

INSTALLATION AND MAINTENANCE INSTRUCTIONS

PWC Series "Magic-Pak" Self-Contained Heat Pump

⚠ WARNING

Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage. Refer to this manual. For assistance or additional information, consult a qualified installer or service agency.

⚠ WARNING

For your safety, do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance. Such actions could result in property damage, personal injury or death.

⚠ WARNING

Installation and servicing of air conditioning equipment can be hazardous due to internal refrigerant pressure and live electrical components. Only trained and qualified service personnel should install or service this equipment. Installation and service performed by unqualified persons can result in property damage, personal injury or death.

⚠ CAUTION

These units are not approved for mobile home applications. Such use could result in property damage, personal injury or death.

⚠ CAUTION

The installation of this appliance must conform to the requirements of the National Fire Protection Association; the National Electrical Code, ANSI/NFPA No. 70 (latest edition) in the United States; the Canadian Electrical Code Part 1, CSA 22.1 (latest edition) in Canada; and any state or provincial laws or local ordinances. Local authorities having jurisdiction should be consulted before installation is made. Such applicable regulations or requirements take precedence over the general instructions in this manual.

TABLE OF CONTENTS

INSTALLATION.....	2
OPERATION	5
MAINTENANCE	6
WIRING DIAGRAMS	7
WARRANTY	10

Manufactured By
A.A.C.
A Lennox International Company
421 Monroe Street
Bellevue, OH 44811



INSTALLATION

General

These instructions explain the recommended method of installation of the PWC heat pump unit and associated electrical wiring.

This unit is designed and approved for use as a self-contained air to air heat pump system.

These instructions, and any instructions packaged with mating components and/or accessories, should be carefully read prior to beginning installation. Note particularly any **CAUTIONS** or **WARNINGS** in these instructions and all labels on the units.

These instructions are intended as a general guide only, for use by qualified personnel and do not supersede any national or local codes in any way. Compliance with all local, state, provincial or national codes pertaining to this type of equipment should be determined prior to installation.

Inspection

Upon receipt of equipment, carefully inspect it for possible shipping damage. If damage is found, it should be noted on the carrier's freight bill. Take special care to examine

the unit inside the carton if the carton is damaged. File a claim with the transportation company. If any damages are discovered and reported to the carrier **DO NOT INSTALL THE UNIT, as claim may be denied.**

Check the unit rating plate to confirm specifications are as ordered.

Location

The design is certified for through-the-wall installation only. The interior portions of the unit may be surrounded by a closet with clearances to combustible material held to 0" at sides, 0" top and 0" front of the plenum.

The grille side of the unit may be flush with, or extend beyond, the face of the exterior wall, but should not be recessed more than 2" from the face of the building and should not be obstructed with trees, landscape materials or building structure.

There is no minimum clearance required on locating the unit to an interior corner of a building. If the unit is to be enclosed, provisions should be made allowing access to the indoor side of the unit for changing filters and for inspection. At least 33" of unobstructed space should be provided in front of the indoor side, whether enclosed or not, to permit removal of the cooling chassis should repairs or inspection be required.

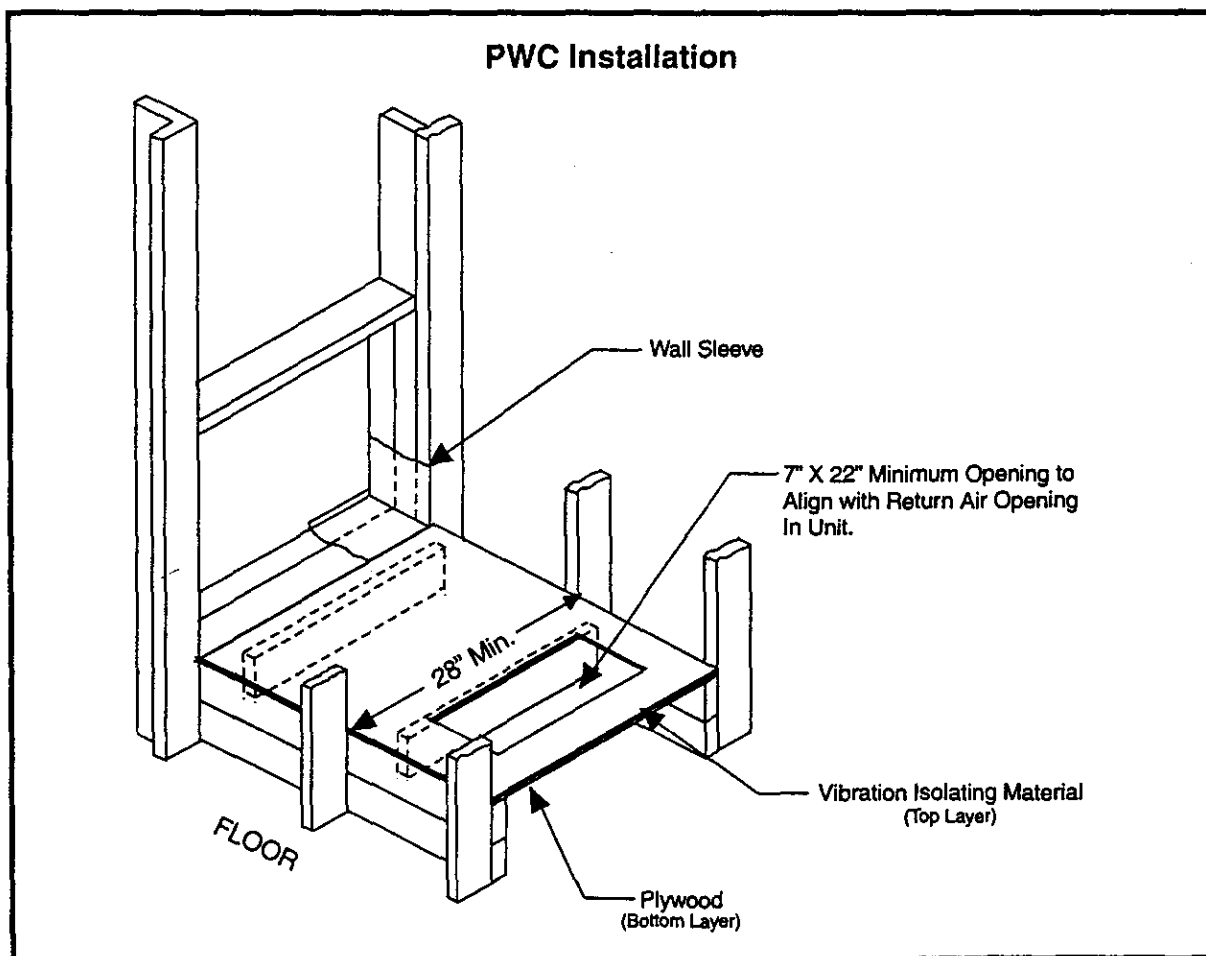


Figure 1

If the unit is installed in a residential garage, it must be located or protected to avoid physical damage by vehicles. The unit must be installed so that no electrical components are exposed to water.

▲ CAUTION

This unit must be installed level to allow for proper drainage of the chassis base pan and unit drain pan.

Installing With a Wall Sleeve

▲ CAUTION

The sleeve is not intended as the sole support for the unit. An additional support must be provided near the return opening on the unit for adequate support. The use of vibration isolation material between the unit and the support is recommended.

Refer to the installation instructions packed with the wall sleeve and Figure 1 for guidance in assembly and mounting using a wall sleeve.

Make sure the gaskets attached to the sleeve are not damaged.

Seal the space between the wall sleeve and the building opening with non-hardening caulking compound. The seal must be weathertight to prevent entrance of moisture and water into the building.

Assure that the unit is completely seated against the gaskets on the wall sleeve.

Installing Without a Wall Sleeve

Refer to the following directions and Figure 1 for guidance in installing the unit without a wall sleeve:

1. Measure the size of the unit and provide an opening in an outside wall that will accept the unit. Local ordinances may require a steel lintel to support the wall above the opening. The opening must be square in all 4 corners.
2. Position the unit so that the grilles on the outside face of the unit are flush or extend beyond the face of the exterior wall, but not recessed more than 2" from the face of the building. **Provide a support under the unit, inside the building.** Make sure that the inside support does not block the return air. The unit should be installed level.

3. Seal the space between the unit and building opening using a non-hardening caulking compound. The seal must be weathertight to prevent entrance of moisture and water into the building. Make sure the drain holes in the base are not plugged with caulking.

Condensate Drain

Install the plastic drain tube (furnished) over the 5/8" O.D. fitting welded to the center of the condensate pan. Connect the other end of the drain tube to trapped drain line (see Figure 2). The plastic drain connection to the chassis base is provided so that it may be disconnected from the permanent drain tubing in the base of unit in the event it becomes necessary to remove the chassis assembly.

The drain line should pitch gradually downward at least 1" per 10 feet of horizontal run to the open drain.

Be certain that the plastic drain tubing has free drainage and is not crimped or flattened at any bend.

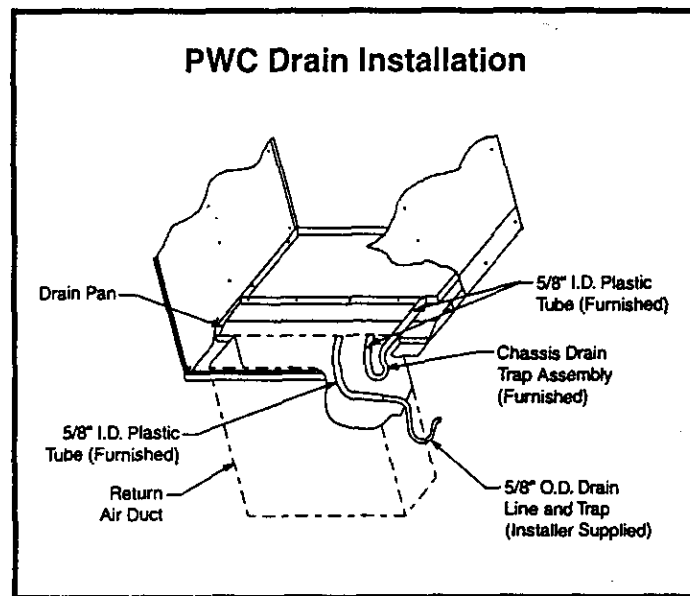


Figure 2

Limitations

The unit should be installed in accordance with all national and local safety codes.

