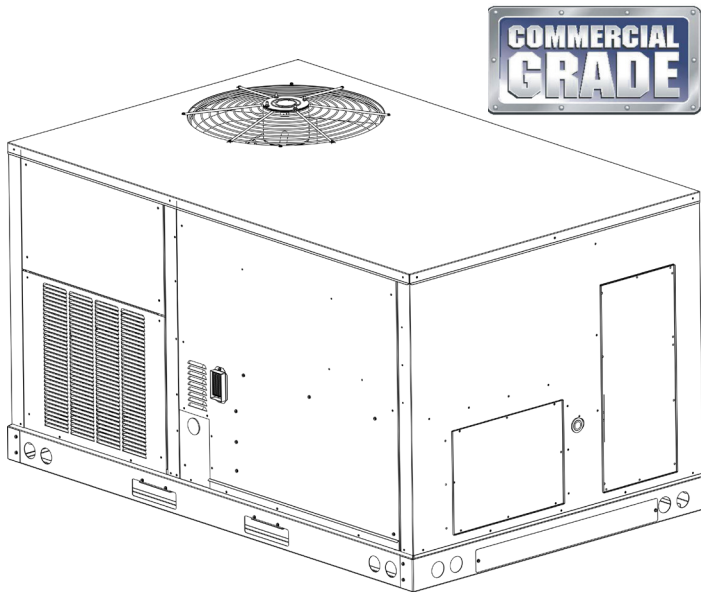


# PACKAGED GAS/ELECTRIC UNIT 3-5 TON ULTRA LOW NOx HIGH EFFICIENCY LIGHT COMMERCIAL DRG MODELS INSTALLATION INSTRUCTIONS



This forced air central unit design complies with requirements embodied in the American National Standard/ National Standard of Canada **ANSI Z21.47•CSA-2.3 Gas-fired central furnaces.**



## WARNING

ONLY PERSONNEL THAT HAVE BEEN TRAINED TO INSTALL, ADJUST, SERVICE, MAINTENANCE OR REPAIR (HEREINAFTER, "SERVICE") THE EQUIPMENT SPECIFIED IN THIS MANUAL SHOULD SERVICE THE EQUIPMENT.

THIS EQUIPMENT IS NOT INTENDED FOR USE BY PERSONS (INCLUDING CHILDREN) WITH REDUCED PHYSICAL, SENSORY OR MENTAL CAPABILITIES, OR LACK OF EXPERIENCE AND KNOWLEDGE, UNLESS THEY HAVE BEEN GIVEN SUPERVISION OR INSTRUCTION CONCERNING USE OF THE APPLIANCE BY A PERSON RESPONSIBLE FOR THEIR SAFETY.

CHILDREN SHOULD BE SUPERVISED TO ENSURE THAT THEY DO NOT PLAY WITH THE EQUIPMENT.

THE MANUFACTURER WILL NOT BE RESPONSIBLE FOR ANY INJURY OR PROPERTY DAMAGE ARISING FROM IMPROPER SUPERVISION, SERVICE OR SERVICE PROCEDURES. IF YOU SERVICE THIS UNIT, YOU ASSUME RESPONSIBILITY FOR ANY INJURY OR PROPERTY DAMAGE WHICH MAY RESULT. IN ADDITION, IN JURISDICTIONS THAT REQUIRE ONE OR MORE LICENSES TO SERVICE THE EQUIPMENT SPECIFIED IN THIS MANUAL, ONLY LICENSED PERSONNEL SHOULD SERVICE THE EQUIPMENT. IMPROPER SUPERVISION, INSTALLATION, ADJUSTMENT, SERVICING, MAINTENANCE OR REPAIR OF THE EQUIPMENT SPECIFIED IN THIS MANUAL, OR ATTEMPTING TO INSTALL, ADJUST, SERVICE OR REPAIR THE EQUIPMENT SPECIFIED IN THIS MANUAL WITHOUT PROPER SUPERVISION OR TRAINING MAY RESULT IN PRODUCT DAMAGE, PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.



## WARNING

DO NOT BYPASS SAFETY DEVICES

Our continuing commitment to quality products may mean a change in specifications without notice.

© 2020-2023 **DAIKIN COMFORT TECHNOLOGIES MANUFACTURING, L.P.**

19001 Kermier Rd., Waller, TX 77484

[www.daikincomfort.com](http://www.daikincomfort.com)



## INDEX

SAFETY INSTRUCTIONS .....	2
REPLACEMENT PARTS .....	2
GENERAL INFORMATION .....	4
CLEARANCES .....	6
ROOF CURB POST-INSTALLATION CHECKS .....	7
ROOF TOP DUCT CONNECTIONS .....	7
RIGGING DETAILS .....	7
WEIGHTS AND CENTER OF GRAVITY .....	8
ELECTRICAL WIRING .....	8
GAS SUPPLY PIPING .....	10
CIRCULATING AIR AND FILTERS .....	12
CONDENSATE DRAIN CONNECTION .....	12
STARTUP, ADJUSTMENTS, AND CHECKS .....	13
AIR FLOW ADJUSTMENTS .....	14
GAS SYSTEM CHECK .....	14
NORMAL SEQUENCE OF OPERATION .....	16
MAINTENANCE .....	20
TROUBLESHOOTING .....	22
APPENDIX A BLOWER PERFORMANCE DATA .....	24
APPENDIX B ELECTRICAL DATA .....	28
APPENDIX C UNIT DIMENSIONS .....	29
APPENDIX D MIN-MAX AIRFLOW .....	30
WIRING DIAGRAMS .....	31
STARTUP CHECKLIST .....	34

## SAFETY INSTRUCTIONS

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

These installation instructions cover the outdoor installation of single package heating and cooling units. See the Specification Sheet applicable to your model for information regarding accessories.

**\*NOTE: PLEASE CONTACT YOUR DISTRIBUTOR OR OUR WEBSITE FOR THE APPLICABLE SPECIFICATION SHEET REFERRED TO IN THIS MANUAL.**

#### **TO THE INSTALLER**

Before installing this unit, please read this manual to familiarize yourself on the specific items which must be adhered to, including maximum external static pressure to unit, air temperature rise, minimum or maximum CFM and motor speed connections.

Keep this literature in a safe place for future reference.

## REPLACEMENT PARTS

### **ORDERING PARTS**

When reporting shortages or damages, or ordering repair parts, give the complete unit model and serial numbers as stamped on the unit's nameplate.

Replacement parts for this appliance are available through your contractor or local distributor. Location of your local distributor can be found at [www.daikinac.com](http://www.daikinac.com) or contact:

## EQUIPMENT SUPPORT

Daikin Comfort Technologies Manufacturing, L.P.  
19001 Kermier Road  
Waller, Texas 77484  
855-770-5678



### **WARNING**

IF THE INFORMATION IN THESE INSTRUCTIONS IS NOT FOLLOWED EXACTLY, A FIRE OR EXPLOSION MAY RESULT CAUSING PROPERTY DAMAGE, PERSONAL INJURY OR LOSS OF LIFE.

- DO NOT STORE OR USE GASOLINE OR OTHER FLAMMABLE VAPORS AND LIQUIDS IN THE VICINITY OF THIS OR ANY OTHER APPLIANCE.
- WHAT TO DO IF YOU SMELL GAS:
  - DO NOT TRY TO LIGHT ANY APPLIANCE.
  - DO NOT TOUCH ANY ELECTRICAL SWITCH; DO NOT USE ANY PHONE IN YOUR BUILDING.
  - IMMEDIATELY CALL YOUR GAS SUPPLIER FROM A NEIGHBOR'S PHONE. FOLLOW THE GAS SUPPLIER'S INSTRUCTIONS. IF YOU CANNOT REACH YOUR GAS SUPPLIER, CALL THE FIRE DEPARTMENT.
- INSTALLATION AND SERVICE MUST BE PERFORMED BY A QUALIFIED INSTALLER, SERVICE AGENCY OR THE GAS SUPPLIER.



### **WARNING**

TO PREVENT THE RISK OF PROPERTY DAMAGE, PERSONAL INJURY, OR DEATH, DO NOT STORE COMBUSTIBLE MATERIALS OR USE GASOLINE OR OTHER FLAMMABLE LIQUIDS OR VAPORS IN THE VICINITY OF THIS APPLIANCE.



### **WARNING**

SHOULD OVERHEATING OCCUR OR THE GAS SUPPLY FAIL TO SHUT OFF, TURN OFF THE MANUAL GAS SHUTOFF VALVE EXTERNAL TO THE FURNACE BEFORE TURNING OFF THE ELECTRICAL SUPPLY.



### **CAUTION**

SHEET METAL PARTS, SCREWS, CLIPS AND SIMILAR ITEMS INHERENTLY HAVE SHARP EDGES, AND IT IS NECESSARY THAT THE INSTALLER AND SERVICE PERSONNEL EXERCISE CAUTION.



## WARNING

DO NOT CONNECT TO OR USE ANY DEVICE THAT IS NOT DESIGN CERTIFIED BY THE MANUFACTURER FOR USE WITH THIS UNIT. SERIOUS PROPERTY DAMAGE, PERSONAL INJURY, REDUCED UNIT PERFORMANCE AND/OR HAZARDOUS CONDITIONS MAY RESULT FROM THE USE OF SUCH NON-APPROVED DEVICES.



## WARNING

TO AVOID PROPERTY DAMAGE, PERSONAL INJURY OR DEATH, DO NOT USE THIS UNIT IF ANY PART HAS BEEN UNDER WATER. IMMEDIATELY CALL A QUALIFIED SERVICE TECHNICIAN TO INSPECT THE FURNACE AND TO REPLACE ANY PART OF THE CONTROL SYSTEM AND ANY GAS CONTROL HAVING BEEN UNDER WATER.



## WARNING

THIS UNIT MUST NOT BE USED AS A "CONSTRUCTION HEATER" DURING THE FINISHING PHASES OF CONSTRUCTION ON A NEW STRUCTURE. THIS TYPE OF USE MAY RESULT IN PREMATURE FAILURE OF THE UNIT DUE TO EXTREMELY LOW RETURN AIR TEMPERATURE AND EXPOSURE TO CORROSIVE OR VERY DIRTY ATMOSPHERES.

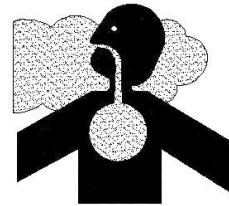


## WARNING

**HIGH VOLTAGE!**  
DISCONNECT ALL POWER BEFORE SERVICING OR INSTALLING THIS UNIT. MULTIPLE POWER SOURCES MAY BE PRESENT. FAILURE TO DO SO MAY CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.



## DANGER PELIGRO



### CARBON MONOXIDE POISONING HAZARD

Special Warning for Installation of Furnace or Air Handling Units in Enclosed Areas such as Garages, Utility Rooms or Parking Areas

Carbon monoxide producing devices (such as automobiles, space heater, gas water heater, etc.) should not be operated in enclosed areas such as unventilated garages, utility rooms or parking areas because of the danger of carbon monoxide (CO) poisoning resulting from the exhaust emissions. If a furnace or air handler is installed in an enclosed area such as a garage, utility room or parking area and a carbon monoxide producing device is operated therein, there must be adequate, direct outside ventilation.

This ventilation is necessary to avoid the danger of CO poisoning which can occur if a carbon monoxide producing device continues to operate in the enclosed area. Carbon monoxide emissions can be (re)circulated throughout the structure if the furnace or air handler is operating in any mode.

CO can cause serious illness including permanent brain damage or death.

B10259-216

### RIESGO DE INTOXICACIÓN POR MONÓXIDO DE CARBONO

Advertencia especial para la instalación de calentadores ó manejadoras de aire en áreas cerradas como estacionamientos ó cuartos de servicio.

Los equipos ó aparatos que producen monóxido de carbono (tal como automóvil, calentador de gas, calentador de agua por medio de gas, etc) no deben ser operados en áreas cerradas debido al riesgo de envenenamiento por monóxido de carbono (CO) que resulta de las emisiones de gases de combustión. Si el equipo ó aparato se opera en dichas áreas, debe existir una adecuada ventilación directa al exterior.

Esta ventilación es necesaria para evitar el peligro de envenenamiento por CO, que puede ocurrir si un dispositivo que produce monóxido de carbono sigue operando en el lugar cerrado.

Las emisiones de monóxido de carbono pueden circular a través del aparato cuando se opera en cualquier modo.

El monóxido de carbono puede causar enfermedades severas como daño cerebral permanente ó muerte.

B10259-216

### RISQUE D'EMPOISONNEMENT AU MONOXYDE DE CARBONE

Avertissement special au sujet de l'installation d'appareils de chauffage ou de traitement d'air dans des endroits clos, tels les garages, les locaux d'entretien et les stationnements.

Evitez de mettre en marche les appareils produisant du monoxyde de carbone (tels que les automobile, les appareils de chauffage autonome, etc.) dans des endroits non ventilés tels que les d'empoisonnement au monoxyde de carbone. Si vous devez faire fonctionner ces appareils dans un endroit clos, assurez-vous qu'il y ait une ventilation directe provenant de l'exterieur.

Cette ventilation est nécessaire pour éviter le danger d'intoxication au CO pouvant survenir si un appareil produisant du monoxyde de carbone continue de fonctionner au sein de la zone confinée.

Les émissions de monoxyde de carbone peuvent être recirculées dans les endroits clos, si l'appareil de chauffage ou de traitement d'air sont en marche.

Le monoxyde de carbone peut causer des maladies graves telles que des dommages permanents au cerveau et même la mort.

B10259-216

## GENERAL INFORMATION



### WARNING

**TO PREVENT PROPERTY DAMAGE, PERSONAL INJURY OR DEATH, DUE TO FIRE, EXPLOSIONS, SMOKE, SOOT, CONDENSATION, ELECTRIC SHOCK OR CARBON MONOXIDE, THIS UNIT MUST BE PROPERLY INSTALLED, REPAIRED, OPERATED, AND MAINTAINED.**

#### **This unit is approved for outdoor installation ONLY.**

Rated performance is achieved after 20 hours of operation. Rated performance is delivered at the specified airflow. See product specification sheet for light commercial models. Specification sheets can be found at [www.daikinac.com](http://www.daikinac.com) for Daikin brand products. Within the website, please select the light commercial products menu and then select the submenu for the type of product to be installed, such as air conditioners or heat pumps, to access a list of product pages that each contain links to that model's specification sheet.

To assure that your unit operates safely and efficiently, it must be installed, operated, and maintained in accordance with these installation and operating instructions, all local building codes and ordinances, or in their absence, with the latest edition of the National Fuel Gas Code NFPA54/ANSI Z223.1 and National Standard of Canada CAN/CSA B149 Installation Codes. In situations where these conflict, local codes take precedence.

#### **EPA REGULATIONS**

**IMPORTANT: THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (EPA) HAS ISSUED VARIOUS REGULATIONS REGARDING THE INTRODUCTION AND DISPOSAL OF REFRIGERANTS IN THIS UNIT. FAILURE TO FOLLOW THESE REGULATIONS MAY HARM THE ENVIRONMENT AND CAN LEAD TO THE IMPOSITION OF SUBSTANTIAL FINES. BECAUSE REGULATIONS MAY VARY DUE TO PASSAGE OF NEW LAWS, WE SUGGEST A CERTIFIED TECHNICIAN PERFORM ANY WORK DONE ON THIS UNIT. SHOULD YOU HAVE ANY QUESTIONS PLEASE CONTACT THE LOCAL OFFICE OF THE EPA.**

#### **NATIONAL CODES**

This product is designed and manufactured to permit installation in accordance with National Codes. It is the installer's responsibility to install the product in accordance with National Codes and/or prevailing local codes and regulations.

The heating and cooling capacities of the unit should be greater than or equal to the design heating and cooling loads of the area to be conditioned. The loads should be calculated by an approved method or in accordance with ASHRAE Guide or Manual J - Load Calculations published by the Air Conditioning Contractors of America.

Obtain from:  
American National Standards Institute  
25 West 43rd Street, 4th Floor  
New York, NY 10036

System design and installation should also, where applicable, follow information presented in accepted industry guides such as the ASHRAE Handbooks. The manufacturer assumes no responsibility for equipment installed in violation of any local codes. The mechanical installation of the packaged roof top units consists of making final connections between the unit and building services; supply and return duct connections; and drain connections (if required). The internal systems of the unit are completely factory-installed and tested prior to shipment.

Units are generally installed on a steel roof mounting curb assembly which has been shipped to the job site for installation on the roof structure prior to the arrival of the unit. The model number shown on the unit's identification plate identifies the various components of the unit such as refrigeration tonnage, heating output and voltage.

Carefully inspect the unit for damage including damage to the cabinetry. Any bolts or screws which may have loosened in transit must be re-tightened.

In the event of damage, the receiver should:

1. Make notation on delivery receipt of any visible damage to shipment or container.
2. Notify the carrier promptly and request an inspection.
3. In case of concealed damage, the carrier should be notified as soon as possible-preferably within 5 days.
4. File the claim with the following supporting documents:
  - a. Original Bill of Lading, certified copy, or indemnity bond.
  - b. Original paid freight bill or indemnity in lieu thereof.
  - c. Original invoice or certified copy thereof, showing trade and other discounts or reductions.
  - d. Copy of the inspection report issued by the carrier representative at the time damage is reported to the carrier. The carrier is responsible for making prompt inspection of damage and for a thorough investigation of each claim. The distributor or manufacturer will not accept claims from dealers for transportation damage.

**NOTE: WHEN INSPECTING THE UNIT FOR TRANSPORTATION DAMAGE, REMOVE ALL PACKAGING MATERIALS. RECYCLE OR DISPOSE OF THE PACKAGING MATERIAL ACCORDING TO LOCAL CODES.**

#### **PRE-INSTALLATION CHECKS**

Carefully read all instructions for the installation prior to installing unit. Ensure each step or procedure is understood and any special considerations are taken into account before starting installation. Assemble all tools, hardware and supplies needed to complete the installation. Some items may need to be purchased locally.

**NOTE: VERIFY THAT THE VOLTAGE LISTED ON THE UNIT DATA PLATE MATCHES THE VOLTAGE SUPPLIED BY THE BUILDING UTILITIES.**



## WARNING

TO PREVENT POSSIBLE EQUIPMENT DAMAGE, PROPERTY DAMAGE, PERSONAL INJURY OR DEATH, THE FOLLOWING BULLET POINTS MUST BE OBSERVED WHEN INSTALLING THE UNIT.

