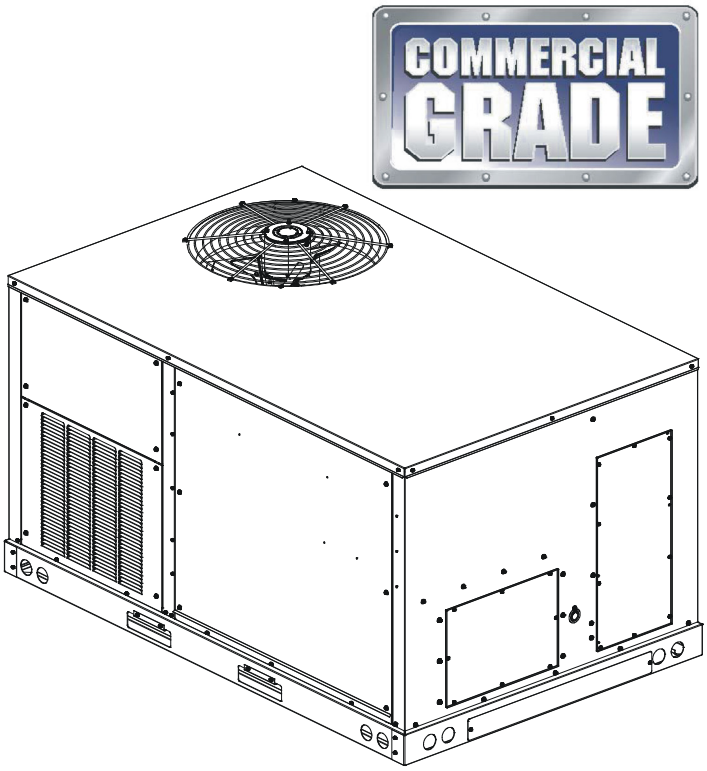
Installation Instructions
For Self-Contained Package Heat Pump Units
GPHM5 15.2 SEER2 5-Ton "M" Series



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. THE MANUFACTURER WILL NOT BE RESPONSIBLE FOR ANY INJURY OR PROPERTY DAMAGE ARISING FROM IMPROPER 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 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 TRAINING MAY RESULT IN PRODUCT DAMAGE, PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

WARNING

DO NOT BYPASS SAFETY DEVICES

RECOGNIZE THIS SYMBOL AS A SAFETY PRECAUTION.

AHRI CERTIFIED® www.ahridirectory.org Unitary Small AC AHRI Standard 210/240 Certification applies only when the complete system is listed with AHRI.

AHRI CERTIFIED® www.ahridirectory.org Unitary Small HP AHRI Standard 210/240 Certification applies only when the complete system is listed with AHRI.

c ETL us Intertek

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

19001 Kermier Rd. Waller, TX 77484
www.daikincomfort.com

IOG-3031A
09/2022

TABLE OF CONTENTS

TO THE INSTALLER

Carefully read all instructions for the installation prior to installing unit. Make sure 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. After deciding where to install unit, closely look the location over – both the inside and outside of the home. Note any potential obstacles or problems that might be encountered as noted in this manual. Choose a more suitable location if necessary.

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

Before using this manual, check the serial plate for proper model identification.
The installation and servicing of this equipment must be performed by qualified, experienced technicians only.

SHIPPING INSPECTION

Checking Product Received

Upon receiving the unit, inspect it for damage from shipment. Claims for damage, either shipping or concealed, should be filed immediately with the shipping company. Check the unit model number, specifications, electrical characteristics, and accessories to determine if they are correct. In the event an incorrect unit is shipped, it must be returned to the supplier and must NOT be installed. The manufacturer assumes no responsibility for installation of incorrectly shipped units.

Message to the Homeowner

These instructions are addressed primarily to the installer; however, useful maintenance information is included and should be kept, after installation, 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. For the location of your nearest distributor, consult the white business pages, the yellow page section of the local telephone book or contact:

HOMEOWNER'S SUPPORT
DAIKIN COMFORT TECHNOLOGIES
MANUFACTURING, L.P.
19001 KERMIER ROAD
WALLER, TEXAS 77484
(855) 770-5678

IMPORTANT SAFETY INSTRUCTIONS

Recognize Safety Symbols, Words, and Labels

The following symbols and labels are used throughout this manual to indicate immediate or potential hazards. It is the owner's responsibility to read and comply with all safety information and instructions accompanying these symbols. Failure to heed safety information increases the risk of serious personal injury or death, property damage and/or product damage.

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

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

Do not connect to or use any device that is not design certified by Daikin 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

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

Connecting unit ductwork to unauthorized heat producing devices such as a fireplace insert, stove, etc. May result in property damage, fire, carbon monoxide poisoning, explosion, personal injury or death.

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 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.

CODES AND REGULATIONS

General

The GPHM5 SEER2 5 TON M-Series heat pump is designed for OUTDOOR USE ONLY. Rated performance is achieved after 20 hours of operation. See product specification sheet for packaged models. Optional field-installed heat kits are available in 5, 10, 15 and 20kW.

The GPHM5 SEER2 M-Series are self-contained packaged units so the only connections needed for installation are the supply and return ducts, the line and low voltage wiring and drain connection. Rated performance is delivered at the specified airflow. See product specification for packaged models.

Specification sheets can be found at: www.goodmanmfg.com for Goodman® brand products. Within the website, please select the residential or 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 the model's specification sheet. The units are ETL listed, and AHRI certified. The information on the rating plate is in compliance with the FTC & DOE rating for single phase units.

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
www.ansi.org

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 code or regulation. 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 carrier promptly and request an inspection.
3. In case of concealed damage, 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 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.

MAJOR COMPONENTS

The unit includes a hermetically sealed refrigerating system (consisting of a compressor, condenser coil, evaporator coil with flowrator), an indoor blower, a condenser fan, and all necessary internal electrical wiring. The heat pump also includes a reversing valve, solenoid, defrost thermostat and control and loss of charge protection. The system is factory-evacuated, charged and performance tested. Refrigerant amount and type are indicated on rating plate.

INSTALLATION

Pre-Installation Checkpoints

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.

Before attempting any installation, the following points should be considered:

- Structural strength of supporting members
- Clearances and provision for servicing
- Power supply and wiring
- Air duct connections
- Drain facilities and connections
- Location may be on any four sides of a home, manufactured or modular, to minimize noise

UNIT LOCATION

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.
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 it's provisions. The user should retain these instructions for future reference.

- 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.
- 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.
- Consider the effect of outdoor fan noise on conditioned space and any adjacent occupied space. It is recommended that the unit be placed so that condenser air discharge does not blow toward windows less than 25 feet away.
- The unit should be set on a solid, level foundation – preferably a concrete slab at least 4 inches thick. The slab should be above ground level and surrounded by a graveled area for good drainage. Any slab used as a unit's foundation should not adjoin the building as it is possible that sound and vibration may be transmitted to the structure.

Heat Pumps require special location consideration in areas of heavy snow accumulation and/or areas with prolonged continuous subfreezing temperatures. Heat pump unit bases have holes under the outdoor coil to permit drainage of defrost water accumulation. The unit must be situated to permit free unobstructed drainage of the defrost water and ice. A minimum of 2" clearance under the outdoor coil is required in milder climates. See FIGURE 1: HEAT PUMP ELEVATION CHART.

Heat Pump Elevation Chart	
Design Temperature	**Suggested Minimum Elevation**
+15° and above	2 ½"
-5° to +14°	8"
Below -5°	12"

Figure 1: Heat Pump Elevation Chart

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.
- Adequate clearances from the unit to any adjacent public walkways, adjacent buildings, building openings or openable windows must be maintained in accordance with National Codes.

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.

⚠ CAUTION

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.

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.