Limitations of the unit and appropriate accessories must also be observed.

The unit must not be installed with any ductwork in the outdoor air stream. The outdoor fan is not designed to operate against any additional static pressure.

Minimum and maximum operation conditions must be observed to assure maximum system performance with minimum service required. Refer to Table 1 on page 4 for the application limitations of the unit.

Application Limitations			
Outdoor Ambient Air Temperature °F			
Minimum DB - Cooling		Maximum DB	
65		Cool 125	Heat 75
Indoor Ambient Air Temperature °F			
Minimum		Maximum	
DB/WB	DB	DB/WB	DB
Cool	Heat	Cool	Heat
62/57	50	90/72	80

Table 1

Ductwork

Ductwork should be designed and sized according to the methods in Manual Q of the Air Conditioning Contractors of America (ACCA).

It is recommended that supply and return duct connections at the unit be made with flexible joints.

The supply and return air duct systems should be designed for the CFM and static requirements of the job. **They should not be sized to match the dimensions of the duct connections on the unit.**

Supply duct flanges are shipped flat and must be bent up before attaching the supply duct.

To connect the return duct to the unit, use a straight piece of duct 22" wide by 7" deep. Insert the duct into the return opening in the bottom of the unit. Flange the duct over the existing flanges around the opening inside unit. Make sure that all sides of the duct are flanged over to permit removal of cooling chassis if required. Use a flexible connection to attach remainder of return duct. The return duct should be sealed to the unit casing and terminate outside the space containing the furnace.

The return duct must allow for the unit drain pan connections and drain tube.

▲ CAUTION

Do not screw into the side of the drain pan.

Air Filter

All indoor return air must be filtered. A permanent-type filter is furnished with the unit, located directly behind the access panel. Removing the panel permits access to the filter.

The filter should be cleaned at least three times during each of the heating and cooling seasons, or more frequently if unusual conditions are encountered. To clean the permanent filter, shake filter to remove excess dirt and/or use a vacuum cleaner. Wash filter in soap or detergent water and replace after filter is dry. It is not necessary to oil the permanent filter after washing.

If an installation is made in which it is more desirable to mount the filter exterior to the unit, in the return duct work or elsewhere, the permanent filter can be used or replaced with a disposable filter. If a disposable filter is used, use the information provided in Table 2 when sizing the disposable filter.

Minimum Required Surface Area for Disposable Filters	
Model Number	Filter Area (minimum)
PWC183	480 square inches
PWC243	480 square inches

Table 2

Thermostat

The room thermostat should be located on an inside wall where it will not be subject to drafts, sun exposure or heat from electrical fixtures or appliances. Follow the manufacturer's instructions enclosed with the thermostat for general installation procedures. Color coded insulated wires (#18 AWG) should be used to connect the thermostat to the unit.

Electrical Connections

All wiring must be done in accordance with the National Electrical Code (NEC), ANSI/NFPA No. 70 (latest edition); Canadian Electrical Code CSA C22.2 Part 1 (latest edition); or local codes, where they prevail. Any alteration of internal wiring will void certification and warranty.

Units are factory wired for a 230 volt power supply. If power supply is 208 volts, it will be necessary to change a wire connection on unit transformer from 240 volt terminal to 208 volt terminal as shown on the wiring diagram.

Use wiring with a temperature limitation of 75° C minimum. Run the 208 or 230 volt, 60 hertz electric power supply through a fused disconnect switch to the control box of the unit and connect as shown in the wiring diagram located on the inside of the control access panel.

The unit must be electrically grounded in accordance with local codes or, in the absence of local codes, with the National Electrical Code ANSI/NFPA No. 70 (latest edition) or CSA C22.2 Part 1 (latest edition).

Power supply to the unit must be NEC Class 1 and must comply with all applicable codes. A fused disconnect switch should be field provided for the unit. The switch must be separate from all other circuits. If any of the wire supplied with the unit must be replaced, replacement wire must be of the type shown on the wiring diagram.

Electrical wiring must be sized to minimum circuit ampacity marked on the unit. **Use copper conductors only.** Each unit must be wired with a separate branch circuit and be properly fused.

OPERATION

Sequence of Operation

Cooling

When the thermostat is in the cooling mode, the O circuit is powered which energizes the reversing valve. Upon cooling demand, the thermostat closes circuit R to Y and G. Closing R to Y closes the unit contactor, starting the compressor and outdoor fan. The thermostat automatically closes R to G circuit which also brings on the indoor blower at the same time. Upon satisfying cooling demand, the thermostat will open the above circuits and open the main contactor, stopping the compressor and outdoor fan. If the unit is equipped with a time delay, the blower will continue to operate for 90 seconds which improves system efficiency.

Heating

Upon heating demand, the thermostat closes circuit R to Y, which closes the unit contactor, starting the compressor and outdoor fan. The reversing valve is not energized in the heating mode. The thermostat again automatically brings on the indoor fan at the same time. The second stage of the thermostat closes circuit R to W, which closes the unit sequencers, bringing the auxiliary electric heat on. Upon satisfying heating demand, the thermostat opens the above circuits and stops unit operation.

Defrost Cycle

If the outdoor ambient conditions are such that frost forms on the outdoor coil, the defrost control monitors the need for and initiates and terminates defrost cycles as necessary to maintain system performance. The defrost control

is time/temperature initiated and temperature terminated with a maximum defrost time (time-out) of 10 minutes.

Time between defrost cycles is preset at 60-minute intervals at the factory, but can be field adjusted between 30, 60 or 90 minutes. To field adjust time between defrost cycles, place defrost time plug in the proper position (see Figure 3). For best performance in Region IV, the PWC243 defrost interval should be adjusted to 30 minutes.

Defrost control will initiate a defrost cycle if the time period has elapsed and the defrost sensor sees a temperature below freezing. At the start of a defrost cycle, the defrost control will energize the reversing valve solenoid, shifting the reversing valve and de-energizing the outdoor fan. The defrost relay will also close, energizing auxiliary heat for increased comfort during defrost. The unit will remain in defrost mode until the defrost sensor has determined that the frost has been removed from the coil or a 10-minute time period has elapsed.

The defrost control is also equipped with a set of pins to aid in troubleshooting of the defrost system (see Figure 3). The following is a brief outline of the testing of the defrost system.

1. Defrost sensor must be closed, 32°F or below. If temperatures are such that switch will not close, jumper between defrost sensor terminals on the defrost control.
2. Start system in heating operation.
3. Jumper test pins. A 1/4" quick connect terminal crimped onto a solid wire or brazing rod works well for test jumper. Closing test pins speeds up time interval by a factor of 256.

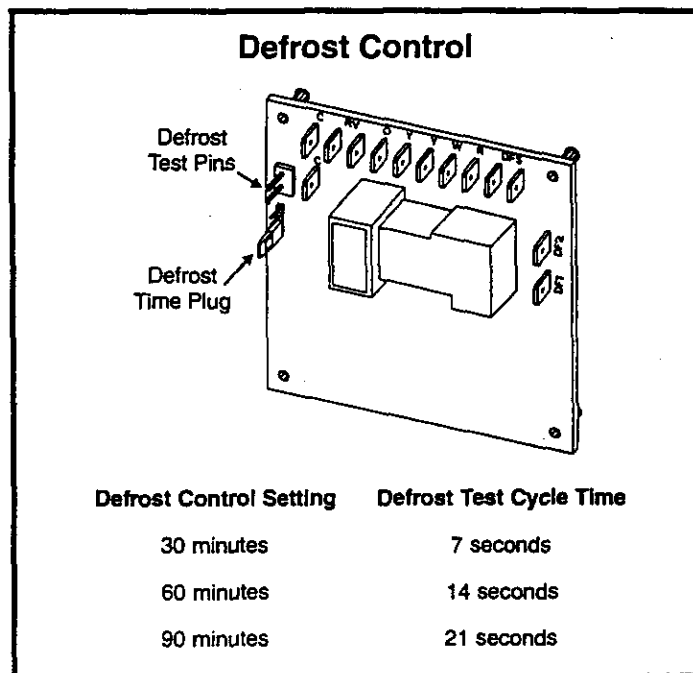


Figure 3

After closing test pins and appropriate cycle time has elapsed, the reversing valve should shift to defrost mode and the outdoor fan should stop. After 2 seconds of defrost operation, the reversing valve should shift back to heating operation and the outdoor fan should start.

System Performance

For maximum performance of this heat pump system, the operating temperatures and pressures should be checked and superheat determined at Standard ARI test conditions of 82°F outdoor - 80°F indoor dry bulb/67°F wet bulb. If superheat measured deviates from the values given in Table 3, refrigerant charge should be adjusted accordingly for maximum performance.

Suction Superheat	
Outdoor Unit Model	Suction Superheat @ ARI Conditions 82° OD 80° IDDB/67° IDWB
PWC183	18° - 20° F
PWC243	17° - 19° F

Table 3

MAINTENANCE

⚠ WARNING

Shutoff all electrical power to the unit before conducting any maintenance procedures. Failure to do so could cause personal injury.

Periodic inspection and maintenance normally consists of changing or cleaning filters and (under some conditions) cleaning the coils.