### **IMPORTANT NOTE: REMOVE WOOD SHIPPING RAILS PRIOR TO INSTALLATION OF THE UNIT.**

#### **ALL INSTALLATIONS:**

**IMPORTANT NOTE: UNIT SHOULD BE ENERGIZED 24 HOURS PRIOR TO COMPRESSOR START UP TO ENSURE CRANKCASE HEATER HAS SUFFICIENTLY WARMED THE COMPRESSORS. COMPRESSOR DAMAGE MAY OCCUR IF THIS STEP IS NOT FOLLOWED.**

**NOTE: APPLIANCE IS SHIPPED FROM FACTORY FOR VERTICAL DUCT APPLICATION.**

Proper installation of the unit ensures trouble-free operation. Improper installation can result in problems ranging from noisy operation to property or equipment damages, dangerous conditions that could result in injury or personal property damage and that are not covered by the warranty. Give this booklet to the user and explain its provisions. The user should retain these instructions for future reference.

- For proper flame pattern within the heat exchanger and proper condensate drainage, the unit must be mounted level.
- The flue outlet must be at least 12 inches from any opening through which flue gases could enter a building, and at least three feet above any forced air inlet located within ten feet. The economizer/manual fresh air intake/motorized fresh air intake and combustion air inlet mounted on the unit are not affected by this restriction.
- To avoid possible corrosion of the heat exchanger, do not locate the unit in an area where the outdoor air (i.e. combustion air for the unit) will be frequently contaminated by compounds containing chlorine or fluorine. Common sources of such compounds include swimming pool chemicals and chlorine bleaches, paint stripper, adhesives, paints, varnishes, sealers, waxes (which are not yet dried) and solvents used during construction and remodeling. Various commercial and industrial processes may also be sources of chlorine/fluorine compounds.
- The unit shall not be connected to a chimney flue serving a separate appliance designed to burn solid fuel.
- To avoid possible illness or death of the building occupants, do NOT locate outside air intake device (economizer, manual fresh air intake, motorized fresh air intake) too close to an exhaust outlet, gas vent termination, or plumbing vent outlet. For specific distances required, consult local codes.

- Allow minimum clearances from the enclosure for fire protection, proper operation, and service access (see unit clearances). These clearances must be permanently maintained.
- The combustion air inlet and flue outlet on the unit must never be obstructed. If used, do not allow the economizer/manual fresh air damper/motorized fresh air damper to become blocked by snow or debris. In some climates or locations, it may be necessary to elevate the unit to avoid these problems.
- When the unit is heating, the temperature of the return air entering the unit must be a minimum of 55° F.

#### **GROUND LEVEL INSTALLATIONS ONLY:**

- When the unit is installed on the ground adjacent to the building, a level concrete (or equal) base is recommended. Prepare a base that is 3" larger than the package unit footprint and a minimum of 3" thick.
- The base should also be located where no runoff of water from higher ground can collect in the unit.

#### **ROOF TOP INSTALLATIONS ONLY:**

- To avoid possible property damage or personal injury, the roof must have sufficient structural strength to carry the weight of the unit(s) and snow or water loads as required by local codes. Consult a structural engineer to determine the weight capabilities of the roof.
- The unit may be installed directly on wood floors or on Class A, Class B, or Class C roof covering material.
- To avoid possible personal injury, a safe, flat surface for service personnel should be provided.
- As indicated on the unit data plate, a minimum clearance of 36" to any combustible material is required on the furnace access side of the unit. All combustible materials must be kept out of this area.
- This 36" clearance must also be maintained to insure proper combustion air and flue gas flow. The combustion air intake and furnace flue discharge must not be blocked for any reason, including blockage by snow.
- Adequate clearances from the furnace flue discharge to any adjacent public walkways, adjacent buildings, building openings or openable windows must be maintained in accordance with the latest edition of the National Fuel Gas Code ANSI Z223.1/NFPA 54.
- Minimum horizontal clearance of 48" from the furnace flue discharge to any electric meters, gas meters, regulators and relief equipment is required.

#### **UNIT PRECAUTIONS**

- Do not stand or walk on the unit.
- Do not drill holes anywhere in panels or in the base frame of the unit except where indicated. Unit access panels provide structural support.
- Do not remove any access panels until unit has been installed on roof curb or field supplied structure.
- Do not roll unit across finished roof without prior approval of owner or architect.

- Do not skid or slide on any surface as this may damage unit base. The unit must be stored on a flat, level surface. Protect the condenser coil because it is easily damaged.

**ROOF CURB INSTALLATIONS ONLY:**

Curb installations must comply with local codes and should be done in accordance with the established guidelines of the National Roofing Contractors Association.

Proper unit installation requires that the roof curb be firmly and permanently attached to the roof structure. Check for adequate fastening method prior to setting the unit on the curb.

Full perimeter roof curbs are available from the factory and are shipped unassembled. Field assembly, squaring, leveling and mounting on the roof structure are the responsibility of the installing contractor. All required hardware necessary for the assembly of the sheet metal curb is included in the curb accessory.

 <b>WARNING</b>
<p><b>TO PREVENT POSSIBLE EQUIPMENT DAMAGE, PROPERTY DAMAGE, PERSONAL INJURY OR DEATH, THE FOLLOWING BULLET POINTS MUST BE OBSERVED WHEN INSTALLING THE UNIT.</b></p>

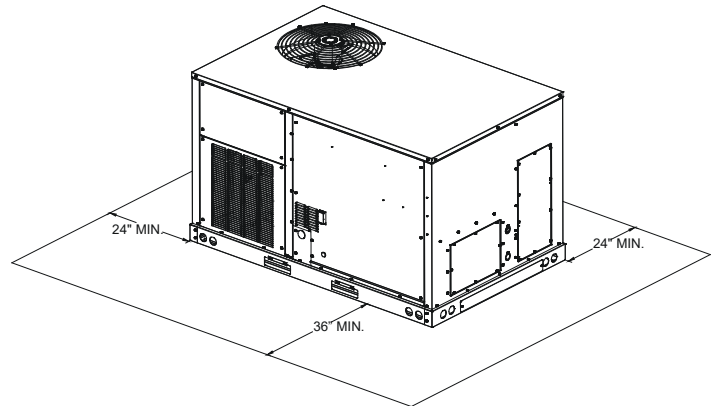
- Sufficient structural support must be determined prior to locating and mounting the curb and package unit.
- Ductwork must be constructed using industry guidelines. The duct work must be placed into the roof curb before mounting the package unit. Our full perimeter curbs include duct connection frames to be assembled with the curb. **NOTE: IT IS NOT NECESSARY TO ATTACH THE DUCT TO THE DUCT SUPPORTS WITH A MECHANICAL FASTENER.** Cantilevered type curbs are not available from the factory.
- Curb insulation, cant strips, flashing and general roofing material are furnished by the contractor.
- The curbs must be supported on parallel sides by roof members.
- The roof members must not penetrate supply and return duct opening areas as damage to the unit might occur.

**NOTE: THE UNIT AND CURB ACCESSORIES ARE DESIGNED TO ALLOW VERTICAL DUCT INSTALLATION BEFORE UNIT PLACEMENT. DUCT INSTALLATION AFTER UNIT PLACEMENT IS NOT RECOMMENDED.**

 <b>CAUTION</b>
<p><b>ALL CURBS LOOK SIMILAR. TO AVOID INCORRECT CURB POSITIONING, CHECK JOB PLANS CAREFULLY AND VERIFY MARKINGS ON CURB ASSEMBLY. INSTRUCTIONS MAY VARY IN CURB STYLES AND SUPERSEDES INFORMATION SHOWN.</b></p>

See the manual shipped with the roof curb for assembly and installation instructions.

**CLEARANCES**



**UNIT CLEARANCES**

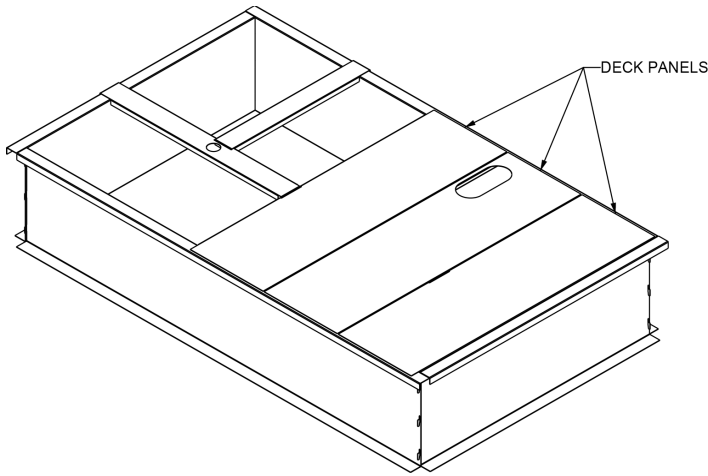
*\*In situations that have multiple units, a 36" minimum clearance is required between the condenser coils.*

Adequate clearance around the unit should be kept for safety, service, maintenance, and proper unit operation. A clearance of 48" is recommended on all sides of the unit to facilitate possible parts replacement, to allow service access and to insure proper ventilation and condenser airflow. The top of the unit should be completely unobstructed. If units are to be located under an overhang, there should be a minimum of 48" clearance and provisions made to deflect the warm discharge air out from the overhang. The unit should be installed remote from all building exhausts to inhibit ingestion of exhaust air into the unit fresh air intake.

**NOTE: IF THE 36" MINIMUM CLEARANCE IS USED ON THE CONTROL PANEL SIDE OF A DRG UNIT, A FLUE EXTENSION KIT NEEDS BE TO PREVENT FLUE GAS RECIRCULATION. SEE TABLE BELOW FOR THE KIT SELECTION.**

Model Size	Kit Part Number
3 ton	HEFLUE036
4 & 5 ton	HEFLUE048060

**FLUE EXTENSION KITS**



**ROOF CURB INSTALLATION  
ROOF CURB POST-INSTALLATION  
CHECKS**

After installation, check the top of the curb, duct connection frame and duct flanges to make sure gasket has been applied properly. Gasket should be firmly applied to the top of the curb perimeter, duct flanges and any exposed duct connection frame. If gasket is loose, re-apply using strong weather resistant adhesive.

**PROTRUSION**

Inspect curb to ensure that none of the utility services (electric) routed through the curb protrude above the curb.

**NOTE: IF FASTENERS ARE USED TO SECURE THE DUCT WORK TO THE CURB, THESE SHOULD BE INSTALLED HORIZONTALLY INTO THE FLANGES OF THE DUCT OPENING OF THE CURB.**

 <b>CAUTION</b>
IF PROTRUSIONS EXIST, DO NOT ATTEMPT TO SET UNIT ON CURB.

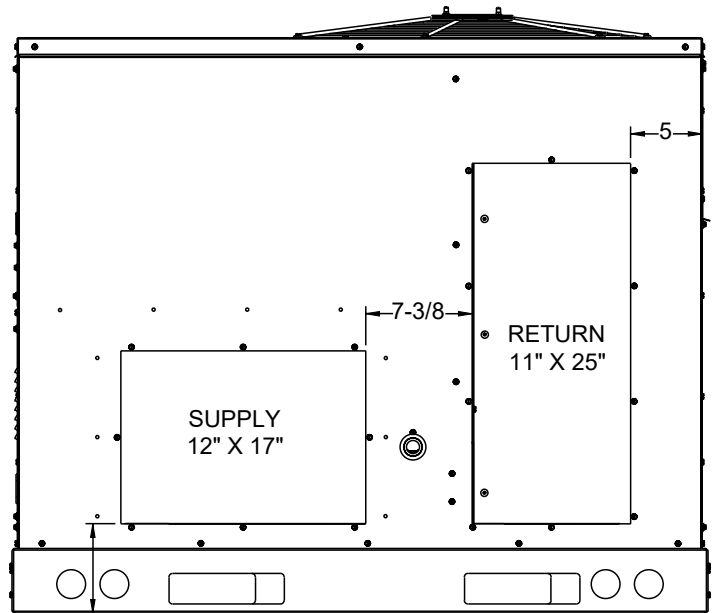
**ROOF TOP DUCT CONNECTIONS**

Install all duct connections on the unit before placing the unit on rooftop.



**HORIZONTAL DISCHARGE**

Refer to IOD-7082 included in the literature pack for installing horizontal duct covers.


Flexible duct connectors between the unit and ducts are recommended. Insulate and weatherproof all external ductwork and joints as required and in accordance with local codes.



**HORIZONTAL DISCHARGE DUCT CONNECTIONS  
RIGGING DETAILS**

 <b>WARNING</b>
TO PREVENT PROPERTY DAMAGE, THE UNIT SHOULD REMAIN IN AN UPRIGHT POSITION DURING ALL RIGGING AND MOVING OPERATIONS. TO FACILITATE LIFTING AND MOVING WHEN A CRANE IS USED, PLACE THE UNIT IN AN ADEQUATE CABLE SLING.
 <b>CAUTION</b>
IF UNITS ARE LIFTED TWO AT A TIME, THE FORK HOLES ON THE CONDENSER END OF THE UNIT MUST NOT BE USED. MINIMUM FORK LENGTH IS 42" TO PREVENT DAMAGE TO THE UNIT; HOWEVER, 48" IS RECOMMENDED.

**PROVISIONS FOR FORKS HAVE BEEN INCLUDED IN THE UNIT BASE FRAME. NO OTHER FORK LOCATIONS ARE APPROVED.**

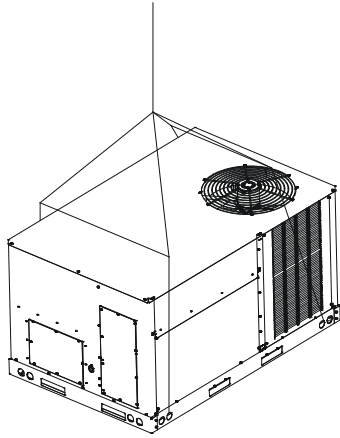
 <b>WARNING</b>
TO PREVENT POSSIBLE EQUIPMENT DAMAGE, PROPERTY DAMAGE, PERSONAL INJURY OR DEATH, THE FOLLOWING BULLET POINTS MUST BE OBSERVED WHEN INSTALLING THE UNIT.

- Unit must be lifted by the four lifting holes located at the base frame corners.
- Lifting cables should be attached to the unit with shackles.
- The distance between the crane hook and the top of the unit must not be less than 60".
- Two spreader bars must span over the unit to prevent damage to the cabinet by the lift cables. Spreader bars must be of sufficient length so that cables do not come in contact with the unit during transport. Remove wood struts mounted beneath unit base

frame before setting unit on roof curb. These struts are intended to protect unit base frame from fork lift damage. Removal is accomplished by extracting the sheet metal retainers and pulling the struts through the base of the unit. Refer to rigging label on the unit.

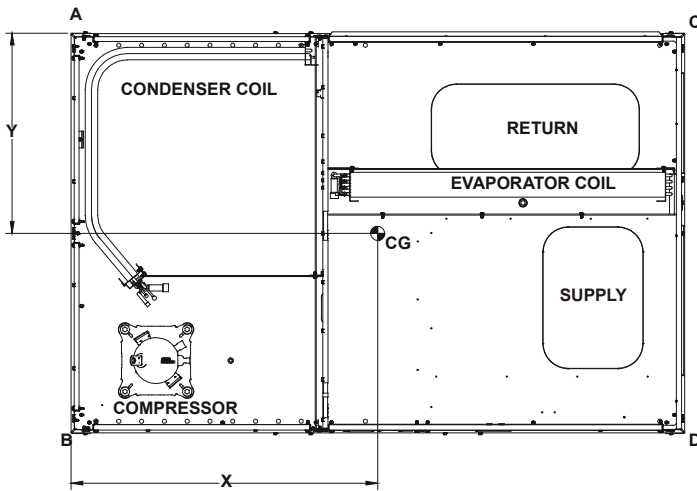
**IMPORTANT: IF USING BOTTOM DISCHARGE WITH ROOF CURB, DUCTWORK SHOULD BE ATTACHED TO THE CURB PRIOR TO INSTALLING THE UNIT. DUCTWORK DIMENSIONS ARE SHOWN IN ROOF CURB INSTALLATION INSTRUCTIONS.**

Refer to the Roof Curb Installation Instructions for proper curb installation. Curbing must be installed in compliance with the National Roofing Contractors Association Manual.



To assist in determining rigging requirements, unit weights and center of gravity are shown as follows:

**WEIGHTS AND CENTER OF GRAVITY**



**CORNER AND CENTER OF GRAVITY LOCATIONS**

**NOTE: UNIT SHOULD BE LIFTED AT A POINT ABOVE CENTER OF GRAVITY.**

MODEL	SHIPPING WEIGHT (LB)	OPERATING WEIGHT (LB)	CORNER WEIGHT (LB)				X (IN)	Y (IN)
			A	B	C	D		
DRG036	630	572	104	141	186	141	36.5	27.7
DRG048	705	647	118	231	180	118	36.3	27.9
DRG060	713	655	148	189	135	183	35.8	27.5

**THE NUMBERS MAY SLIGHTLY VARY DEPENDING ON INSTALLED OPTIONS.**

**CAUTION**

TO PREVENT SEVERE DAMAGE TO THE BOTTOM OF THE UNIT, DO NOT FORK LIFT UNIT AFTER WOOD STRUTS HAVE BEEN REMOVED.

Bring condenser end of unit into alignment with the curb first. Lower unit carefully onto roof mounting curb. When a rectangular cantilever curb is used, care should be taken to center the unit. Check for proper alignment and orientation of supply and return openings with duct.

**RIGGING REMOVAL**

**CAUTION**

TO PREVENT DAMAGE TO THE UNIT, DO NOT ALLOW CRANE HOOKS AND SPREADER BARS TO REST ON THE ROOF OF THE UNIT.

Remove spreader bars, lifting cables and other rigging equipment.

**ELECTRICAL WIRING**

**WARNING**

**HIGH VOLTAGE!**  
DISCONNECT ALL POWER BEFORE SERVICING OR INSTALLING THIS UNIT. MULTIPLE POWER SOURCES MAY BE PRESENT. FAILURE TO DO SO MAY CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

**WARNING**

**HIGH VOLTAGE!**  
TO AVOID PERSONAL INJURY OR DEATH DUE TO ELECTRICAL SHOCK, DO NOT TAMPER WITH FACTORY WIRING. THE INTERNAL POWER AND CONTROL WIRING OF THESE UNITS ARE FACTORY-INSTALLED AND HAVE BEEN THOROUGHLY TESTED PRIOR TO SHIPMENT. CONTACT YOUR LOCAL REPRESENTATIVE IF ASSISTANCE IS REQUIRED.