WARNING

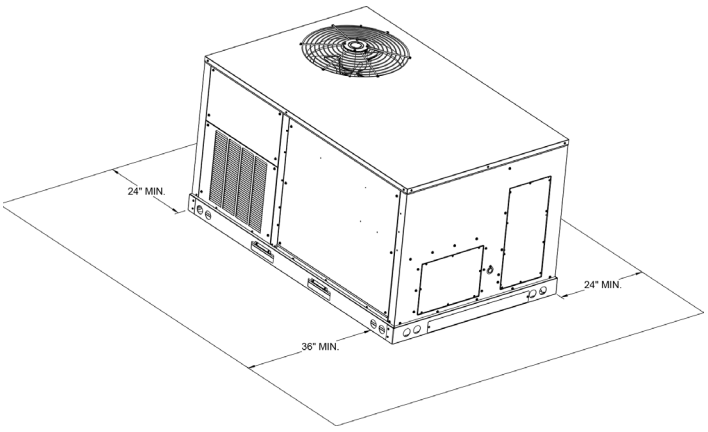
TO PREVENT POSSIBLE EQUIPMENT DAMAGE, PROPERTY DAMAGE, PERSONAL INJURY OR DEATH, THE FOLLOWING BULLET POINTS MUST BE OBSERVED WHEN INSTALLING THE UNIT.

- 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. 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.

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

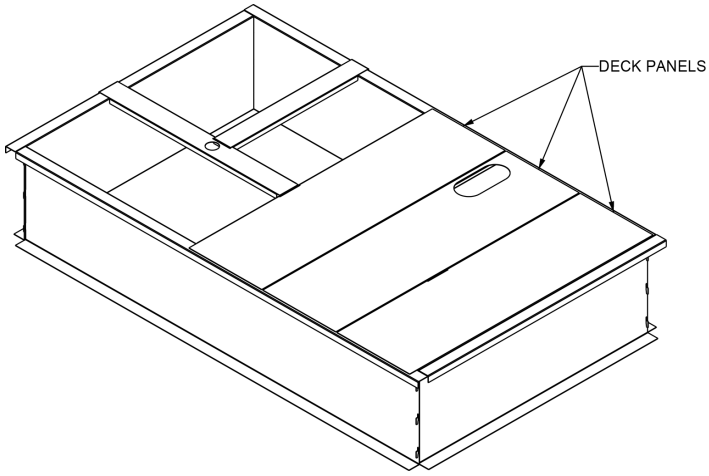
CLEARANCES



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.



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.

CAUTION

IF PROTRUSIONS EXIST, DO NOT ATTEMPT TO SET UNIT ON CURB.

ROOF TOP DUCT CONNECTIONS

ROOF TOP INSTALLATION

1. Before locating the unit on the roof, make sure that the strength of the roof and beams is adequate to support the weight involved. (See specification sheet for weight of units). This is very important and the installer's responsibility.
2. Make a proper consideration for weather-tight integrity of the roof and proper drainage of condensate.

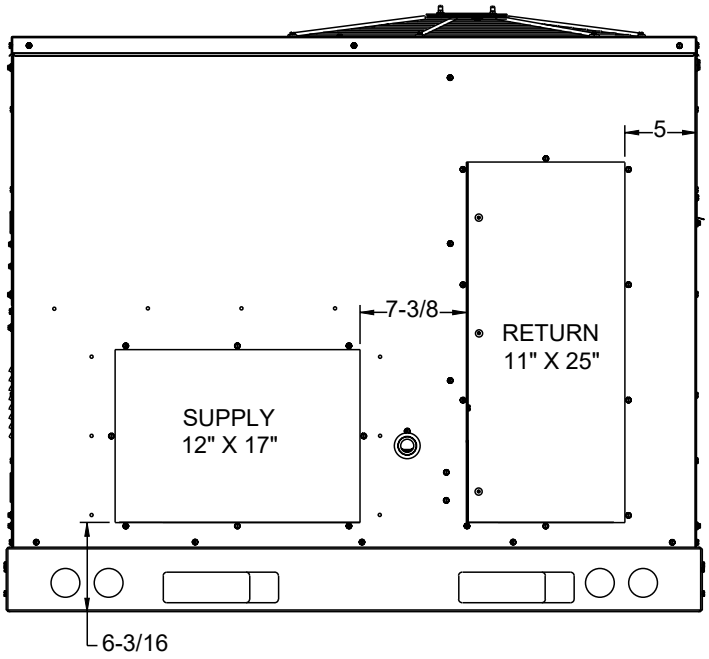
3. To ensure proper condensate drainage, unit must be installed in a level position.
4. Consideration should also be given to shade, appearance, and noise.

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

WARNING

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.

CAUTION

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.

WARNING

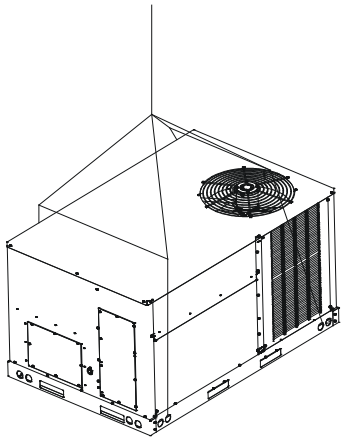
To prevent possible equipment damage, property damage, personal injury or death, the following bullet points must be observed when installing the unit.

Provisions for forks have been included in the unit base frame. No other fork locations are approved.

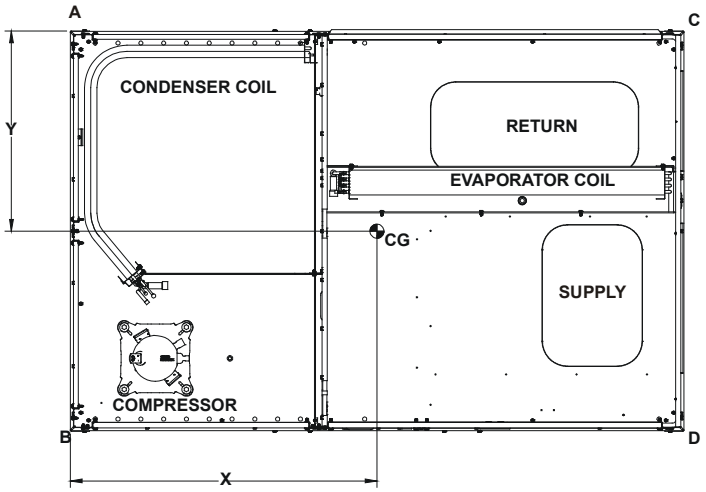
- Unit must be lifted by the four lifting holes located at the base frame corners.
- Lifting cables should be attached to the unit with shackles.
- The distance between the crane hook and the top of the unit must not be less than 60".
- Two spreader bars must span over the unit to prevent damage to the 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:



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 Weights (lb)				X (in)	Y (in)
			A	B	C	D		
GPHM56041	688	630	150	194	165	121	33.5	27.6

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

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 interanl 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

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.

Rated Voltage	Minimum Supply Voltage	Minimum Supply Voltage
208/230V	197	253

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. Refer to model nomenclature in Appendix B for voltage requirement for your unit.

NOTE: If supply voltage is 208V, lead on primary of transformer(s) must be moved from the 240V 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 database. Size wires in accordance with the ampacity tables in Article 310 of the National Electrical Code. 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.

Branch Circuit Ampacity	15	20	25	30	35	40	45	50
SUPPLY WIRE LENGTH - FEET								
200	6	4	4	4	3	3	2	2
150	8	6	6	4	4	4	3	3
100	10	8	8	6	6	6	4	4
50	14	12	10	10	8	8	6	6

Wiring Table

CAUTION

To avoid risk of property damage, personal injury or fire, use only copper conductors.