Filter

Inspect the filter once a month. Replace disposable filter or clean the permanent-type filter as necessary (a minimum of three times each heating or cooling season is recommended). Do not replace permanent-type filter with a disposable filter unless an installation was made in which the filter was mounted exterior to the unit (see Air Filter section on page 4).

Motors

The indoor and outdoor fan motors are permanently lubricated and require no maintenance.

Outdoor Coil

Foreign material should not be allowed to accumulate on the outdoor coil surface or other parts in the air circuit. Cleaning should be as often as necessary to keep the coil clean. Use a brush, vacuum cleaner attachment or other suitable means. **Be sure power to unit is shut off before using water to clean the coil.**

Care should be used when cleaning the coils so that the coil fins are not damaged.

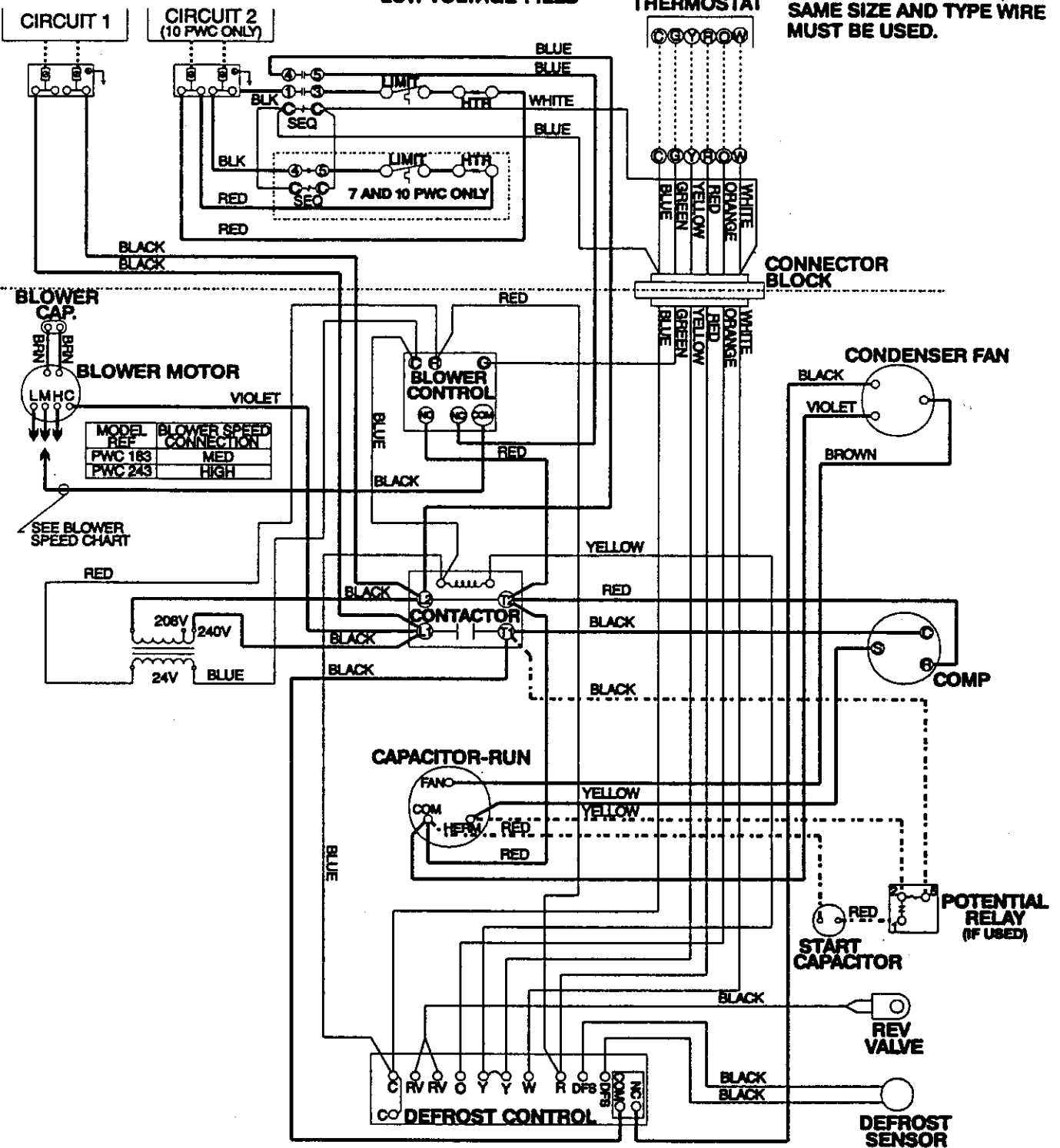
Outdoor Base Drain

Foreign material should not be allowed to clog the drain hole. Inspect and clear drain opening prior to heating season.

208/230-1-60
POWER SUPPLY WITH MIN.
75°C COPPER WIRE

—— LINE VOLTAGE-FACTORY
- - - - LINE VOLTAGE-FIELD
- · - · - LINE VOLTAGE-FIELD (IF USED)
—— LOW VOLTAGE-FACTORY
- · - · - LOW VOLTAGE-FIELD

NOTE:
IF ANY OF THE ORIGINAL
WIRES ARE REPLACED, THE
SAME SIZE AND TYPE WIRE
MUST BE USED.



Connection Diagram
PWC with 5, 7 or 10 KW Heat Strip

Part #41164-3

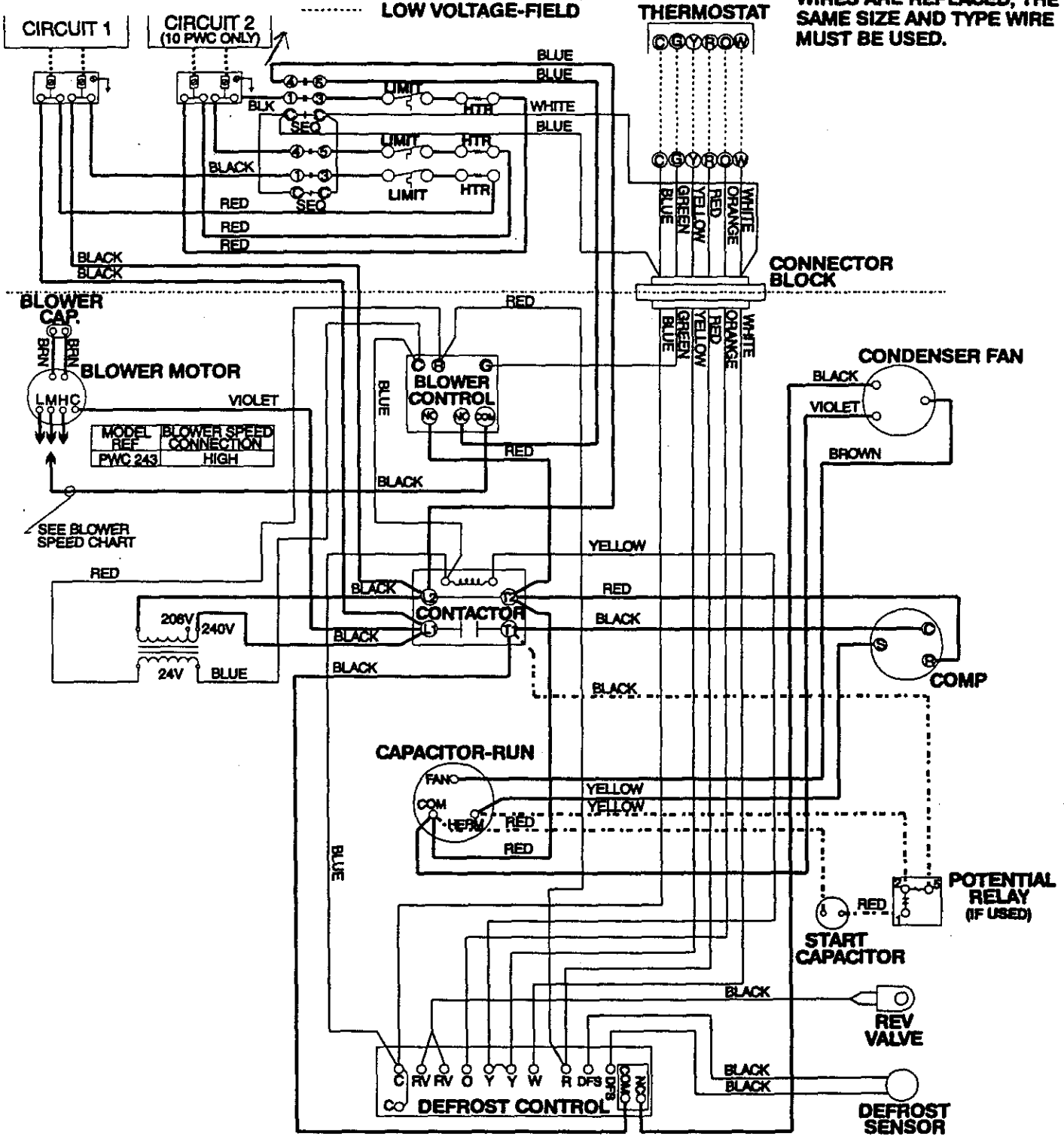
Figure 4

208/230-1-60
POWER SUPPLY WITH MIN.
75°C COPPER WIRE

— LINE VOLTAGE-FACTORY
- - - LINE VOLTAGE-FIELD
- · - · - LINE VOLTAGE-FIELD (IF USED)
— LOW VOLTAGE-FACTORY
- · - · - LOW VOLTAGE-FIELD

NOTE:

IF ANY OF THE ORIGINAL
WIRES ARE REPLACED, THE
SAME SIZE AND TYPE WIRE
MUST BE USED.