**CAUTION**

TO PREVENT DAMAGE TO THE WIRING, PROTECT WIRING FROM SHARP EDGES. FOLLOW NATIONAL ELECTRICAL CODE AND ALL LOCAL CODES AND ORDINANCES. DO NOT ROUTE WIRES THROUGH REMOVABLE ACCESS PANELS.

**CAUTION**

CONDUIT AND FITTINGS MUST BE WEATHER-TIGHT TO PREVENT WATER ENTRY INTO THE BUILDING.



For unit protection, use a fuse or HACR circuit breaker that is in excess of the circuit ampacity, but less than or equal to the maximum overcurrent protection device. **DO NOT EXCEED THE MAXIMUM OVERCURRENT DEVICE SIZE SHOWN ON UNIT DATA PLATE.**

All line voltage connections must be made through weatherproof fittings. All exterior power supply and ground wiring must be in approved weatherproof conduit.

The main power supply wiring to the unit and low voltage wiring to accessory controls must be done in accordance with these instructions, the latest edition of the National Electrical Code (ANSI/NFPA 70), and all local codes and ordinances.

The unit is factory wired for the voltage shown on the unit's data plate.

**NOTE: IF SUPPLY VOLTAGE IS 208V, LEAD ON PRIMARY OF TRANSFORMER(S) MUST BE MOVED FROM THE 230V TO THE 208V TAP. REFER TO WIRING DIAGRAM ON UNIT FOR DETAILS.**

Main power wiring should be sized for the minimum circuit ampacity shown on the unit's data plate. Size wires in accordance with the ampacity tables in the prevailing local electrical codes (National Electrical Code, NFPA 70, or the Canadian Electrical Code, CSA C22.1, Part 1). If long wires are required, it may be necessary to increase the wire size to prevent excessive voltage drop. Wires should be sized for a maximum of 3% voltage drop.

 <b>CAUTION</b>
<p><b>TO AVOID RISK OF PROPERTY DAMAGE, PERSONAL INJURY OR FIRE, USE ONLY COPPER CONDUCTORS.</b></p>

 <b>CAUTION</b>
<p><b>TO PREVENT IMPROPER AND DANGEROUS OPERATION DUE TO WIRING ERRORS, LABEL ALL WIRES PRIOR TO DISCONNECTION WHEN SERVICING CONTROLS. VERIFY PROPER OPERATION AFTER SERVICING.</b></p>

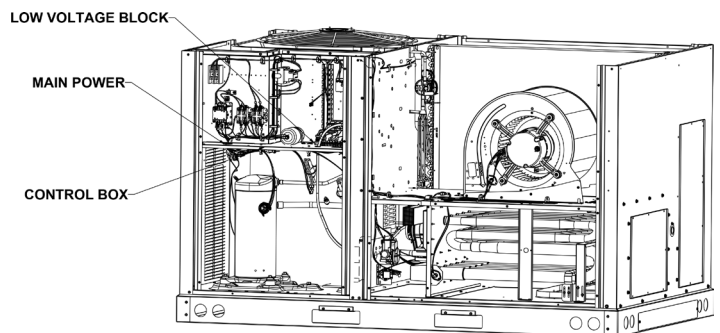
**NOTE: A WEATHER-TIGHT DISCONNECT SWITCH, PROPERLY SIZED FOR THE UNIT TOTAL LOAD, MUST BE FIELD OR FACTORY INSTALLED. AN EXTERNAL FIELD SUPPLIED DISCONNECT MAY BE MOUNTED ON THE EXTERIOR PANEL.**

Ensure the data plate is not covered by the field-supplied disconnect switch.

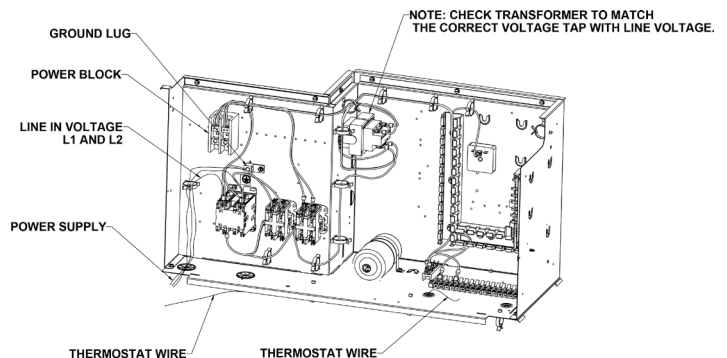
- Some disconnect switches are not fused. Protect the power leads at the point of distribution in accordance with the unit data plate.
- The unit must be electrically grounded in accordance with local codes or, in the absence of local codes, with the latest edition of the National Electrical Code ANSI/NFPA 70, and/or the Canadian Electrical Code, CSA C22.1, Part 1. A ground lug is provided for this

purpose. Do not use the ground lug for connecting a neutral conductor.

- Connect Power wiring to electrical power block, ground wire ground lug, and thermostat wiring to terminal block within the main control box.



**POWER AND LOW VOLTAGE BLOCK CONNECTIONS**



**GAS CONTROL BOX**

**NOTE: DEPENDING ON THE OPTIONS INSTALLED, THE LOCATION OF THE COMPONENTS MAY VARY IN SOME MODELS**

 <b>WARNING</b>
<p><b>OPERATING THE UNIT WITH AN IMPROPER LINE VOLTAGE OR WITH EXCESSIVE PHASE UNBALANCE CAN CAUSE DAMAGE TO OR FAILURE OF THE UNIT. SUCH DAMAGE OR FAILURE IS NOT COVERED UNDER THE UNIT'S WARRANTY.</b></p>

**AREAS WITHOUT CONVENIENCE OUTLET**

It is recommended that an independent 115V power source be brought to the vicinity of the roof top unit for portable lights and tools used by the service mechanic.

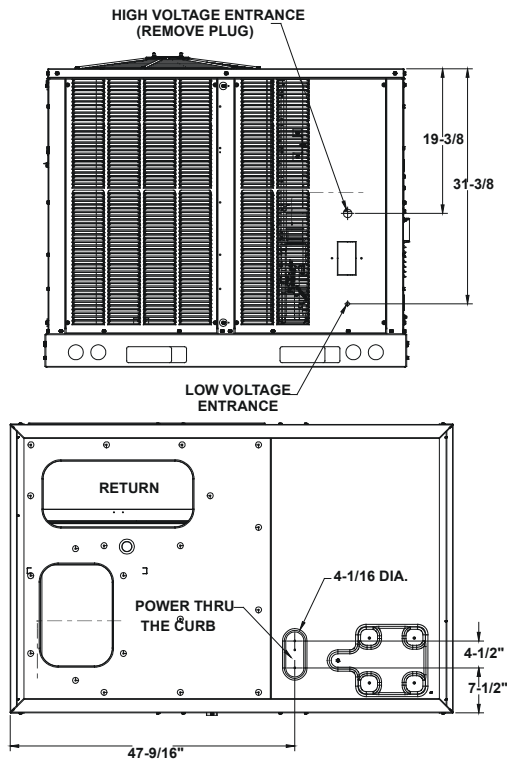
**NOTE: REFER TO LOCAL CODES FOR REQUIREMENTS. THESE OUTLETS CAN ALSO BE FACTORY INSTALLED.**

**UNITS INSTALLED ON ROOF TOPS**

Main power and low voltage wiring may enter the unit through the condenser end of unit or through the roof curb. Install conduit connectors at the designated locations. External connectors must be weatherproof. All holes in the unit base must be sealed (including those around conduit nuts) to prevent water leakage into building. All required conduit and fittings are to be field supplied.

Supply voltage to roof top unit must not vary by more than

10% of the value indicated on the unit data plate. Phase voltage unbalance must not exceed 2%. Contact your local power company for correction of improper voltage or phase unbalance.



**ELECTRICAL ENTRANCE AND THRU CURB  
(BOTTOM VIEW OF UNIT)**

**LOW VOLTAGE CONTROL WIRING**

1. A 24V thermostat must be installed for unit operation.
2. Locate thermostat or remote sensor in the conditioned space where it will sense average temperature. Do not locate the device where it may be directly exposed to supply air, sunlight or other sources of heat. Follow installation instructions packaged with the installed device.
3. Use #18 AWG wire for 24V control wiring runs not exceeding 75 feet. Use #16 AWG wire for 24V control wiring runs not exceeding 125 feet. Use #14 AWG wire for 24V control wiring runs not exceeding 200 feet. Low voltage wiring may be National Electrical Code (NEC) Class 2 where permitted by local codes.
4. Route the low voltage control wires from sub-base terminals to the unit. Control wiring should enter through the condenser panel opening or through curb indicated in "Electrical Entrance" figure. Connect thermostat and any accessory wiring to low voltage terminal block TB1 in the main control box.

**NOTE: FIELD-SUPPLIED CONDUIT MAY NEED TO BE INSTALLED DEPENDING ON UNIT/CURB CONFIGURATION. USE #18 AWG SOLID CONDUCTOR WIRE WHENEVER CONNECTING THERMOSTAT WIRES TO TERMINALS ON SUB-BASE. DO NOT USE LARGER THAN #18 AWG WIRE. A**

**TRANSITION TO #18 AWG WIRE MAY BE REQUIRED BEFORE ENTERING THERMOSTAT SUB-BASE.**

**NOTE: REFER TO UNIT WIRING DIAGRAMS FOR THERMOSTAT OR REMOTE SENSOR CONNECTIONS.  
GAS SUPPLY PIPING**

 <b>WARNING</b>
<p><b>TO PREVENT PERSONAL INJURY OR DEATH DUE TO IMPROPER INSTALLATION, ADJUSTMENT, ALTERATION, SERVICE OR MAINTENANCE, REFER TO THIS MANUAL. FOR ADDITIONAL ASSISTANCE OR INFORMATION, CONSULT A QUALIFIED INSTALLER, SERVICER AGENCY OR THE GAS SUPPLIER.</b></p>

**IMPORTANT NOTE: THIS UNIT IS FACTORY SET TO OPERATE ON NATURAL GAS AT THE ALTITUDES SHOWN ON THE RATING PLATE.**

INLET GAS PRESSURE	
NATURAL	Min. 5.0" W.C., Max. 10.0" W.C.

**INLET GAS PRESSURE MUST NOT EXCEED MAXIMUM VALUE SHOWN IN TABLE ABOVE.**

The minimum supply pressure should not vary from that shown in the table above because this could prevent the unit from having dependable ignition. In addition, gas input to the burners must not exceed the rated input shown on the rating plate. Overfiring of the unit could result in premature heat exchanger failure.

**PIPING**

**IMPORTANT NOTE: To AVOID POSSIBLE UNSATISFACTORY OPERATION OR EQUIPMENT DAMAGE DUE TO UNDER FIRING OF EQUIPMENT, DO NOT UNDERSIZE THE NATURAL/PROPANE GAS PIPING FROM THE METER/TANK TO THE UNIT. WHEN SIZING A TRUNK LINE, INCLUDE ALL APPLIANCES ON THAT LINE THAT COULD BE OPERATED SIMULTANEOUSLY.**

The gas line installation must comply with local codes, or in the absence of local codes, with the latest edition of the National Fuel Gas Code NFPA 54 / ANSI Z223.1.

**NATURAL GAS CONNECTION**

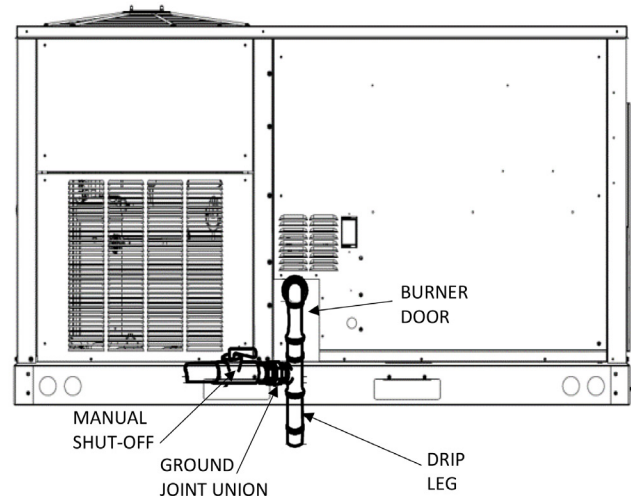
Natural Gas Capacity of Pipe in Cubic Feet of Gas Per Hour (CFH)					
Length of Pipe in Feet	Nominal Black Pipe Size (inches)				
	1/2	3/4	1	1 1/4	1 1/2
10	132	278	520	1050	1600
20	92	190	350	730	1100
30	73	152	285	590	980
40	63	130	245	500	760
50	56	115	215	440	670
60	50	105	195	400	610
70	46	96	180	370	560
80	43	90	170	350	530
90	40	84	160	320	490
100	38	79	150	305	460

Pressure = .50 PSIG or less and Pressure Drop of 0.3" W.C.  
(Based on 0.60 Specific Gravity Gas)

$$CFH = \frac{\text{BTUH Furnace Input}}{\text{Heating Value of Gas (BTU/Cubic Foot)}}$$

Refer to the Proper Piping Practice drawing for the general layout at the unit. The following rules apply:

1. Use black iron pipe and fittings for the supply piping. The use of a flex connector and/or copper piping is permitted as long as it is in agreement with local codes.
2. Use pipe joint compound on male threads only. Pipe joint compound must be resistant to the action of the fuel used.
3. Use ground joint unions.
4. Install a drip leg to trap dirt and moisture before it can enter the gas valve. The drip leg must be a minimum of three inches long.
5. Use two pipe wrenches when making connection to the gas valve to keep it from turning.
6. Install a manual shut-off valve in a convenient location (within six feet of unit) between the meter and the unit.
7. Tighten all joints securely.
8. The unit must be connected to the building piping by one of the following methods:
  - Rigid metallic pipe and fittings
  - Semirigid metallic tubing and metallic fittings (Aluminum alloy tubing must not be used in exterior locations).
  - Listed gas appliance connectors used in accordance with the terms of their listing that are completely in the same room as the equipment. Always use a new listed connector.
  - In the prior two methods above the connector or tubing must be protected from physical and thermal damage. Aluminum alloy tubing and connectors must be coated to protect against external corrosion when in contact with masonry, plaster or insulation or are subject to repeated wettings by liquids (water - not rain water, detergents or sewage).



**PROPER PIPING PRACTICE**

**NOTE: THE UNIT GAS SUPPLY ENTRANCE IS FACTORY SEALED WITH PLUGS. KEEP PLUGS IN PLACE UNTIL GAS SUPPLY IS READY TO BE INSTALLED. ONCE READY, REPLACE THE PLUGS WITH THE SUPPLIED GROMMETS AND INSTALL GAS SUPPLY LINE.**

#### GAS PIPING CHECKS



#### CAUTION

**TO PREVENT PROPERTY DAMAGE OR PERSONAL INJURY DUE TO FIRE, THE FOLLOWING INSTRUCTIONS MUST BE PERFORMED REGARDING GAS CONNECTIONS AND PRESSURE TESTING:**

- THE UNIT AND ITS GAS CONNECTIONS MUST BE LEAK TESTED BEFORE PLACING IN OPERATION. BECAUSE OF THE DANGER OF EXPLOSION OR FIRE, NEVER USE A MATCH OR OPEN FLAME TO TEST FOR LEAKS. NEVER EXCEED SPECIFIED PRESSURES FOR TESTING. HIGHER PRESSURE MAY DAMAGE GAS VALVE AND CAUSE OVERFIRING WHICH MAY RESULT IN PREMATURE HEAT EXCHANGE FAILURE.
- THIS UNIT AND ITS SHUT-OFF VALVE MUST BE DISCONNECTED FROM THE GAS SUPPLY DURING ANY PRESSURE TESTING OF THAT SYSTEM AT TEST PRESSURES IN EXCESS OF 1/2 PSIG (3.48 kPa).
- THIS UNIT MUST BE ISOLATED FROM THE GAS SUPPLY SYSTEM BY CLOSING ITS MANUAL SHUT-OFF VALVE DURING ANY PRESSURE TESTING OF THE GAS SUPPLY PIPING SYSTEM AT TEST PRESSURES EQUAL TO OR LESS THAN 1/2 PSIG (3.48 kPa).



#### WARNING

**TO AVOID PROPERTY DAMAGE OR PERSONAL INJURY, BE SURE THERE IS NO OPEN FLAME IN THE VICINITY DURING AIR BLEEDING.**

There will be air in the gas supply line after testing for leaks on a new installation. Therefore, the air must be bled from the line by loosening the ground joint union until pure gas is expelled. Tighten union and wait for five minutes until all gas has been dissipated in the air. Be certain there is no open flame in the vicinity during air bleeding procedure. The unit is placed in operation by closing the main electrical disconnect switch for the unit.

#### ROOF TOP LOCATION AND INSTALLATION

The gas supply piping location and installation for roof top

units must be in accordance with local codes or, in the absence of local codes, with ordinances of the latest edition of the National Fuel Gas Code ANSI Z223.1/NFPA 54.

A manual gas shut off valve must be field installed external to the roof top unit. In addition, a drip leg must be installed near the inlet connection. A ground joint union connection is required between the external shut off valve and the unit connection to the gas valve to permit removal of the burner assembly for servicing.



1. Route gas piping to unit so that it does not interfere with the removal of access panels. Support and align piping to prevent strains or misalignment of the manifold assembly.
2. All units are furnished with standard female 1/2" NPT pipe connections. The size of the gas supply piping to the unit must be based on length of run, number of units on the system, gas characteristics, BTU requirement and available supply pressure. All piping must be done in accordance with local codes or, in the absence of local codes, with the latest edition of the National Fuel Gas Code ANSI Z223.1/NFPA 54.

**NOTE: THE GAS CONNECTION SIZE AT THE UNIT DOES NOT ESTABLISH THE SIZE OF THE SUPPLY LINE.**

3. With all units on a common line operating under full fire, natural gas main supply pressure should be adjusted to approximately 7.0" w.c., measured at the unit gas valve. If the gas pressure at the unit is greater than 10.0" w.c., the contractor must furnish and install an external type positive shut off service pressure regulator. The unit will not function satisfactorily if supply gas pressure is less than 5.0" w.c. or greater than 10.0" w.c..