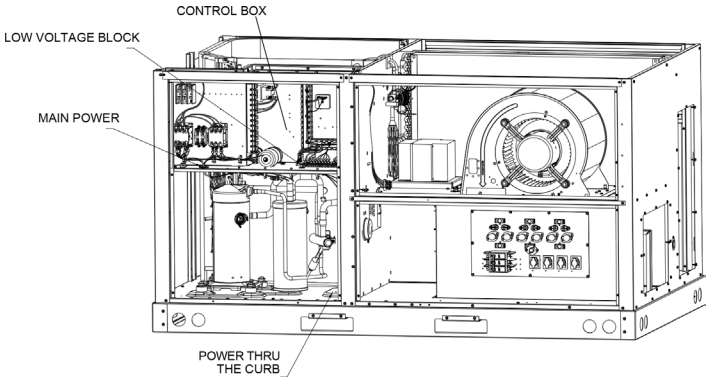
CAUTION

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

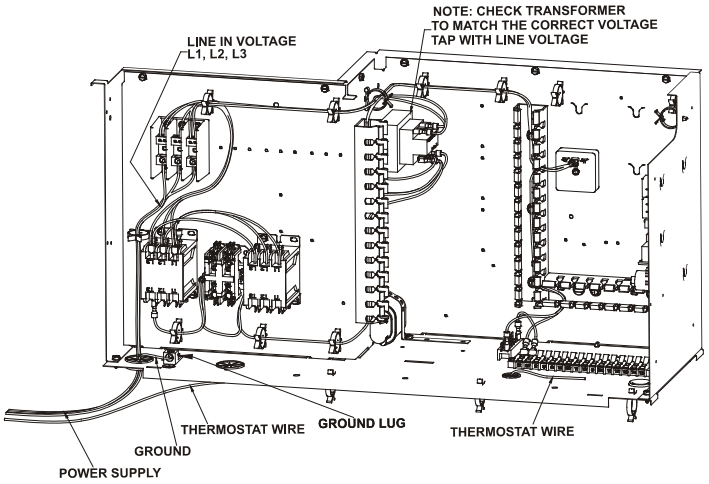
NOTE: A weather-tight disconnect switch, properly sized for the unit total load, must be field or factory installed. An external field supplied disconnect may be mounted on the exterior panel.

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 the electrical power block located within the main control box.



Control Box



control box Connections

NOTE: depending on the options installed, the location of the components may vary in some models.

WARNING

Failure of unit due to operation on improper line voltage or with excessive phase unbalance constitutes product abuse and will void your warranty and may cause severe damage to the unit electrical components.

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.

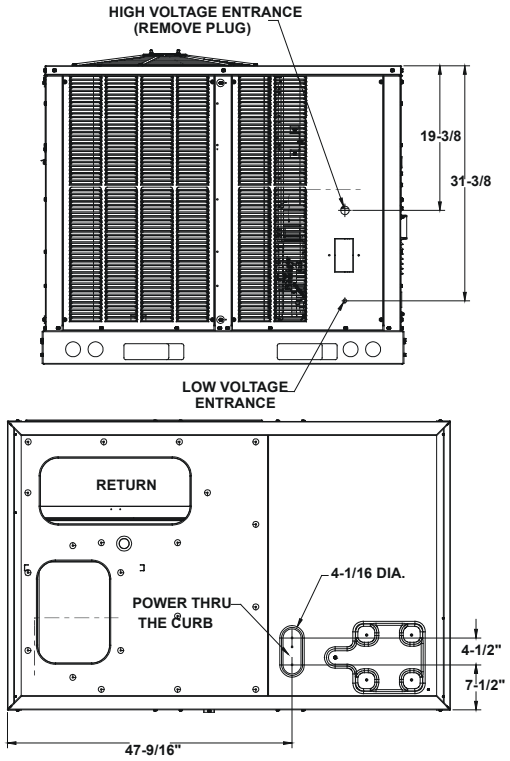
NOTE: Refer to local codes for requirements. These outlets can also be factory installed.

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 desired entrance 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 thermostat.
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 thermostat 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.

CIRCULATING AIR AND FILTERS

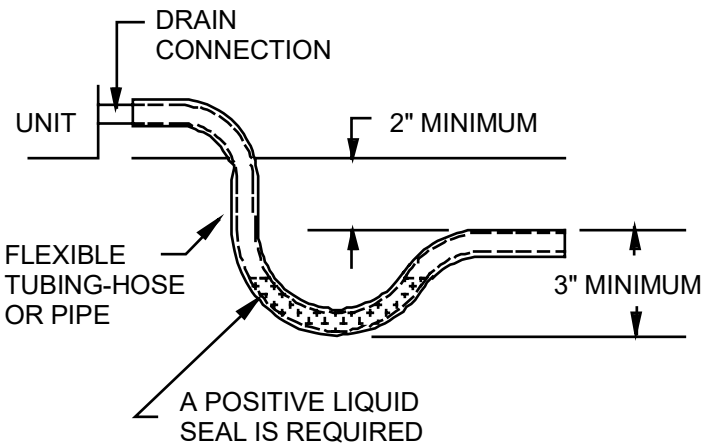
Ducting

Ducting work should be fabricated by the installing contractor in accordance with local codes. Industry manuals may be used as a guide when sizing and designing the duct system-such as NESCA (National Environmental Systems Contractors Association, 1501 Wilson., Arlington, Virginia 22209).

The unit should be placed as close as possible to the space to be air-conditioned allowing clearance dimensions as indicated. Ducts should run as directly as possible to supply and return outlets. Use of non-flammable weatherproof flexible connectors on both supply and return connections at the unit to reduce noise transmission is recommended.

CONDENSATE DRAIN PIPING

The condensate drain connection of the evaporator is a ¾” NPT half coupling. A trap must be provided to have proper condensate draining. Install condensate drain trap as shown in FIGURE 9: CONDENSATE DRAIN TRAP PLUMBING. Ensure drain connection is 3/4” or larger. Do not operate unit without trap and ensure unit is level or slightly inclined toward drain.



DRAIN CONNECTION

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

WARNING

HIGH VOLTAGE!

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.

CAUTION

To prevent property damage or personal injury, do not start the unit until all necessary pre-checks and tests have been performed.

WARNING

MOVING MACHINERY HAZARD!

To prevent possible personal injury or death, disconnect power to the unit and padlock in the "OFF" position before servicing fans.

Pre-Startup Instructions

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. **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 ambients 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.
- All filters are in place.

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.

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.

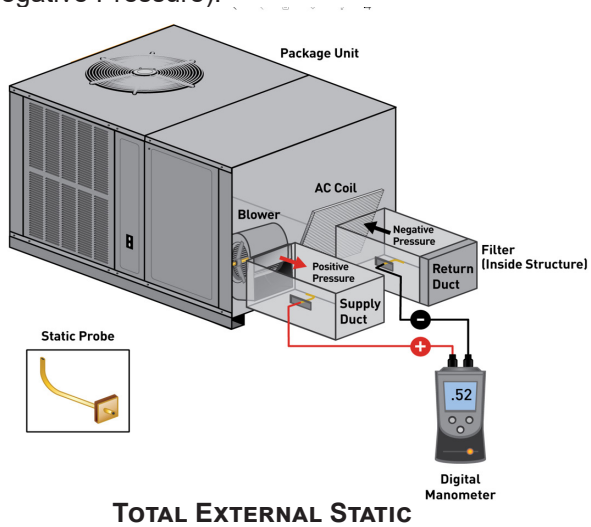
Utilization Voltage - The voltage of the line terminals of the equipment at which the equipment must give fully satisfactory performance. Once it is established that supply voltage will be maintained within the utilization range under all system conditions, check and calculate if an unbalanced condition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

TOTAL EXTERNAL STATIC PRESSURE CHECK

The total external static pressure must be checked on this unit to determine if the airflow is proper.

Total External Static Testing

1. Using a digital manometer measure the static pressure of the return duct at the inlet of the unit (Negative Pressure).



Total External Static

2. Measure the static pressure of the supply duct (Positive Pressure).
3. Add the two readings together

NOTE: Both readings may be taken simultaneously and read directly on the manometer if so desired.

4. Consult proper table for quantity of air.

If the external static pressure exceeds the minimum or maximum allowable statics, check for closed dampers, dirty filter, undersized or poorly laid out ductwork.

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.

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

High stage airflow setting to be between 300 and 500 CFM per ton, see Table below. For models with electric heat the total airflow must not be less than that required for operation of the electric heaters. See Appendix D for minimum airflow for specific electric heaters.