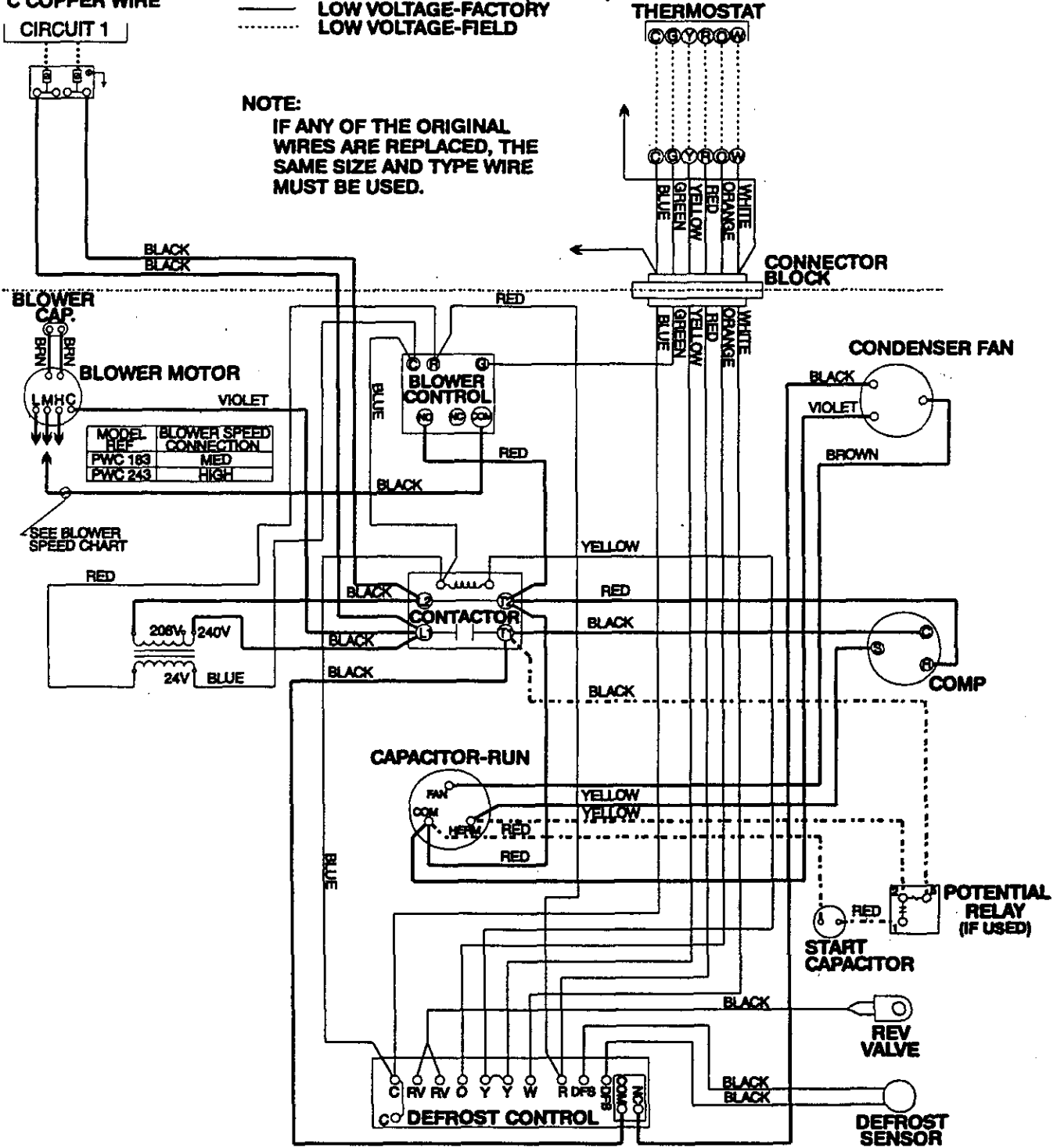
Connection Diagram
PWC with 15 KW Heat Strip
Part #42203-2

208/230-1-60
POWER SUPPLY WITH MIN.
75°C COPPER WIRE

- LINE VOLTAGE-FACTORY
- - - LINE VOLTAGE-FIELD
- · - · - LINE VOLTAGE-FIELD (IF USED)
- LOW VOLTAGE-FACTORY
- · - · - LOW VOLTAGE-FIELD

CIRCUIT 1

NOTE:
IF ANY OF THE ORIGINAL
WIRES ARE REPLACED, THE
SAME SIZE AND TYPE WIRE
MUST BE USED.



Connection Diagram
PWC with No Heat Strip
Part #45322-1

Figure 6

Limited Warranty

August 1, 1997

This warranty gives you specific legal rights and you may have other rights which vary from state/province to state/province.

Warrantor: Armstrong Air Conditioning Inc., 421 Monroe St., Bellevue, OH 44811

Armstrong Air Conditioning Inc. products are available under the following names: Air Ease, Armstrong Air, American Aire, Concord

Subject to the limitations stated in this warranty, we warrant to the first buyer for use the residential heating, cooling or heat pump unit, when installed, operated and maintained as required by this warranty, to be free of defects in workmanship or material for a period of five years (two years for commercial equipment) from the time of installation. We will replace any defective component without cost or expense to you except for the costs of delivery and labor for removal and replacement of the defective component.

Warranty Begins

The warranty period begins when the installation is complete and the product is ready to operate. You must be able to verify this date whenever a warranty claim is made. Original bill of sale, installer's invoice or other similar document will suffice. If the beginning date cannot be verified, we will consider warranty coverage to begin six months after the date the product was shipped from our factory.

Limitations on Implied Warranties

Implied warranties of merchantability or, to the extent applicable, fitness for a particular purpose are limited to five years, the same duration as the basic limited written warranty provided herein. Some states/provinces do not allow limitations on how long an implied warranty of merchantability or fitness lasts, so the above limitations or exclusions may not apply to you.

Only Warranty

This written Limited Warranty is the only warranty made by the warrantor; this warranty is in lieu of and excludes all other warranties, express or implied. The warrantor does not authorize any person to provide any other warranty or to assume for it any further obligation in connection with the warranted product.

What is NOT Covered

1. Cabinets or cabinet pieces.
2. Normal maintenance items such as filters, fan belts, fuses or other consumable items.
3. Damage caused by misuse, failure to maintain properly, accidents or acts of God.
4. External wiring, piping, venting or attachment of accessory products not integral to our product, including without limitation, humidifier, air cleaner, vent damper, thermostat or other mechanical devices not manufactured by the warrantor.
5. Products that have been operated in a corrosive atmosphere where a concentration of acids, halogenated hydrocarbons or other corrosive elements causes deterioration to metal surfaces or integral components. NOTE: Operation in a corrosive atmosphere is considered abuse and voids this warranty.
6. Products that have NOT been installed in accordance with our published installation instructions, applicable local, state/provincial or national codes, ACCA published standards.
7. Products that have NOT been installed by competent, qualified installers.
8. Products that have been moved from their original place of installation.

Warranty on Replacement Components

Any replacement component furnished by us will assume the remaining (unused) portion of the Limited Warranty.

Consequential Damages

The warrantor shall not be responsible for any consequential damages caused by any defect in the product. Some state/provinces do not allow the exclusion or limitations of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

NOTE: After the first year, in the event that a gas or oil heat exchanger is no longer being manufactured by the warrantor, the warrantor will allow a credit equal to the then current wholesale price of an equivalent heat exchanger towards the purchase of a new Armstrong gas or oil furnace.

This product must be installed, used and cared for in accordance with the instruction manual. You are responsible for required periodic maintenance or service, such as changing or cleaning of air filters and lubrication or cleaning of components. Failure to properly install, operate or maintain your unit voids this warranty.

Owner Record

Model # _____ Serial # _____ Installation Date _____

INSTALLED BY:

Dealer _____

Address _____

Telephone # _____ License # _____

INSTALLATION INSTRUCTIONS

Wall Sleeve Kit CA239

For Use With

HW/HWC/EWC/PWC Series

Magic-Pak Thru-the-Wall Unit

WARNING

Improper installation, adjustment, service, or maintenance can cause property damage, personal injury, or death. Consult a qualified installer or service agency for information or assistance.

Parts List

Quantity	Description
1	Top Panel
1	Bottom Panel
1	Right Side Panel
1	Left Side Panel
2	Squaring Braces
1	Top Support Angle
2	Side Support Angles
24	#8 x 3/8" Screws
1	Installation Instructions

General

The wall sleeve is designed to facilitate the installation of Magic-Pak units by providing an accurate opening during building construction. The use of a wall sleeve allows units to remain off-site until building construction approaches completion.

The wall sleeve is comprised of four assemblies (top, bottom, and right and left sides) which easily slip together on the job to form a rectangular box correctly sized to receive a Magic-Pak unit.

When in place and securely fastened, the wall sleeve opening provides easy access to the finished wall perimeter for caulk sealing.

The weather-seal caulking is easier to perform when the sleeve protrudes beyond the finished wall by 3/8" to 1".

Inspection of Shipment

If any damage to the contents of this kit is found at the time of delivery, proper notification should be made on the carrier's freight bill. Damage claims should be filed with the carrier at once. Claims of shortage should be filed with the manufacturer within 5 days.

Manufactured By
A.A.C.
A Lennox International Company
421 Monroe Street
Bellevue, OH 44811



INSTALLATION

Wall Sleeve Assembly

To assemble the wall sleeve, refer to the following instructions and Figure 1.