**NOTE: A MINIMUM HORIZONTAL DISTANCE OF 48" BETWEEN THE REGULATOR AND THE FURNACE FLUE DISCHARGE IS REQUIRED.**

4. All pipe connections should be sealed with a pipe thread compound, which is resistant to the fuel used with the furnace. A soapy water solution should be used to check all joints for leaks. A tap is located on the entering side of the gas valve for test gauge connection to measure supply (main) gas pressure. Another tap is provided on the manifold side of the gas valve for checking manifold pressure.

 <b>WARNING</b>
<p><b>THIS UNIT AND ITS INDIVIDUAL SHUTOFF VALVE MUST BE DISCONNECTED FROM THE GAS SUPPLY SYSTEM DURING ANY PRESSURE TESTING OF THAT SYSTEM AT TEST PRESSURES IN EXCESS OF 1/2 PSIG (13.8" w.c.).</b></p>
 <b>CAUTION</b>
<p><b>THIS UNIT MUST BE ISOLATED FROM THE GAS SUPPLY PIPING SYSTEM BY CLOSING ITS INDIVIDUAL MANUAL SHUTOFF VALVE DURING ANY PRESSURE TESTING EQUAL TO OR LESS THAN 1/2 PSIG.</b></p>

5. There must be no obstruction to prevent the flow of

combustion and ventilating air. A vent stack is not required and must never be used. The power venter will supply an adequate amount of combustion air as long as the air passageways are kept free of any obstructions and the recommended external unit clearances are maintained.

## CIRCULATING AIR AND FILTERS

### DUCTWORK

The supply duct from the unit through a wall may be installed without clearance. However, minimum unit clearances must be maintained (see "Clearances" section). The supply duct should be provided with an access panel large enough to inspect the air chamber downstream of the heat exchanger. A cover should be tightly attached to prevent air leaks.

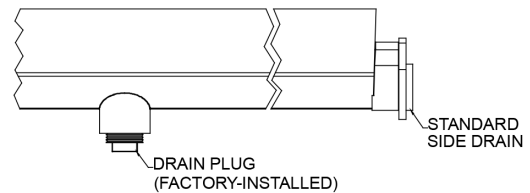
Ductwork dimensions are shown in the roof curb installation manual.

If desired, supply and return duct connections to the unit may be made with flexible connections to reduce possible unit operating sound transmission.

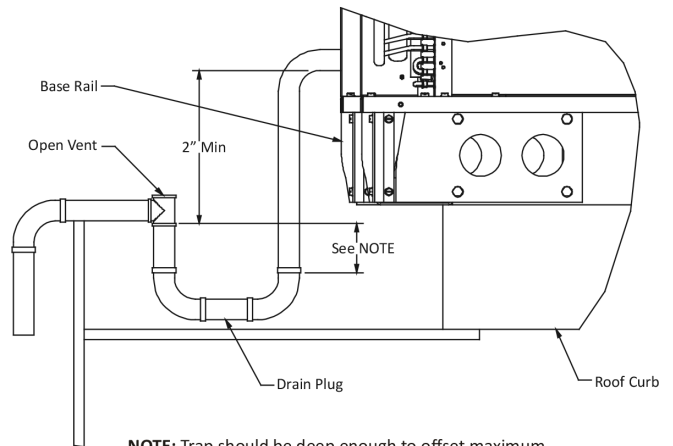
## CONDENSATE DRAIN CONNECTION

### CONDENSATE DRAIN CONNECTION

A 3/4" female NPT drain connection is supplied on the end of the unit and bottom of the drain pan for condensate piping. An external trap must be installed for proper condensate drainage. Hand tighten drain fitting to the drain connection.



### Drain Pan (Side View)



**NOTE:** Trap should be deep enough to offset maximum unit static difference. A minimum 4" trap is recommended.

### DRAIN CONNECTION

Install condensate drain trap as shown. Use 3/4" drain line and fittings or larger. Do not operate without trap.

**NOTE: ALL THREADED CONNECTIONS SHOULD BE SEALED WITH THREAD SEALER TO PREVENT LEAKS.**

#### HORIZONTAL DRAIN

Drainage of condensate directly onto the roof may be acceptable; refer to local code. It is recommended that a small drip pad of either stone, mortar, wood or metal be provided to prevent any possible damage to the roof.



#### VERTICAL DRAIN

To use the bottom drain connection, remove the drain plug from the bottom connection and install it in the horizontal connection.

#### CLEANING

Due to the fact that drain pans in any air conditioning unit will have some moisture in them, algae and fungus will grow due to airborne bacteria and spores. Periodic cleaning is necessary to prevent this build-up from plugging the drain.



## STARTUP, ADJUSTMENTS, AND CHECKS

 <b>WARNING</b>	
<b>HIGH VOLTAGE!</b> TO AVOID PERSONAL INJURY OR DEATH DUE TO ELECTRICAL SHOCK, BOND THE FRAME OF THIS UNIT TO THE BUILDING ELECTRICAL GROUND BY USE OF THE GROUNDING TERMINAL PROVIDED OR OTHER ACCEPTABLE MEANS. DISCONNECT ALL POWER BEFORE SERVICING OR INSTALLING THIS UNIT.	

#### PRE-STARTUP INSTRUCTIONS - GENERAL

 <b>CAUTION</b>
TO PREVENT PROPERTY DAMAGE OR PERSONAL INJURY, DO NOT START THE UNIT UNTIL ALL NECESSARY PRE-CHECKS AND TESTS HAVE BEEN PERFORMED.

Prior to the beginning of Startup, Adjustments, and Checks procedures, the following steps should be completed in the building.

 <b>WARNING</b>
<b>MOVING MACHINERY HAZARD!</b> TO PREVENT POSSIBLE PERSONAL INJURY OR DEATH, DISCONNECT POWER TO THE UNIT AND PADLOCK IN THE "OFF" POSITION BEFORE SERVICING FANS.
 <b>CAUTION</b>
TO PREVENT PROPERTY DAMAGE OR PERSONAL INJURY, DO NOT START THE UNIT UNTIL ALL NECESSARY PRE-CHECKS AND TESTS HAVE BEEN PERFORMED.

This unit is equipped with an electronic ignition device to automatically light the main burners. It also has a power vent blower to exhaust combustion products.

On new installations, or if a major component has been replaced, the operation of the unit must be checked.

Check unit operation as outlined in the following instructions. If any sparking, odors, or unusual sounds are encountered, shut off electrical power and recheck for wiring errors, or obstructions in or near the blower motors. **If horizontal duct is installed, duct covers must be removed before operating unit.**

The Startup, Adjustments, and Checks procedure provides a step-by-step sequence which, if followed, will assure the proper startup of the equipment in the minimum amount of time. Air balancing of duct system is not considered part of this procedure. However, it is an important phase of any air conditioning system startup and should be performed upon completion of the Startup, Adjustments, and Checks procedure. The Startup, Adjustments, and Checks procedure at outside ambient below 55°F should be limited to a readiness check of the refrigeration system with the required final check and calibration left to be completed when the outside ambient rises above 55°F.

#### TEMPORARY HEATING OR COOLING

If the unit is to be used for temporary heating or cooling, a "Startup, Adjustments, and Checks" must first be performed in accordance with this manual. Damage or repairs due to failure to comply with these requirements are not covered under the warranty. **After** the machines are used for temporary heating or cooling, inspect the coils, fans, and motors for unacceptable levels of construction dust and dirt and install new filters.

#### CONTRACTOR RESPONSIBILITY

The installing contractor must be certain that:

- All supply and return air ductwork is in place, properly sealed, and corresponds with installation instructions.
- All thermostats are mounted and wired in accordance with installation instructions.
- All electric power, all gas, hot water or steam line connections, and the condensate drain installation have been made to each unit on the job. These

main supply lines must be functional and capable of operating all units simultaneously.

- Requirements are met for venting and combustion air.
- Air filters are in place.
- Input rate and temperature rise are adjusted per rating plate.

### ROOF CURB INSTALLATION CHECK

Inspect the roof curb for correct installation. The unit and curb assembly should be level. Inspect the flashing of the roof mounting curb to the roof, especially at the corners, for good workmanship. Also check for leaks around gaskets. Note any deficiencies in a separate report and forward to the contractor.

### OBSTRUCTIONS, FAN CLEARANCE AND WIRING

Remove any extraneous construction and shipping materials that may be found during this procedure. Rotate all fans manually to check for proper clearances and that they rotate freely. Check for bolts and screws that may have jarred loose during shipment to the job site. Re-tighten if necessary. Re-tighten all electrical connections.

### FIELD DUCT CONNECTIONS

Verify that all duct connections are tight and that there is no air bypass between supply and return.

### FILTER SECTION CHECK

Remove filter section access panels and check that filters are properly installed. Note airflow arrows on filter frames.

### PRE-STARTUP PRECAUTIONS

It is important to your safety that the unit has been properly grounded during installation. Check ground lug connection in main control box for tightness prior to closing circuit breaker or disconnect switch. Verify that supply voltage on line side of disconnect agrees with voltage on unit identification plate and is within the utilization voltage range as indicated in Appendix B Electrical Data.

**System Voltage** - That nominal voltage value assigned to a circuit or system for the purpose of designating its voltage class.

**Nameplate Voltage** - That voltage assigned to a piece of equipment for the purpose of designating its voltage class and for the purpose of defining the minimum and maximum voltage at which the equipment will operate.

**Utilization Voltage** - The voltage of the line terminals of the equipment at which the equipment must give fully satisfactory performance. Once it is established that supply voltage will be maintained within the utilization range under all system conditions, check and calculate if an unbalanced condition exists between phases. Calculate percent voltage unbalance as follows.

### THREE PHASE MODELS ONLY

$$3) \text{ PERCENT VOLTAGE UNBALANCE} = 100 \times \frac{2) \text{ MAXIMUM VOLTAGE DEVIATIONS FROM AVERAGE VOLTAGE}}{1) \text{ AVERAGE VOLTAGE}}$$

HOW TO USE THE FORMULA:

EXAMPLE: Line to neutral voltage of 220, 216, and 213

$$1) \text{ Average Voltage} = 220 + 216 + 213 = 649 / 3 = 216$$

$$2) \text{ Maximum Voltage Deviations from Average Voltage} = 220 - 216 = 4$$

$$3) \text{ Percent Voltage Unbalance} = 100 \times \frac{4}{216} = \frac{400}{216} = 1.8\%$$

Percent voltage unbalance MUST NOT exceed 2%.

## AIR FLOW ADJUSTMENTS

When the final adjustments are complete, the current draw of the motor should be checked and compared to the full load current rating of the motor. The amperage must not exceed the service factor stamped on the motor nameplate. The total airflow must not be less than that required for operation of the furnace.

If an economizer is installed, check the unit operating balance with the economizer at full outside air and at minimum outside air.

**NOTE: NEVER RUN CFM BELOW 300 CFM PER TON. EVAPORATOR FREEZING OR POOR UNIT PERFORMANCE IS POSSIBLE.**

### STANDARD STATIC DRIVE MOTOR

Adjust the CFM for the unit by changing the position of the low voltage leads on the terminal block TB1. Refer to Appendix A for blower performance at each speed tap. Refer to Appendix D for maximum and minimum allowed airflow for heating and cooling.

**NOTE: IF MORE THAN ONE LEAD IS ENERGIZED SIMULTANEOUSLY, THE MOTOR WILL RUN AT THE HIGHER NUMERICAL SPEED TAP.**

Purple wire Y2 (High Cool) is connected to TB1-T3. Y1, Y2 and W1 wires can be moved together or separately. Y2 wire can also be moved to unoccupied terminal T4 or T5.

**NOTE: FOR PROPER OPERATION Y2 SHOULD HAVE A HIGHER SPEED SETTING THAN THE G, Y1 AND W1 SPEED SETTING.**

For gas heat units, the airflow must be adjusted so that the air temperature rise falls within the ranges given stated on Data Plate.

### ELECTRICAL INPUT CHECK

Make preliminary check of evaporator fan ampere draw and verify that motor nameplate amps are not exceeded. A final check of amp draw should be made upon completion of air balancing of the duct system (see Appendix B).

## GAS SYSTEM CHECK

### PRE-OPERATION CHECKS

1. Close the manual gas valve external to the unit.
2. Turn off the electrical power supply to the unit.
3. Change heating setpoint to its lowest possible setting.
4. Remove the heat exchanger door on the side of the unit by removing screws.
5. This unit is equipped with an ignition device which automatically lights the main burner. DO NOT try to light burner by any other method.
6. Move the gas control valve switch to the OFF position.
7. Wait five minutes to clear out any gas.
8. Smell for gas, including near the ground. This is important because some types of gas are heavier than air. If you have waited five minutes and you do smell gas, immediately follow the warning WHAT TO DO IF YOU SMELL GAS on page 2 of this manual. If having waited for five minutes and no gas smell is noted, move the gas control valve switch to the ON position.
9. Replace the heat exchanger door on the side of the unit.
10. Open the manual gas valve external to the unit.
11. Turn on the electrical power supply to the unit.
12. Change heating setpoint to desired setting.

### GAS SUPPLY PRESSURES & REGULATOR ADJUSTMENTS



#### WARNING

SHOULD OVERHEATING OCCUR OR THE GAS SUPPLY FAIL TO SHUT OFF, TURN OFF THE MANUAL GAS SHUTOFF VALVE EXTERNAL TO THE UNIT BEFORE TURNING OFF THE ELECTRICAL SUPPLY.



#### WARNING

TO AVOID PROPERTY DAMAGE, PERSONAL INJURY OR DEATH, DO NOT FIRE GAS UNIT WITH FLUE BOX COVER REMOVED.

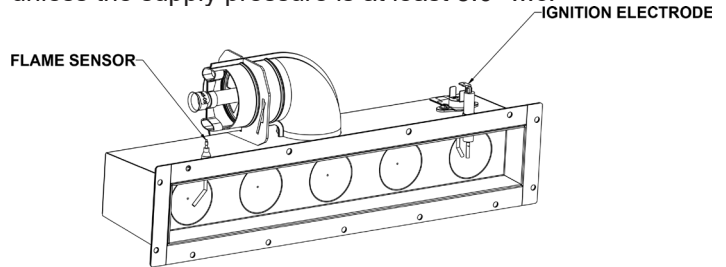
**NOTE: EXCEPT DURING BRIEF PERIODS WHEN GAS PRESSURES ARE BEING MEASURED BY QUALIFIED SERVICE PERSONNEL, THE FURNACE ACCESS PANEL MUST ALWAYS BE SECURED IN PLACE WHEN THE FURNACE IS IN OPERATION.**

The first step in checking out the gas-fired furnace is to test the gas supply piping to the unit for tightness and purge the system of air using methods outlined in the latest edition of the National Fuel Gas Code ANSI Z223.1 / NFPA 54. Verify that the disconnect switch is in the "OFF" position. A soapy water solution should be used to check for gas leaks.

Since the unit is subject to considerable jarring during shipment, it is extremely important that all gas connections and joints be tested for tightness. Gas piping downstream from the unit inlet should be checked for leaks during the subsequent sequence check.

The supply gas pressure should be adjusted to 7.0" w.c. with the gas burners operating. If there is more than one unit on a common gas line, the pressures should be checked with all units under full fire. A supply pressure tap is provided on the upstream side of the gas valve. A manifold pressure tap is provided on the manifold side of the gas valve. The normal manifold pressure is 3.0" w.c. Minimum gas supply pressure is 5.0" w.c.

Do not attempt adjustment of the built-in pressure regulator unless the supply pressure is at least 5.0" w.c.



**FLAME SENSOR AND IGNITION ELECTRODE LOCATION**

**NOTE: GAS APPLIANCES LOCATED MORE THAN 2000 FEET ABOVE SEA LEVEL MUST BE DERATED 4% PER 1000 FEET OF TOTAL ELEVATION AND THAT VARIANCE IN GAS HEATING VALUE AND SPECIFIC GRAVITY REQUIRE CHANGE IN MANIFOLD PRESSURE TO OBTAIN RATING, IT IS MANDATORY THAT THE INPUT BE ADJUSTED AT THE INSTALLATION SITE. ALL INSTALLATIONS SHOULD BE MADE AS OUTLINED IN THE LATEST EDITION OF THE NATIONAL FUEL GAS CODE ANSI Z223.1, SECTION "PROCEDURES TO BE FOLLOWED TO PLACE AN APPLIANCE IN OPERATION". REFER ALSO TO THE "USER'S INFORMATION MANUAL" SUPPLIED WITH THE UNIT FOR ADDITIONAL INFORMATION ON THE GAS FURNACE.**

### GAS SUPPLY AND MANIFOLD CHECK

Gas supply pressure and manifold pressure with the burners operating must be as specified on the rating plate.

### GAS INLET PRESSURE CHECK

Gas inlet pressure must be checked and adjusted in accordance to the type of fuel being consumed.

#### WITH POWER AND GAS OFF:

1. Connect a manometer to the inlet pressure tap of the gas valve.

Inlet gas pressure can also be measured by removing the cap from the dripleg and installing a predrilled cap with a hose fitting.

#### WITH POWER AND GAS ON:

2. Put unit into heating cycle and turn on all other gas consuming appliances.

### INLET GAS PRESSURE

**NATURAL**

Min. 5.0" W.C., Max. 10.0" W.C.

**NOTE: INLET GAS PRESSURE MUST BE WITHIN LIMITS**

## SHOWN ABOVE.

If operating pressures differ from above, make necessary pressure regulator adjustments, check piping size, etc., and/or consult with local utility.

### MANIFOLD PRESSURE CHECK AND ADJUSTMENT

The gas valve has a pressure tap to facilitate measurement of the manifold pressure. The manifold pressure must be measured with the burners operating.

1. With disconnect switch open, remove field connected thermostat wire from terminal R and W1 on TB1. Place jumper wire between R and W1 to engage heating.
2. See Figure in gas input check section for gas valve adjustment.

To adjust the pressure regulator, remove the adjustment screw cover on the gas valve. Turn the adjustment screw out (counterclockwise) to decrease pressure, turn in (clockwise) to increase pressure. Only small variations in gas flow should be made by means of the pressure regulator adjustment. Any major changes in flow should be made by changing the size of the burner orifices. The measured input rate to the furnace must not exceed the rating specified on the unit rating plate.

The high stage manifold pressure must be between 2.7 and 3.3 inches water column (3.0 nominal).

### GAS INPUT CHECK

It is the responsibility of the contractor to adjust the gas input to the unit.

