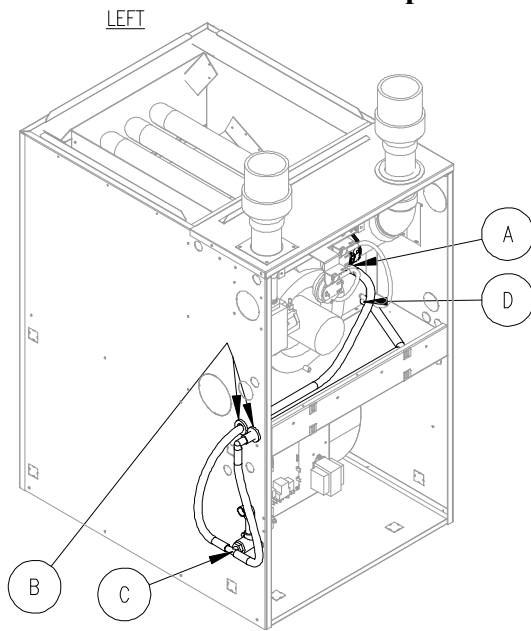
*Should acidic compounds form in the furnace they may significantly reduce the useful life of the furnace.*

- a. The Combustion Air Intake piping may enter the furnace thru either the top, left or right side as depicted in Figure 7A-D. Upon selection of the location to exit the furnace, cut out the appropriate knock-out and install the Intake Air Flange provided using 4 self-tapping screws.
- b. A section of 2-inch PVC pipe should then be inserted into the Intake Air Flange, using silicone caulk to seal the pipe to the flange. The pipe may protrude into the furnace up to 1 inch past the flange. For increased rigidity, a self-tapping screw may be installed thru the flange into the PVC pipe.

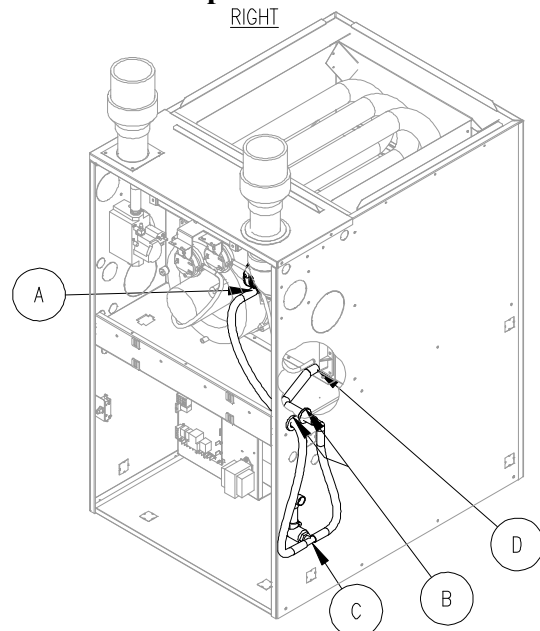
## **I. CONDENSATE DRAIN LINE & TRAP ASSEMBLY**

1. The following diagrams depict typical condensate drain and trap connections for the furnace models series CLQS1, refer to the illustrations in Figures 8A-G.

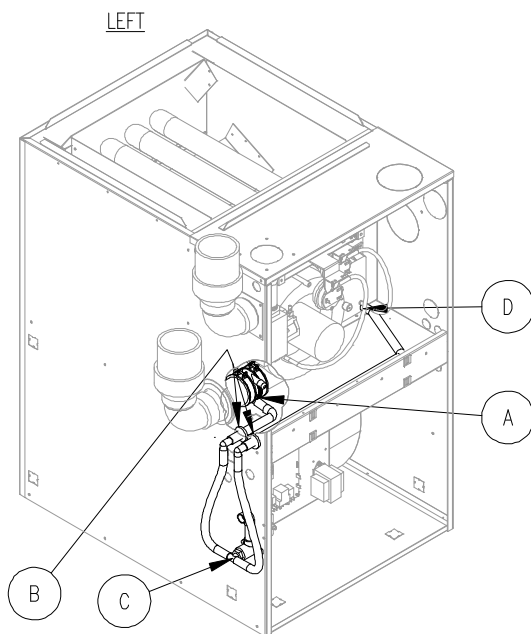
**All installations and services must be performed by qualified service personnel.**



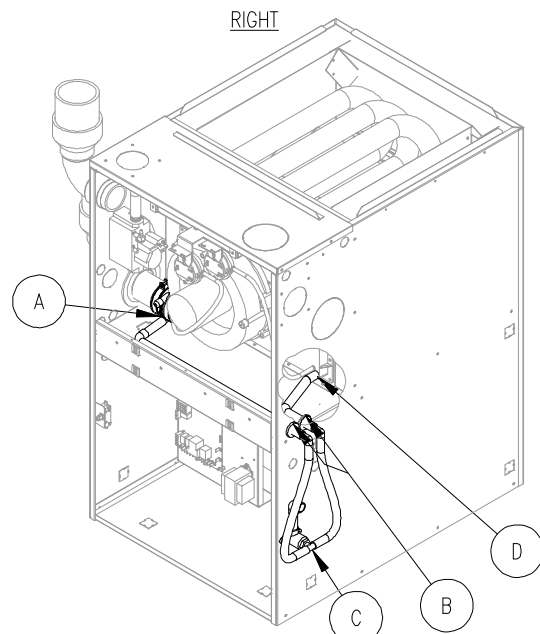
**Figure 8B**



**Figure 8A**



**Figure 8D**



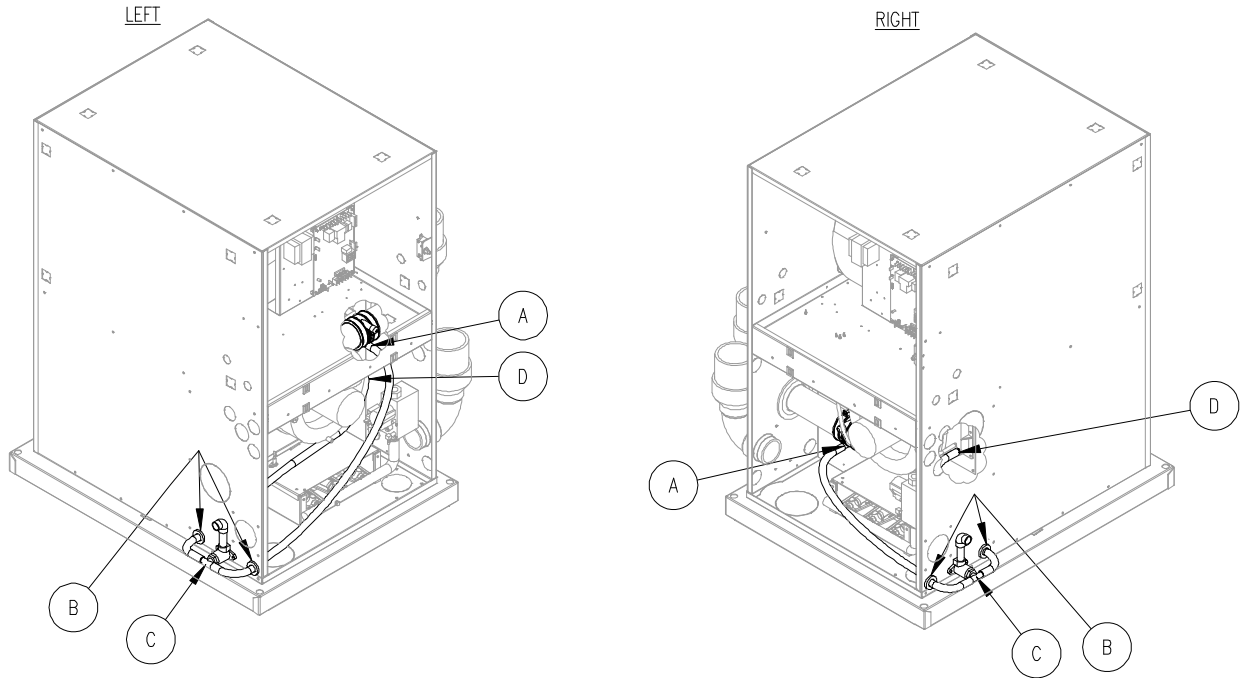
**Figure 8C**

**Upflow– Condensate Trap Options**

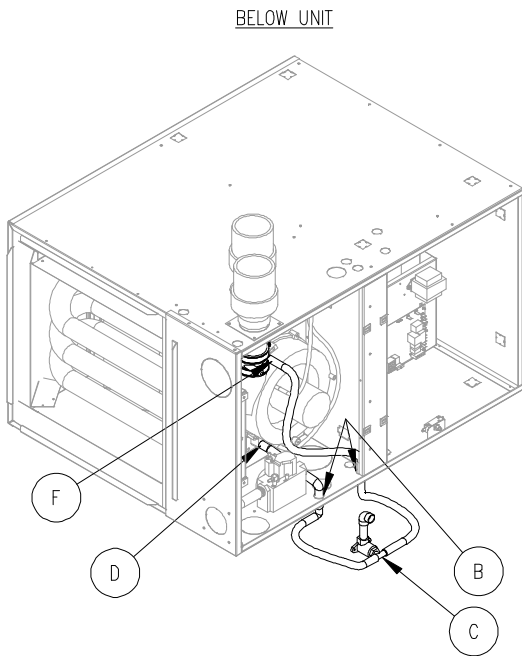
COMPONENTS REQUIRED FOR CONDENSATE TRAP CONNECTION

- A. LOWER PORT OF FLEXIBLE DRAIN ADAPTER
- B. ADHESIVE BACKED FOAM WASHER (SUPPLIED WITH UNIT)
- C. CONDENSATE TRAP (SUPPLIED WITH UNIT)
- D. DRAIN PORT OF COIL FRONT COVER
- F. RIGHT PORT OF FLEXIBLE DRAIN ADAPTER

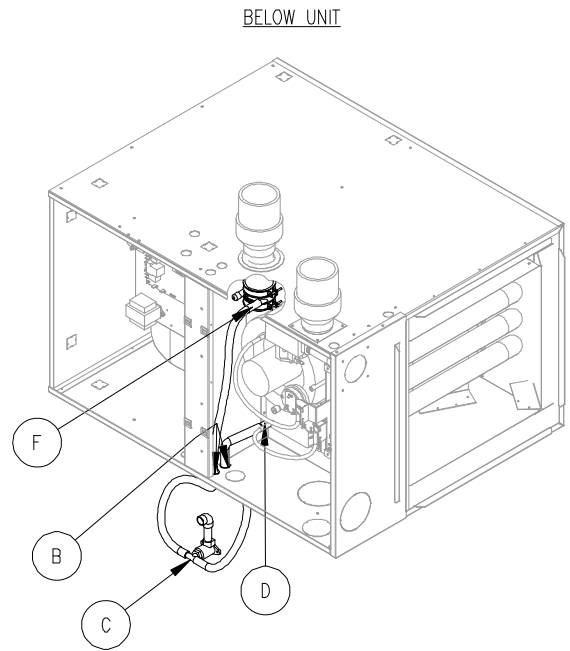
All installations and services must be performed by qualified service personnel.



**Figure 8E: Downflow- Condensate Trap Options**



**Figure 8F: Horizontal Left-  
Condensate Trap Options**



**Figure 8G: Horizontal Right-  
Condensate Trap Options**

**All installations and services must be performed by qualified service personnel.**

2. UPLFLOW (as delivered)

**If Inducer points Right and condensate exits Right, see figure 8A.**

- a. Attach black tube labeled “A” to the bottom port of the coil outlet. The end of the tube with the label “A” should be installed on the coil outlet and the other end should be horizontal. On CLQS1-100T48N & CLQS1-050T36N models, trim tube “A” so that approximately 1” of tubing extends thru the cabinet. Attach the barb elbow to end of tube “A” and attach a piece of clear flexible tubing to the barb, leading to the drain trap.
- b. Attach clear flexible tubing to the rubber drain at the exit of the inducer and exit cabinet using the remaining knockout. Connect to drain trap and trim excess as necessary.

**If inducer points Right and condensate exits Left, see figure 8B.**

- a. Attach tube “C” to the bottom port of the coil outlet. The end of the tube with label “C” should be installed on the coil outlet and the other end should be horizontal. On CLQS1-075T42N & CLQS1-050T36N models, trim tube “C” so that approximately 1” of tubing extends thru the cabinet. Attach the barb elbow to the end tube “C” and attach a piece of clear flexible tubing to the barb, leading to the drain trap.
- b. Attach clear flexible tubing to the rubber drain at the exit of the inducer and exit cabinet using the remaining knockout. Connect to drain trap and trim excess as necessary.

**If inducer points Left and condensate exits Right, see figure 8C.**

- a. Remove inducer, rotate 180° and reinstall. Remove yellow cap from rubber drain and move to its top port. Remove the clear internal support from rubber drain and move to its bottom port.
- b. Attach black tube labeled “A” to the bottom port of the coil outlet. The end of the tube with the label “A” should be installed on the coil outlet and the other end should be horizontal. On CLQS1-100T48N & CLQS1-050T36N models, trim tube “A” so that approximately 1” of tubing extends thru the cabinet. Attach the barb elbow to end of tube “A” and attach a piece of clear flexible tubing to the barb, leading to the drain trap.
- c. Loosen rubber drain clamp at the exit of inducer and attach tube “B” to the bottom port. The end of the tube with the label “B” should be installed on the rubber drain and the other end should be horizontal. Rotate rubber drain so that it points slightly downward, in line with tube “B”, and tighten clamp. On CLQS1-100T48N & CLQS1-050T36N models, trim tube “B” so that approximately 1” of tubing extends thru the cabinet. Attach the barb elbow to end of tube “B” and attach a piece of clear flexible tubing to the barb, leading to the drain trap.

**If inducer points Left and condensate exits Left, see figure 8D.**

- a. Remove inducer, rotate 180° and reinstall. Remove yellow cap from rubber drain and move to its top port. Remove the clear internal support from rubber drain and move to its bottom port.