1. Slide top panel over side panels until retaining clips are engaged in slotted openings.
2. Place side and top assembly down with the front flange against floor and slide bottom panel into side panel slip strips until tabs on bottom panels are locked in place.
3. Attach squaring braces to top and side panels using existing holes. (Do not remove braces until wall sleeve is secured to building.)
4. Attach the support angles to top and side panels using the #8 x 3/8" screws provided. Two sets of holes are provided in the panels for attaching the support angles. Use the row of holes nearest the front of the sleeve to attach the support angles for 1" spacing or the second set of holes for 3-3/4" spacing.
5. **The wall sleeve must be square in opening before securing sleeve to building.** This is required to assure the Magic-Pak unit will slide into the sleeve.
6. Caulk all seams where the bottom panel joins to the side panels including the front corners of the bottom panel and the top of side panel slip joints. Caulk sealing is best accomplished after the wall sleeve is assembled but before it is placed in the wall opening. Remaining final caulk sealing can be done just after the sleeve is secured into the wall opening, if desired, to avoid breaking the seal during handling.

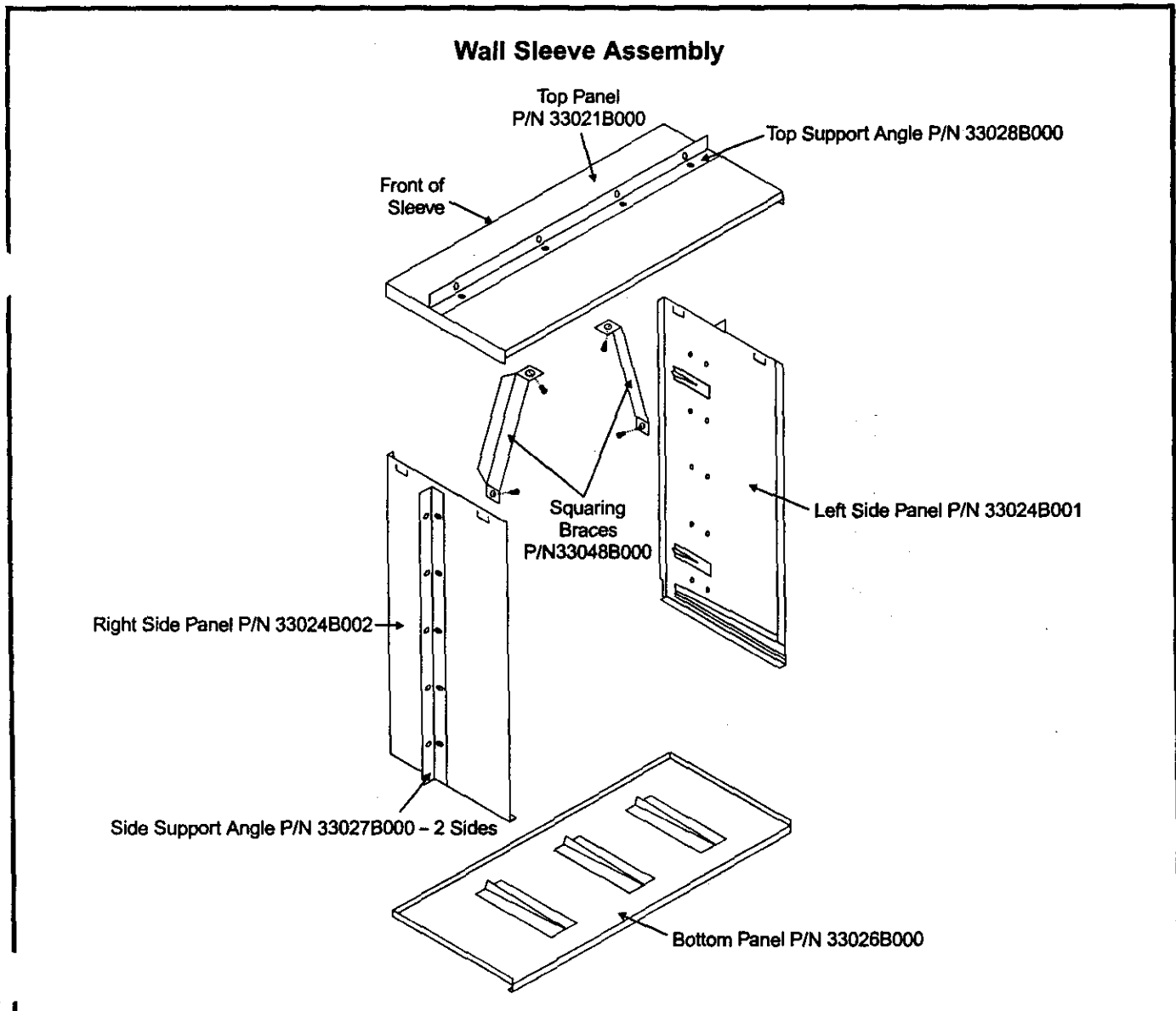


Figure 1

Further sealing against air infiltration must be done after the Magic-Pak unit is installed in the wall sleeve and utility connections have been completed (see **Sealing/Weatherproofing Wall Sleeves** section).

Wall Sleeve Installation

The wall sleeve may be installed from either the inside or outside of the building.

Some builders will attach the wall sleeve to the support wall through the side support angles whether they are inserting the sleeve from the outside or the inside. Others will use the side angles simply as a locating "stop" to achieve the appropriate dimension while shooting fasteners through the sides of the wall sleeve into the supporting wall. In either case, **the wall sleeve must be fastened to the supporting wall and not to the finished wall.**

The sleeve may extend farther than 1" beyond the finished wall, but reaching the perimeter of the opening from inside for sealing becomes increasingly difficult. In any case, adequate safety precautions must be considered to protect personnel.

Installing Wall Sleeve from Inside

The most popular method of installing the wall sleeve is from the inside of the building with the weather seal applied from the outside as the finish wall is applied.

Installing Wall Sleeve from Outside

In many high-rise construction applications, contractors insert the wall sleeves from the outside while the wall is being constructed. The two-sided support angles should then be attached to the wall sleeve sides at a location that will exceed the thickness of the outside finish wall by the recommended 3/8" to 1" dimension.

For example, if the supporting wall is concrete block with a brick facing, there is usually a space between the block and the brick. This space dimension must be added to the width of the brick (plus 3/8" to 1") so that when the sleeve is inserted into the block wall opening, up to the angles and fastened to the block wall before the brick is installed, the sleeve will protrude beyond the finished brick by 3/8" to 1", as needed for caulk sealing.

The same applies if the supporting wall is wood frame. One may insert the sleeve from the outside up to the angles located on each side, allowing for the thickness of sheathing, finish siding, and caulk sealing.

Recessed Sleeves

In some applications, where either the building walls are very thick (over 16") or architectural design dictates, units can be recessed. Avoid recessing the wall sleeve if the wall opening is required to be the same size as the wall

sleeve opening. However, if the wall opening can be larger in vertical dimension than the wall sleeve so that the bottom can rest on a sill that is at least 2" higher than the bottom of the wall opening, some recessing is permitted.

This sill should be recessed further than the sleeve by 3/8" to 1" to permit weather-seal caulking along the bottom edge without plugging the drain holes in the sleeve.

The top of the wall opening should be above the top of the wall sleeve by a dimension equal to or greater than the amount of the recess in order to avoid restriction of the condenser discharge air.

Sealing/Weatherproofing Wall Sleeves

A high grade non-hardening caulking compound approved for exterior use must be applied outside around the perimeter of the wall sleeve and the finished wall. Caulk should also be applied around the sleeve's perimeter and the finished interior wall.

Final sealing against air infiltration must be done after the Magic-Pak unit is installed in the wall sleeve. For additional protection, the space between the unit and the wall sleeve should be sealed on all sides with a bead of sealant.

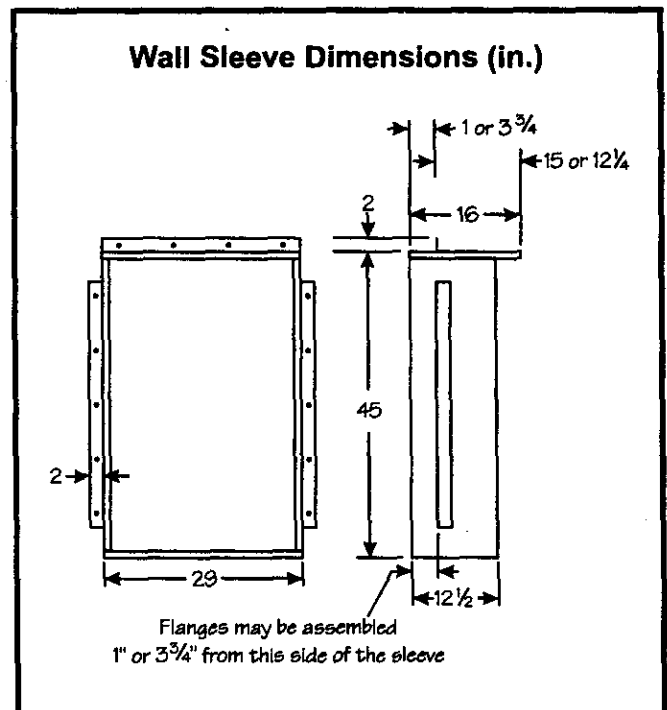


Figure 2

PART NO.

411948096

INSTALLATION AND MAINTENANCE INSTRUCTIONS

PWC SERIES

SELF-CONTAINED HEAT PUMP

PART NO.

411948096

DATE

2-1-96

SUPERSEDES

41194D094

PAGE 1 OF 10

Manufactured By
ARMSTRONG AIR CONDITIONING INC.
A **LENNOX** International Inc. Company
421 Monroe Street

GENERAL

These instructions explain the recommended method of installation of the PWC heat pump unit and associated electrical wiring.

This unit is designed and approved for use as a self-contained air to air heat pump system.

These instructions, and any instructions packaged with mating components and/or accessories, should be carefully read prior to beginning installation. Note particularly any CAUTIONS or NOTES in these instructions and all labels on the unit.