To measure the gas input use a gas meter and proceed as follows:

1. Turn off gas supply to all other appliances except the unit.
2. With the unit operating, time the smallest dial on the meter for one complete revolution. If this is a 2 cubic foot dial, divide the seconds by 2; if it is a 1 cubic foot dial, use the seconds as is. This gives the seconds per cubic foot of gas being delivered to the unit.
3.  $INPUT = GAS\ HTG\ VALUE \times 3600 / SEC.\ PER\ CUBIC\ FOOT$

**Example:** Natural gas with a heating value of 1000 BTU per cubic foot and 34 seconds per cubic foot as determined by Step 2, then:

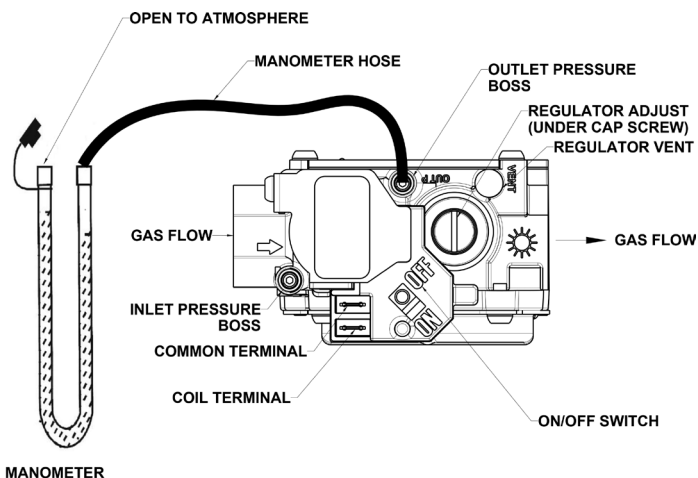
$$Input = 1000 \times 3600 / 34 = 106,000 \text{ BTU per Hour.}$$

**NOTE: BTU CONTENT OF THE GAS SHOULD BE OBTAINED FROM THE GAS SUPPLIER. THIS MEASURED INPUT MUST NOT BE GREATER THAN SHOWN ON THE UNIT RATING PLATE.**

Adjust input rate by varying the adjustment of the gas pressure regulator on the gas valve. All adjustments must be made with furnace operating at high fire and at normal operating temperature. A manometer should be connected to the gas valve to verify pressure is within the specified range (see following figures for manometer connections). Clockwise rotation of the pressure regulator

screw increases pressure and gas flow rate. Turn screw counterclockwise to decrease pressure and gas flow rate. After adjustment the furnace temperature rise must be within the range specified on the unit data plate.

**NOTE: THERMAL EFFICIENCY OF THE FURNACE IS A PRODUCT EFFICIENCY RATING DETERMINED UNDER CONTINUOUS OPERATING CONDITIONS INDEPENDENT OF ANY INSTALLED SYSTEM.**



### WHITE-RODGERS GAS CONTROL VALVE CONNECTED TO MANOMETER PRESSURE ADJUSTMENTS

To connect manometer to gas valve:

1. Back outlet pressure tap screw (inside inlet pressure boss) out one turn (counterclockwise, not more than one turn).
2. Attach a hose and manometer to the outlet pressure boss of the valve.

To remove manometer from gas valve:

1. Remove manometer hose from outlet pressure boss.
2. Turn outlet pressure tap screw in to seal pressure port (clockwise, 7 in-lb. minimum).
3. Turn on electrical power and gas supply to the system.
4. Turn on system power and energize valve.
5. Using a leak detection solution or soap suds, check for leaks at pressure boss screw. Bubbles forming indicate a leak. SHUT OFF GAS AND FIX ALL LEAKS IMMEDIATELY.

### CAUTION

**TO PREVENT UNRELIABLE OPERATION OR EQUIPMENT DAMAGE, THE GAS MANIFOLD PRESSURE MUST BE AS SPECIFIED ON THE UNIT RATING PLATE. ONLY MINOR ADJUSTMENTS SHOULD BE MADE BY ADJUSTING THE GAS VALVE PRESSURE REGULATOR.**

6. Relight all other appliances turned off in step 1 of gas input check. Be sure all pilot burners are operating.

### TEMPERATURE RISE CHECK

Check the temperature rise through the unit by placing thermometers in supply and return air registers as close to the unit as possible. Thermometers must not be able to



sample temperature directly from the unit heat exchangers, or false readings could be obtained.

1. All registers must be open; all duct dampers must be in their final (fully or partially open) position and the unit operated for 15 minutes before taking readings
2. The temperature rise must be within the range specified on the rating plate.

**NOTE: AIR TEMPERATURE RISE IS THE TEMPERATURE DIFFERENCE BETWEEN SUPPLY AND RETURN AIR.**

With a properly designed system, the proper amount of temperature rise will normally be obtained when the unit is operated at rated input with the recommended blower speed.

If the correct amount of temperature rise is not obtained, it may be necessary to change the blower speed. A higher blower speed will lower the temperature rise. A slower blower speed will increase the temperature rise.

**NOTE: BLOWER SPEED MUST BE SET TO GIVE THE CORRECT AIR TEMPERATURE RISE THROUGH THE UNIT AS MARKED ON THE RATING PLATE.**

## NORMAL SEQUENCE OF OPERATION

### HEATING

This unit has one (RS) Manual Reset Limit Control Switch. Check the limit to make sure it has not tripped. The limit may arrive at the job site tripped as a result of shipping shock.

If the vent motor comes on, but the unit does not attempt ignition, check if the ALS (Auxiliary High Limit Control Switch) requires resetting.

This unit is equipped with an ignition control that automatically lights the main burner. DO NOT attempt to light the main burners by any other method.

1. R and W thermostat contacts close, initiating a call for heat.
2. Integrated control module performs safety circuit checks.
3. Inducer draft blower is energized for 30 second pre-purge period causing pressure sensor contacts to close.
4. At the end of pre-purge period, integrated control module transitions the induced draft blower to light-off setting.
5. Once the light-off pressure setting is verified by the integrated control module, the spark igniter and gas valve are energized for 4 seconds.

**NOTE: THE IGNITER PRODUCES A VERY INTENSE ELECTRICAL SPARK THAT IGNITES THE GAS.**

6. Integrated control module monitors flame presence. Gas valve will remain open only if the flame is detected.

7. The 30-second HEAT FAN ON delay time begins after main burner lights.
8. The unit delivers heat to the conditioned space until the thermostat is satisfied; integrated control module monitors safety circuits continuously.
9. R and W thermostat contacts open, completing the call for heat; gas valve de-energizes.
10. Induced draft blower keeps operating for 30-second post purge.
11. Ignition control begins timing the HEAT FAN OFF delay. There is an adjustable HEAT FAN OFF delay of approximately 90/120/150/180 seconds (factory set at 150).

**NOTE: THIS DELAY ALLOWS ANY ADDITIONAL HEAT IN THE HEAT EXCHANGER TO BE TRANSFERRED TO THE CONDITIONED SPACE. AFTER THE HEAT FAN OFF DELAY TIME HAS ELAPSED, THE BLOWER WILL DE-ENERGIZE.**

### UNIT SHUTDOWN

1. Set the room heating setpoint to lowest setting.
2. Turn off the electrical power supply to the unit.
3. Remove the heat exchanger door on the side of the unit by removing screws.
4. Move the gas control valve switch to the OFF position.
5. Close manual gas shut off valve external to the unit.
6. Replace the heat exchanger door on the unit.
7. If cooling and/or air circulation will be desired, turn ON gas control valve switch and the electrical power.

### AUTOMATIC RESET HIGH LIMIT CONTROL (LS)

Located in the burner compartment on the heat exchanger, its sensing element projects through the blower section bulkhead and senses the temperature at the rear of the furnace. It will cycle the furnace off if the temperature exceeds 100°F plus maximum rise.

### AUXILIARY HIGH LIMIT CONTROL (ALS)

Located in the blower compartment on the blower housing, it senses air temperature within the blower compartment and protects the filters from excessive temperature. It will shut down the furnace if it senses excessive temperatures.

Elevated temperatures at the control are normally caused by blower failure. The reason for the shut down should be determined and repaired prior to resetting.

### BLOCKED INLET LIMIT CONTROL

Located in the burner compartment at the top of the burner assembly, it senses high temperature that could occur if the burner inlet is blocked. The reason for elevated temperatures at the control should be determined and repaired prior to resetting this manual reset control.



## WARNING

TO AVOID PROPERTY DAMAGE, PERSONAL INJURY OR DEATH DUE TO FIRE OR EXPLOSION, A QUALIFIED SERVICER MUST INVESTIGATE THE REASON FOR THE ROLLOUT PROTECTION DEVICE TO OPEN BEFORE MANUALLY RESETTING THE ROLLOUT PROTECTION DEVICE.

### CHECK SUBCOOLING

**NOTE: UNIT WITH A TXV SHOULD BE CHARGED TO SUBCOOLING ONLY. MAKE SURE THE AIR FLOW IS CORRECT BEFORE MAKING ANY ADJUSTMENTS.**

#### EXAMPLE:

- a. Liquid Line Pressure = 417 PSI
- b. Corresponding Temp. = 120°F
- c. Thermometer on Liquid line = 109°F.

To obtain the amount of subcooling, subtract 109°F from 120°F. The difference is 11° subcooling. See the specification sheet or technical information manual for the design subcooling range for your unit.

**SUBCOOLING FORMULA = SATURATED LIQUID LINE TEMPERATURE - LIQUID LINE TEMPERATURE**

### CHECKING SUPERHEAT

#### EXAMPLE:

- a) Suction Pressure = 143 PSI
- b) Corresponding Temp. = 50°F
- c) Thermometer on Suction Line = 59°F

To obtain the degrees temperature of superheat, subtract 50.0 from 59.0°F. The difference is 9° Superheat. The 9° Superheat would fall in the ± range of allowable superheat.

**SUPERHEAT = SUCTION LINE TEMP - SAT. SUCTION TEMP.**

### SUPERHEAT ADJUSTMENT

**NOTE: SUPERHEAT ADJUSTMENTS SHOULD NOT BE MADE UNTIL INDOOR AMBIENT CONDITIONS HAVE STABILIZED. THIS COULD TAKE UP TO 24 HOURS DEPENDING ON INDOOR TEMPERATURE AND HUMIDITY. BEFORE CHECKING SUPERHEAT, RUN THE UNIT IN COOLING FOR 15-20 MINUTES OR UNTIL REFRIGERANT PRESSURES STABILIZE. USE THE FOLLOWING GUIDELINES AND METHODS TO CHECK UNIT OPERATION AND ENSURE THAT THE REFRIGERANT CHARGE IS WITHIN LIMITS.**

For TXV systems, to adjust superheat, unscrew the cover from the expansion valve, locate the adjustment screw, and turn it clockwise (in) to increase superheat or counterclockwise (out) to decrease superheat. It is recommended to make small adjustments at a time, 1/8-1/4 turn increments. Replace adjustment cap. Wait a minimum of 15 minutes between adjustments to allow time for the TXV and pressures to stabilize.

### REFRIGERANT CHARGE CHECK

**NOTE: FOR OPTIMAL PERFORMANCE, FOLLOW CHARGING INSTRUCTIONS BELOW.**

#### (UNITS WITH FIXED ORIFICE DEVICES)

All package units with fixed orifice devices are charged using the superheat method at the compressor suction line. To increase super heat, remove charge and to decrease super heat, add charge. After superheat is adjusted, it is recommended to check unit subcooling at the condenser coil liquid line. See Design Superheat and Subcooling table for targets on each model.

#### (UNITS WITH EXPANSION VALVE (TXV))

Single Stage Cooling Application: Refer to the Design Superheat & Subcooling table

Two Stage Cooling Application : Run unit on Low Stage cooling and refer to Design Superheat & Subcooling table.

1. Purge gauge lines. Connect service gauge manifold to access fittings. Run system at least 10 minutes to allow pressure to stabilize.
2. Temporarily install thermometer on liquid (small) line near liquid line access fitting with adequate contact and insulate for best possible reading.
3. Check subcooling and superheat. System should have a subcooling and superheat within the range listed on the Design Superheat and Subcooling table.
  - a. If subcooling and superheat are low, adjust TXV superheat, then check subcooling.

**NOTE:** To adjust superheat, turn the valve stem clockwise to increase and counterclockwise to decrease.

- b. If subcooling is low and superheat is high, add charge to raise subcooling then check superheat.
- c. If subcooling and superheat are high, adjust TXV valve superheat, then check subcooling.
- d. If Subcooling is high and superheat is low, adjust TXV valve superheat and remove charge to lower the subcooling.

**NOTE: Do NOT ADJUST THE CHARGE BASED ON SUCTION PRESSURE UNLESS THERE IS A GROSS UNDERCHARGE. IF AN UNDER CHARGE IS SUSPECTED RECOVER THE CHARGE, RE-EVACUATE THE SYSTEM AND RECHARGE PER DATA PLATE. NO ADJUSTMENTS SHOULD BE MADE IF SUSPECTING A CHARGE ISSUE.**

4. Disconnect manifold set, installation is complete.

Design Superheat & Subcooling					
Model	Superheat (°F)	Subcooling (°F)	Expansion Device	Cooling Stage	Outdoor Ambient (°F)
DRG036	14 – 16	11 – 13	TXV	Low	82
DRG048	12 – 14	9 – 11	TXV	Low	82
DRG060	11 – 13	11 – 13	TXV	Low	82
DRG072	15 – 17	9 – 11	TXV	Low	82

scroll compressors in these units MUST operate in the proper rotation. To ensure the compressor is operating in the correct direction, check the compressor discharge line pressure or temperature after the compressor is started.

The discharge pressure and discharge line temperature should increase. If this does not occur and the compressor is producing an exceptional amount of noise, perform the following checks.

- If the compressor is operating backward, disconnect the unit power supply and lock it in the “OFF” position. Switch two leads of the power supply at the unit Single Point Power Block. Reconnect power and check for compressor and condenser fan motor operation.
- 7. With all safety devices closed, the system will continue cooling operation until the room temperature is satisfied.
- 8. Increasing the room cooling setpoint to a value above the current room temperature will simulate a satisfied thermostat. The compressor and the supply fan will cycle off.
- 9. After a time delay of approximately 3 minutes, the compressor control circuits will be ready to respond to a subsequent call for cooling.

### START-UP PROCEDURE AND CHECKLIST

Begin with power turned off at all disconnects.

1. Turn thermostat system switch to “Cool,” and fan switch to “Auto” and turn temperature setting as high as it will go.
2. Inspect all registers and set them to the normal open position.
3. Turn on the electrical supply at the disconnect.
4. Turn the fan switch to the “ON” position. The blower should operate after a 7 second delay.
5. Turn the fan switch to “Auto” position. The blower should stop after a 60 second delay.
6. Slowly lower the cooling temperature until the unit starts. The compressor, blower and fan should now be operating. Allow the unit to run 10 minutes, make sure cool air is being supplied by the unit.
7. Turn the temperature setting to the highest position, stopping the unit. The indoor blower will continue to run for 60 seconds.
8. Turn the thermostat system switch to “OFF” and disconnect all power when servicing the unit.

### REFRIGERATION SEQUENCE CHECK

1. 24VAC control voltage is provided by the control transformer to terminal XS. The control voltage is passed through any installed safety shutdown devices such as the smoke detector before providing 24VAC to terminals ES and R.
2. To simulate a mechanical call for cooling lower the room cooling setpoint to a value below the current room temperature. The cooling is energized when the room temperature is above the setpoint for cooling.
3. **UNIT WITH ECONOMIZER OPTION:** The compressor circuit is interlocked through the economizer module. If the outdoor air enthalpy (temperature and humidity) is not suitable for cooling, the economizer will permit the compressor to be energized.
4. The blower motor is operated to provide cool supply air to the space.
5. Compressor contactor closes its contacts to provide power to the compressor motor. In addition, the condenser fan motor is energized through the compressor contactor.

### REFRIGERATION PERFORMANCE CHECK

Check that compressor RLA corresponds to values shown in Appendix B. RLA draw can be much lower than values listed at low load conditions and low ambient condensing temperatures. Values in Appendix B can slightly exceed at high load conditions and high ambient condensing temperatures.

### FINAL SYSTEM CHECKS

1. Check to see if all supply and return air grilles are adjusted and the air distribution system is balanced for the best compromise between heating and cooling.
2. Check for air leaks in the ductwork. See Sections on Air Flow Adjustments.
3. Make sure the unit is free of “rattles”, and the tubing in the unit is free from excessive vibration. Also make sure tubes or lines are not rubbing against each other or sheet metal surfaces or edges. If so, correct the trouble.
4. Set the thermostat at the appropriate setting for cooling and heating or automatic changeover for normal use.
5. Be sure the Owner is instructed on the unit operation, filter, servicing, correct thermostat operation, etc.

 <b>WARNING</b>
<b>BURN HAZARD!</b> <b>DO NOT TOUCH! DISCHARGE LINE MAY BE HOT!</b>

6. Check that the compressor is operating correctly. The

## MAINTENANCE



### 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.



### WARNING

#### HIGH VOLTAGE!

DISCONNECT ALL POWER BEFORE SERVICING OR INSTALLING THIS UNIT. MULTIPLE POWER SOURCES MAY BE PRESENT. FAILURE TO DO SO MAY CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.



### WARNING

TO PREVENT PERSONAL INJURY OR DEATH DUE TO IMPROPER INSTALLATION, ADJUSTMENT, ALTERATION, SERVICE OR MAINTENANCE, REFER TO THIS MANUAL. FOR ADDITIONAL ASSISTANCE OR INFORMATION, CONSULT A QUALIFIED INSTALLER, SERVICER AGENCY OR THE GAS SUPPLIER.



### CAUTION

SHEET METAL PARTS, SCREWS, CLIPS AND SIMILAR ITEMS INHERENTLY HAVE SHARP EDGES, AND IT IS NECESSARY THAT THE INSTALLER AND SERVICE PERSONNEL EXERCISE CAUTION.

## FILTERS



### CAUTION

TO PREVENT PROPERTY DAMAGE DUE TO FIRE AND LOSS OF EQUIPMENT EFFICIENCY OR EQUIPMENT DAMAGE DUE TO DUST AND LINT BUILD UP ON INTERNAL PARTS, NEVER OPERATE UNIT WITHOUT AN AIR FILTER INSTALLED IN THE RETURN AIR SYSTEM.

Every application may require a different frequency of replacement of dirty filters. Filters must be replaced at least every three (3) months during operating seasons.