NOTE: Never run CFM below 300 CFM per ton, evaporator freezing or poor unit performance is possible.

Model	Minimum	Nominal	Maximum
GPHM56041	1500	1850	2500

High Stage Airflow Setting, CFM (without electric heat)

EEM - 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

NOTE: If more than one lead is energized simultaneously, the motor will run at the higher speed.

Fan speed for G (Fan), Y1 (Low Cool) and W1 (Low Heat) are fixed setting on TB1/T1 and cannot be moved.

Purple wire Y2 (High Cool) and Brown wire W2 (High Heat) are connected to TB1/T2. These wires can be moved together or separately and placed on any unoccupied terminal T3-T5.
Note: for proper operation Y2 and W2 should have a higher speed setting than the G, Y1 and W1 speed setting.
If Electric Heater kit is installed use the red wire provided with the literature kit to jumper terminal TB1/W1 to an unoccupied speed tap that satisfies the minimum airflow required for the heater kit. This must be a different tap than Y2 is connected to. Refer to Appendix D for minimum required airflow for electric heaters.

Note: On Heat Pump units, the Yellow (YL) wire from relay BR1 to TB1/T2 must always be moved to the same terminal location as the Brown (BR) wire after adjustments are made, to ensure proper blower speed during defrost operation.

SUPERHEAT AND SUBCOOLING

Checking Subcooling

NOTE: Units with a TXV should be charged to Subcooling only.

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 10-15 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 10 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 (TXV) Device

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.
4. Disconnect manifold set, installation is complete.

Design Superheat & Subcooling					
Model	Superheat ±2°F	Subcooling ±1°F	Expansion Device	Cooling Stage	Outdoor ambient (°F)
GPHM56041	15	10	Fixed TXV	Low	82

START-UP PROCEDURES AND CHECKLIST

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.

Begin with power turned off at all disconnects.

Air Conditioning Start-Up Procedure

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 begin ramping down after an approximate 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 approximately 60 seconds.

8. Turn the thermostat system switch to “OFF” and disconnect all power when servicing the unit.

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.

HEAT PUMP START-UP PROCEDURE

1. Check the cooling mode for the heat pump in the same manner as above. The reversing valve is energized when the thermostat is placed in the cooling position. A clicking sound should be noticeable from the reversing valve. By lowering the temperature setting to call for cooling, the solenoid valve is energized. The compressor, blower and fan should then be running. After the cooling mode is checked out, turn the thermostat system switch to “OFF”.
2. Turn the thermostat system switch to “HEAT” and fan switch to “AUTO”.
3. Slowly raise the heating temperature setting. When the heating first stage makes contact, stop raising the temperature setting.. The compressor, blower and fan should now be running with the reversing valve in the deenergized (heating) position. After giving the unit time to settle out, make sure the unit is supplying heated air.
4. If the outdoor ambient is above 80°F, the unit may trip on its high-pressure cutout when in heating mode. The compressor should stop. The heating cycle must be thoroughly checked, so postpone the test to another day when conditions are more suitable but, DO NOT FAIL TO TEST.
5. If the outdoor ambient is low and the unit operates properly in the heating cycle, you may check the pressure cutout operation by blocking off the indoor return air until the unit trips.
6. If unit operates properly in the heating cycle, raise the temperature setting until the heating second stage makes contact. Supplemental resistance heat, if installed should now come on. Make sure it operates properly.

NOTE: 15.2 SEER2 MODEL HAS TWO STAGES OF COMPRESSOR HEAT. DURING RESISTANCE HEAT TEST, INCREASE TEMPERATURE SETTING UNTIL THIRD STAGE HEAT IS ENERGIZED.

NOTE: IF OUTDOOR THERMOSTATS ARE INSTALLED THE OUTDOOR AMBIENT MUST BE BELOW THE SET POINT OF THESE THERMOSTATS FOR THE HEATERS TO OPERATE. IT MAY BE NECESSARY TO JUMPER THESE THERMOSTATS TO CHECK HEATER OPERATION IF OUTDOOR AMBIENT IS MILD.

If the outdoor ambient is low and the unit operates properly in the heating cycle, you may check the pressure cutout operation by blocking off the indoor return air until the unit trips. If unit operates properly in the heating cycle, raise the temperature setting until the heating second stage makes contact. Supplemental resistance heat, if installed should now come on. Make sure it operates properly.

7. THERMOSTATS WITH EMERGENCY HEAT. For thermostats with an emergency heat switch, raise the temperature setting until the heating second stage makes contact. The emergency heat switch is located at the bottom of the thermostat. Move the switch to emergency heat. The heat pump will stop, the blower will continue to run, all heaters will come on and the thermostat emergency heat light will come on.
8. If checking the unit in the wintertime, when the outdoor coil is cold enough to acuate the defrost control, observe at least one defrost cycle to make sure the unit defrosts completely.

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.
3. Check air flow and refrigerant charge. See Sections on **Air Flow Measurement and Adjustment** and **Checking Charge.**
4. Ensure 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 discovered, ensure issue is corrected.
5. Set the thermostat at the appropriate setting for cooling and heating or automatic changeover for normal use.
6. Ensure the Owner is instructed on the unit operation, filter, servicing, correct thermostat operation, etc.

NOTE: THE “AIR CONDITIONER START-UP PROCEDURE” IS A RECOMMENDED STEP AS IT SERVES AS A SYSTEM INDICATOR THAT THE UNIT WILL OPERATE NORMALLY.

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.

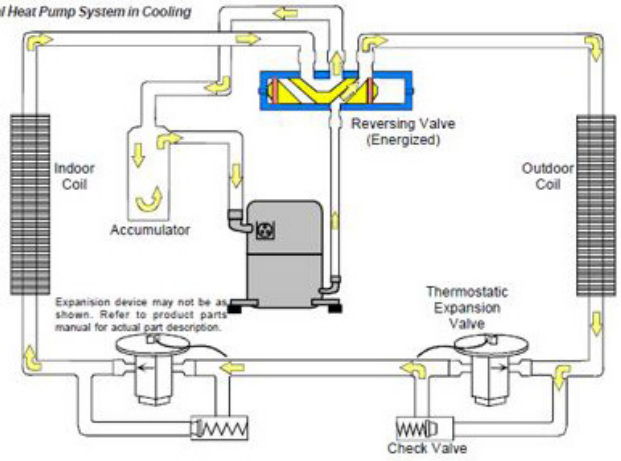
HEAT PUMP OPERATION

COOLING CYCLE

When the heat pump is in the cooling cycle, it operates exactly as an Air Conditioner Unit.

SYSTEM OPERATION

Typical Heat Pump System in Cooling

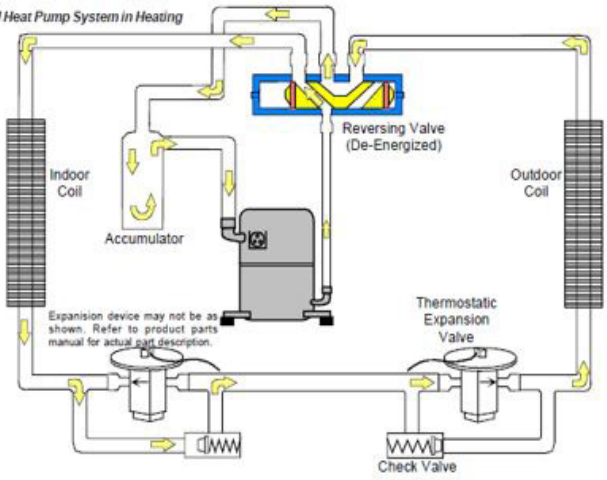


Heating Cycle

The heat pump operates in the heating cycle by redirecting refrigerant flow through the refrigerant circuit external to the compressor. This is accomplished with the reversing valve. Hot discharge vapor from the compressor is directed to the indoor coil (evaporator on the cooling cycle) where the heat is removed, and the vapor condenses to liquid.
It then goes through the expansion device to the outdoor coil (condenser on the cooling cycle) where the liquid is evaporated, and the vapor goes to the compressor.