These instructions are intended as a general guide only, for use by qualified personnel, and do not supersede any national or local codes in any way. Compliance with all local, state, provincial, or national codes pertaining to this type of equipment should be determined prior to installation.

INSPECTION OF SHIPMENT

Upon receipt of equipment, carefully inspect it for possible shipping damage. If damage is found, it should be noted on the carrier's freight bill. Take special care to examine the unit inside the carton if the carton is damaged. File a claim with the transportation company.

If any damages are discovered and reported to the carrier **DO NOT INSTALL THE UNIT** as claim may be denied.

Check the unit rating plate to confirm specifications are as ordered.

CAUTION: INSTALLATION AND SERVICING OF AIR CONDITIONING EQUIPMENT CAN BE HAZARDOUS DUE TO INTERNAL REFRIGERANT PRESSURE AND LIVE ELECTRICAL COMPONENTS. ONLY TRAINED AND QUALIFIED SERVICE PERSONNEL SHOULD INSTALL, REPAIR, OR SERVICE THIS EQUIPMENT.

**WARNING
FOR YOUR SAFETY**

DO NOT STORE OR USE GASOLINE OR OTHER FLAMMABLE VAPORS AND LIQUIDS IN THE VICINITY OF THIS OR ANY OTHER APPLIANCE.

NOMENCLATURE:

10 PWC 242 A - 1A
1 2 3 4 5

1. ELECTRIC HEATING

5 = 5kW
7 = 7kW
10 = 10kW
15 = 15kW

4. Electrical Rating Code:

A=208/230 volts; 60 Hz; 1 phase

5. Revision Code**2. PWC=(HEAT) PUMP WITH COOLING****3. COOLING CAPACITY TONNAGE**

182 = 1½ TON
242 = 2 TON
302 = 2½ TON

LOCATION

The design is certified for through-the-wall installation only. The interior portions of the unit may be surrounded by a closet with clearances to combustible material held to 0" at sides, 0" top and 0" front of the plenum.

The grille side of the unit may be flush with or extend beyond the face of the exterior wall, but should not be recessed more than two (2) inches from the face of the building and should not be obstructed with trees, landscape materials, or building structure.

There is no minimum clearance required on locating a unit to an interior corner of a building. If the unit is to be enclosed, provisions should be made allowing access to the indoor side of the unit for changing filters and for inspection. At least 33" of unobstructed space should be provided in front of the indoor side, whether enclosed or not, to permit removal of the cooling chassis should repairs or inspection be required.

If this unit is installed in a residential garage it must be located or protected to avoid physical damage by vehicles. This unit must be installed so that no electrical components are exposed to water.

INSTALLATION

CAUTION: THE SLEEVE IS NOT INTENDED AS THE SOLE SUPPORT FOR THE UNIT. AN ADDITIONAL SUPPORT MUST BE PROVIDED NEAR THE RETURN OPENING ON THE UNIT FOR ADEQUATE SUPPORT. THE USE OF VIBRATION ISOLATION MATERIAL BETWEEN THE UNIT AND THE SUPPORT IS RECOMMENDED.

CAUTION: THIS UNIT MUST BE INSTALLED LEVEL FOR PROPER DRAINAGE OF THE CHASSIS BASE PAN AND UNIT DRAIN PAN.

WITHOUT WALL SLEEVE

Measure the size of the unit and provide an opening in an outside wall that will accept the unit. Local ordinances may require a steel lintel to support the wall above the opening. This opening must be square in all corners.

Position the unit so that the grilles on the outside face of the unit are flush or extend beyond the face of the exterior wall, but not recessed more than two (2) inches from the face of the building. **PROVIDE A SUPPORT UNDER THE UNIT INSIDE THE BUILDING.** Make sure that the inside support does not block the return air. The unit should be installed level.

Seal the space between the unit and the building opening using a non-hardening caulking compound. The seal must be weather-tight to prevent entrance of moisture and water into the building. Make sure the drain holes in the base are not plugged with caulking.

WITH WALL SLEEVE

See the installation instructions packed with the wall sleeve to assemble and mount in a wall. Make sure that the gaskets attached to the sleeve are not damaged. Assure that the unit is completely seated against the gaskets on the wall sleeve.

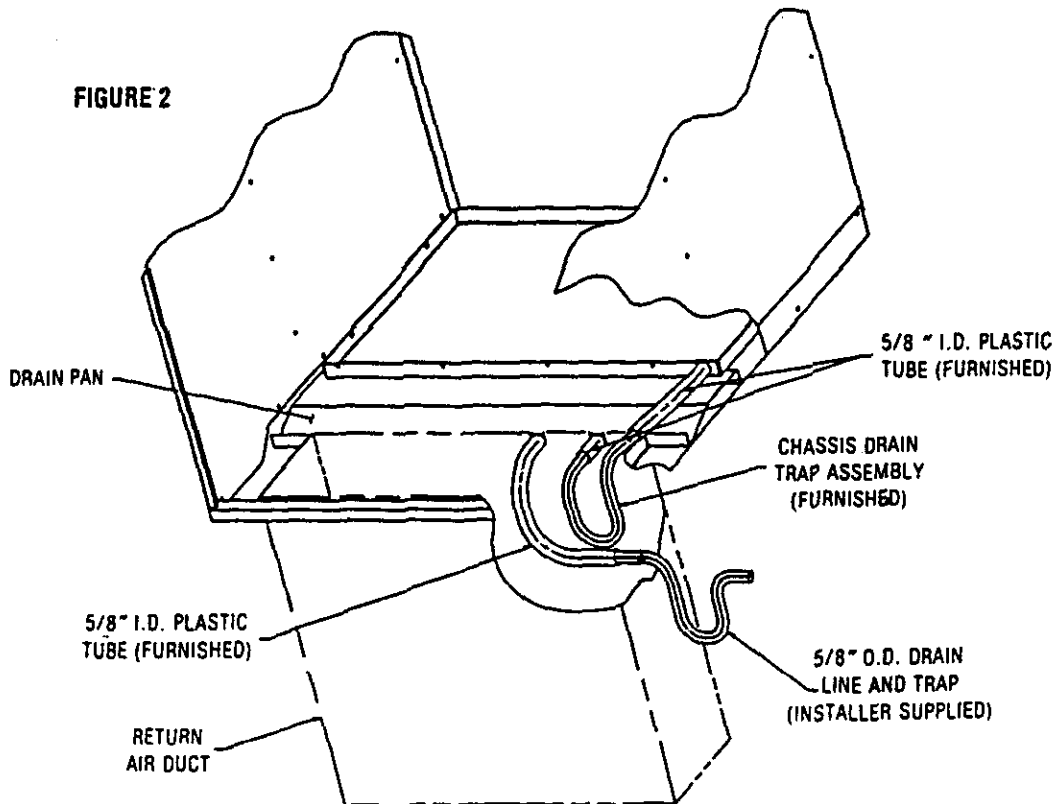
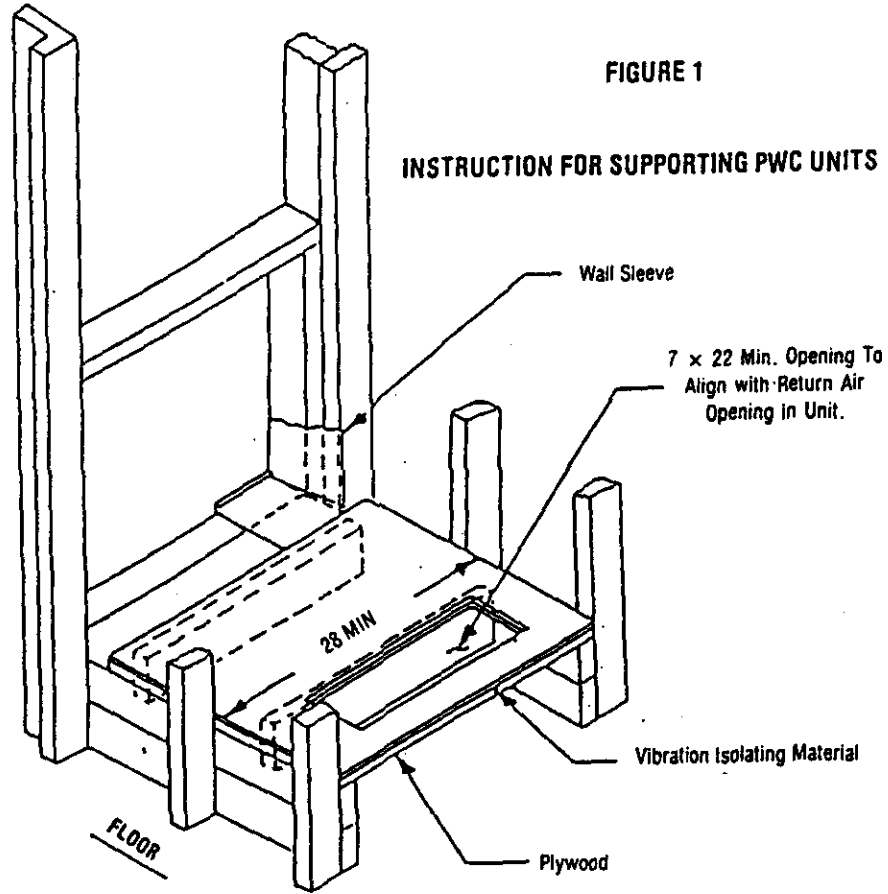
Seal space between wall sleeve and building opening using non-hardening caulking compound. This seal must be water tight.

CONDENSATE DRAIN

Install the plastic drain tube (furnished) over the 5/8" O.D. fitting welded to the condensate pan. Connect other end of the drain tube to trapped drain line (See Figure 2). The plastic drain connection to the chassis base is provided so that it may be disconnected from the permanent drain tubing in the base of unit in the event it becomes necessary to remove the chassis assembly.