**All installations and services must be performed by qualified service personnel.**

b. Attach tube “C” to the bottom port of the coil outlet. The end of the tube with the label “C” should be installed on the coil outlet and the other end should be horizontal. On CLQS1-075T42N & CLQS1-050T36N models, trim tube “C” so that approximately 1” of tubing extends thru the cabinet. Attach the barb elbow to the end of the tube “C” and attach a piece of clear flexible tubing to the barb, leading to the drain trap.

c. Trim approximately 1” from the small diameter end of the black tube labeled “B”. Loosen rubber drain clamp at the exit of inducer and attach tube “B” to the bottom port. The end of the tube with the label “B” should be installed on the rubber drain and the other end should be horizontal. Rotate rubber drain so that it points slightly downward, in line with tube “B”, and tighten clamp. Trim tube “B” so that approximately 1” of tubing extends thru the cabinet. Attach the barb elbow to end of tube “B” and attach a piece of clear flexible tubing to the barb, leading to the drain trap.

3. DOWNFLOW, see figures 8E.

a. Clear condensate tube to the coil outlet must be moved to the bottom ½” port of the coil outlet. Move 1/2” cap to the unused coil outlet port.

b. Clear condensate tube to the rubber drain at the exit of the inducer must be moved to the bottom port of the drain. The plastic internal tube support must also be moved to the bottom port of the drain.

Condensate lines exit thru the cabinet on left or right, & must slope down to the trap at every point.

c. Black condensate tubing will not be used.

4. HORIZONTAL LEFT, see figure 8F.

a. Attach tube “C” to the bottom port of the coil outlet. The end of the tube with the label “C” should be installed on the coil outlet and the other end should be vertical. On CLQS1-075T42N & CLQS1-050T36N models, trim tube “C” so that approximately 1” of tubing extends thru the cabinet. Attach the barb elbow to the end of tube “C” and attach a piece of clear flexible tubing to the barb, leading to the drain trap. Move 1/2” cap to the unused coil outlet port.

b. Attach clear flexible tubing from rubber drain at the exit of the inducer thru the cabinet to the drain trap.

**NOTICE:** Condensate trap must be installed at least 2-1/2” below furnace.

5. HORIZONTAL RIGHT, see figure 8G.

a. Inducer must be removed, rotated 180° & re-installed so that vent pipe exits cabinet thru the top.

b. Attach black tube labeled “A” to the bottom port of the coil outlet. The end of the tube with the label “A” should be installed on the coil outlet and the other end should be vertical. On CLQS1-100T48N & CLQS1-050T36N models, trim tube “A” so that approximately 1” of tubing extends thru

**All installations and services must be performed by qualified service personnel.**

the cabinet. Attach the barb elbow to end of tube “A” and attach a piece of clear flexible tubing to the barb, leading to the drain trap.

c. Attach clear flexible tubing from rubber drain at the exit of the inducer thru the cabinet to the drain trap.

**NOTICE:** Condensate trap must be installed at least 2-1/2” below furnace.

6. Additional Requirements

Apply adhesive backed foam washers onto condensate tubing at the exit of the cabinet to seal the gap created between tubing and knockout.

If the condensate trap is not primed at the time the furnace is powered up, the furnace will run and eventually produce enough condensate to cause the furnace to shut off. At that time the condensate will flow out of the heat exchanger into the trap and the furnace will restart, resuming normal operation.

**NOTICE:** In all configurations, condensate drain tubing must be installed with continuous slope down to the trap. Failure to do so will cause water to back into the furnace and prevent proper operation. Damage to furnace and the creation of hazardous exhaust may occur.

**CAUTION: Do not bypass pressure switches. They are critical safety features. If a pressure switch functions, check for blockage. Do not circumvent pressure switches.**

7. Plan, source, and install a condensate drain line using ½ inch diameter CPVC (chlorinated polyvinyl chloride) thermoplastic pipe and pipefittings. In the event ½ inch PVC is preferred, a CPVC to PVC adapter is included in the parts kit provided with the furnace. Route the line in the shortest possible manner to reach a nearby drain. Secure all joints using cement. For gravity drainage, the condensate drain line must maintain a minimum ¼ inch per foot downward slope toward the drain. The drain line must be watertight, supported, and secured such that it cannot be easily moved.

**NOTICE:** If an air conditioning condensate drain line is combined with the furnace condensate drain line, the air conditioning evaporator coil must have a separate trap installed ahead of the connection joint.

8. A condensate pump may be required when,

- a suitable drain is not present,
- the drain is above the trap outlet level on the furnace, or
- the drain line cannot be sloped downward its full length to the drain.

9. **CAUTION: Continual exposure to condensate may injure plants and damage certain building materials, including many metals, wood, stone, and concrete.**

**All installations and services must be performed by qualified service personnel.**

Flue gas condensate is slightly acidic with a pH of about 3.5. (A pH level of 7.0 is considered neutral. Carbonated cola drinks with a pH of 3.1 are actually slightly more acidic than condensate.) If local codes require an acid neutralizing kit, a kit is available from Thermo Products under part no. 320095. Follow the instructions enclosed with the neutralizing kit for proper installation.

10. The condensate piping in the furnace and the drain system should be flushed out at the start of every heating season. This will ensure trouble free operation and will keep the acidity level well above a pH of 3.4, i.e. more towards neutral.

To flush the condensate drain system, follow these steps.

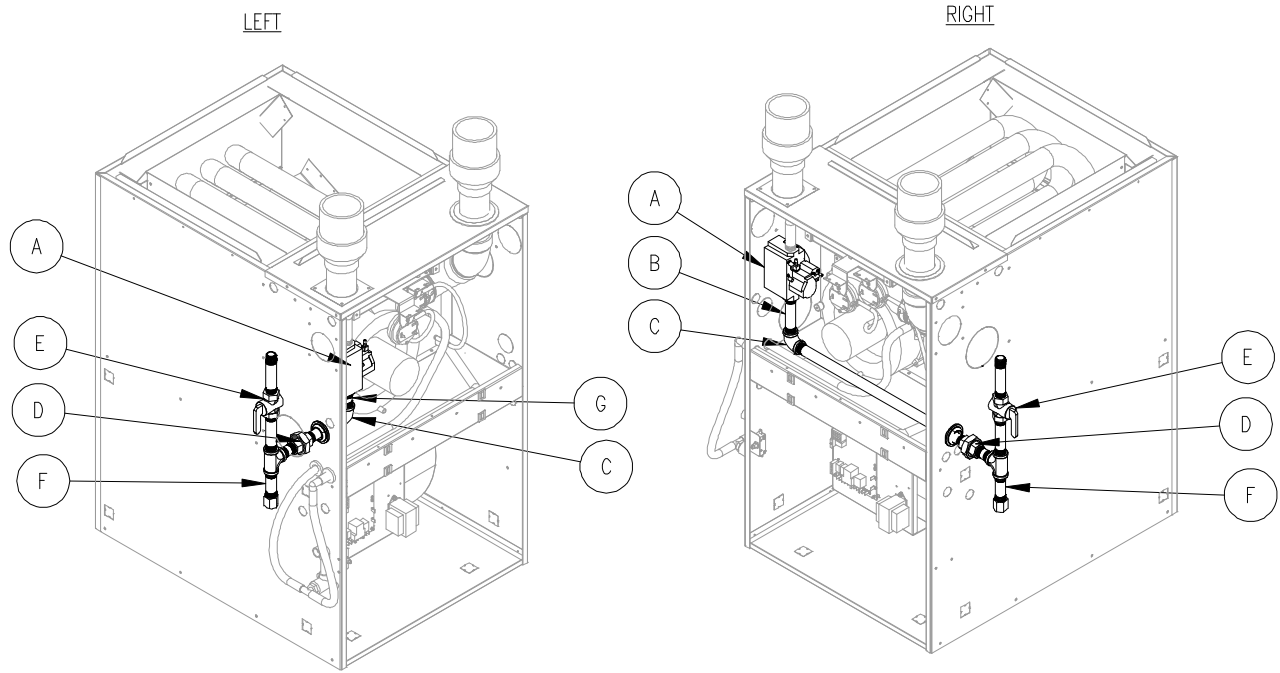
- a. Turn off electrical power to the furnace at the disconnecting switch and adjust the room thermostat to “OFF”, or to the lowest temperature setting.
- b. Flush the drain system by removing the drain hose from the Coil Front Cover of the secondary heat exchanger and running tap water into the open end of the tubing. Run at least a quart of water through the drain system, until the water leaving the drain system is clear and free of any particulate matter.
- c. Replace the drain tubing by pushing it firmly onto the nipple. Make sure the spring-type hose clamp is returned to the original position to prevent leaks.
- d. If any of the electrical controls are inadvertently wetted during the flushing process, dry them with a soft cloth and wait 24 hours before operating the furnace.
- e. Adjust the room thermostat to the “HEAT” position, or to the desired temperature, and restore electrical power to the furnace.

## **J. GENERAL GAS PIPING**

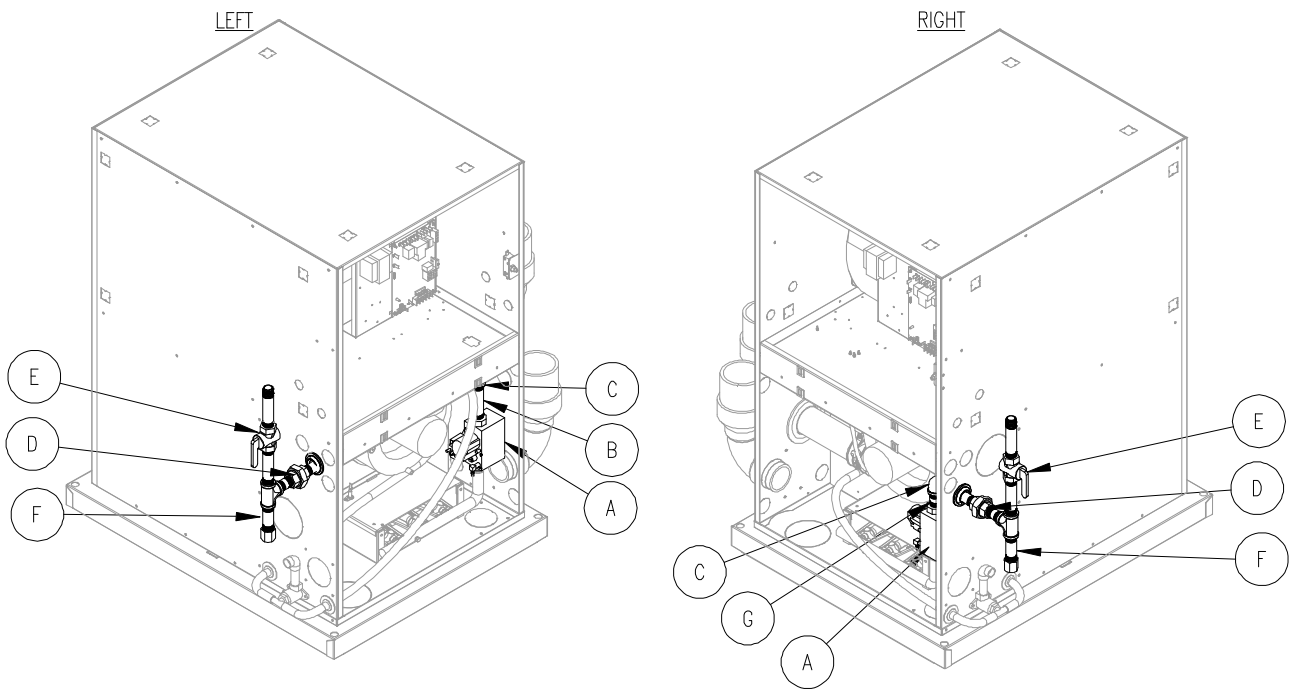
***⚠WARNING: Because of the potential of odorant fade, a gas leak may not be detected by smell. If this furnace is installed below grade, contact your gas supplier for a gas detector.***

1. Left and right gas supply piping - These furnaces are set-up to be gas piped through either the left or right side by using a nipple, elbow and a straight pipe.

**All installations and services must be performed by qualified service personnel.**



**Figure 10A: Upflow– Gas Piping Options**

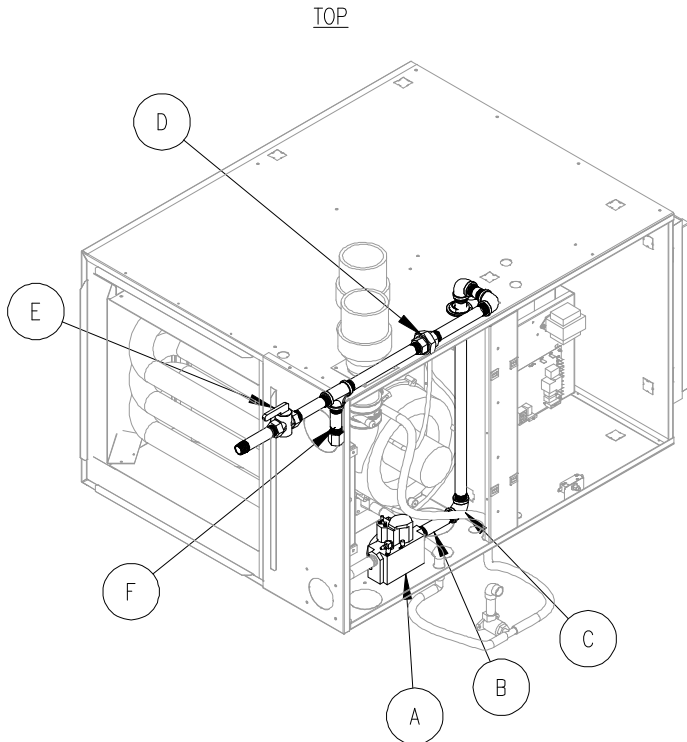


COMPONENTS REQUIRED FOR GAS PIPE CONNECTION

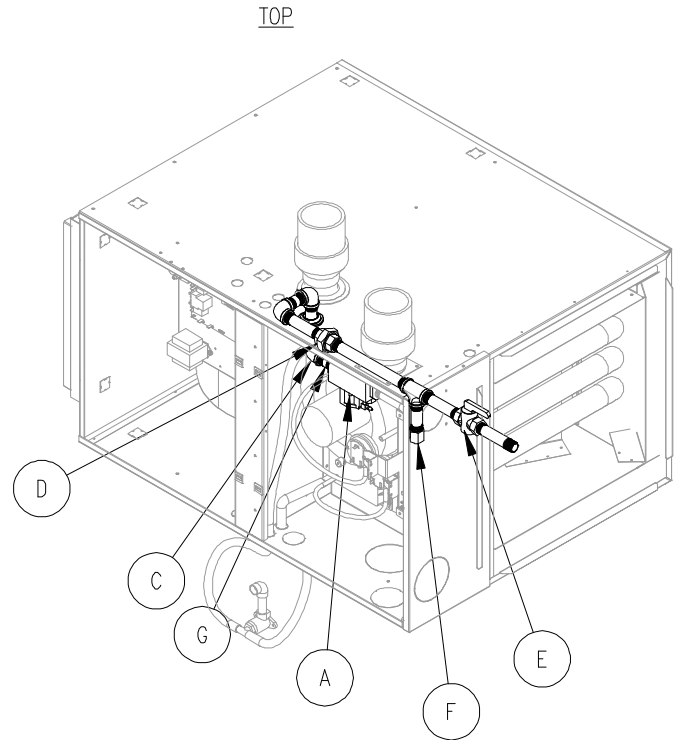
- |                                    |                                    |
|------------------------------------|------------------------------------|
| A. GAS VALVE (FACTORY INSTALLED)   | E. MANUAL SHUT-OFF VALVE           |
| B. 4-1/2 IN. X 1/2 NPT PIPE NIPPLE | F. DRIP LEG                        |
| C. 1/2 IN. NPT ELBOW               | G. 2-1/2 IN. X 1/2 NPT PIPE NIPPLE |
| D. 1/2 IN. UNION                   |                                    |