When the solenoid valve coil is operated either from heating to cooling or vice versa, the piston in the reversing valve to the low pressure (high pressure) reverse positions in the reversing valve. The following figure shows a schematic of the heat pump in the heating cycle.

Typical Heat Pump System in Heating



For Heat Pump units, the expansion devices are Fixed Thermal Expansion Devices (TXV) and perform the same function on the heating cycle as on the cooling cycle. The Fixed TXV also act as check valves to allow for the reverse of refrigerant flow.

When the heat pump is on the heating cycle, the outdoor coil is functioning as an evaporator. The temperature of the refrigerant in the outdoor coil must be below the temperature of the outdoor air in order to extract heat from the air. Thus, the greater the difference in the outdoor temperature and the outdoor coil temperature, the greater the heating capacity of the heat pump. This phenomenon is a characteristic of a heat pump. It is a good practice to provide supplementary heat for all heat pump installations in areas where the temperature drops below 45° F. It is also a good practice to provide sufficient supplementary heat to handle the entire heating requirement should there be a component failure of the heat pump, such as a compressor, or refrigerant leak, etc.

Since the temperature of the liquid refrigerant in the outdoor coil on the heating cycle is generally below freezing point, frost forms on the surfaces of the outdoor coil under certain weather conditions of temperature and relative humidity. Therefore, it is necessary to reverse the flow of the refrigerant to provide hot gas in the outdoor coil to melt the frost accumulation. This is accomplished by reversing the heat pump to the cooling cycle. At the same time, the outdoor fan stops to hasten the temperature rise of the outdoor coil and lessen the time required for defrosting. The indoor blower continues to run, and the supplementary heaters are energized.

Defrost Control

During operation the power to the circuit board is controlled by a temperature sensor, which is clamped to a feeder tube entering the outdoor coil. Defrost timing periods of 30,60 and 90 minutes may be selected by setting the circuit board jumper to 30, 60 and 90 respectively. Accumulation of time for the timing period selected starts when the sensor closes (approximately 30°± 5°F), and when the wall thermostat calls for heat. At the end of the timing period, the unit's defrost cycle will be initiated provided the sensor remains closed. When the sensor opens (approximately 60°± 5°F), the defrost cycle is terminated and the timing period is reset. If the defrost cycle is not terminated due to the sensor temperature, a twelve-minute override interrupts the unit's defrost period.

TROUBLESHOOTING

Suggested Field Testing/Troubleshooting

TESTING DEFROST CONTROL

NOTE: PCBDM133 Defrost controls have a three (3) minute compressor off cycle delay.

NOTE: The PCBDM133 defrost controls are shipped from the factory with the compressor delay option selected. This will de-energize the compressor contactor for 30 seconds on defrost initiation and defrost termination. If the jumper is set to normal, the compressor will continue to run during defrost initiation and defrost termination. The control will also ignore the low-pressure switch connected to R-PS1 and PS2 for 5 minutes upon defrost initiation and 5 minutes after defrost termination.

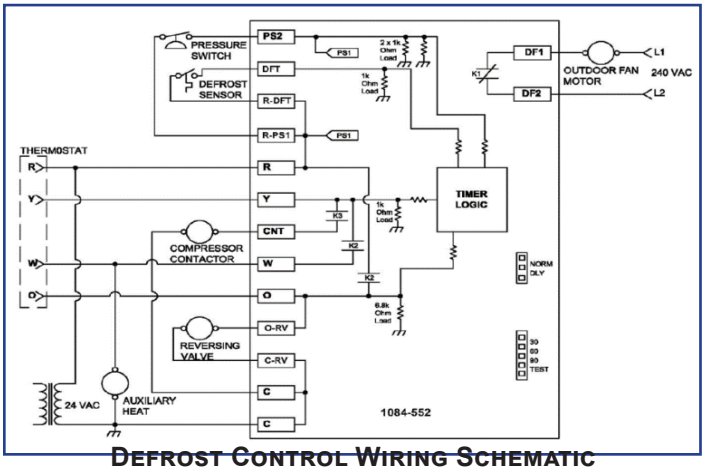
To check the defrost control for proper sequencing, proceed as follows: With power ON; unit not running.

1. Jumper defrost thermostat by placing a jumper wire across the terminals "DFT" and "R"/" R-DFT" at

defrost control board.

2. Remove jumper from timer pins and jump across test pins on defrost control board.
   NOTE: Do not use screwdriver or field supplied jumper to test the control.
3. Set thermostat to call for heating. System should go into defrost within 21 seconds.
4. Immediately remove jumper from test pins.
5. Using VOM check for voltage across terminals “C & O”. Meter should read 24 volts.
6. Using VOM check for voltage across fan terminals DF1 and DF2 on the board. Should read line voltage (208-230 VAC) indicating the relay is open in the defrost mode.
7. Using VOM check for voltage across “W”/”W2” & “C” terminals on the board. Should read 24 volts.
8. If not as above, replace control board.
9. Set thermostat to off position and disconnect power. Remove jumper from defrost thermostat and replace timer jumper to the desired defrost time.

NOTE: Remove jumper across defrost thermostat before returning system to service.



Defrost Control Wiring Schematic

Testing Defrost Thermostat

1. Install a thermocouple type temperature test lead on the tube adjacent to the defrost control. Insulate the lead point of contact.
2. Check the temperature at which the control closes its contacts by lowering the temperature of the control. It should close at approximately 30°F.
3. Check the temperature at which the control opens its contacts by raising the temperature of the control. It should open at approximately 60°F.
4. If not as above, replace control.

REVERSING VALVE TROUBLESHOOTING

Checking Reversing Valve and Solenoid

Reversing valve used in heat pumps could potentially leak internally. Discharge gases can leak into the suction inside the valve. Compound gages will give the same symptoms as bad compressor valves or broken scroll flanks. The temperature between true suction and the suction line after the valve should not be greater than 4 degrees. Note: The center tube is always the suction line and should be cold.

Troubleshooting the Reversing Valve for Electrical Failure

1. Place unit into the cooling mode. Test for 24 volts at the solenoid. If there is no voltage present at coil, check the control voltage.
2. If voltage is present, loosen the nut on the top of the coil. Remove the coil, there should be slight resistance.
3. If the slight resistance is felt, remove the coil. As you remove the coil listen carefully, an audible click should be detected. The clicking is due to the movement of the pilot valve plunger. The absence of a clicking sound indicates the plunger is stuck.

Troubleshooting Mechanical Failures on a Reversing Valve by Pressure

1. Troubleshooting the reversing valve can be done by pressure and touch.
2. Raise the head pressure. In the cooling mode block the fan exhaust. Once head pressure has been raised, cycle between cooling and heating and see if the piston can be freed.

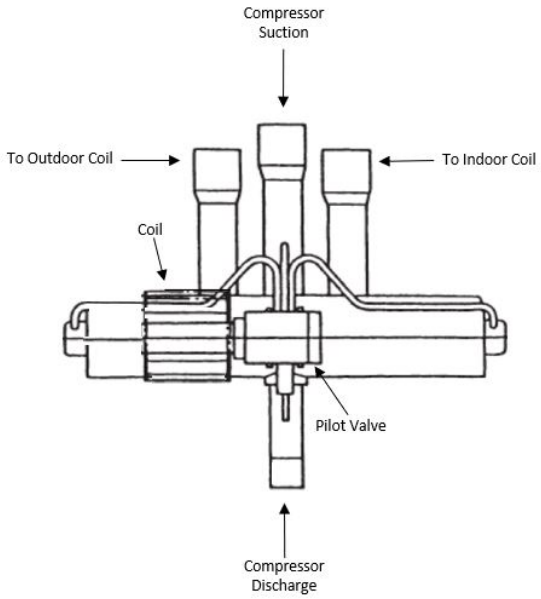
Troubleshooting Mechanical Failures on a Reversing Valve byTemperature

1. When operating properly the valve contains refrigerant gases at certain temperatures.
2. The discharge line should be the same temperature after the valves discharge line.
3. The true suction should be the same as the suction line after the valve. If there is a 4-degree difference, valve is leaking

When stuck in the mid-position, part of the discharge gas from the compressor is directed back to the suction side, resulting in excessively high suction pressure. An increase in the suction line temperature through the reversing valve can also be measured. Check operation of the valve by starting the system and switching the operation from COOLING to HEATING cycle.