The drain line should pitch gradually downward at least 1" per 10 foot of horizontal run to the open drain.

Be certain that the plastic drain tubing has free drainage and is not crimped or flattened at any bend.



LIMITATIONS

The unit should be installed in accordance with all national and local safety codes.

Limitations of the unit and appropriate accessories must also be observed.

The unit must NOT be installed with any ductwork in the outdoor airstream. The outdoor fan is not designed to operate against any additional static pressure.

Minimum and maximum operating conditions must be observed to assure maximum system performance with minimum service required.

TABLE 1 - APPLICATION LIMITATIONS

OUTDOOR AMBIENT AIR TEMP. °F		
MIN. DB - COOL	MAX. DB	
65	COOL 125	HEAT 75

INDOOR AMBIENT TEMP. °F			
MIN.		MAX.	
DB/WB	DB	DB/WB	DB
COOL	HEAT	COOL	HEAT
62/57	50	90/72	80

DUCTWORK

Ductwork should be designed and sized according to applicable methods from the Air Conditioning Contractors of America (ACCA).

It is recommended that supply and return duct connections at the unit be made with flexible joints.

The supply and return air duct systems should be designed for the CFM static requirements of the job. They should NOT be sized to match the dimensions of the duct connections on the unit.

NOTE: SUPPLY DUCT FLANGES ARE SHIPPED FLAT AND MUST BE BENT UP BEFORE ATTACHING THE SUPPLY DUCT.

To connect the return duct to the unit, use a straight piece of duct 22" wide by 7" deep. Insert the duct into the return opening in the bottom of the unit. Flange the duct over the existing flanges around the opening inside unit. Make sure that all sides of the duct are flanged over to permit removal of cooling chassis if required. Use a flexible connection to attach remainder of return duct. The return duct should be sealed to the unit casing and terminate outside the space containing the furnace.

NOTE: THE RETURN DUCT MUST ALLOW FOR THE UNIT DRAIN PAN CONNECTIONS AND DRAIN TUBE.

CAUTION: DO NOT SCREW INTO THE SIDE OF THE DRAIN PAN.

AIR FILTER

All indoor return air must be filtered. A permanent-type filter is furnished with the unit, located directly behind the access panel. Removing the panel permits access to the filter.

The filter should be cleaned at least three times during each of the heating and cooling seasons, or more frequently if unusual conditions are encountered. To clean the permanent filter, shake filter to remove excess dirt and/or use vacuum cleaner. Wash filter in soap or detergent water and replace after filter is dry.

The filter supplied need not be oiled after washing.

If an installation is made in which it is more desirable to mount the filter exterior to the unit, in the return duct work, or otherwise, either the permanent filter supplied or a disposable filter may be used. If a disposable filter is used, the minimum area required is as follows:

MODEL NO.	FILTER AREA (MIN.)
PWC 182	480 sq. in.
PWC 242	480 sq. in.
PWC 302	480 sq. in.

THERMOSTAT

The room thermostat should be located on an inside wall where it will not be subject to drafts, sun exposure or heat from electrical fixtures or appliances. Follow the manufacturer's instructions enclosed with the thermostat for general installation procedures. Color coded insulated wires (#18 AWG) should be used to connect the thermostat to the unit.

POWER AND CONTROL WIRING

ELECTRICAL CONNECTIONS

ALL WIRING SHOULD BE DONE IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE, ANSI/NFPA No. 70 (LATEST EDITION). IN CANADA CSA C22.2 Part 1 (LATEST EDITION), OR WITH LOCAL CODES, WHERE THEY PREVAIL.

NOTE: UNITS ARE FACTORY WIRED FOR A 230 VOLT POWER SUPPLY. IF POWER SUPPLY IS 208 VOLTS, IT WILL BE NECESSARY TO CHANGE A WIRE CONNECTION ON UNIT TRANSFORMER FROM 240V TERMINAL TO 208V TERMINAL AS SHOWN ON WIRING DIAGRAM.

Use wiring with a temperature limitation of 75°C min. Run the 208 or 230 volt, 60 hertz electric power supply through a fused disconnect switch to the control box of the unit and connect as shown in the wiring diagram located on the inside of the control access panel.

The unit must be electrically grounded in accordance with local codes or in the absence of local codes with the National Electric Code ANSI/NFPA No. 70 (latest edition) or CSA C22.2 Part 1 (latest edition).

Power supply to the unit must be N.E.C. Class 1, and must comply with all applicable codes. A fused disconnect switch should be field provided for the unit. The switch must be separate from all other circuits. If any of the wire supplied with the unit must be replaced, replacement wire must be of the type shown on the wiring diagram.

Electrical wiring must be sized to minimum circuit ampacity marked on the unit. USE COPPER CONDUCTORS ONLY. Each unit must be wired with a separate branch circuit and be properly fused.

SEQUENCE OF UNIT OPERATION

COOLING - When the thermostat is in the cooling mode, the O circuit is powered which energizes the reversing valve. Upon cooling demand, the thermostat closes circuit R to Y and G. Closing R to Y closes the unit contactor, starting the compressor and outdoor fan. The thermostat automatically closes R to G circuit which also brings on the indoor blower at the same time. Upon satisfying cooling demand, the thermostat will open the above circuits and open the main contactor, stopping the compressor and outdoor fan. If the unit is equipped with a time delay, the blower will continue to operate for 90 seconds which improves system efficiency.

HEATING - Upon heating demand the thermostat closes circuit R to Y closing the unit contactor, starting the compressor and outdoor fan. The reversing valve is not energized in the heating mode. The thermostat again automatically brings on the indoor blower at the same time. The second stage of the thermostat closes circuit R to W closing the unit sequencers, bring the auxiliary electric heat on. Upon satisfying heating demand the thermostat opens above circuits and stops unit operation.

DEFROST CYCLE - If outdoor ambient conditions are such that frost forms on the outdoor coil, the defrost control monitors the need for and initiates and terminates defrost cycles as necessary to maintain system performance. The defrost control is time/temperature initiated and temperature terminated with a maximum defrost time (time-out) of 10 minutes. Time between defrost cycles is pre-set at 60 minute intervals at the factory, but can be field adjusted to 30, 60, or 90 minutes. See illustration for field adjustment of defrost timing. For best performance in Region IV, the PWC242 defrost interval should be adjusted to 30 minutes.

PART NO.

41194D094

INSTALLATION AND MAINTENANCE INSTRUCTIONS

PWC SERIES

SELF-CONTAINED HEAT PUMP

PART NO.

41194D094

DATE

4-15-94

SUPERSEDES

NEW

PAGE 1 OF 10

Manufactured By
ARMSTRONG AIR CONDITIONING INC.
A LENNOX International Inc. Company
421 Monroe Street
Bellevue, OH 44811

GENERAL

These instructions explain the recommended method of installation of the PWC heat pump unit and associated electrical wiring.

This unit is designed and approved for use as a self-contained air to air heat pump system.

These instructions, and any instructions packaged with mating components and/or accessories, should be carefully read prior to beginning installation. Note particularly any CAUTIONS or NOTES in these instructions and all labels on the unit.

These instructions are intended as a general guide only, for use by qualified personnel, and do not supersede any national or local codes in any way. Compliance with all local, state, provincial, or national codes pertaining to this type of equipment should be determined prior to installation.

INSPECTION OF SHIPMENT

Upon receipt of equipment, carefully inspect it for possible shipping damage. If damage is found, it should be noted on the carrier's freight bill. Take special care to examine the unit inside the carton if the carton is damaged. File a claim with the transportation company.

If any damages are discovered and reported to the carrier **DO NOT INSTALL THE UNIT** as claim may be denied.

Check the unit rating plate to confirm specifications are as ordered.

CAUTION: INSTALLATION AND SERVICING OF AIR CONDITIONING EQUIPMENT CAN BE HAZARDOUS DUE TO INTERNAL REFRIGERANT PRESSURE AND LIVE ELECTRICAL COMPONENTS. ONLY TRAINED AND QUALIFIED SERVICE PERSONNEL SHOULD INSTALL, REPAIR, OR SERVICE THIS EQUIPMENT.

**WARNING
FOR YOUR SAFETY**

DO NOT STORE OR USE GASOLINE OR OTHER FLAMMABLE VAPORS AND LIQUIDS IN THE VICINITY OF THIS OR ANY OTHER APPLIANCE.

NOMENCLATURE:

10 PWC 242 A - 1A
1 2 3 4 5

1. ELECTRIC HEATING

5 = 5kW

7 = 7kW

10 = 10kW

15 = 15kW

4. Electrical Rating Code:

A=208/230 volts; 60 Hz; 1 phase

5. Revision Code

2. PWC=(HEAT) PUMP WITH COOLING

3. COOLING CAPACITY TONNAGE

182 = 1½ TON

242 = 2 TON

302 = 2½ TON

LOCATION

The design is certified for through-the-wall installation only. The interior portions of the unit may be surrounded by a closet with clearances to combustible material held to 0" at sides, 0" top and 0" front of the plenum.

The grille side of the unit may be flush with or extend beyond the face of the exterior wall, but should not be recessed more than two (2) inches from the face of the building and should not be obstructed with trees, landscape materials, or building structure.

There is no minimum clearance required on locating a unit to an interior corner of a building. If the unit is to be enclosed, provisions should be made allowing access to the indoor side of the unit for changing filters and for inspection. At least 33" of unobstructed space should be provided in front of the indoor side, whether enclosed or not, to permit removal of the cooling chassis should repairs or inspection be required.

If this unit is installed in a residential garage it must be located or protected to avoid physical damage by vehicles. This unit must be installed so that no electrical components are exposed to water.