**Figure 10B: Downflow– Gas Piping Options**

**All installations and services must be performed by qualified service personnel.**



**Figure 10C: Horizontal Left-Gas Piping Options**



**Figure 10D: Horizontal Right-Gas Piping Options**

2. A drip leg must be used on both LP and natural gas installations prior to the furnace in order to trap oil, condensate and other impurities which might otherwise lodge in the gas valve or plug the burner orifice. Failure to install a drip leg may void the limited warranty on the furnace.
3. A 1/8 inch NPT plugged tapping, accessible for test gage connection, must be installed immediately upstream of the gas supply connection to the furnace.
4. If local codes allow the use of a flexible gas appliance connector, always use a new listed connector. Do not use a connector which has previously serviced another gas appliance.
5. The furnace and its equipment shutoff valve must be disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of 1/2 psi (3.5 kPa).

**All installations and services must be performed by qualified service personnel.**

**⚠ WARNING**

**FIRE OR EXPLOSION HAZARD**

Failure to follow the safety warning exactly could result in serious injury, death or property damage.

Never test for gas leaks with an open flame. Use a commercially available soap solution made specifically for the detection of leaks to check all connections. A fire or explosion may result causing property damage, personal injury or loss of life.

**⚠ AVERTISSEMENT**

**RISQUE D'INCENDIE OU D'EXPLOSION**

Le non-respect des avertissements de sécurité pourrait entraîner des blessures graves, la mort ou des dommages matériels.

Ne jamais utiliser une flamme nue pour vérifier la présence des fuites de gaz. Pour la vérification de tous les joints, utiliser plutôt une solution savonneuse commerciale fabriquée spécifiquement pour la détection des fuites de gaz. Un incendie ou une explosion peut entraîner des dommages matériels, des blessures ou la mort.

**⚠ CAUTION:** *Care must be taken not to wet electronic components during leak test. Wetting the electronic components may damage their circuitry and cause a hazardous situation. Dry moisture from all leads and terminals if wetting occurs. Wait at least 24 hours for the circuit to fully dry before energizing the burner circuit.*

## **K. REQUIREMENTS AND SIZING OF DUCT WORK**

The duct system must be sized and installed by a qualified installer or service person, following the design standards of the Air Conditioning Contractors of America (ACCA) or ASHRAE.

1. When it is located in the same room as the furnace, a return air register must be installed a minimum of 20 feet away from the furnace.
2. When a furnace is installed so that supply ducts carry air circulated by the furnace to areas outside the space containing the furnace, the return air shall also be handled by ducts(s) sealed to the furnace casing and terminating outside the space containing the furnace.
3. The return air duct system must equal the supply air duct system in its capabilities. Use a supplier's catalog for proper sizing of outlet and return air registers and grills to ensure that they meet the CFM requirements of the run to which they are connected.
4. If the furnace is used in connection with an air conditioning evaporator coil, the furnace must be installed parallel with or on the upstream side of the coil, to prevent condensation in the heat exchanger. If the evaporator coil is installed with a parallel flow arrangement, dampers or other means to control flow of air should be installed to prevent chilled air from entering the furnace. If such a device is manually operated, it must be equipped with a means to prevent operation of either the furnace or air conditioner unless it is in the full heat or cool position.

We recommend that the outlet duct be equipped with a removable access panel to allow for visual inspection of the heat exchanger to check for leakage or to allow for insertion of a probe sampler in the air stream. This removable access cover should be attached to ensure there is no air leakage.

**All installations and services must be performed by qualified service personnel.**

5. The duct system shall be sized for the maximum CFM requirement of the installation whether it is for heating or cooling. Two common rules for heating and cooling follow:

A. COOLING: 400 CFM (1200 BTU's) per ton of cooling is typically required.

B. HEATING: 14 CFM of heating per 1,000 BTU's of furnace output based on a nominal temperature rise.

**EXAMPLE:**

Heating output of a furnace is 100,000 BTU:  $100 \times 14 \text{ CFM} = 1400 \text{ CFM}$

Air conditioning installed is 4 tons:  $4 \times 400 \text{ CFM} = 1600 \text{ CFM}$

NOTE: The duct system must be sized for the larger CFM requirement for cooling. If only 3 tons of cooling were installed:  $3 \times 400 \text{ CFM} = 1200 \text{ CFM}$ . The duct would then have to be sized for the 1400 CFM heating requirement.

All trunk lines, take-offs, registers and grill-free areas must be figured when determining the air handling capacity of a duct system. Use a supplier's catalog for proper sizing of outlet and return air registers to insure that the register will meet the CFM requirements of the run to which it is connected.

The speed of the blower motor may have to be changed to obtain the proper 45°F to 75°F temperature rise for heating when an air conditioning coil is installed. This depends on the static resistance of an individual duct system and the size of the air conditioner.

**L. FILTERS**

It is necessary to cut the return air opening in the casing depending upon the needs of the specific installation. It is possible to cut the return air opening in the left, right, or bottom of the cabinet.

**NOTICE:** If your furnace will require air delivery above 1800 CFM it is advisable that both sides, or a combination of 1 side and the bottom, be used.

This furnace has been factory supplied with a high quality re-usable filter rated for air velocities up to 600 ft/min. An optional Thermo Pride filter rack assembly (part no. AOPS7547 for -050, -075 & -100 and AOPS7375 for -125)

is available which is sized for the filter provided. See Figure 12.

This filter should be inspected monthly. When dirty, the filter must be cleaned or replaced, if necessary, to assure proper furnace operation. Follow the cleaning, removal and replacement procedure below.

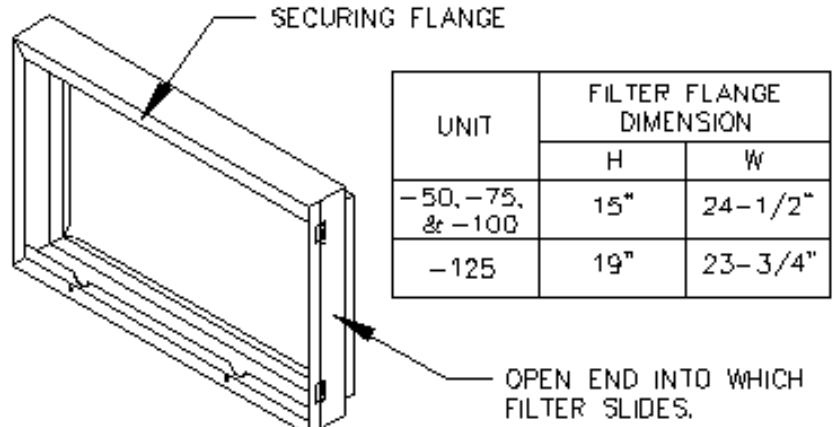
**NOTICE:** If the furnace is installed in a home or structure being remodeled, dust levels may be much higher than normal. The filter must be inspected daily and cleaned as needed until dusty conditions have been eliminated.

**⚠WARNING:** *This furnace is not to be used for temporary heating of buildings or structures under construction.*

**All installations and services must be performed by qualified service personnel.**

The filter rack or drop chute will be located between the return air plenum and the return air opening of the furnace. Slide dirty filter out of the filter rack. Clean the filter by vacuuming, rinsing with tap water, hosing or dipping in an ordinary detergent solution. Replace the completely dry filter in the rack.

If an optional Thermo Pride filter rack is used with the furnace, it will serve as a template to scribe a mark for the return air opening on the casing. Place the filter rack on the casing 1 inch up from the bottom of the furnace on either the Left or Right side of the cabinet. Align the back of the filter rack with the back of the cabinet, and place the securing flange against the casing for locating the return air opening.



**Figure 12**

**NOTICE:** While scribing the return air opening, the filter rack can be held into position by tape or similar means.

Position the open end of the filter rack so that it is accessible for filter replacement. Once the filter rack is positioned correctly, scribe a line along the inside of the securing flange of the filter rack on three of the sides. To scribe a line on the fourth side, on the open end, use the open end support for a guide. Remove the filter rack and cut the return air opening in the casing.

Now the filter rack can be permanently attached to the furnace with screws or pop-rivets along the securing flange. Connect the return plenum to the filter rack and slide the filter into place.

**Use of Non Thermo Pride Filter Retention Means**

If a method other than the Thermo Pride filter rack is selected for retention of the filter and/or use of a different filter type is desired, see Table 3 for minimum size guidelines for selecting a filter system for the furnace.



All installations and services must be performed by qualified service personnel.

**MINIMUM FILTER AREA REQUIRED (LENGTH X WIDTH)**

FILTER TYPE	MAX. RATED VELOCITY	EQUATION: REQUIRED CFM / MAX. RATED VELOCITY X 144 = FILTER AREA (IN <sup>2</sup> ) HEATING VALUES PROVIDED IN CHART BELOW			
		-050	-075	-100	-125
THERMO PRIDE * SUPPLIED PERMANENT FILTER	600 FT/MIN	176 IN <sup>2</sup>	264 IN <sup>2</sup>	352 IN <sup>2</sup>	440 IN <sup>2</sup>
STANDARD PERMANENT FILTER	500 FT/MIN	211 IN <sup>2</sup>	317 IN <sup>2</sup>	422 IN <sup>2</sup>	528 IN <sup>2</sup>
DISPOSABLE TYPE FILTER	300 FT/MIN	352 IN <sup>2</sup>	528 IN <sup>2</sup>	704 IN <sup>2</sup>	880 IN <sup>2</sup>

**TABLE 3**

\* The Thermo Pride supplied filter can be cut to size to fit other filter retention systems as long as the minimum size requirement is met. NOTICE: Any internal stiffeners used in the filter must not be removed, although they can be cut to size as needed.

**NOTICE:** The filter areas in Table 3 are the **minimum** areas required based on the CFM generated by the furnace for standard heating speeds only. The following formula can be used to determine the minimum filter area required for cooling if the unit is equipped with cooling. This value should then be compared to the value shown in Table 3 and the larger of the two should then be used for determining the minimum filter area required for that installation.

**FORMULA:**

$$\frac{(\text{tons of cooling}) \times (400 \text{ CFM per ton}) \times (144 \text{ square inches per foot})}{(\text{max. rated velocity of filter from Table 3 for the filter type})} = \text{filter area in sq.inches}$$

**EXAMPLE:**

If you have a CLQS1-100 furnace with 4 tons of cooling and a standard permanent filter.

$$\frac{4 \text{ tons} \times 400 \text{ CFM} \times 144}{500 \text{ fpm}} = 460 \text{ square inches for cooling}$$

For heating, a CLQS1-100 needs 422 square inches of filter. The filter system must be designed for the larger CFM requirement determined for cooling of 460 square inches. A filter would have to be sized so that the area (length X width) was at least 460 sq. in.

**All installations and services must be performed by qualified service personnel.**

## **M. WIRING**

All wiring shall be performed by a qualified electrician or service person. The wiring must comply with local codes, the instructions in this manual, and in the absence of codes with the National Electrical Code (ANSI/NFPA-70 or latest edition).

1. The following items are guidelines to complete the wiring portion of the installations.
  - a. A separate power supply circuit with over current protection and a disconnect switch must be provided. See furnace specifications or furnace rating label for maximum fuse size.
  - b. All furnaces are supplied with a fuse disconnect switch box to be mounted on the outside surface of the right or left side casing so a fuse disconnect can be mounted on the furnace. Make the 120 volt supply connection in this junction box. A green screw and a strain relief are provided in order to connect the power supply ground wire and provide strain relief for the 120 volt power leads from the furnace in the fuse disconnect box. A disconnect switch can be field mounted on the 2x4 box provided. If not, the disconnect switch must be located reasonably close to and within sight of the furnace.

**NOTICE:** The hot surface igniter and operation of this furnace depends on correct polarity. The hot leg of the supply circuit must be connected to the **black** line lead and the common leg to the white line lead in the field mounted junction box. The hot leg must pass through the disconnect switch in all cases to prevent the hazard of electrical shock when servicing.

**IMPORTANT:** The furnace must be grounded in accordance with local codes and with the National Electrical Code (ANSI/NFPA NO. 70 or latest edition).