If the valve fails to change its position, test the voltage (24V) at the valve coil terminals, while the system is on the COOLING cycle.

If voltage is registered at the coil, tap the valve body lightly while switching the system from HEATING to COOLING, etc. If this fails to cause the valve to switch positions, remove the coil connector cap and test the continuity of the reversing valve solenoid coil. If the coil does not test continuous - replace it. If the coil test continuous and 24 volts is present at the coil terminals, the valve is inoperative - replace it.



Reversing Valve

MAINTENANCE

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.

The Self Contained Packaged Air Conditioner and Heat Pump should operate for many years without excessive service calls if the unit is installed properly. However it is recommended that the owner inspect the unit before a seasonal start up. The coils should be free of debris so adequate airflow is achieved. The return and supply registers should be free of any obstructions. The filters should be cleaned or replaced. These few steps will help to keep the product up time to a maximum. The Service section that follows should help in identifying problems if the unit does not operate properly.

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.

Lubrication

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

Functional Parts

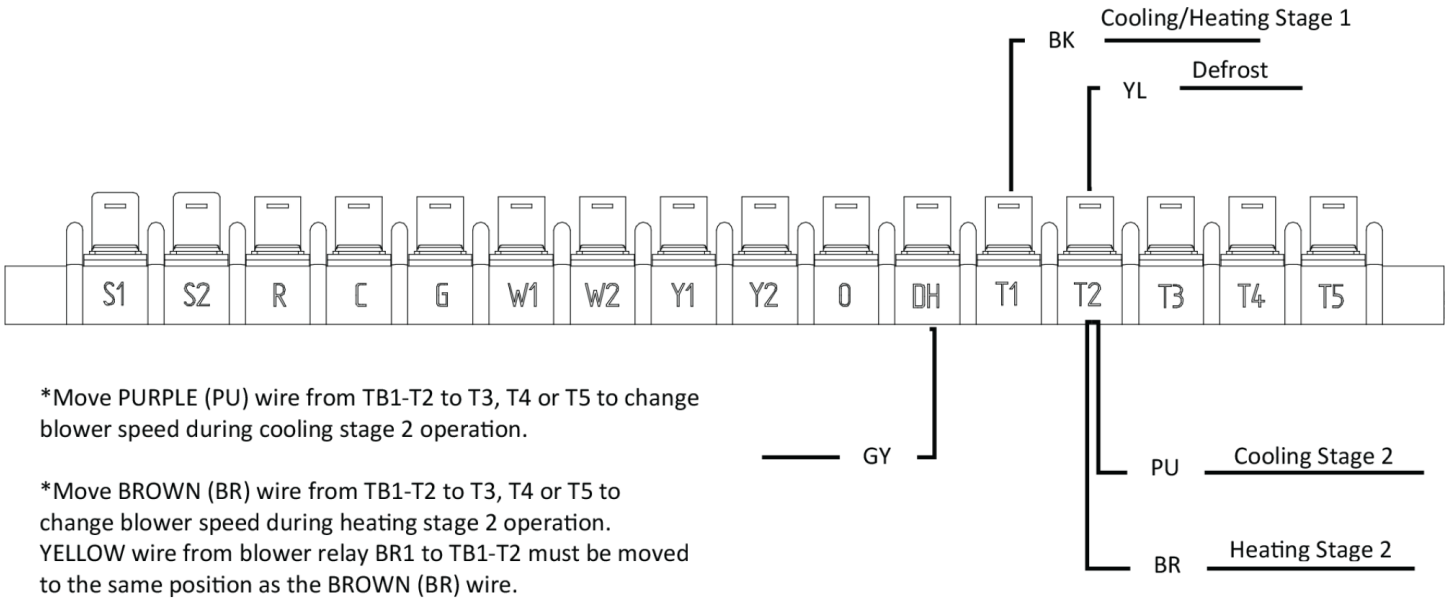
Refer to the unit Parts Catalog for a list of functional parts. Parts are available from your distributor.

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

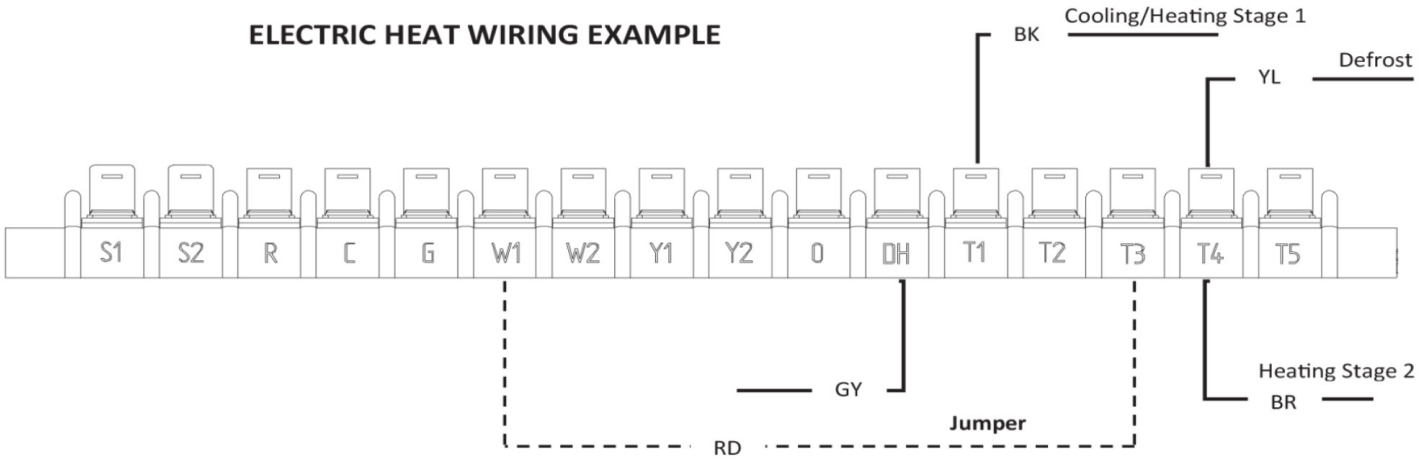
To prevent personal injury or death due to improper installation, adjustment, alteration, service or maintenance, refer to this manual. For additional assistance or information, consult a qualified installer, servicer agency or the gas supplier.



*Move PURPLE (PU) wire from TB1-T2 to T3, T4 or T5 to change blower speed during cooling stage 2 operation.

*Move BROWN (BR) wire from TB1-T2 to T3, T4 or T5 to change blower speed during heating stage 2 operation. YELLOW wire from blower relay BR1 to TB1-T2 must be moved to the same position as the BROWN (BR) wire.

Wiring Example



*Move BROWN (BR) wire from TB1-T2 to T3, T4 or T5 to change blower speed during heating stage 2 operation. YELLOW wire from blower relay BR1 to TB1-T2 must be moved to the same position as the BROWN (BR) wire.

*Install RED jumper to connect TB1-W1 and unoccupied speed tap to change blower speed during heating.