Dirty filters are the most common cause of inadequate heating or cooling performance. Filter inspection should be made at least every two months; more often if necessary because of local conditions and usage.

Dirty throwaway filters should be discarded and replaced with a new, clean filter.

Disposable return air filters are supplied with this unit. See the unit Specification Sheet or Technical Manual for the correct size and part number. To remove the filters, remove the filter access panel on return side of the unit.

#### CABINET FINISH MAINTENANCE

Use a fine grade automotive wax on the cabinet finish to maintain the finish's original high luster. This is especially important in installations with extended periods of direct sunlight.

#### CLEAN OUTSIDE COIL (QUALIFIED SERVICER ONLY)

The coil with the outside air flowing over it should be inspected annually and cleaned as frequently as necessary to keep the finned areas free of lint, hair and debris.

#### CONDENSER AND INDUCED DRAFT MOTORS

Bearings on the condenser fan motors and the combustion fan motor are permanently lubricated. No additional oiling is required.

#### FLAME SENSOR (QUALIFIED SERVICER ONLY)

A drop in the flame current can be caused by a nearly invisible coating on the flame sensor. This coating, created by the fuel or combustion air supply, can be removed by carefully cleaning the flame sensor with steel wool.

**NOTE: AFTER CLEANING, THE MICROAMP SIGNAL SHOULD BE STABLE AND IN THE RANGE OF 4 - 6 MICROAMPS DC.**

#### FLUE PASSAGES (QUALIFIED SERVICER ONLY)

At the start of each heating season, inspect and, if necessary, clean the unit flue passage.

#### LUBRICATION

The fan shaft bearings, the supply fan motors, the condenser fan motors and compressors are permanently lubricated.

#### INSPECTION & CLEANING

All flue product carrying areas of the furnace, its vent system, and main burners should be examined by a

Preventive maintenance is the best way to avoid unnecessary expense and inconvenience. Have this system inspected at regular intervals by qualified service personnel, at least twice a year. Routine maintenance should cover the following items:

1. Tighten all set screws, and wire connections.
2. Clean evaporator and condenser coils mechanically or with cold water, if necessary. Usually any fouling is only matted on the entering air face of the coil and can be removed by brushing.
3. Replace filters as needed (see below).
4. Check for blockage of condensate drain.
5. Check power and control voltages.
6. Check running amperage.
7. Check operating temperatures and pressures.
8. Check and adjust temperature and pressure controls.
9. Check and adjust damper linkages.
10. Check operation of all safety controls.
11. Examine gas furnaces (see below and the User's Information Manual).
12. Check condenser fans and tighten set screws.

qualified service agency, and cleaned if necessary, before the start of each heating season. This examination is necessary for continued safe operation. Particular attention should be given to deterioration from corrosion or other sources. This examination is accomplished in the following manner.

1. Disconnect power to the unit and remove furnace section access panel.
2. Remove burner assembly:
  - a. Disconnect the wires from the gas valve after noting which wires are connected to each terminal.
  - b. Disconnect wires from the flame rod and ignition electrode.
  - c. Disconnect the gas piping at the union.
  - d. The entire burner assembly can now be removed from the unit.

**NOTE: USE ALL SCREWS THAT WERE REMOVED; THEY ARE NECESSARY FOR SAFE AND PROPER OPERATION OF THE UNIT.**

3. Inspect and periodically clean the vent outlet (bird screen) on the access panel.

**NOTE: PERIODIC CHECK OF OPERATION AND A LOG OF CO<sub>2</sub> MEASUREMENTS ARE RECOMMENDED. THIS WILL AID IN DETERMINING WHETHER THE FURNACE IS OPERATING EFFICIENTLY OR IF THE FURNACE REQUIRES CLEANING.**



## WARNING

TO AVOID PERSONAL INJURY OR DEATH DUE TO ELECTRIC SHOCK, DO NOT REMOVE ANY INTERNAL COMPARTMENT COVERS OR ATTEMPT ANY ADJUSTMENT. CONTACT A QUALIFIED SERVICER AT ONCE IF AN ABNORMAL OPERATION SHOULD DEVELOP.

## FUNCTIONAL PARTS

Refer to the unit Parts Catalog for a list of functional parts. Parts are available from your distributor.

# TROUBLESHOOTING

## IGNITION CONTROL ERROR CODES

The following presents probable causes of questionable unit operation. Refer to *Diagnostic Indicator Chart* for an interpretation of the signal and to this section for an explanation.

Remove the control box access panel and note the number of diagnostic LED flashes.

## FAULT RECALL

The ignition control is equipped with a momentary push-button switch that can be used to display on the diagnostic LED the last five faults detected by the control. Any time the control is powered, the fault code history can be retrieved for display by depressing and releasing the button once (less than 5 seconds); the LED will flash the Fault Code History (up to 5 fault codes from newest to oldest). The Fault Code History is retained between power cycles until cleared. A fault code is added to the history log as it

is encountered if it differs from the most recent history log item. If the history log is already full, then the oldest entry is dropped from the log and the remaining entries are moved down in the Fault Code History so that the new fault can be added to the Fault Code History as the most recent fault.

**NOTE: DO NOT HOLD FOR LONGER THAN 5 SECONDS. HOLDING THE BUTTON FOR 5 SECONDS OR HIGHER WILL ERASE THE MEMORY!**

## ABNORMAL OPERATION - HEATING CODES

### RESETTING FROM LOCKOUT

An external lockout occurs if the integrated ignition control determines that a measurable combustion cannot be established within three (3) consecutive ignition attempts. If flame is not established within the four (4) second trial for ignition, the gas valve is de-energized, 30 second inter-purge cycle is completed, and ignition is re-attempted. The control will repeat this routine three times if a measurable combustion is not established. The control will then shut off the induced draft blower and go into a lockout state. If flame is established but lost, the control will energize the circulator blower at the heat speed and then begin a new ignition sequence. If flame is established then lost on subsequent attempts, the control will recycle the ignition sequence.

The diagnostic fault code is 1 flash for a lockout due to failed ignition attempts. The integrated control will automatically reset after one hour, or it can be reset by removing the thermostat signal or disconnecting the electrical power supply for over five seconds.

**IMPORTANT NOTE: IF YOU HAVE TO FREQUENTLY RESET YOUR GAS/ELECTRIC PACKAGE UNIT, IT MEANS THAT A PROBLEM EXISTS THAT SHOULD BE CORRECTED. CONTACT A QUALIFIED SERVICER FOR FURTHER INFORMATION.**

### PRESSURE SENSOR

The pressure sensor is mounted in the control box and connected to the induced draft blower. Its function is to regulate the induced draft blower's speed in order to maintain proper air-fuel ratio for clean and reliable combustion. The electrical output signal from the sensor is expected to be proportional to the magnitude of the differential pressure between the inducer inlet negative pressure and the ambient air pressure. The pressure sensor also guards against insufficient airflow (combustion air and flue products) through the heat exchanger. At the beginning of a call for heat, the control ensures the inducer is in an off state, then checks the pressure sensor output for the proper null offset value. If the pressure sensor output is outside the acceptable range for the null value, the control enters a five minute lockout. After the lockout timer has expired, the control resumes normal operation.

During inducer operation, including all operating modes

except for the null test, the control monitors the pressure sensor output for expected values. The control limits during normal operation are expected to be within certain tolerances of the target pressures. In response to a pressure sensor span error, the control enters a five minute lockout. After the lockout timer has expired, the control resumes normal operation.

#### **PRIMARY LIMIT**

A primary limit will open due to excessive supply air temperatures. This can be caused by a dirty filter, excessive duct static, insufficient air flow, or a faulty limit. Check filters, total external duct static, blower motor, blower motor speed tap (see wiring diagram), and limit. This limit will automatically reset once the temperature falls below a preset level.

If a limit switch opens, the gas valve is immediately de-energized, the induced draft and air circulating blowers are energized. The induced draft and air circulator blowers remain energized for 5 minutes or until the limit switch re-closes, whichever happens first.

**NOTE: IF THE PRIMARY LIMIT OPENS THREE (3) TIMES WITHIN THE SAME CALL FOR HEAT, THE IGNITION CONTROL WILL LOCK OUT FOR ONE (1) HOUR WITH THE AIR CIRCULATING BLOWER ENERGIZED AT HEATING SPEED. FLAME DETECTED WITH GAS VALVE CLOSED**

If flame is detected with the gas valve de-energized, the combustion and air circulator blowers are energized. The control can be reset by removing the power supply to the unit or it will automatically reset after one hour. Miswiring is the probable cause for this fault. The initial lockout period is 5 minutes. After that time, the control continues to monitor the flame sense input and resumes normal operation when flame is no longer sensed.

#### **LOW FLAME SIGNAL**

Under some conditions, the fuel or air supply can create a nearly invisible coating on the flame sensor. This coating acts as an insulator causing a drop in the flame signal. If the flame signal drops below a predetermined value, the ignition control will display an error code of (1) flash on the amber diagnostic LED. The unit will continue to operate until the control can no longer detect flame.

#### **BURNER SWITCH**

The burner temperature switch is mounted on the burner assembly to monitor the burner box temperature. It is normally closed (electrically), auto-reset sensor. This switch guards against the burner flames not being properly drawn into the heat exchanger.

The control senses an open blocked burner switch, indicating that the burner temperature/pressure has exceeded its set point. The control de-energizes the gas valve, energizes the inducer to the pre-purge setting and

energizes the indoor blower. The initial lockout period is five minutes. After this time elapses, the control evaluates the state of the blocked burner switch. If the switch is closed, the control resumes normal operation. The control will enter a one hour lockout state if the blocked burner switch fails to reset before the recovery timer has expired.

#### **ID Plug**

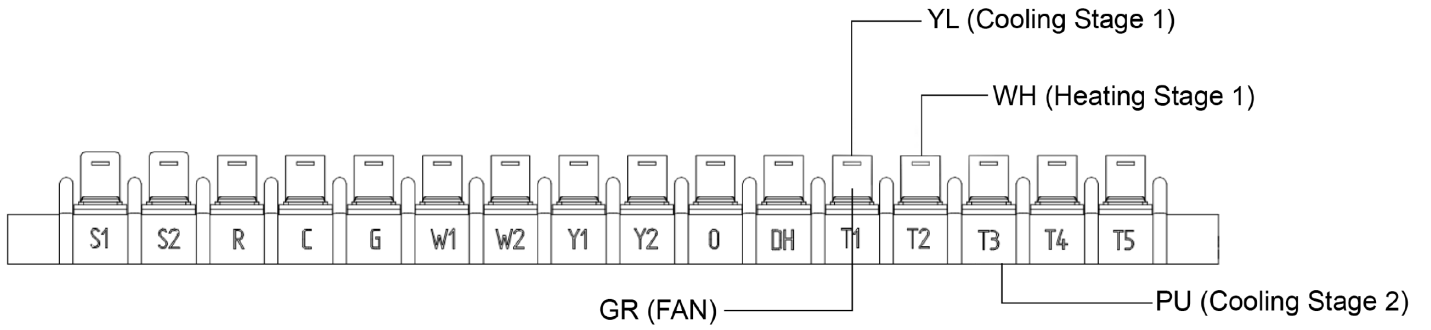
The control operational parameters are stored in ID Plug which connects on the circuit board. The control requires a valid ID plug present to operate in heating mode. If a valid ID plug is not present the control will not respond to a call for heat. However, the control will respond to thermostat inputs "Y" or "G", operating the appropriate fan output. The cooling delays are ignored in this operating mode. The control puts the burner into hard lockout and will not respond to heating requests until the power is cycled with a valid ID plug installed.

**NOTE: SOME ELECTRONIC THERMOSTATS ALSO HAVE A BUILT-IN COMPRESSOR SHORT CYCLE TIMER THAT MAY BE LONGER THAN THE THREE MINUTE DELAY GIVEN ABOVE. IF YOU ARE USING AN ELECTRONIC THERMOSTAT AND THE COMPRESSOR HAS NOT STARTED AFTER THREE MINUTES, WAIT AN ADDITIONAL FIVE MINUTES TO ALLOW THE THERMOSTAT TO COMPLETE ITS SHORT CYCLE DELAY TIME.**

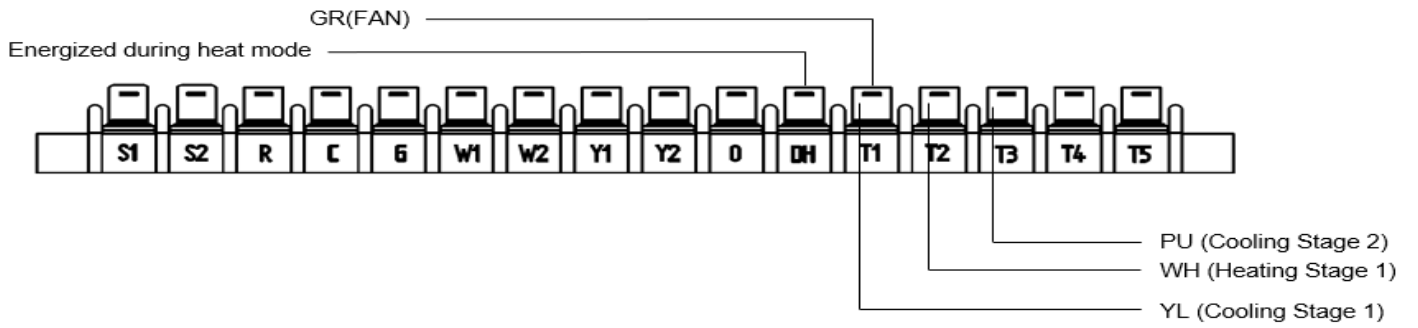
The status light on the furnace control may be used as a guide to troubleshooting this appliance. Some more useful status light codes are below:

<sup>1</sup>The fault condition must be cleared for 30 seconds before normal operation can resume. A power cycle will also reset any lockout.

### DRG MODEL WIRING (STANDARD STATIC)



### DRG MODEL WIRING (HIGH STATIC)



### DRG OPERATION AND WIRE RANGE CHART (STANDARD STATIC)

DRG OPERATIONS					WIRE RANGE				
GAS	G	Y1	Y2	W1	T1	T2	T3	T4	T5
FAN ONLY	X				GR				
COOLING MODE LO	X	X			●	————— YL —————→			
COOLING MODE HI	X	X	X			————— ● ————— PU —————→			
HEATING MODE	X			X		● ————— WH —————→			

### DRG OPERATION AND WIRE RANGE CHART (HIGH STATIC)

DRG OPERATIONS						WIRE RANGE									
GAS	G	Y1	Y2	W1	W2	T1	T2	T3	T4	T5	T1'	T2'	T3'	T4'	T5'
FAN ONLY	X					GR					X				
COOLING MODE LO	X	X				●	————— YL —————→								
COOLING MODE HI	X	X	X				————— ● ————— PU —————→								
HEATING MODE	X			X	X							————— ● ————— WH —————→			

X = 24V SIGNAL

●—————→ RANGE OF AVAILABLE TAPS

FOR WIRE COLOR INFORMATION AND PLACEMENT VIEW DRG MODEL WIRING SECTION



PCBBL216 ULN CONTROL ERROR CODES

LED ACTIVITY	DESCRIPTION	COLOR	MINIMUM LOCKOUT PERIOD <sup>1</sup>	LED ACTIVITY	DESCRIPTION	COLOR	MINIMUM LOCKOUT PERIOD <sup>1</sup>	LED ACTIVITY	DESCRIPTION	COLOR	MINIMUM LOCKOUT PERIOD <sup>1</sup>
LED OFF	NO 24 VAC POWER TO CONTROL	-	N/A	6 FLASHES	NORMALLY CLOSED BLOCKED BURNER SWITCH/AUXILLARY SWITCH OPEN	RED	MAXIMUM RECOVERY PERIOD - 1 HOUR IF TIME EXCEEDED	2 FLASHES	ID PLUG FAILURE	AMBER	HARD LOCKOUT HEATING MODE
RED, AMBER, GREEN	POWER-UP VERIFICATION OF LED	-	N/A	7 FLASHES	GAS VALVE CIRCUIT SHORTED	RED	1 HOUR	3 FLASHES	CONTROL FUSE OPEN	AMBER	5 MINUTES
STEADY ON	CONTROL FAULT DETECTED	RED	1 HOUR OR HARD LOCKOUT	8 FLASHES	RESERVED	RED	-	STEADY ON	STANDBY NORMAL OPERATION NO THERMOSTAT REQUESTS	GREEN	N/A
1 FLASH	RETRIES EXCEEDED	RED	1 HOUR FIXED	10 FLASHES	HIGH LIMIT SWITCH RECOVERY TIMER EXPIRED	RED	1 HOUR OR HARD LOCKOUT	RAPID FLASH	CLEAR ERROR HISTORY	GREEN	N/A
2 FLASHES	PRESSURE SENSOR NULL ERROR	RED	5 MINUTES	STEADY ON	OEM FACTORY TEST MODE	AMBER	N/A	1 FLASH	CALL FOR HEATING	GREEN	N/A
3 FLASHES	PRESSURE SENSOR SPAN ERROR	RED	5 MINUTES	RAPID FLASH	FIELD TEST MODE	AMBER	N/A	2 FLASHES	CALL FOR COOLING	GREEN	N/A
4 FLASHES	HIGH LIMIT SWITCH OPEN	RED	MAXIMUM RECOVERY TIME - 1 HOUR AFTER MAX TRIPS EXCEEDED	1 FLASH	LOW FLAME SENSE	AMBER	N/A	3 FLASHES	CONTINUOUS FAN OPERATION	GREEN	N/A
5 FLASHES	FLAME PRESENT WITH GAS VALVE OFF	RED	5 MINUTES	-	-	-	-	-	-	-	-

# APPENDIX A BLOWER PERFORMANCE DATA

3 Ton

Models: DRG0361D1 and DRG0363D1

Standard Static Drive

Burners Input: 100,000 BTU/HR

DOWN FLOW				
SPEED TAP	EXTERNAL STATIC PRESSURE (ESP), IN W.C.	SCFM	RPM	BHP
T1	0.2	1000	600	0.15
	0.4	865	685	0.18
	0.6	730	750	0.19
	0.8	600	810	0.21
	1.0	-	-	-
T2	0.2	1655	795	0.45
	0.4	1560	855	0.49
	0.6	1455	920	0.53
	0.8	1360	975	0.56
	1.0	1265	1020	0.58
T3	0.2	1225	670	0.24
	0.4	1110	745	0.27
	0.6	985	815	0.29
	0.8	880	870	0.31
	1.0	780	915	0.33
T4	0.2	1425	730	0.33
	0.4	1325	795	0.36
	0.6	1210	865	0.39
	0.8	1115	920	0.42
	1.0	1015	960	0.43
T5	0.2	1900	850	0.61
	0.4	1800	910	0.65
	0.6	1695	970	0.69
	0.8	1595	1035	0.74
	1.0	1495	1090	0.78