### 2. Electronica Air Cleaner (EAC) and Humidifier Installation

The ignition module on this furnace has designated terminals to control the operation of an electronic air cleaner and/or humidifier. These terminals provide line voltage (1.0 Amp @ 120VAC) for the control of these accessories (see wiring diagram). The Humidifier is energized whenever the combustion inducer motor is energized. The EAC is energized whenever the circulation blower motor is energized for heating or cooling.

**NOTICE:** It is important to confirm that the operating voltage of the humidifier or EAC being installed matches the output of this control. If not, a field supplied relay or transformer may be necessary to provide the proper control and supply voltage for the accessory being installed. See the manufacturer's instructions for the humidifier or EAC for additional instructions.

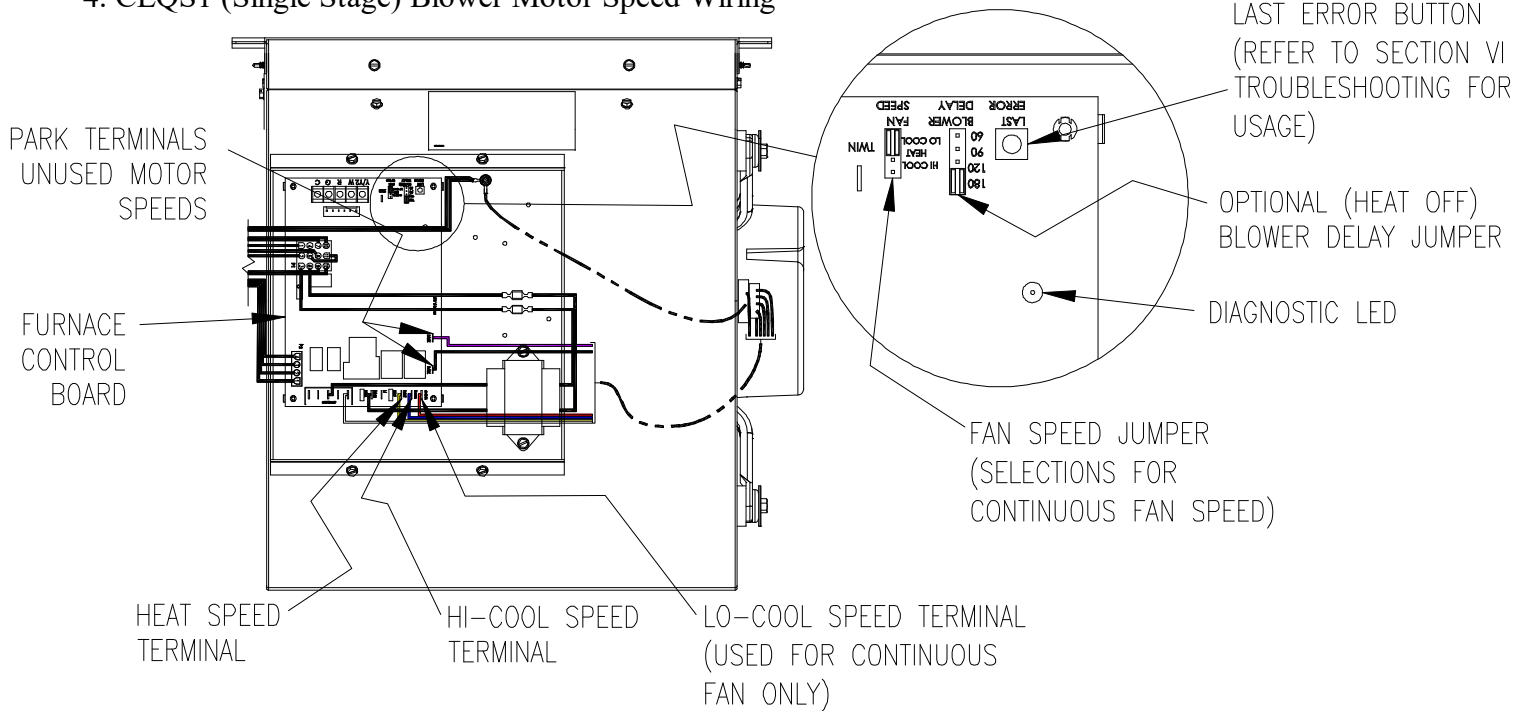
### 3. Thermostat Anticipator Setting

When using an analog thermostat, proper control of the indoor temperature can only be achieved if the thermostat is calibrated to the heating and/or cooling cycle. A vital consideration of this calibration is related to the thermostat heat anticipator. Newer digital thermostats do not have an Anticipator Setting and do not require calibration.

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The proper thermostat heat anticipator setting is 0.4 Amps for furnace operation only. To increase length of cycle, increase setting of heat scale; to decrease length of cycle, decrease setting of heat scale. Anticipators for the cooling operation are generally pre-set by the thermostat manufacturer and require no adjustment. Anticipators for the heating operation are of two types, pre-set and adjustable. Those that are pre-set will not have an adjustment scale and are generally marked accordingly.

#### 4. CLQS1 (Single Stage) Blower Motor Speed Wiring



**Figure 13**

**⚠WARNING: TURN OFF THE ELECTRICAL POWER to the furnace before attempting to change blower speed wiring.**

- A. The furnace is factory wired to the ignition control with standard heating and cooling speeds. When changing motor speeds, simply switch the needed speed to either the heating or cooling terminal as applicable on the module to obtain the desired CFM. The unused speeds should then be reconnected to the module in the “park” positions.
- B. The optional blower delay jumpers on the integrated control (Figure 13) are used to determine the length of the heat delay-to-fan-off periods. The delay-to-fan-on period is preset and non-adjustable. The available options for the delay-to-fan-off are as follows: 60, 90, 120 & 180 sec.

The fan speed jumper will determine which motor speed tap (Hi-cool, Heat, or Lo-cool) is energized when only the “G” terminal has a 24VAC signal.

The factory default for optimum performance of the delay-to-fan-off period is 180 seconds.

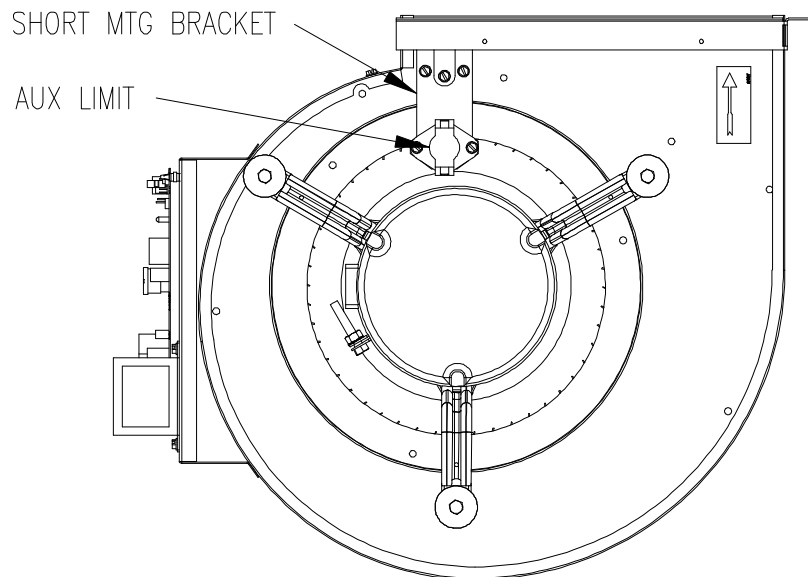
**All installations and services must be performed by qualified service personnel.**

In Downflow and Horizontal configurations, setups with restricted airflow may not adequately cool the heat exchanger, This results in the auxiliary limit opening, but it may be prevented by increasing the blower off delay.

#### **N. AUXILIARY LIMIT**

When setup in the Horizontal Left configuration, the Auxiliary Limit must be moved to the “motor side” of the blower assembly. A short mounting bracket is provided for the new location of the Auxiliary Limit. The blower assembly must be removed from the unit to facilitate moving to the new location.

To remove the blower assembly, first remove the Door Latch Channel by removing it’s 4 screws. Then remove the 2 screws which retain the blower assembly. (These 2 screws are visible above the control board.) Disconnect the wiring harness and pull the blower assembly toward the front of the furnace. Rotate the blower assembly, if necessary, until it can be removed from the furnace.



**Figure 13A: Horizontal Left – Auxiliary Limit**

Remove the Auxiliary Limit from the default mounting bracket and move to the “motor side” short mounting bracket location. The default mounting bracket may be left in place, or discarded. Be sure that the wires to the Auxiliary Limit are intact and positioned to prevent damage.

Reinstall the blower assembly, the Door Latch Channel and reconnect the wiring harness. Start furnace and verify proper operation.

**All installations and services must be performed by qualified service personnel.**

## **O. TWINNING**

When twinned, the circulating blower speeds are synchronized between the furnaces. If either furnace has a need to run the blower, both furnaces will run the blower on the same speed. The cooling speed has highest priority, followed by heating speed and fan speed.

Field installation of twinning consists of connecting wires between the “C” and “Twin” terminals of the two controls. The 24 VAC secondary of the two systems must be in phase. All thermostat connections are made to one control only.

The twin without thermostat connections is to have the call for heat supplied by an external isolation relay to prevent its rollout switch from being bypassed by the other twin. The coil of the isolation relay connects from the thermostat “W” to 24 VAC common. The contacts of the relay connect “R” to “W” on the non-thermostat twin.

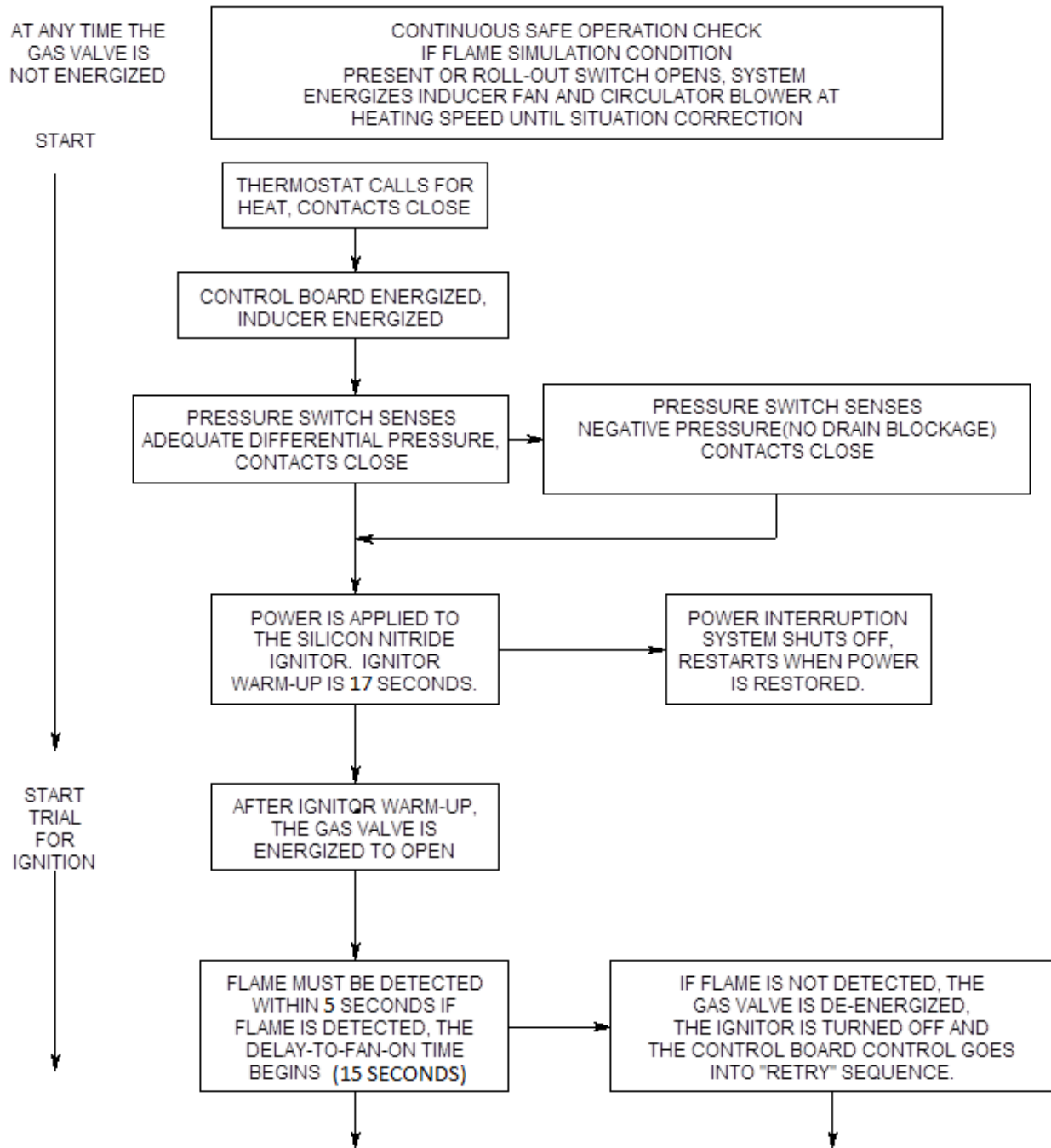
Failure to establish flame, an open limit switch, or undesired flame on one furnace shall not affect the other furnace except for the possibility of causing its fan to run.

The blower off delay times and the continuous fan speed **MUST BE** the same on both controls.