Electric Heat Wiring Example

APPENDIX A BLOWER PERFORMANCE TABLES - HEAT PUMP

5 TON HEAT PUMP

Standard Static Drive
Model: GPHM56041

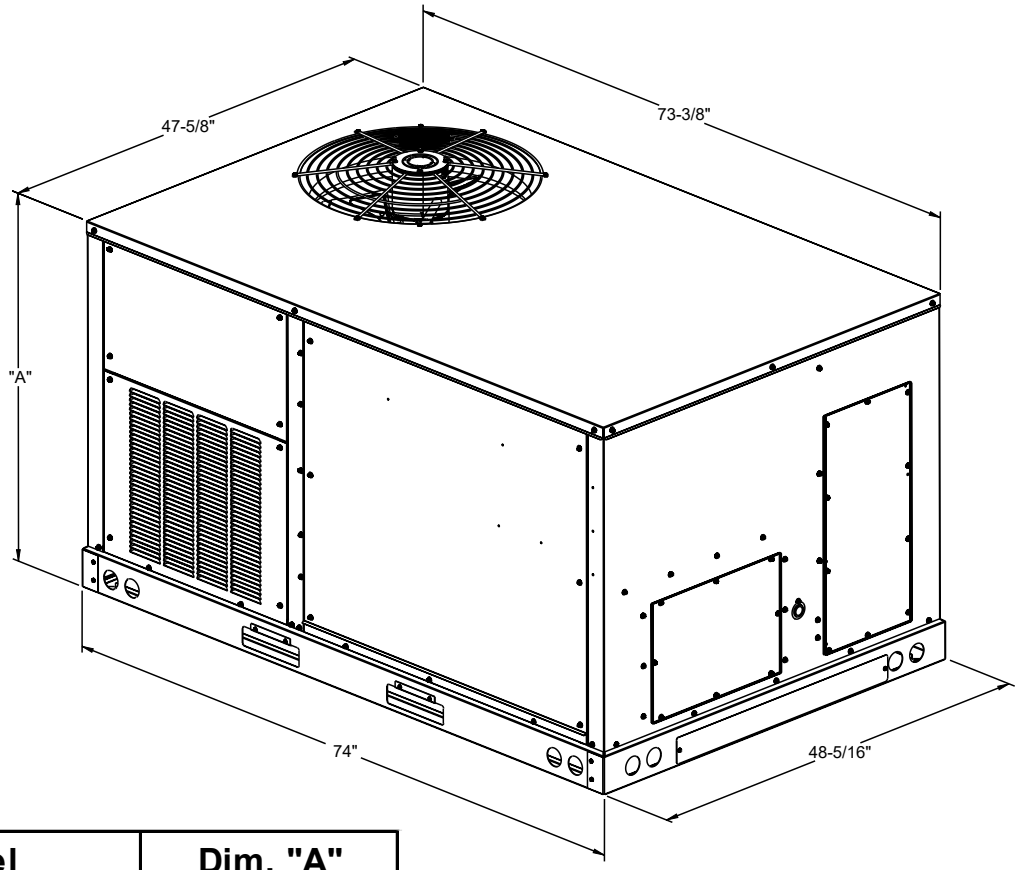
Horizontal Flow					Down Flow				
Speed Tap	External Static Pressure (ESP), in w.c.	SCFM	RPM	BHP	Speed Tap	External Static Pressure (ESP), in w.c.	SCFM	RPM	BHP
T1	0.2	1372	665	0.20	T1	0.2	1380	664	0.20
	0.4	1259	734	0.23		0.4	1262	735	0.23
	0.6	1133	813	0.25		0.6	1132	811	0.25
	0.8	1016	888	0.27		0.8	1006	884	0.27
T2	0.2	2176	878	0.69	T2	0.2	2145	902	0.71
	0.4	2080	939	0.74		0.4	2056	952	0.75
	0.6	1973	1000	0.79		0.6	1967	1003	0.79
	0.8	1887	1048	0.83		0.8	1890	1051	0.83
T3	0.2	2176	878	0.69	T3	0.2	2145	902	0.71
	0.4	2080	939	0.74		0.4	2056	952	0.75
	0.6	1973	1000	0.79		0.6	1967	1003	0.79
	0.8	1887	1048	0.83		0.8	1890	1051	0.83
T4	0.2	2234	960	0.86	T4	0.2	2293	950	0.85
	0.4	2162	1003	0.9		0.4	2195	995	0.89
	0.6	2101	1042	0.83		0.6	2112	1042	0.93
	0.8	2053	1073	0.96		0.8	2034	1088	0.97
T5	0.2	2300	982	0.93	T5	0.2	2364	971	0.92
	0.4	2222	1025	0.98		0.4	2274	1019	0.97
	0.6	2170	1061	1.01		0.6	2190	1063	1.01
	0.8	2120	1095	1.04		0.8	2113	1110	1.06

Shaded area indicates air flow below 1500 SCFM (300 SCFM/ton) that is not recommended for High Stage cooling or heating

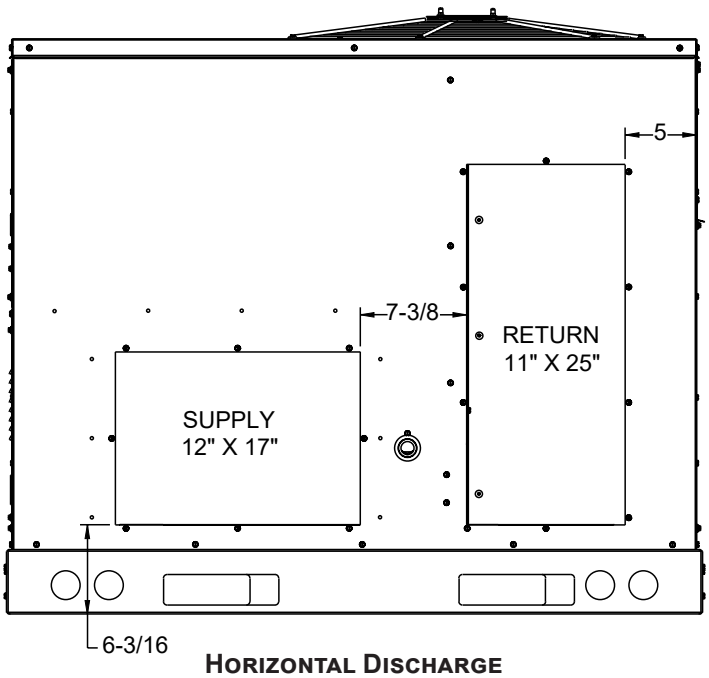
APPENDIX B ELECTRICAL DATA

Model Number	Electrical Rating	Compressor			Outdoor Fan Motor			Indoor Fan Motor			Optional Electric Heat			Optional Powered Convienience Outlet FLA	Optional Power Exhaust FLA	Power Supply	
		QTY	RLA	LRA	QTY	HP	FLA	Type	HP	FLA	Part #	KW*	FLA			MCA	MOP
GPHM560	208-230/1/60	1	26.9	152.9	1	0.3	3.5	Direct Drive - Standard Static	1	6.9	-	-	-	-	-	44.1/44.1	70.0/70.0
											-	-	-	7.2/6.5	-	51.3/50.6	70.0/70.0
											EH*-1S05	3.76/5.00	18.1/20.8	-	-	66.6/70.1	70.0/80.0
														7.2/6.5	-	73.8/76.6	80.0/80.0
											EH*-1S10	7.51/10.0	36.1/41.7	-	-	89.2/96.1	90.0/100
														7.2/6.5	-	96.4/103	100/110
											EH*-1S15	11.3/15.0	54.2/62.5	-	-	112/122	125/125
														7.2/6.5	-	119/129	125/150
											EH*-1S20	15.0/20.0	72.2/83.3	-	-	134/148	150/150
														7.2/6.5	-	142/155	150/175