HORIZONTAL				
SPEED TAP	EXTERNAL STATIC PRESSURE (ESP), IN W.C.	SCFM	RPM	BHP
T1	0.2	1050	580	0.15
	0.4	910	665	0.17
	0.6	765	730	0.19
	0.8	630	785	0.2
	1.0	-	-	-
T2	0.2	1740	770	0.44
	0.4	1640	830	0.47
	0.6	1530	890	0.51
	0.8	1430	945	0.54
	1.0	1330	990	0.57
T3	0.2	1285	650	0.23
	0.4	1165	725	0.26
	0.6	1035	790	0.28
	0.8	925	845	0.3
	1.0	820	890	0.32
T4	0.2	1495	710	0.32
	0.4	1390	770	0.35
	0.6	1270	840	0.38
	0.8	1170	890	0.4
	1.0	1065	930	0.42
T5	0.2	1995	825	0.59
	0.4	1890	885	0.63
	0.6	1780	940	0.67
	0.8	1675	1005	0.72
	1.0	1570	1055	0.75

4 Ton

Models: DRG0481D1 and DRG0483D1

Standard Static Drive

Burners Input: 100,000 BTU/HR

DOWN FLOW				
SPEED TAP	EXTERNAL STATIC PRESSURE (ESP), IN W.C.	SCFM	RPM	BHP
T1	0.2	1040	595	0.15
	0.4	895	680	0.17
	0.6	755	750	0.19
	0.8	630	820	0.21
	1.0	-	-	-
T2	0.2	1405	710	0.3
	0.4	1300	770	0.33
	0.6	1185	845	0.36
	0.8	1070	900	0.39
	1.0	965	955	0.41
T3	0.2	1510	740	0.36
	0.4	1410	800	0.39
	0.6	1305	870	0.42
	0.8	1195	925	0.45
	1.0	1095	980	0.47
T4	0.2	1620	780	0.43
	0.4	1530	830	0.45
	0.6	1425	895	0.49
	0.8	1330	950	0.52
	1.0	1235	1005	0.55
T5	0.2	1805	840	0.56
	0.4	1715	890	0.59
	0.6	1630	940	0.63
	0.8	1550	990	0.66
	1.0	1455	1045	0.7

HORIZONTAL				
SPEED TAP	EXTERNAL STATIC PRESSURE (ESP), IN W.C.	SCFM	RPM	BHP
T1	0.2	1090	575	0.15
	0.4	940	660	0.17
	0.6	795	730	0.19
	0.8	660	795	0.2
	1.0	-	-	-
T2	0.2	1475	690	0.3
	0.4	1365	745	0.32
	0.6	1245	820	0.35
	0.8	1125	875	0.37
	1.0	1015	925	0.4
T3	0.2	1585	720	0.35
	0.4	1480	775	0.38
	0.6	1370	845	0.41
	0.8	1255	895	0.43
	1.0	1150	950	0.46
T4	0.2	1700	755	0.41
	0.4	1605	805	0.44
	0.6	1495	870	0.48
	0.8	1395	920	0.5
	1.0	1295	975	0.53
T5	0.2	1895	815	0.54
	0.4	1800	865	0.58
	0.6	1710	910	0.61
	0.8	1630	960	0.64
	1.0	1530	1015	0.68

# APPENDIX A BLOWER PERFORMANCE DATA

5 Ton

Models: DRG0601D1 and DRG0603D1

Standard Static Drive

Burners Input: 100,000 BTU/HR

DOWN FLOW					HORIZONTAL				
SPEED TAP	EXTERNAL STATIC PRESSURE (ESP), IN W.C.	SCFM	RPM	BHP	SPEED TAP	EXTERNAL STATIC PRESSURE (ESP), IN W.C.	SCFM	RPM	BHP
T1	0.2	1220	650	0.21	T1	0.2	1280	630	0.21
	0.4	1095	730	0.24		0.4	1150	710	0.23
	0.6	965	800	0.26		0.6	1015	775	0.26
	0.8	850	865	0.29		0.8	895	840	0.28
	1.0	-	-	-		1.0	-	-	-
T2	0.2	1400	705	0.29	T2	0.2	1470	685	0.29
	0.4	1290	780	0.32		0.4	1355	755	0.31
	0.6	1170	845	0.35		0.6	1230	820	0.34
	0.8	1065	910	0.38		0.8	1120	885	0.37
	1.0	940	950	0.4		1.0	985	920	0.38
T3	0.2	1895	865	0.62	T3	0.2	1990	840	0.6
	0.4	1810	920	0.66		0.4	1900	890	0.64
	0.6	1720	965	0.69		0.6	1805	935	0.67
	0.8	1640	1020	0.73		0.8	1720	990	0.71
	1.0	1515	1060	0.76		1.0	1590	1030	0.74
T4	0.2	1910	870	0.63	T4	0.2	2005	845	0.61
	0.4	1825	925	0.67		0.4	1915	895	0.65
	0.6	1735	970	0.7		0.6	1820	940	0.68
	0.8	1655	1020	0.74		0.8	1740	990	0.72
	1.0	1530	1060	0.77		1.0	1605	1030	0.75
T5	0.2	2145	955	0.91	T5	0.2	2250	925	0.88
	0.4	2065	990	0.94		0.4	2170	960	0.91
	0.6	1980	1035	0.99		0.6	2080	1005	0.96
	0.8	1900	1075	1.02		0.8	1995	1045	0.99
	1.0	1820	1120	1.07		1.0	1910	1085	1.03

3 Ton

Models: DRG0361D8 and DRG0363D8

Standard Static Drive

Burners High Fire Input: 80,000 BTU/HR

DOWN FLOW					HORIZONTAL				
SPEED TAP	EXTERNAL STATIC PRESSURE (ESP), IN W.C.	SCFM	RPM	BHP	SPEED TAP	EXTERNAL STATIC PRESSURE (ESP), IN W.C.	SCFM	RPM	BHP
T1	0.2	1000	600	0.15	T1	0.2	1050	580	0.15
	0.4	865	685	0.18		0.4	910	665	0.17
	0.6	730	750	0.19		0.6	765	730	0.19
	0.8	600	810	0.21		0.8	630	785	0.2
	1.0	-	-	-		1.0	-	-	-
T2	0.2	1120	640	0.2	T2	0.2	1175	620	0.19
	0.4	1000	715	0.22		0.4	1050	695	0.22
	0.6	865	785	0.24		0.6	910	760	0.24
	0.8	750	840	0.26		0.8	790	815	0.25
	1.0	645	890	0.28		1.0	675	865	0.27
T3	0.2	1225	670	0.24	T3	0.2	1285	650	0.23
	0.4	1110	745	0.27		0.4	1165	725	0.26
	0.6	985	815	0.29		0.6	1035	790	0.28
	0.8	880	870	0.31		0.8	925	845	0.3
	1.0	780	915	0.33		1.0	820	890	0.32
T4	0.2	1425	730	0.33	T4	0.2	1495	710	0.32
	0.4	1325	795	0.36		0.4	1390	770	0.35
	0.6	1210	865	0.39		0.6	1270	840	0.38
	0.8	1115	920	0.42		0.8	1170	890	0.4
	1.0	1015	960	0.43		1.0	1065	930	0.42
T5	0.2	1900	850	0.61	T5	0.2	1995	825	0.59
	0.4	1800	910	0.65		0.4	1890	885	0.63
	0.6	1695	970	0.69		0.6	1780	940	0.67
	0.8	1595	1035	0.74		0.8	1675	1005	0.72
	1.0	1495	1090	0.78		1.0	1570	1055	0.75

# APPENDIX A BLOWER PERFORMANCE DATA

4 Ton

Models: DRG0481D8 and DRG0483D8

Standard Static Drive

Burners High Fire Input: 80,000 BTU/HR

DOWN FLOW					HORIZONTAL				
SPEED TAP	EXTERNAL STATIC PRESSURE (ESP), IN W.C.	SCFM	RPM	BHP	SPEED TAP	EXTERNAL STATIC PRESSURE (ESP), IN W.C.	SCFM	RPM	BHP
T1	0.2	1040	595	0.15	T1	0.2	1090	575	0.15
	0.4	895	680	0.17		0.4	940	660	0.17
	0.6	755	750	0.19		0.6	795	730	0.19
	0.8	630	820	0.21		0.8	660	795	0.2
	1.0	-	-	-		1.0	-	-	-
T2	0.2	1260	660	0.24	T2	0.2	1325	640	0.23
	0.4	1140	735	0.26		0.4	1195	715	0.26
	0.6	1015	805	0.29		0.6	1065	780	0.28
	0.8	895	870	0.31		0.8	940	845	0.3
	1.0	-	-	-		1.0	-	-	-
T3	0.2	1510	740	0.36	T3	0.2	1585	720	0.35
	0.4	1410	800	0.39		0.4	1480	775	0.38
	0.6	1305	870	0.42		0.6	1370	845	0.41
	0.8	1195	925	0.45		0.8	1255	895	0.43
	1.0	1095	980	0.47		1.0	1150	950	0.46
T4	0.2	1620	780	0.43	T4	0.2	1700	755	0.41
	0.4	1530	830	0.45		0.4	1605	805	0.44
	0.6	1425	895	0.49		0.6	1495	870	0.48
	0.8	1330	950	0.52		0.8	1395	920	0.5
	1.0	1235	1005	0.55		1.0	1295	975	0.53
T5	0.2	1805	840	0.56	T5	0.2	1895	815	0.54
	0.4	1715	890	0.59		0.4	1800	865	0.58
	0.6	1630	940	0.63		0.6	1710	910	0.61
	0.8	1550	990	0.66		0.8	1630	960	0.64
	1.0	1455	1045	0.7		1.0	1530	1015	0.68

5 Ton

Models: DRG0601D8 and DRG0603D8

Standard Static Drive

Burners High Fire Input: 80,000 BTU/HR

DOWN FLOW					HORIZONTAL				
SPEED TAP	EXTERNAL STATIC PRESSURE (ESP), IN W.C.	SCFM	RPM	BHP	SPEED TAP	EXTERNAL STATIC PRESSURE (ESP), IN W.C.	SCFM	RPM	BHP
T1	0.2	1220	650	0.21	T1	0.2	1280	630	0.21
	0.4	1095	730	0.24		0.4	1150	710	0.23
	0.6	965	800	0.26		0.6	1015	775	0.26
	0.8	850	865	0.29		0.8	895	840	0.28
	1.0	-	-	-		1.0	-	-	-
T2	0.2	1280	670	0.24	T2	0.2	1345	650	0.23
	0.4	1160	745	0.27		0.4	1220	725	0.26
	0.6	1030	815	0.29		0.6	1080	790	0.28
	0.8	920	880	0.31		0.8	965	855	0.31
	1.0	800	925	0.33		1.0	840	895	0.32
T3	0.2	1895	865	0.62	T3	0.2	1990	840	0.6
	0.4	1810	920	0.66		0.4	1900	890	0.64
	0.6	1720	965	0.69		0.6	1805	935	0.67
	0.8	1640	1020	0.73		0.8	1720	990	0.71
	1.0	1515	1060	0.76		1.0	1590	1030	0.74
T4	0.2	1910	870	0.63	T4	0.2	2005	845	0.61
	0.4	1825	925	0.67		0.4	1915	895	0.65
	0.6	1735	970	0.7		0.6	1820	940	0.68
	0.8	1655	1020	0.74		0.8	1740	990	0.72
	1.0	1530	1060	0.77		1.0	1605	1030	0.75
T5	0.2	2145	955	0.91	T5	0.2	2250	925	0.88
	0.4	2065	990	0.94		0.4	2170	960	0.91
	0.6	1980	1035	0.99		0.6	2080	1005	0.96
	0.8	1900	1075	1.02		0.8	1995	1045	0.99
	1.0	1820	1120	1.07		1.0	1910	1085	1.03

# APPENDIX A BLOWER PERFORMANCE DATA

3 Ton

Models: DRG0361D6 and DRG0363D6

Standard Static Drive

Burners Input: 60,000 BTU/HR

DOWN FLOW					HORIZONTAL				
SPEED TAP	EXTERNAL STATIC PRESSURE (ESP), IN W.C.	SCFM	RPM	BHP	SPEED TAP	EXTERNAL STATIC PRESSURE (ESP), IN W.C.	SCFM	RPM	BHP
T1	0.2	1000	600	0.15	T1	0.2	1050	580	0.15
	0.4	865	685	0.18		0.4	910	665	0.17
	0.6	730	750	0.19		0.6	765	730	0.19
	0.8	600	810	0.21		0.8	630	785	0.2
	1.0	-	-	-		1.0	-	-	-
T2	0.2	895	570	0.12	T2	0.2	940	555	0.12
	0.4	755	655	0.14		0.4	795	635	0.14
	0.6	610	725	0.16		0.6	640	705	0.15
	0.8	470	780	0.17		0.8	495	755	0.16
	1.0	-	-	-		1.0	-	-	-
T3	0.2	1225	670	0.24	T3	0.2	1285	650	0.23
	0.4	1110	745	0.27		0.4	1165	725	0.26
	0.6	985	815	0.29		0.6	1035	790	0.28
	0.8	880	870	0.31		0.8	925	845	0.3
	1.0	780	915	0.33		1.0	820	890	0.32
T4	0.2	1425	730	0.33	T4	0.2	1495	710	0.32
	0.4	1325	795	0.36		0.4	1390	770	0.35
	0.6	1210	865	0.39		0.6	1270	840	0.38
	0.8	1115	920	0.42		0.8	1170	890	0.4
	1.0	1015	960	0.43		1.0	1065	930	0.42
T5	0.2	1900	850	0.61	T5	0.2	1995	825	0.59
	0.4	1800	910	0.65		0.4	1890	885	0.63
	0.6	1695	970	0.69		0.6	1780	940	0.67
	0.8	1595	1035	0.74		0.8	1675	1005	0.72
	1.0	1495	1090	0.78		1.0	1570	1055	0.75