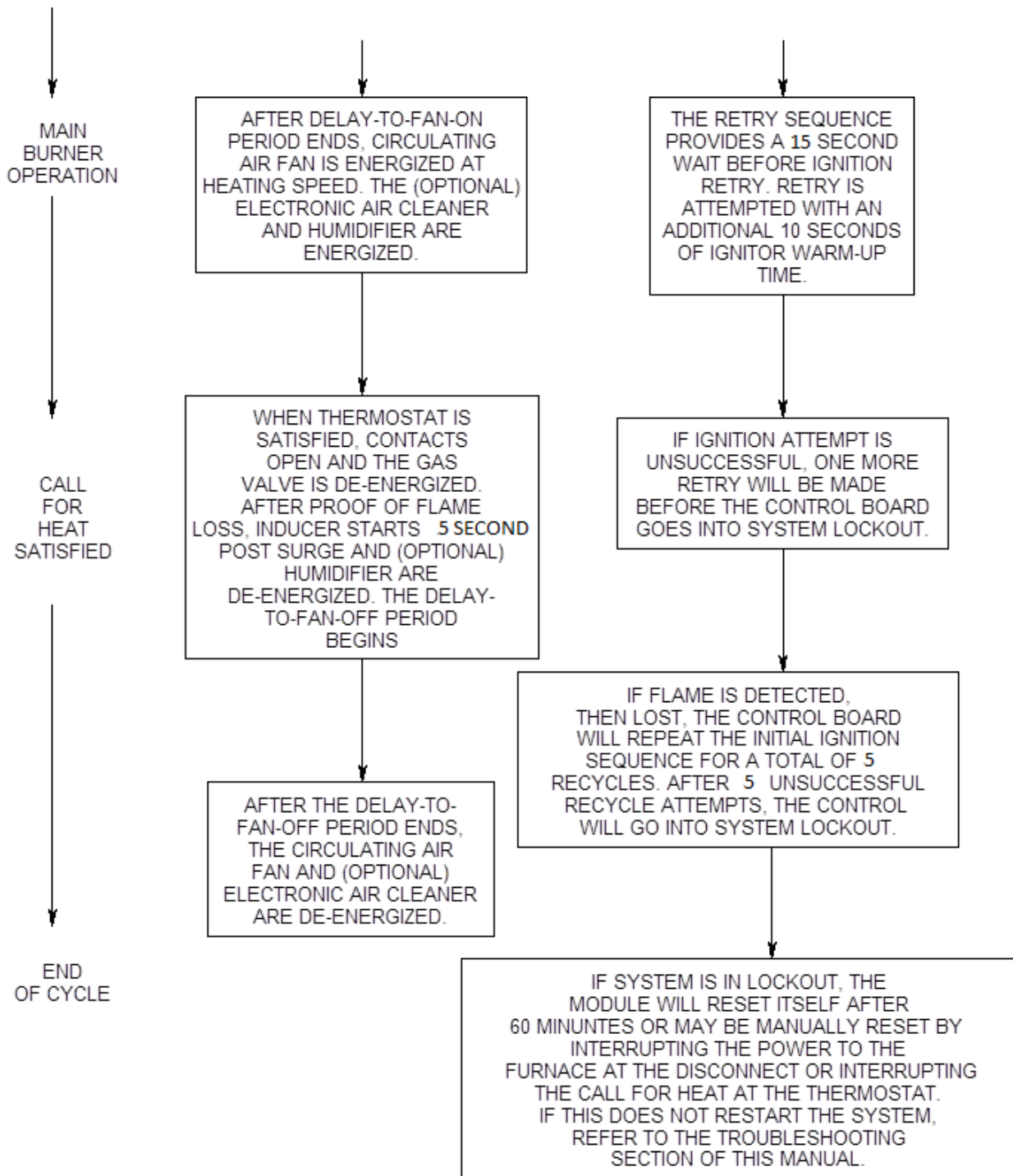
All installations and services must be performed by qualified service personnel.

#### IV. STARTING THE UNIT

##### A. SEQUENCE OF OPERATIONS



**All installations and services must be performed by qualified service personnel.**



**All installations and services must be performed by qualified service personnel.**

## **B. INITIAL START UP**

This furnace does not have a pilot. It is equipped with a hot surface igniter, which automatically lights the burner. Do not attempt to light the burner by hand. Check the following items before the initial start-up.

1. Check all wiring for loose connections and proper hook up.
2. Leak test gas piping connections.
3. Check all tubing to the pressure switch and drain, making sure they are connected firmly at all connection points.
4. Check flue pipe, combustion air inlet and all PVC connections for tightness and to ensure there is no blockage.
5. Make sure air filter is in place.
6. Make sure the outside vent and air intakes are installed according to instructions and are free from blockage.
7. Make sure that the drain trap is properly connected to the furnace and to the buildings drain system.
8. Make sure that the combustion door is properly installed.
9. Prime the condensate trap by adding water through a drain hose to expedite the setup & startup process.

***⚠WARNING: Turn off power to furnace before it is placed into service. The gas piping system must have been leak tested by a qualified heating contractor. (See Section III, J, of these instructions on the installation of gas piping).***

***⚠WARNING: It may be necessary to purge the air out of the gas line for initial start-up of the furnace after installation. This should be done by a qualified heating contractor. If excessive gas escapes when purging the gas supply at the union, allow the area to ventilate for at least 15 minutes before attempting to start the furnace. LP gas is especially dangerous because the specific gravity of LP gas allows it to accumulate at floor level at a dangerous concentration. For remainder of operating instructions, reference Users Information Manual.***

***⚠WARNING: Heat exchanger oil will burn off on initial firing creating an unpleasant odor. To prevent this odor from occurring more than once, it is suggested that:***

- 1. A window(s) be opened.***
- 2. The thermostat be set at highest setting.***
- 3. The furnace remain running at conditions 1&2 for 30 minutes or until odor has dissipated.***

## **C. ADJUSTMENT OF BTU INPUT RATE**

The Orifice for this furnace was sized: 1) for natural gas having a heating value of 1025 BTU per cubic foot and a specific gravity of 0.65, or 2) for liquefied propane gas with a heating value of 2,500 BTU per cubic foot and a specific gravity of 1.55. The information plate inside the furnace vestibule will specify which gas your furnace is setup to use. If the furnace is installed at an altitude that is more than 2,000 feet above sea level, it is mandatory that the input to the burner be reduced 4.0% for every 1,000 feet that it is above sea level. If the furnace is installed at an elevation of 5,000 feet, its input must be reduced 20.0%. Example: a furnace rated at 100,000 BTU at sea level must be reduced to a firing rate of 80,000 ( $100,000 \times 0.80 = 80,000$ ) at an elevation of 5,000 feet. If the furnace is installed at an elevation of 2,000 feet or



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less, no reduction in input is required. If installed above 2,000 feet, the furnace installer should contact Thermo-Products for replacement orifices.

To check the input of your natural gas furnace, allow the unit to operate for 10 to 15 minutes and proceed as follows:

- a. Call your gas supplier and ask for the BTU content (heating value) of one cubic foot of the gas, supplied to the installation area. An alternate approach is to assume a value of 1025 BTU/Cu Ft, which is the national average.
- b. With all other gas appliances turned off and using a stopwatch, clock the time required for the dial on the gas meter to make one full revolution. The meter will state how many cubic feet has flowed for one revolution; usually one, two or five. The unit must have been in operation at least 10 minutes before clocking.

FORMULA:  $\text{BTU Content} \times \text{Number of CU FT} \times 3600 / \text{Time Required for Revolution} = \text{Input BTU/Hr}$

EXAMPLE:

The gas meter reads 2 CU FT per revolution, and it takes 74.8 sec. to complete 1 revolution.  
 $1025 \text{ BTU/CU FT} \times 2 \text{ CU FT} \times 3600 / 74.8 \text{ sec.} = 98,663 \text{ BTU/Hr}$

Check for the model number of this furnace, its input, the type of gas and the manifold pressure on the information plate located on the vestibule panel behind the upper front panel. In the example above, if the furnace was a CLQS1-100 model, then the 98,663 BTU input would be acceptable because it was within 2% of the listed input of 100,000 BTU.

Make sure that the gas supply pressure to the furnace falls within the maximum range of 4.5" to 14.0" w.c. pressure on natural gas and 11.0" to 14.0" w.c. on Propane gas. The pressure to the furnace must be checked while the furnace burner and any other gas appliances on the same supply system are operating.

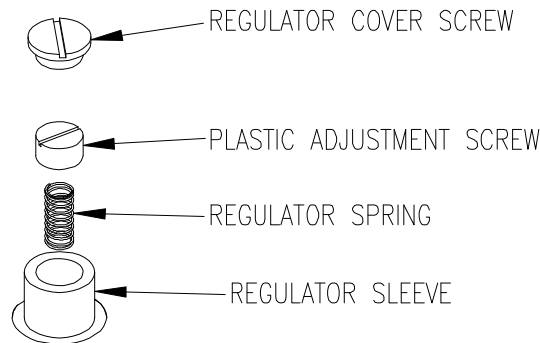
All installations and services must be performed by qualified service personnel.

**GAS PRESSURE CHART FOR ALL CLQSI MODEL FURNACES**

Fuel Gas Type	Propane	Natural
Operating Mode and Model Series	High Fire	High Fire
Normal Manifold Pressure (in. W.G.)	10.0 ± 0.3	3.5 + 0.0 / -0.5
Maximum Gas Supply Pressure (in. W.G.)	14	14
Minimum Gas Supply Pressure (in. W.G.)	11	4.5

**TABLE 4**

This gas furnace is equipped with a fixed orifice sized for the manifold pressure shown on the information plate. The input should only be increased or decreased by adjusting the manifold pressure. Remove the 1/8" threaded pipe plug located on the manifold and connect a U-Tube manometer or pressure gage to measure the pressure.



**Figure 15**

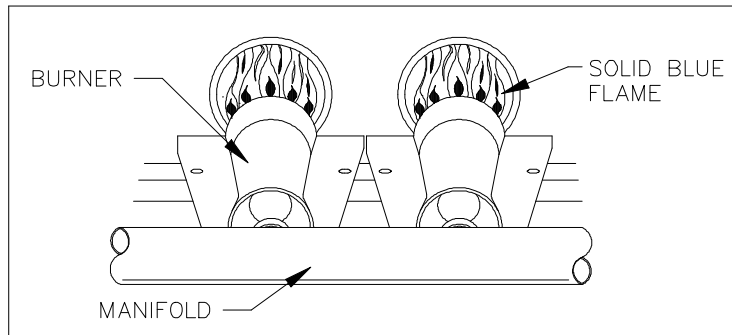
To adjust the pressure, remove the regulator cover screw from the regulator on the outlet side of the gas valve and using the adjustment screw, Refer to Figure 15, decrease the pressure by turning the screw counterclockwise or increase it by turning the screw clockwise. ADJUSTMENTS TO THE LISTED PRESSURE MUST NOT EXCEED THE VALUES IN TABLE 4. Replace cover screw when adjustment is complete. The correct input can be assumed if the furnace manifold pressure is the same as that shown on the information label if a gas meter is not available for natural gas, or the unit is installed on liquefied petroleum gases which are not metered.

Shut off the gas supply to the furnace. Remove the pressure gage and re-install the pipe plug using a thread compound resistant to the action of Liquefied Petroleum gases. If the rated input cannot be obtained with the present orifice at the correct pressure, your installer should contact Thermo Products to assist in sizing the proper orifice. Our Engineering Department will gladly assist in sizing the orifice if you provide them with the heating value in BTU per cubic foot and the specific gravity of the gas.

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#### **D. BURNER ADJUSTMENT**

This unit is designed to require no burner adjustment. Flames should be visually examined at the start of the heating season and monthly during the heating season. The flames should be checked by looking through the sight glass in the combustion door and observing the flames inside the burner box. Burner flames should be clear, blue and almost transparent in color. (See Figure 16). Burner flames should not impinge or fire against the side of the tube opening. **NOTE:** It is not unusual to have orange tipped flames visible in the tube for Propane gas.



**Figure 16**

**⚠CAUTION:** *These furnace models are an in-shot burner design, which does not require an air shutter adjustment (air shutters are not used) for proper flame characteristics. Combustion door should always be in place when operating furnace.*

#### **E. FURNACE CHECKOUT PROCEDURE**

Before any system of gas piping is finally put into service, it shall be carefully tested to assure that it is gas tight as indicated in the manual.

**NOTICE:** All controls on the unit should be checked for proper functioning prior to the qualified service personnel leaving the job site. Specifically the following should be checked:

With furnace in normal heating operation, check to make certain blower will start and stop automatically under control of integrated fan control.

1. Check safety limit control as follows:
  - a. Shut off incoming power.
  - b. Block return air opening or disconnect blower motor leads.
  - c. Restore power to furnace.
  - d. Set thermostat above room temperature calling for heat.
  - e. When temperatures are reached in furnace at limit control setting with blower out of operation, burner should shut off.
  - f. Shut off electrical power.

**IMPORTANT:** Remove blockage or reconnect blower motor and restore power.

**All installations and services must be performed by qualified service personnel.**

2. Make certain thermostat will automatically start and stop furnace.
3. Block the PVC flue outlet gradually with a flat piece of metal, until the pressure switch functions shutting off the main burners.
4. Block the PVC air inlet gradually with a flat piece of metal until pressure switch functions shutting off the main burners.

**IMPORTANT:** Remove flue & air inlet blockage when done.

5. Remove the blower door with the house air blower operating. The door interrupt switch is in the 120 volt circuit and will shut down the entire system. Replace the blower door and the blower will resume operation.

## **V. INSTALLER'S INSTRUCTIONS TO USER:**

After completing the installation, the installer shall inform and/or demonstrate to the homeowner:

1. The location of all the instructions in the furnace and that these instructions and the users information manual must be kept along with instructions for any accessories in the plastic pouch on the outside of the furnace.
2. The location and use of the manual gas shut off valve and furnace electrical disconnect switch. Instruct user to always shut off gas before shutting off electric power.
3. The sequence of operation of the furnace.
4. The correct operation and maintenance of the appliance as outlined in the users information manual.
5. That failure to maintain and operate this furnace in accordance with these instructions could result in hazardous conditions, bodily injury, property damage and may void the limited warranty on the furnace.
6. Review with and encourage the user to read the label reproductions and all warnings and instructions outlined on the front cover and in sections I, II and III of this manual and in the Users Information Manual.
7. Recommend that the user have a qualified heating contractor inspect the furnace at the start of each heating season. Inform the user of the frequency of inspection required for each item in Section III of the User's Manual.

**All installations and services must be performed by qualified service personnel.**

## **VI. TROUBLESHOOTING**

**NOTICE:** Before troubleshooting, familiarize yourself with the startup and checkout procedures.

To assist you in troubleshooting this furnace, it is equipped with an integrated ignition control with diagnostics. These diagnostics evaluate what control system has experienced a failure and will activate a flashing light on the control in different sequences to help pinpoint the failure which has occurred.