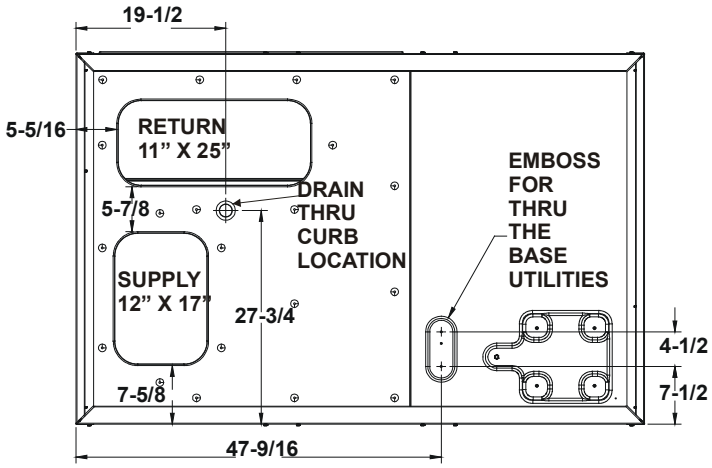
APPENDIX C UNIT DIMENSIONS



Model	Dim. "A"
5 Ton Heat Pump	43-1/2"



HORIZONTAL DISCHARGE



BOTTOM VIEW OF UNIT

VERTICAL DISCHARGE

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

APPENDIX D AIR FLOW FOR ELECTRIC HEAT

UNIT	HEATER KIT MODEL NUMBER	kW	MINIMUM SCFM	MAXIMUM SCFM
GPHM56041	EH*-*S05	5	1500	2500
	EH*-*S10	10	1500	
	EH*-*S15	15	1500	
	EH*-*S20	20	1550	

HEATER KIT MODEL NUMBER NOMENCLATURE

E	H	*	-	*	S	15
1	2	3	-	4	5	6, 7

Electric

Heater

Heater Type

X	Staged
S	SCR (modulating)

Voltage

1	208-230/1/60	Single phase 60 Hz

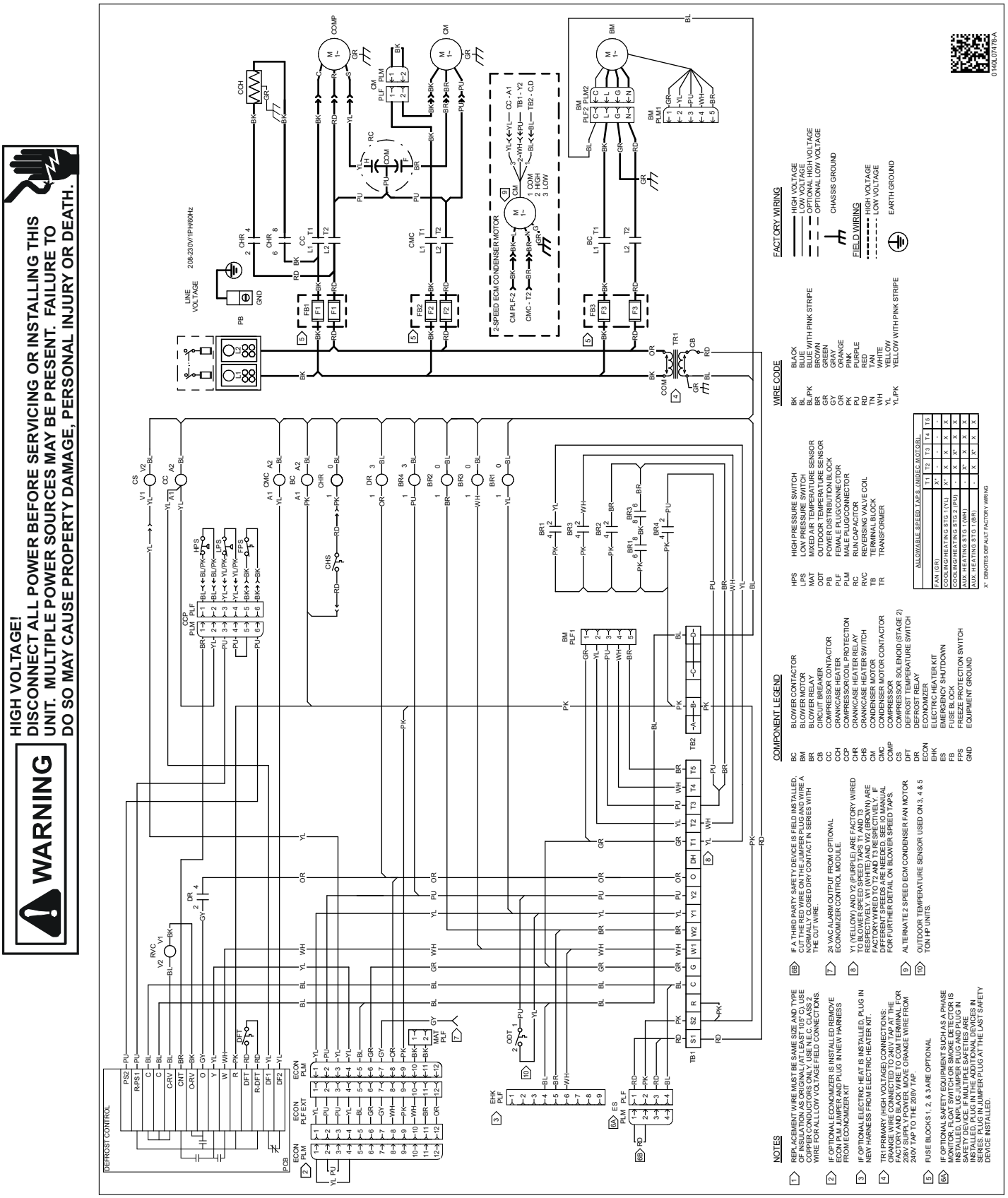
Chassis

S	Small

Kilowatt

5	5 kW
10	10 kW
15	15 kW
18	18 KW
20	20 kW
30	30 kW

WIRING DIAGRAMS



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

START-UP CHECKLIST

Residential Package - (Indoor Section)					
	Model Number				
	Serial Number				
ELECTRICAL					
Line Voltage (Measure L1 and L2 Voltage)	L1 - L2				
Secondary Voltage (Measure Transformer Output Voltage)	R - C				
Blower Amps					
Heat Strip 1 - Amps					
Heat Strip 2 - Amps					
BLOWER EXTERNAL STATIC PRESSURE					
Return Air Static Pressure			IN. W.C.		
Supply Air Static Pressure			IN. W.C.		
Total External Static Pressure (Ignoring +/- from the reading above, add total here)			IN. W.C.		
TEMPERATURES					
Return Air Temperature (Dry bulb / Wet bulb)			DB °F		WB °F
Cooling Supply Air Temperature (Dry bulb / Wet bulb)			DB °F		WB °F
Heating Supply Air Temperature			DB °F		
Temperature Rise			DB °F		
Delta T (Difference between Supply and Return Temperatures)			DB °F		
GAS PRESSURES					
Gas Inlet Pressure			IN. W.C.		
Gas Manifold Pressure (Low Fire)			IN. W.C.		
Gas Manifold Pressure (High Fire)			IN. W.C.		
Gas Type (NG) = Natural Gas / (LP) = Liquid Propane					
Residential Package - (Outdoor Section)					
ELECTRICAL					
Supply Voltage (Measure L1 and L2 Voltage)	L1 - L2				
Compressor Amps					
Condenser Fan Amps					
PRESSURES / TEMPERATURES					
Suction Circuit (Pressure / Suction Line Temperature)	PSIG		TEMP		°F
Liquid Circuit (Pressure / Liquid Temperature)	PSIG		TEMP		°F
Outdoor Air Temperature (Dry bulb / Wet bulb)			DB °F		WB °F
SUPERHEAT / SUBCOOLING	SH		SC		
Additional Checks					
Check wire routings for any rubbing					
Check product for proper draining					
Check for kinked pressure switch tubing.					
Check flue elbow for alignment and clamp tightness.					
Check screw tightness on blower wheel.					
Check factory wiring and wire connections.					
Check screw tightness on Outdoor Motor and Blade					
Check product for proper clearances as noted by installtion instructions					
°F to °C formula: (°F - 32) divided by 1.8 = °C		**°C to °F formula: (°C multiplied by 1.8) + 32 = °F**			

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We are very interested in all product comments.
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You can also scan the QR code on the right for the product brand you purchased to be directed to the feedback page.

GOODMAN® BRAND

AMANA® BRAND

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