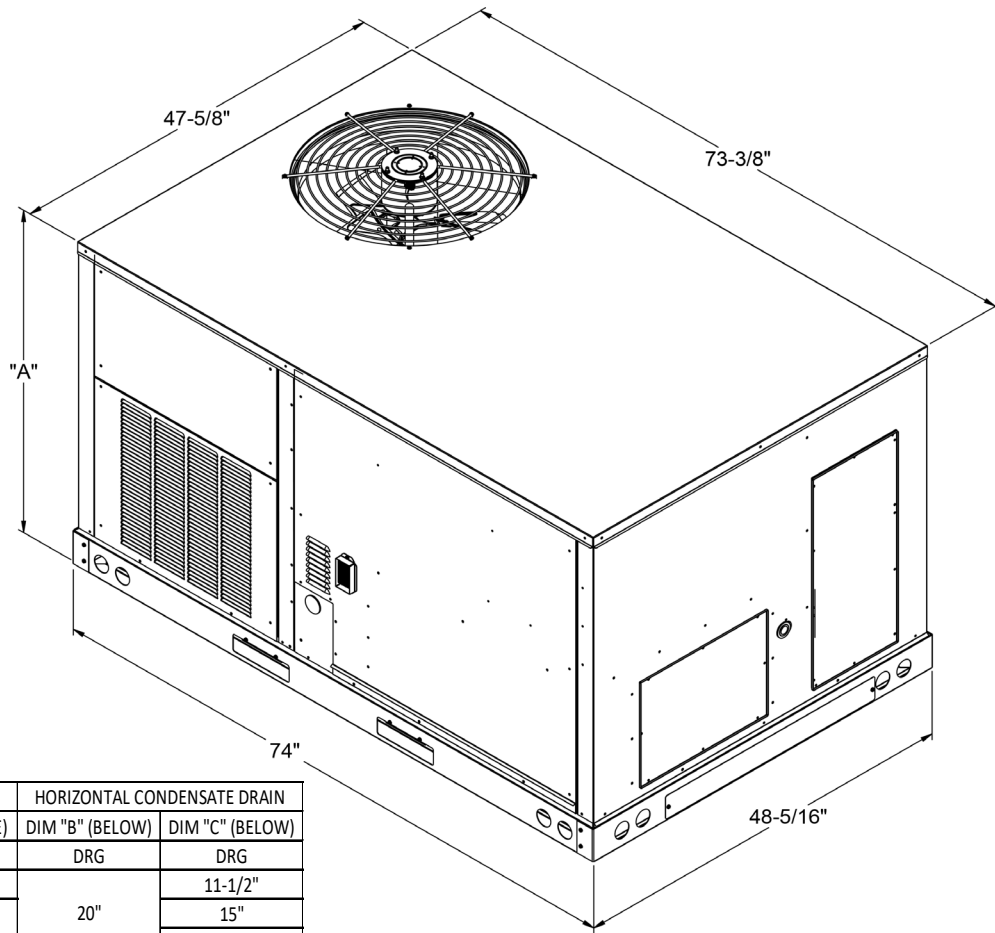
# APPENDIX B ELECTRICAL DATA

## ELECTRICAL DATA

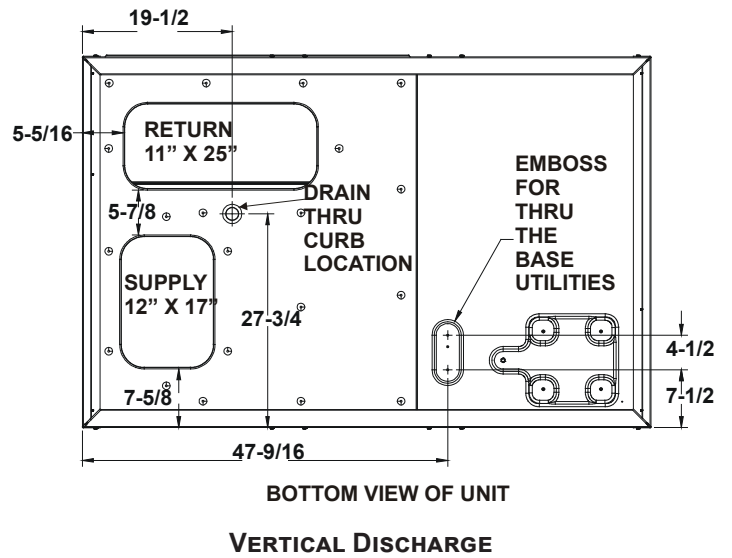
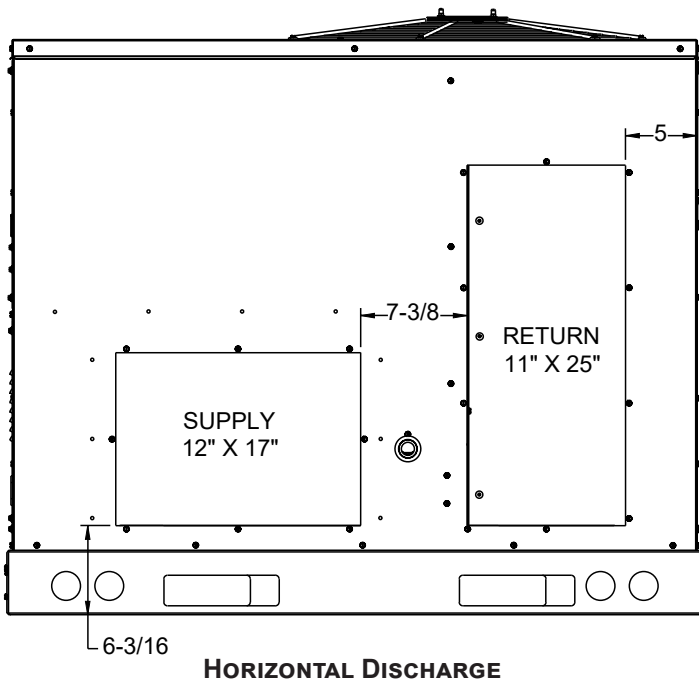
Model Number	Electrical Rating	Compressor			Outdoor Fan Motor			Indoor Fan Motor			Optional Electric Heat			Optional Powered Convenience Outlet	Optional Power Exhaust	Power Supply	
		QTY	RLA	LRA	QTY	HP	FLA	QTY	HP	FLA	Part #	KW*	FLA	FLA	FLA	MCA	MOP
DRG0361D	208/230/1/60	1	15.6	83	1	0.17	0.95	1	0.75	5.7	-	-	-	-	-	26.2/26.2	40/40
											-	-	-	9.6/8.7	-	35.8/34.9	50/50
											-	-	-	-	1.7/1.5	27.9/27.7	40/40
											-	-	-	9.6/8.7	1.7/1.5	37.5/36.4	50/50
DRG0363D	208/230/3/60	1	11.6	73	1	0.17	0.95	1	0.75	5.7	-	-	-	-	-	21.2/21.2	30/30
											-	-	-	9.6/8.7	-	30.8/29.9	40/40
											-	-	-	-	1.7/1.5	22.9/22.7	30/30
											-	-	-	9.6/8.7	1.7/1.5	32.5/31.4	40/40
DRG0363W	208/230/3/60	1	11.6	73	1	0.17	0.95	1	1.2	5	-	-	-	-	-	20.5/20.5	30/30
											-	-	-	9.6/8.7	-	30.1/29.2	40/40
											-	-	-	-	1.7/1.5	22.2/22.0	30/30
											-	-	-	9.6/8.7	1.7/1.5	31.8/30.7	40/40
DRG0364D	460/3/60	1	5.7	38	1	0.17	0.48	1	1.2	2.5	-	-	-	-	-	10.1	15
											-	-	-	4.3	-	14.4	20
											-	-	-	-	0.5	10.6	15
											-	-	-	4.3	0.5	14.9	20
DRG0364W	460/3/60	1	5.7	38	1	0.17	0.48	1	1.2	2.5	-	-	-	-	-	10.1	15
											-	-	-	4.3	-	14.4	20
											-	-	-	-	0.5	10.6	15
											-	-	-	4.3	0.5	14.9	20
DRG0367D	575/3/60	1	4	25.6	1	0.17	0.39	1	1.2	2	-	-	-	-	-	7.4	15
											-	-	-	3.5	-	10.9	15
											-	-	-	-	*1.7	8.0	15
											-	-	-	3.5	*1.7	11.5	15
DRG0367W	575/3/60	1	4	25.6	1	0.17	0.39	1	1.2	2	-	-	-	-	-	7.4	15
											-	-	-	3.5	-	10.9	15
											-	-	-	-	*1.7	8.0	15
											-	-	-	3.5	*1.7	11.5	15
DRG0481D	208/230/1/60	1	21.2	104	1	0.17	0.95	1	1	6.9	-	-	-	-	-	34.3/34.3	50/50
											-	-	-	9.6/8.7	-	43.9/43.0	60/60
											-	-	-	-	1.7/1.5	36.0/35.8	50/50
											-	-	-	9.6/8.7	1.7/1.5	45.6/44.5	60/60
DRG0483D	208/230/3/60	1	14	83.1	1	0.17	0.95	1	1	6.9	-	-	-	-	-	25.4/25.4	35/35
											-	-	-	9.6/8.7	-	35.0/34.1	45/45
											-	-	-	-	1.7/1.5	27.1/26.9	40/40
											-	-	-	9.6/8.7	1.7/1.5	36.7/35.6	50/45
DRG0483W	208/230/3/60	1	14	83.1	1	0.17	0.95	1	1.2	5	-	-	-	-	-	23.5/23.5	35/35
											-	-	-	9.6/8.7	-	33.1/32.2	45/45
											-	-	-	-	1.7/1.5	25.2/25.0	35/35
											-	-	-	9.6/8.7	1.7/1.5	34.8/33.7	45/45
DRG0484D	460/3/60	1	6.4	41	1	0.17	0.48	1	1.2	2.5	-	-	-	-	-	11.0	15
											-	-	-	4.3	-	15.3	20
											-	-	-	-	0.5	11.5	15
											-	-	-	4.3	0.5	15.8	20
DRG0484W	460/3/60	1	6.4	41	1	0.17	0.48	1	1.2	2.5	-	-	-	-	-	11.0	15
											-	-	-	4.3	-	15.3	20
											-	-	-	-	0.5	11.5	15
											-	-	-	4.3	0.5	15.8	20
DRG0487D	575/3/60	1	4.6	33	1	0.17	0.39	1	1.2	2	-	-	-	-	-	8.1	15
											-	-	-	3.5	-	11.6	15
											-	-	-	-	*1.7	8.7	15
											-	-	-	3.5	*1.7	12.2	15
DRG0487W	575/3/60	1	4.6	33	1	0.17	0.39	1	1.2	2	-	-	-	-	-	8.1	15
											-	-	-	3.5	-	11.6	15
											-	-	-	-	*1.7	8.7	15
											-	-	-	3.5	*1.7	12.2	15
DRG0601D	208/230/1/60	1	26.9	139.9	1	0.33	2.6	1	1	6.9	-	-	-	-	-	43.2/43.2	70/70
											-	-	-	9.6/8.7	-	52.8/51.9	70/70
											-	-	-	-	1.7/1.5	44.9/44.7	70/70
											-	-	-	9.6/8.7	1.7/1.5	54.5/53.4	80/80
DRG0603D	208/230/3/60	1	16.2	110	1	0.33	2.6	1	1	6.9	-	-	-	-	-	29.8/29.8	45/45
											-	-	-	9.6/8.7	-	39.4/38.5	50/50
											-	-	-	-	1.7/1.5	31.5/31.3	45/45
											-	-	-	9.6/8.7	1.7/1.5	41.1/40.0	50/50
DRG0603W	208/230/3/60	1	16.2	110	1	0.33	2.6	1	2.3	7.7	-	-	-	-	-	30.6/30.6	45/45
											-	-	-	9.6/8.7	-	40.2/39.3	50/50
											-	-	-	-	1.7/1.5	32.3/32.1	45/45
											-	-	-	9.6/8.7	1.7/1.5	41.9/40.8	50/50
DRG0604D	460/3/60	1	7.6	52	1	0.33	1.6	1	1.2	2.5	-	-	-	-	-	13.6	20
											-	-	-	4.3	-	17.9	25
											-	-	-	-	0.5	14.1	20
											-	-	-	4.3	0.5	18.4	25
DRG0604W	460/3/60	1	7.6	52	1	0.33	1.6	1	2.3	4.5	-	-	-	-	-	15.6	20
											-	-	-	4.3	-	19.9	25
											-	-	-	-	0.5	16.1	20
											-	-	-	4.3	0.5	20.4	25
DRG0607D	575/3/60	1	5.3	38.9	1	0.33	*2.6	1	1.2	2	-	-	-	-	-	9.8	15
											-	-	-	3.5	-	13.3	15
											-	-	-	-	*1.7	10.4	15
											-	-	-	3.5	*1.7	13.9	15
DRG0607W	575/3/60	1	5.3	38.9	1	0.33	*2.6	1	2.3	3.8	-	-	-	-	-	11.6	15
											-	-	-	3.5	-	15.1	20
											-	-	-	-	*1.7	12.2	15
											-	-	-	3.5	*1.7	15.7	20

\* Motor nameplate 208V/203V values are shown in the table. MCA and MOP calculations account for the use of a transformer in 575V models.

# APPENDIX C UNIT DIMENSIONS



TONNAGE	UNIT HEIGHT	HORIZONTAL CONDENSATE DRAIN	
	DIM "A" (ABOVE)	DIM "B" (BELOW)	DIM "C" (BELOW)
	DRG	DRG	DRG
3 TON	39-7/8"	20"	11-1/2"
4 TON	43-1/2"		15"
5 TON			8-1/8"



**NOTE: REFER TO IOD-7082 INCLUDED IN THE LITERATURE PACK FOR INSTALLING HORIZONTAL DUCT COVERS.**

## APPENDIX D MIN-MAX AIRFLOW

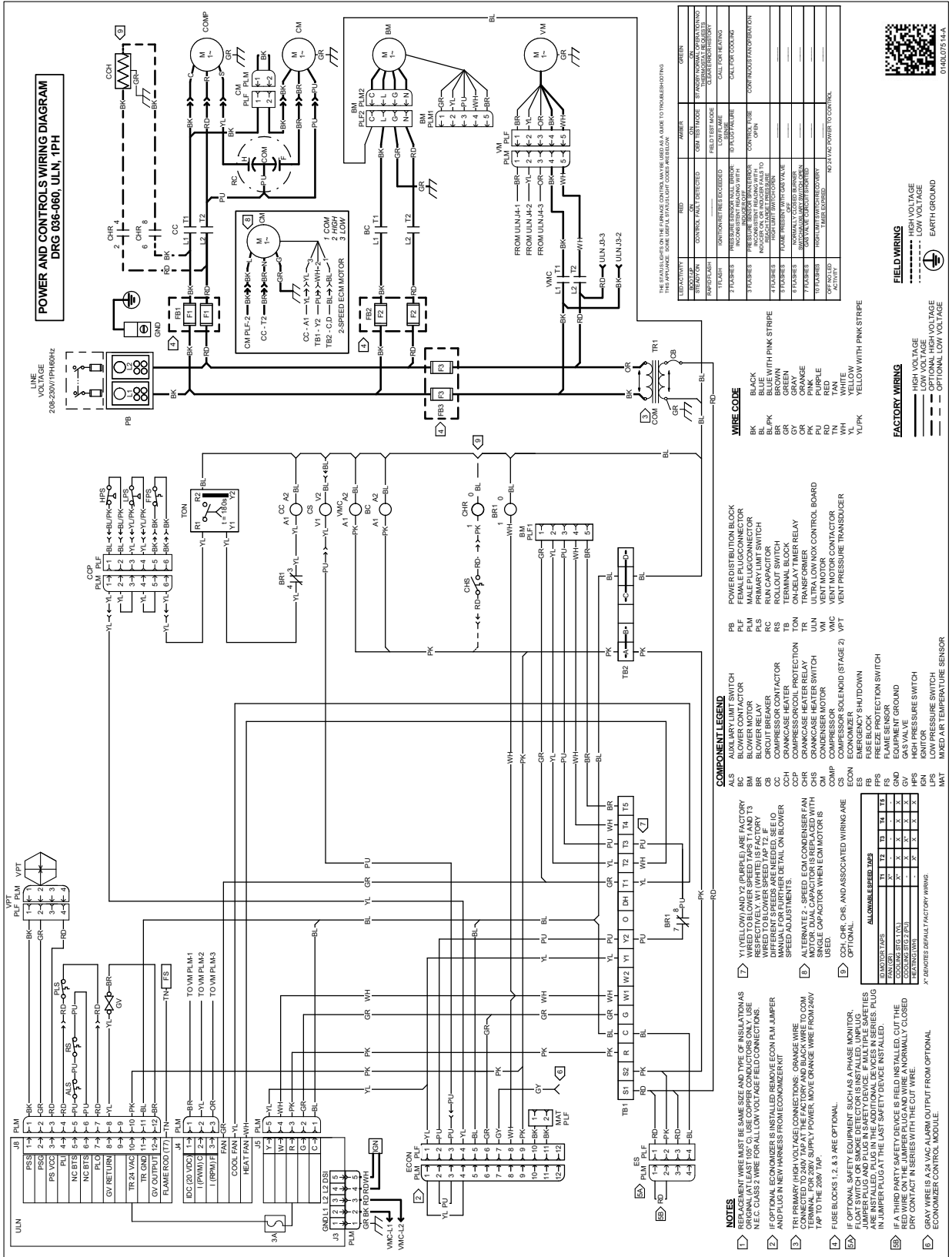
RECOMMENDED MIN-MAX AIRFLOW RANGE				
UNIT	FIRE RATE BTU/HR	<u>HEATING</u> MINIMUM SCFM	<u>COOLING</u> MINIMUM SCFM	MAXIMUM SCFM
DRG036	100,000	1300	900	1500
DRG036	80,000	950	900	1500
DRG036	60,000	800	900	1500
DRG048	100,000	1100	1200	2000
DRG048	80,000	1100	1200	2000
DRG060	100,000	1200	1500	2500
DRG060	80,000	1100	1500	2500



# DRG ULN 1 PHASE WIRING DIAGRAM



**WARNING**  
HIGH VOLTAGE!  
DISCONNECT ALL POWER BEFORE SERVICING OR INSTALLING THIS UNIT. MULTIPLE POWER SOURCES MAY BE PRESENT. FAILURE TO DO SO MAY CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.



Wiring is subject to change. Always refer to the wiring diagram on the unit for the most up-to-date wiring.







# Start-up Checklist

*\*Store in job file*

Date: \_\_\_\_\_ Location: \_\_\_\_\_  
Model Number: \_\_\_\_\_  
Serial Number: \_\_\_\_\_  
Technician: \_\_\_\_\_ Unit #: \_\_\_\_\_

## Pre Start-Up

*(Check each item as completed)*

- Verify all packaging material has been removed.
- Remove all shipping brackets per installation instructions.
- Verify the job site voltage agrees with the unit serial plate.
- Verify condensate connection is installed per installation instructions.
- Verify proper clearance around the unit for safety, service, maintenance and proper unit operation.
- Verify proper weatherproofing of all ductwork, roof curbs and electrical connections.
- Check that the flue screen is in place.
- Check gas piping for leaks.
- Verify gas pressure to the unit is within the range specified on the serial plate.
- Check to ensure that all fans, pulleys and wheels are secure.
- Check for proper belt tension and alignment per installation instructions.
- Check refrigerant piping for rubbing and leaks. *Repair if necessary.*
- Check unit wiring to ensure it is not in contact with refrigerant piping or sharp metal edges.
- Check all electrical connections and terminals. *Tighten as needed.*
- Verify that the crankcase heaters have been energized for 24 hours.
- Verify the scroll compressor(s) are rotating in the right direction.
- Verify all accessories are installed and operating correctly.
- Check filters and replace if necessary.
- Verify the installation of the thermostat.



# Start-up Checklist

**Start-Up**  
*(Insert the values as each item is completed.)*

## ELECTRICAL

Supply Voltage	L1 - L2	_____	L2 - L3	_____	L3 - L1	_____
Circuit 1 Compressor Amps	L1	_____	L2	_____	L3	_____
Circuit 2 Compressor Amps	L1	_____	L2	_____	L3	_____
Blower Amps	L1	_____	L2	_____	L3	_____
Condenser Fan Amps	Fan 1	_____	Fan 2	_____	Fan 3	_____

## BLOWER EXTERNAL STATIC PRESSURE

Return Air Static Pressure	_____	IN. W.C.
Supply Air Static Pressure	_____	IN. W.C.
Total External Static Pressure	_____	IN. W.C.
Blower Wheel RPM	_____	RPM

## TEMPERATURES

Outdoor Air Temperature	_____	DB	_____	WB
Return Air Temperature	_____	DB	_____	WB
Cooling Supply Air Temperature	_____	DB	_____	WB
Heating Supply Air Temperature	_____	DB	_____	

## PRESSURES

Gas Inlet Pressure	_____	IN. W.C.	
Gas Manifold Pressure	_____	IN. W.C. (Low Fire)	_____ IN. W.C. (High Fire)
Suction Circuit 1	_____	PSIG	_____ °F
Superheat (Orifice System)			_____ °F
Suction Circuit 2	_____	PSIG	_____ °F
Superheat (Orifice System)			_____ °F
Discharge Circuit 1	_____	PSIG	_____ °F
Subcooling (TXV System)			_____ °F
Discharge Circuit 2	_____	PSIG	_____ °F
Subcooling (TXV System)			_____ °F

## (HEAT PUMP ONLY)

Suction Circuit 1	_____	PSIG	_____ °F
Suction Circuit 2	_____	PSIG	_____ °F
Discharge Circuit 1	_____	PSIG	_____ °F
Discharge Circuit 2	_____	PSIG	_____ °F

THIS PAGE IS INTENTIONALLY LEFT BLANK

THIS PAGE IS INTENTIONALLY LEFT BLANK

## CUSTOMER FEEDBACK

Daikin is very interested in all product comments.

Please fill out the feedback form on the following link:

<https://daikincomfort.com/contact-us>

You can also scan the QR code on the right to be directed to the feedback page.



Our continuing commitment to quality products may mean a change in specifications without notice.

©2020-2023 **DAIKIN COMFORT TECHNOLOGIES MANUFACTURING, L.P.**

19001 Kermier Rd., Waller, TX 77484

[www.daikincomfort.com](http://www.daikincomfort.com)