**IMPORTANT:** For your convenience, Thermo Products has installed a sight glass in the blower door of this furnace. The number of flashes in groups should be observed through this sight glass and recorded before turning off power to the furnace. Momentarily pressing the “Last Error” button on the control board will initiate the display of the last 5 failure codes, even if the furnace power has been shut off. Holding the “Last Error” button for 5 seconds, or more, will erase the error history.

### **DIAGNOSTIC FEATURES**

The integrated control continuously monitors its own operation and the operation of the system. If a failure occurs, the LED will indicate a failure code as shown below. If the failure is internal to the control, the light will stay on continuously. In this case, the entire control should be replaced, as the control is not field-repairable.

If the sensed failure is in the system (external to the control), the LED will flash in the following flash-pause sequences to indicate failure status (each flash will last approximately 0.25 seconds, and each pause will last approximately 1 second).

### **CLQS1 (Single Stage Furnaces)**

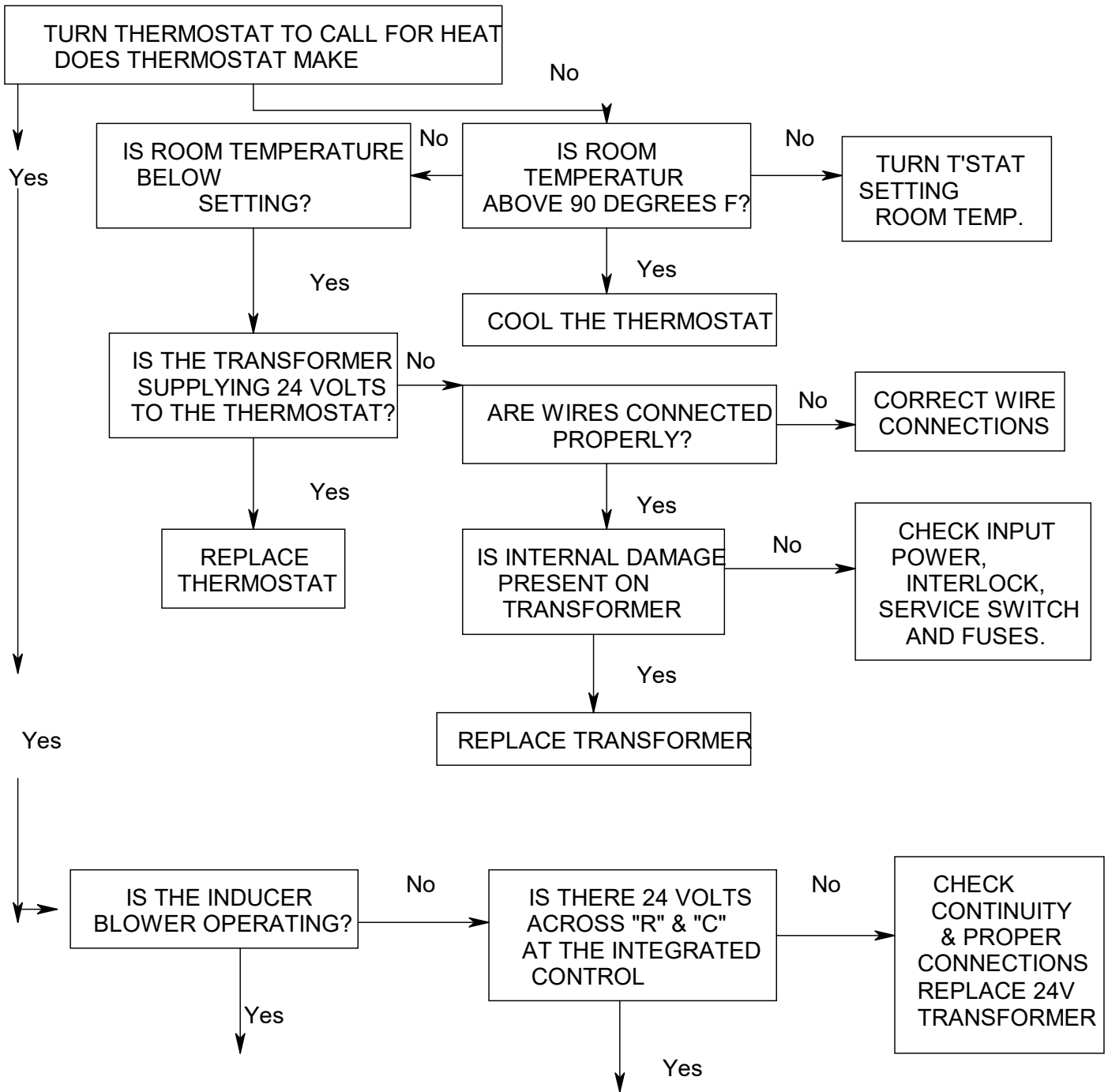
- LED Off - No power to control, pushbutton switch pressed, or control fault
- LED steady ON (Any color) - Control hardware fault detected
- Slow Green flash - No call for heat, no active errors
- Slow Orange flash - Call for heat present, no active errors
- 1 RED flash - High limit switch open
- 2 RED flashes - Pressure switch open with inducer on
- 3 RED flashes - Pressure switch closed with inducer off
- 4 RED flashes - 1 hour lockout code
- 5 RED flashes - Incorrect line voltage polarity or incorrect polarity on 24 VAC line from transformer
- 6 RED flashes – Too many limit trips in one call for heat
- 7 RED flashes – Pressure switch cycle lockout
- 8 RED flashes - Too many flame dropouts detected
- 9 RED flashes – Not Used
- 10 RED flashes – Flame present with gas valve off
- Rapid flash – Incorrect 24 VAC phasing/twinning error

**⚠WARNING:** *Power must be disconnected before servicing.*

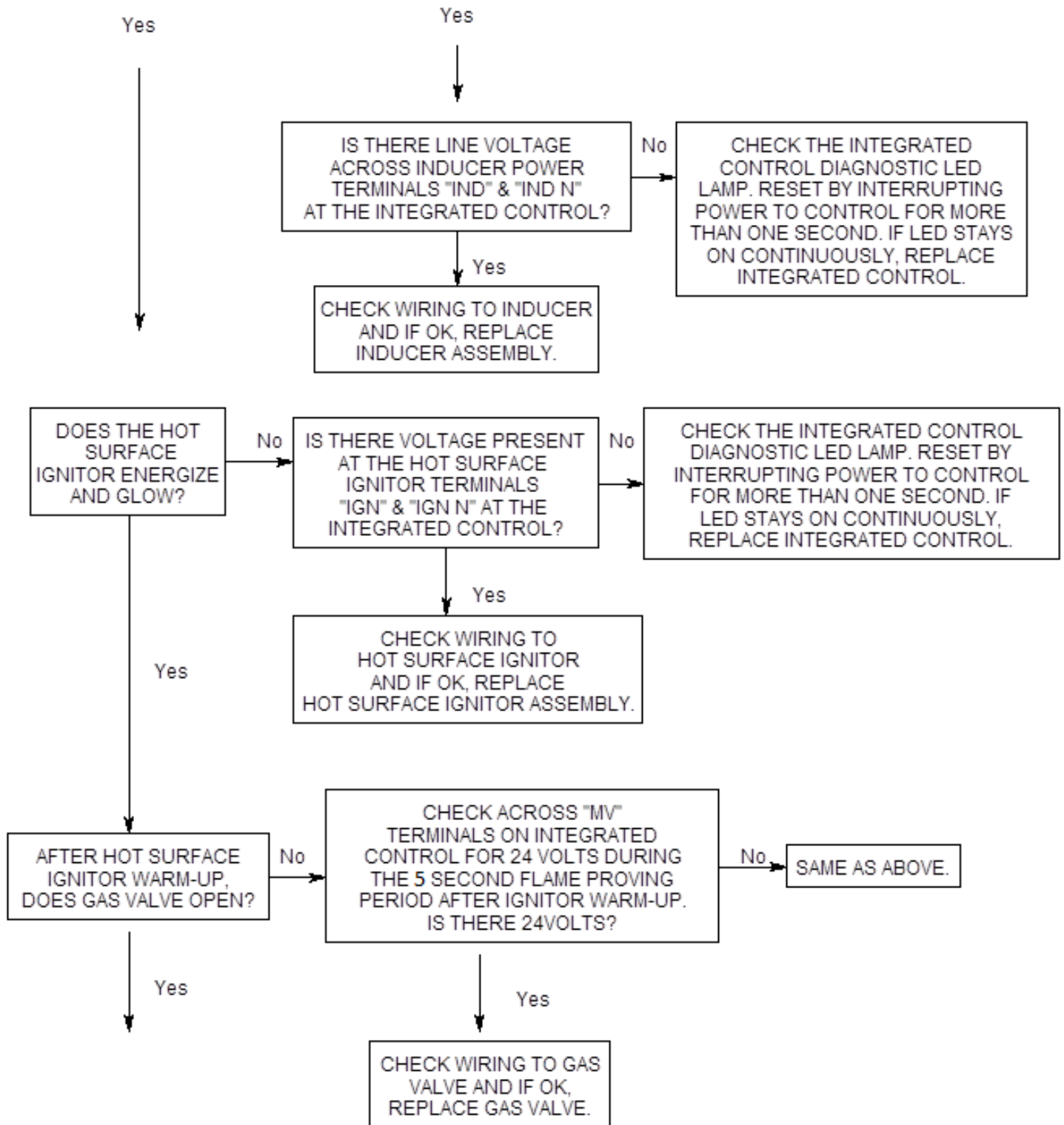
All installations and services must be performed by qualified service personnel.

TROUBLESHOOTING GUIDE  
 THE SYSTEM IS STARTED BY SETTING THE THERMOSTAT TO CALL FOR HEAT. THE FOLLOWING SHOULD HELP ESTABLISH THE TYPE OF MALFUNCTION OR DEVIATION FROM THE NORMAL OPERATION.

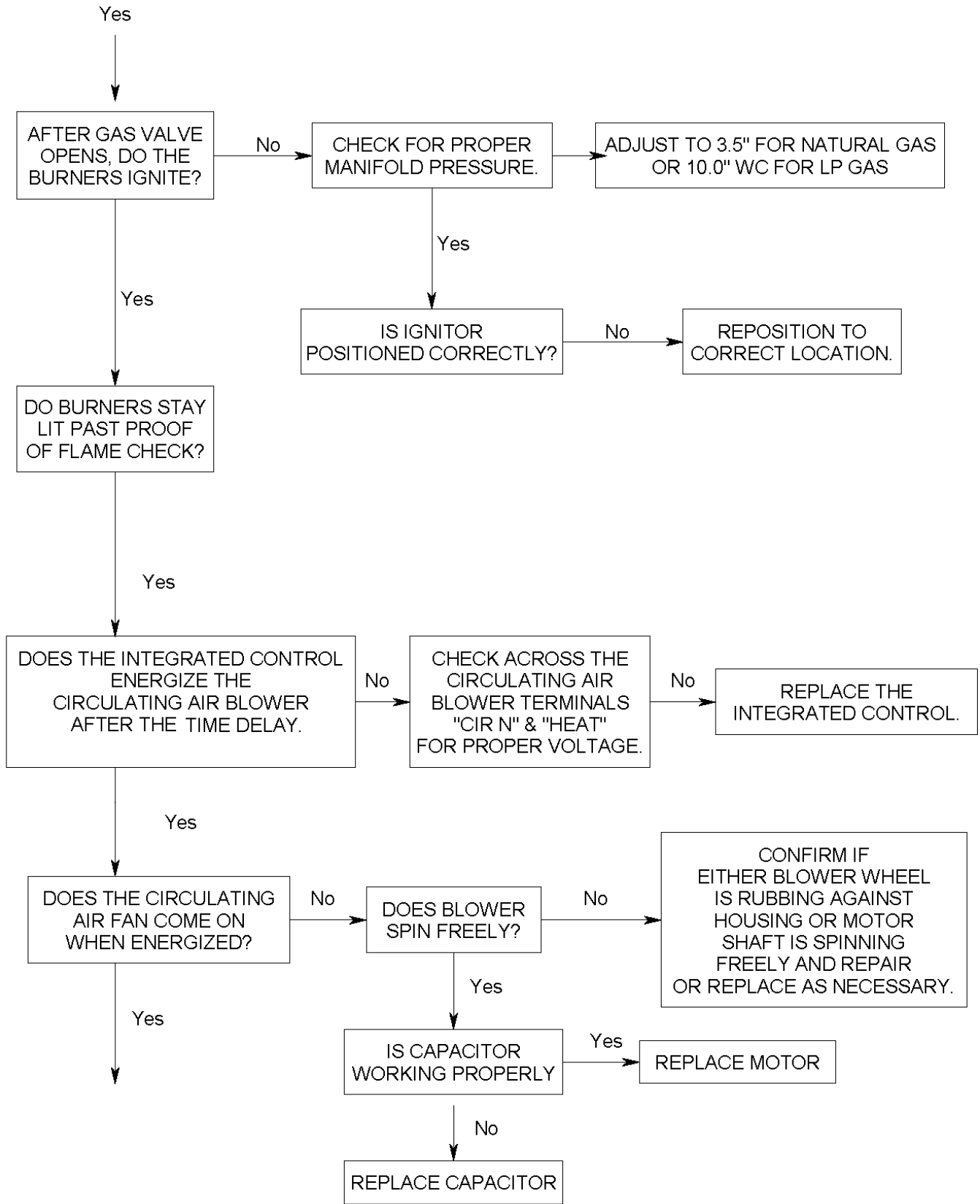
TO USE THIS DIAGRAM, YOU JUST NEED TO FOLLOW THE INSTRUCTIONS IN THE BOXES.



All installations and services must be performed by qualified service personnel.

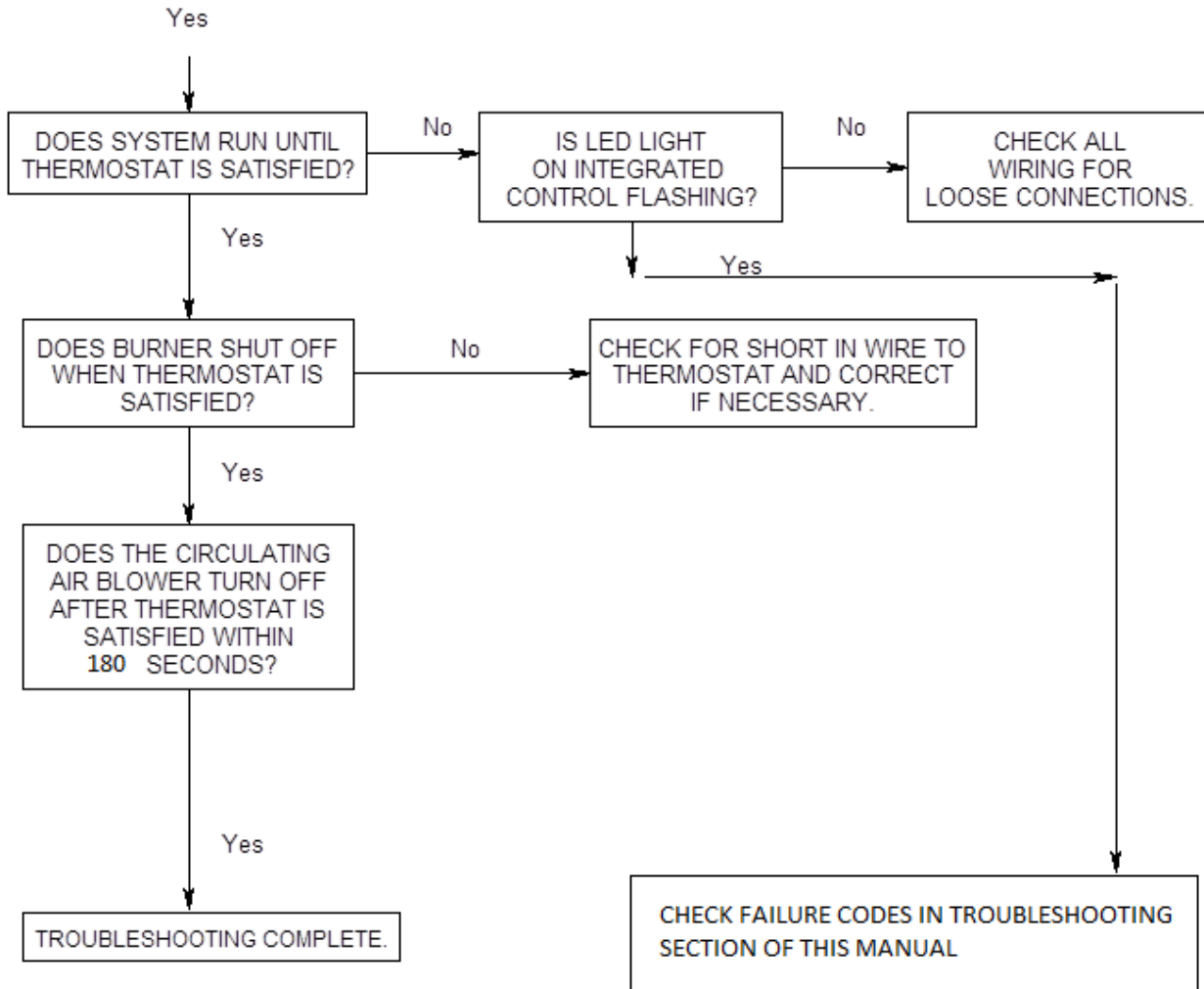


**All installations and services must be performed by qualified service personnel.**



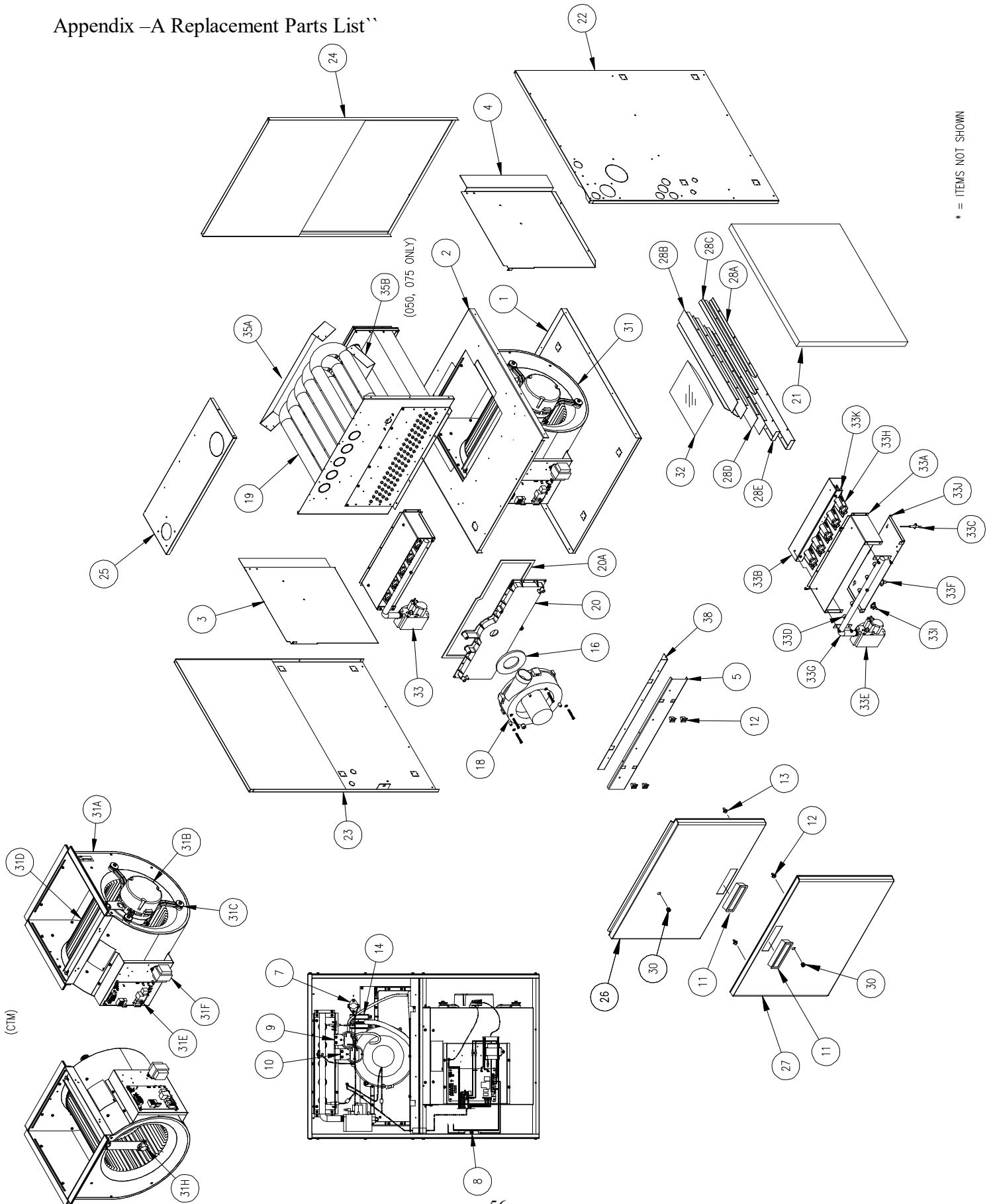


All installations and services must be performed by qualified service personnel.



All installations and services must be performed by qualified service personnel.

Appendix –A Replacement Parts List



\* = ITEMS NOT SHOWN

**All installations and services must be performed by qualified service personnel.**

ITEM	SUB-ASSEMBLY PARTS DESCRIPTION	CLQS1-050T36N		CLQS1-075T42N		CLQS1-100T48N		CLQS1-125T60N	
		PART NO.	QTY.	PART NO.	QTY.	PART NO.	QTY.	PART NO.	QTY.
1	BASE	14483	1	14484	1	14484	1	14486	1
2	BLOWER PAN	14589	1	14590	1	14590	1	14591	1
3	AIR SIDE BAFFLE, LEFT	14572	1	14572	1	14572	1	14572	1
4	AIR SIDE BAFFLE, RIGHT	14573	1	14573	1	14573	1	14573	1
5	FRONT CENTER PANEL	14525	1	14526	1	14526	1	14527	1
6	-	-	-	-	-	-	-	-	-
7	LIMIT SWITCH	351022	1	351017	1	351018	1	351022	1
8	SWITCH, DOOR INTERLOCK	350139	1	350139	1	350139	1	350139	1
9	PRESSURE SWITCH (DRAIN)	351012	1	351012	1	351013	1	351008	1
10	PRESSURE SWITCH (INDUCER)	351012	1	351012	1	351013	1	351014	1
11	DOOR PULL	320157	2	320157	2	320157	2	320157	2
12	STRIKE/LATCH ASSEMBLY	50044	2	50044	2	50044	2	50044	2
13	-	-	-	-	-	-	-	-	-
14	DRAIN FITTING	320913	1	320913	1	320913	1	320913	1
15	-	-	-	-	-	-	-	-	-
16	GASKET, INDUCER	330137	1	330137	1	330137	1	330137	1
18	INDUCER ASSEMBLY W\ GASKET	AOPS7416	1	AOPS7416	1	AOPS7416	1	AOPS7416	1
19	HEAT EXCHANGER ASSEMBLY	34563	1	34564	1	34565	1	34566	1
20	COIL OUTLET BOX	360577	1	360578	1	360579	1	360580	1
20A	PUTTY TAPE	330017	5.5'	330017	5.5'	330017	5.5'	330017	5.5'
21	FILTER	370023 (16x25)	1	370023 (16x25)	1	370023 (16x25)	1	370051 (20x25)	1
22	CASING, RIGHT SIDE	614578E	1	614578E	1	614578E	1	614578E	1
23	CASING, LEFT SIDE	50000	1	50000	1	50000	1	50000	1
24	CASING, REAR	614579E	1	614580E	1	614580E	1	614581E	1
25	CASING, TOP FRONT	50001	1	50002	1	50003	1	50004	1
26	DOOR, BURNER ACCESS	50005	1	50006	1	50006	1	50007	1
27	DOOR, BLOWER ACCESS	50008	1	50009	1	50009	1	50010	1
28	PLENUM ANGLE PACKAGE	S00S4580	1	S00S4581	1	S00S4582	1	S00S4583	1
28A	PLENUM ANGLE, FRONT	14587	1	14587	1	14587	1	14587	1
28B	PLENUM ANGLE, SIDE & REAR	14586	3	14586	3	14586	2	614611	2
28C	PLENUM ANGLE, REAR	-	-	-	-	14610	1	14610	1
28D	PLENUM ANGLE, SIDE (COUNTERFLOW)	-	-	-	-	-	-	614612	2
28E	PLENUM ADAPTER ANGLE (COIL CASE)	614618	2	-	-	-	-	-	-
29	-	-	-	-	-	-	-	-	-
30	WINDOW PLUG	350248	2	350248	2	350248	2	350248	2
31	BLOWER ASSEMBLY w\o CONTROLS	50011	1	50012	1	50013	1	50014	1
31A	BLOWER HOUSING w\ WHL ASS'Y	S00S4517 (10-9R)	1	S00S4518 (10-10R)	1	S00S4518 (10-10R)	1	S00S4519 (12-11T)	1
31B	MOTOR, DD, MULTI-SPEED	350362 ( 1/2 HP)	1	350212 (1/2 HP)	1	350213 (3/4 HP)	1	350395 ( 3/4 HP)	1
31C	MOTOR BRACKET ASSEMBLY	AOPS7746	1	AOPS7746	1	AOPS7746	1	AOPS7746	1
31D	BLOWER WHEEL	340083	1	340097	1	340097	1	340109	1
31E	CONTROL, GAS FUR, 1-STG PSC	350211	1	350211	1	350211	1	350211	1
31F	TRANSFORMER 24V	350405	1	350405	1	350405	1	350405	1
*31G	WIRE HARNESS, BLOWER	350638	1	350638	1	350638	1	350638	1
31H	AUX LIMIT	351024	1	351024	1	351024	1	351024	1

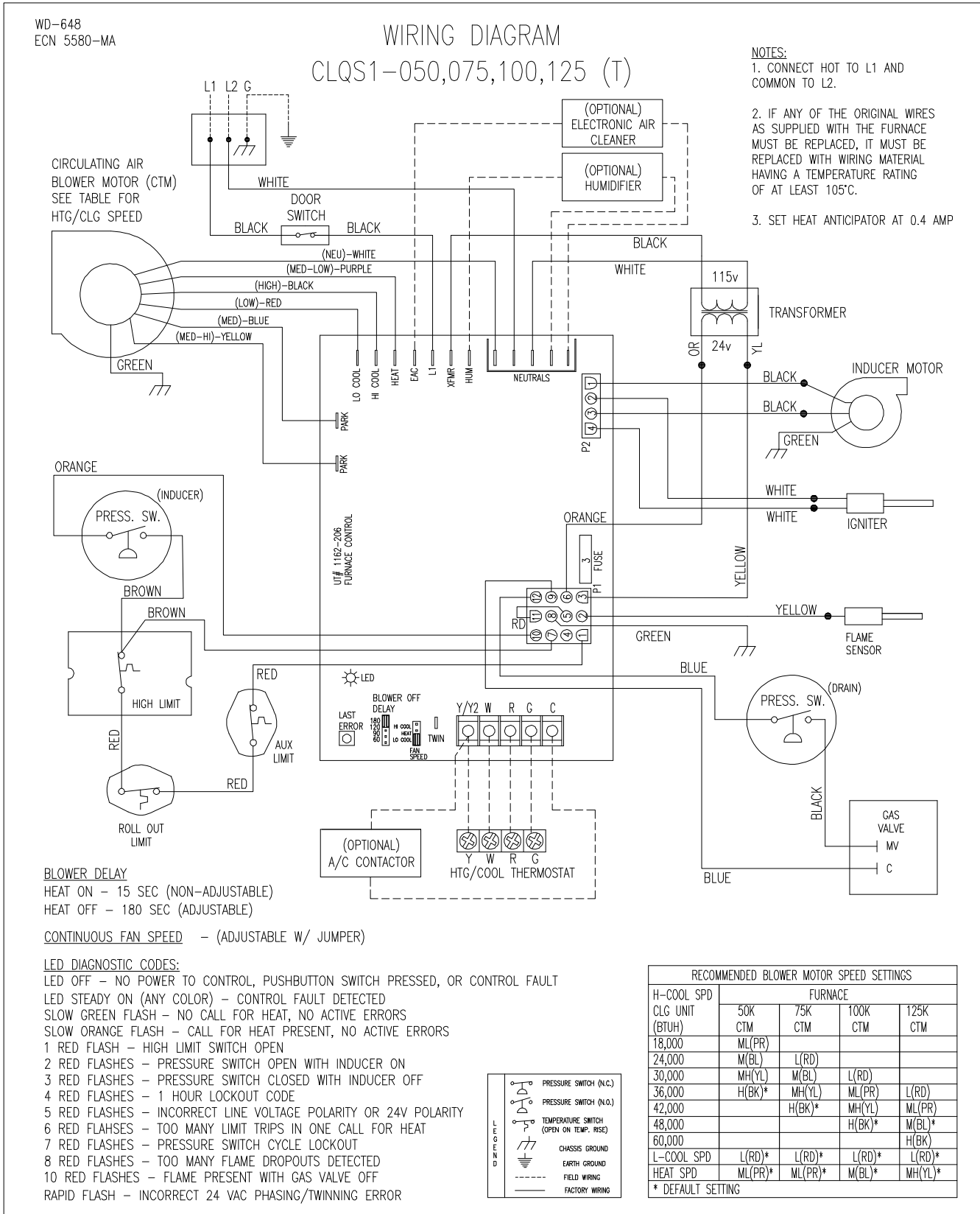
**All installations and services must be performed by qualified service personnel.**

32	PARTS PACKAGE	S00S4566	1	S00S4567	1	S00S4568	1	S00S4569	1
*32A	LP CONVERSION KIT	AOPS7746	1	AOPS7747	1	AOPS7748	1	AOPS7749	1
*32B	NAT CONVERSION KIT	AOPS7745	1	AOPS7745	1	AOPS7745	1	AOPS7745	1
*32C	CPVC X PVC ADAPTER	320833	1	320833	1	320833	1	320833	1
*32D	CPVC TRAP ASSEMBLY	320928	1	320928	1	320928	1	320928	1
33	BURNER BOX ASSEMBLY	S00S8234	1	S00S8235	1	S00S8236	1	S00S8237	1
33A	BURNER BOX WRAP	14508	1	14509	1	14510	1	14511	1
33B	SHOOT PLATE	14568	1	14569	1	14570	1	14571	1
33C	FLAME SENSOR	350759	1	350759	1	350759	1	350759	1
33D	ORIFICE, .094/#42 (NAT)	380600	2	380600	3	380600	4	380600	5
33E	GAS VALVE, w\ LP KIT	AOPS7674	1	AOPS7674	1	AOPS7674	1	AOPS7674	1
33F	IGNITER, NITRIDE	380771	1	380771	1	380771	1	380771	1
33G	MANIFOLD, 1/2"	50031	1	50032	1	50033	1	50034	1
33H	BURNER, INSHOT	380830	2	380830	3	380830	4	380830	5
33I	LIMIT SWITCH (ROLLOUT)	351023	1	351023	1	351023	1	351023	1
33J	BURNER BOX COVER	14597	1	14598	1	14599	1	14600	1
33K	BURNER HOLDER	14601	1	14602	1	14603	1	14604	1
35A	AIR SIDE BAFFLE, UPPER REAR	14574	1	14574	1	14575	1	14575	1
35B	AIR SIDE BAFFLE, BETWEEN TUBES	14576	1	14538	1	-	-	-	-
*36	WIRE HARNESS, VESTIBULE	350637	1	350637	1	350637	1	350637	1
*37	WIRE HARNESS, SUPPLY	350579	1	350579	1	350579	1	350579	1
38	ANGLE	14554	1	14555	1	14555	1	14556	1

All installations and services must be performed by qualified service personnel.

Appendix – B Wiring Diagrams

1. CLQS1-050, -075, -100 and -125 with Constant Torque Blower Motor



**All installations and services must be performed by qualified service personnel.**

Appendix C – Speed Specifications

**CLQS1-050T (Single Stage with Constant Torque blower motor)**

Alterations Req'd For A/C @ Design External Static Pressure		
Cooling Unit	HTG Speed	Recommended CLG Speed
18,000	Med Low (Purple)	Med Low (Purple)
24,000	Med Low (Purple)	Med (Blue)
30,000	Med Low (Purple)	Med High (Yellow)
36,000	Med Low (Purple)	High (Black)

Temperature Rise (°F)

Speed Tap	External Static Pressure (in WC)						
	0.1	0.2	0.3	0.4	0.5	0.6	0.7
Low (Red)	58	65	74	86	105	137	206
Med Low (Purple)	49	53	58	63	72	81	95
Med (Blue)	42	45	48	52	55	61	68
Med High (Yellow)	36	38	39	42	44	47	49
High (Black)	31	32	33	35	37	38	40

Airflow (CFM)

Speed Tap	External Static Pressure (in WC)						
	0.1	0.2	0.3	0.4	0.5	0.6	0.7
Low (Red)	758	672	598	511	420	322	213
Med Low (Purple)	905	827	761	698	610	546	461
Med (Blue)	1046	987	908	851	797	716	644
Med High (Yellow)	1216	1167	1124	1048	1000	945	889
High (Black)	1404	1360	1322	1269	1193	1156	1110

Current (A)

Speed Tap	External Static Pressure (in WC)						
	0.1	0.2	0.3	0.4	0.5	0.6	0.7
Low (Red)	2.4	2.5	2.5	2.5	2.5	2.6	2.7
Med Low (Purple)	2.7	2.8	2.9	3.0	3.0	3.1	3.1
Med (Blue)	3.2	3.3	3.4	3.5	3.6	3.7	3.7
Med High (Yellow)	4.0	4.2	4.3	4.4	4.5	4.7	4.7
High (Black)	5.4	5.4	5.6	5.7	5.9	5.9	6.0

Power (W) \*

Speed Tap	External Static Pressure (in WC)						
	0.1	0.2	0.3	0.4	0.5	0.6	0.7
Low (Red)	199	207	210	212	216	220	225
Med Low (Purple)	235	243	249	257	262	267	272
Med (Blue)	279	291	297	307	313	321	325
Med High (Yellow)	354	366	377	387	395	407	416
High (Black)	466	474	489	501	514	521	530

Note: Shading indicates recommended operating range for heating.

\* Includes 130W to power controls.

All installations and services must be performed by qualified service personnel.

**CLQS1-075T (Single Stage with Constant Torque blower motor)**

Alterations Req'd For A/C @ Design External Static Pressure		
Cooling Unit	HTG Speed	Recommended CLG Speed
24,000	Med Low (Purple)	Low (Red)
30,000	Med Low (Purple)	Med Blue
36,000	Med Low (Purple)	Med High (Yellow)
42,000	Med Low (Purple)	High (Black)

Temperature Rise (°F)

Speed Tap	External Static Pressure (in WC)						
	0.1	0.2	0.3	0.4	0.5	0.6	0.7
Low (Red)	63	67	71	79	86	94	103
Med Low (Purple)	57	61	64	69	74	79	86
Med (Blue)	55	58	61	65	70	75	80
Med High (Yellow)	48	50	52	55	57	61	64
High (Black)	44	45	46	48	50	57	63

Airflow (CFM)

Speed Tap	External Static Pressure (in WC)						
	0.1	0.2	0.3	0.4	0.5	0.6	0.7
Low (Red)	1089	1025	967	869	800	733	670
Med Low (Purple)	1197	1133	1078	990	933	865	803
Med (Blue)	1251	1189	1122	1064	982	914	856
Med High (Yellow)	1424	1379	1314	1254	1210	1132	1075
High (Black)	1577	1531	1480	1432	1368	1214	1086

Current (A)

Speed Tap	External Static Pressure (in WC)						
	0.1	0.2	0.3	0.4	0.5	0.6	0.7
Low (Red)	3.6	3.6	3.7	3.8	3.9	3.9	4.0
Med Low (Purple)	4.1	4.2	4.3	4.4	4.5	4.5	4.6
Med (Blue)	4.3	4.4	4.5	4.6	4.7	4.8	4.8
Med High (Yellow)	5.4	5.5	5.6	5.7	5.8	6.0	6.0
High (Black)	6.7	6.7	6.9	7.0	7.1	6.5	6.0

Power (W) \*

Speed Tap	External Static Pressure (in WC)						
	0.1	0.2	0.3	0.4	0.5	0.6	0.7
Low (Red)	317	324	331	342	347	353	358
Med Low (Purple)	364	374	381	393	400	406	412
Med (Blue)	387	397	405	415	425	432	438
Med High (Yellow)	496	507	516	526	536	549	557
High (Black)	621	632	645	655	660	606	568

Note: Shading indicates recommended operating range for heating.

\* Includes 135W to power controls.

**All installations and services must be performed by qualified service personnel.**

**CLQS1-100T (Single Stage with Constant Torque blower motor)**

Alterations Req'd For A/C @ Design External Static Pressure		
Cooling Unit	HTG Speed	Recommended CLG Speed
30,000	Med (Blue)	Low (Red)
36,000	Med (Blue)	Med Low (Purple)
42,000	Med (Blue)	Med High (Yellow)
48,000	Med (Blue)	High (Black)

Temperature Rise (°F)

Speed Tap	External Static Pressure (in WC)						
	0.1	0.2	0.3	0.4	0.5	0.6	0.7
Low (Red)	71	75	79	84	90	100	109
Med Low (Purple)	62	65	68	72	74	79	83
Med (Blue)	60	62	66	69	72	75	79
Med High (Yellow)	55	56	58	61	63	66	68
High (Black)	49	50	51	53	57	61	67

Airflow (CFM)

Speed Tap	External Static Pressure (in WC)						
	0.1	0.2	0.3	0.4	0.5	0.6	0.7
Low (Red)	1239	1178	1107	1046	976	883	806
Med Low (Purple)	1414	1357	1295	1224	1186	1120	1062
Med (Blue)	1467	1416	1341	1276	1229	1177	1119
Med High (Yellow)	1601	1558	1505	1448	1391	1340	1301
High (Black)	1799	1762	1716	1646	1547	1438	1322

Current (A)

Speed Tap	External Static Pressure (in WC)						
	0.1	0.2	0.3	0.4	0.5	0.6	0.7
Low (Red)	3.9	4.1	4.2	4.3	4.4	4.5	4.5
Med Low (Purple)	4.8	4.9	5.1	5.2	5.2	5.3	5.5
Med (Blue)	5.1	5.2	5.4	5.5	5.6	5.6	5.8
Med High (Yellow)	6.0	6.1	6.3	6.4	6.5	6.6	6.7
High (Black)	7.3	7.5	7.7	7.9	7.6	7.3	6.9

Power (W) \*

Speed Tap	External Static Pressure (in WC)						
	0.1	0.2	0.3	0.4	0.5	0.6	0.7
Low (Red)	328	341	351	359	370	379	386
Med Low (Purple)	406	422	434	446	452	464	477
Med (Blue)	434	451	464	473	483	490	502
Med High (Yellow)	523	540	557	569	579	589	597
High (Black)	655	668	689	712	683	656	612

Note: Shading indicates recommended operating range for heating.

\* Includes 120W to power controls.



All installations and services must be performed by qualified service personnel.

**CLQS1-125T (Single Stage with Constant Torque blower motor)**

Alterations Req'd For A/C @ Design External Static Pressure		
Cooling Unit	HTG Speed	Recommended CLG Speed
36,000	Med High (Yellow)	Low (Red)
42,000	Med High (Yellow)	Med Low (Purple)
48,000	Med High (Yellow)	Med (Blue)
60,000	Med High (Yellow)	High (Black)

Temperature Rise (°F)

Speed Tap	External Static Pressure (in WC)						
	0.1	0.2	0.3	0.4	0.5	0.6	0.7
Low (Red)	73	76	81	86	93	99	106
Med Low (Purple)	68	71	74	78	83	87	93
Med (Blue)	62	64	67	70	73	77	81
Med High (Yellow)	59	61	63	65	68	71	75
High (Black)	53	54	55	57	58	60	63

Airflow (CFM)

Speed Tap	External Static Pressure (in WC)						
	0.1	0.2	0.3	0.4	0.5	0.6	0.7
Low (Red)	1512	1444	1365	1275	1180	1111	1038
Med Low (Purple)	1625	1553	1481	1414	1330	1263	1186
Med (Blue)	1767	1710	1649	1582	1513	1437	1359
Med High (Yellow)	1878	1813	1753	1685	1617	1544	1463
High (Black)	2093	2047	1988	1938	1882	1819	1745

Current (A)

Speed Tap	External Static Pressure (in WC)						
	0.1	0.2	0.3	0.4	0.5	0.6	0.7
Low (Red)	4.4	4.6	4.7	4.8	4.9	5.0	5.1
Med Low (Purple)	5.2	5.4	5.5	5.6	5.7	5.9	6.0
Med (Blue)	6.0	6.3	6.4	6.5	6.7	6.8	7.0
Med High (Yellow)	6.3	6.6	6.7	6.8	7.0	7.1	7.3
High (Black)	8.7	8.9	9.0	9.3	9.5	9.7	9.7

Power (W) \*

Speed Tap	External Static Pressure (in WC)						
	0.1	0.2	0.3	0.4	0.5	0.6	0.7
Low (Red)	386	402	412	427	439	447	457
Med Low (Purple)	464	480	493	506	517	529	540
Med (Blue)	543	566	580	592	607	622	636
Med High (Yellow)	578	600	611	626	642	656	670
High (Black)	810	830	843	866	886	901	919

Note: Shading indicates recommended operating range for heating.

\* Includes 135W to power controls.