INSTALLATION

CAUTION: THE SLEEVE IS NOT INTENDED AS THE SOLE SUPPORT FOR THE UNIT. AN ADDITIONAL SUPPORT MUST BE PROVIDED NEAR THE RETURN OPENING ON THE UNIT FOR ADEQUATE SUPPORT. THE USE OF VIBRATION ISOLATION MATERIAL BETWEEN THE UNIT AND THE SUPPORT IS RECOMMENDED.

CAUTION: THIS UNIT MUST BE INSTALLED LEVEL FOR PROPER DRAINAGE OF THE CHASSIS BASE PAN AND UNIT DRAIN PAN.

WITHOUT WALL SLEEVE

Measure the size of the unit and provide an opening in an outside wall that will accept the unit. Local ordinances may require a steel lintel to support the wall above the opening. This opening must be square in all corners.

Position the unit so that the grilles on the outside face of the unit are flush or extend beyond the face of the exterior wall, but not recessed more than two (2) inches from the face of the building. PROVIDE A SUPPORT UNDER THE UNIT INSIDE THE BUILDING. Make sure that the inside support does not block the return air. The unit should be installed level.

Seal the space between the unit and the building opening using a non-hardening caulking compound. The seal must be weather-tight to prevent entrance of moisture and water into the building. Make sure the drain holes in the base are not plugged with caulking.

WITH WALL SLEEVE

See the installation instructions packed with the wall sleeve to assemble and amount in a wall. Make sure that the gaskets attached to the sleeve are not damaged. Assure that the unit is completely seated against the gaskets on the wall sleeve.

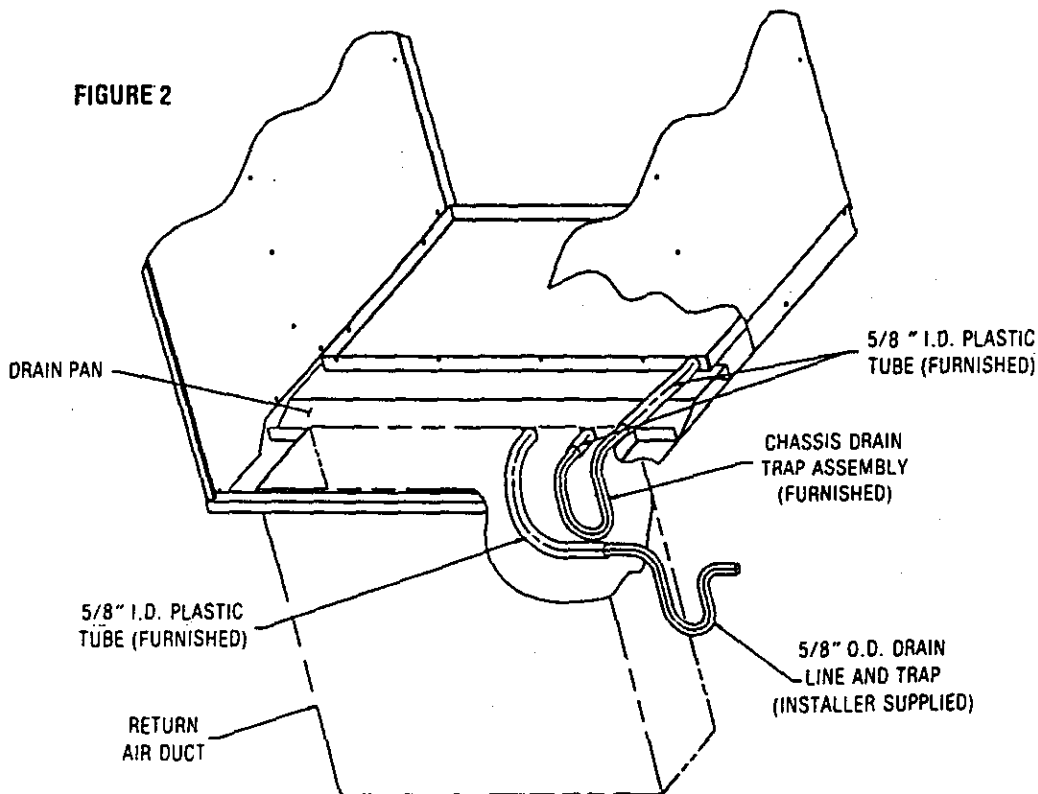
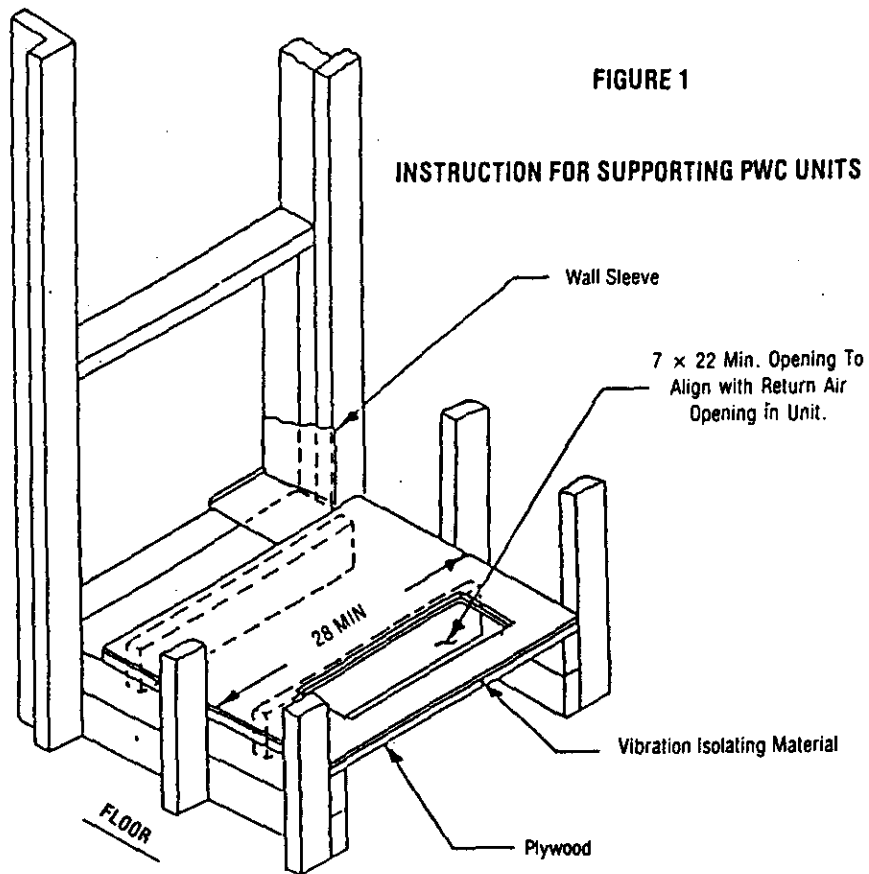
Seal space between wall sleeve and building opening using non-hardening caulking compound. This seal must be water tight.

CONDENSATE DRAIN

Install the plastic drain tube (furnished) over the 5/8" O.D. fitting welded to the condensate pan. Connect other end of the drain tube to trapped drain line (See Figure 2). The plastic drain connection to the chassis base is provided so that it may be disconnected from the permanent drain tubing in the base of unit in the event it becomes necessary to remove the chassis assembly.

The drain line should pitch gradually downward at least 1" per 10 foot of horizontal run to the open drain.

Be certain that the plastic drain tubing has free drainage and is not crimped or flattened at any bend.



LIMITATIONS

The unit should be installed in accordance with all national and local safety codes.

Limitations of the unit and appropriate accessories must also be observed.

The unit must NOT be installed with any ductwork in the outdoor airstream. The outdoor fan is not designed to operate against any additional static pressure.

Minimum and maximum operating conditions must be observed to assure maximum system performance with minimum service required.

TABLE 1 - APPLICATION LIMITATIONS

OUTDOOR AMBIENT AIR TEMP. °F		
MIN. DB - COOL	MAX. DB	
65	COOL 125	HEAT 75

INDOOR AMBIENT TEMP. °F			
MIN.		MAX.	
DB/WB	DB	DB/WB	DB
COOL	HEAT	COOL	HEAT
62/57	50	90/72	80

DUCTWORK

Ductwork should be designed and sized according to applicable methods from the Air Conditioning Contractors of America (ACCA).

It is recommended that supply and return duct connections at the unit be made with flexible joints.

The supply and return air duct systems should be designed for the CFM static requirements of the job. They should NOT be sized to match the dimensions of the duct connections on the unit.

NOTE: SUPPLY DUCT FLANGES ARE SHIPPED FLAT AND MUST BE BENT UP BEFORE ATTACHING THE SUPPLY DUCT.

To connect the return duct to the unit, use a straight piece of duct 22" wide by 7" deep. Insert the duct into the return opening in the bottom of the unit. Flange the duct over the existing flanges around the opening inside unit. Make sure that all sides of the duct are flanged over to permit removal of cooling chassis if required. Use a flexible connection to attach remainder of return duct. The return duct should be sealed to the unit casing and terminate outside the space containing the furnace.

NOTE: THE RETURN DUCT MUST ALLOW FOR THE UNIT DRAIN PAN CONNECTIONS AND DRAIN TUBE.

CAUTION: DO NOT SCREW INTO THE SIDE OF THE DRAIN PAN.

AIR FILTER

All indoor return air must be filtered. A permanent-type filter is furnished with the unit, located directly behind the access panel. Removing the panel permits access to the filter.

The filter should be cleaned at least three times during each of the heating and cooling seasons, or more frequently if unusual conditions are encountered. To clean the permanent filter, shake filter to remove excess dirt and/or use vacuum cleaner. Wash filter in soap or detergent water and replace after filter is dry.

The filter supplied need not be oiled after washing.

If an installation is made in which it is more desirable to mount the filter exterior to the unit, in the return duct work, or otherwise, either the permanent filter supplied or a disposable filter may be used. If a disposable filter is used, the minimum area required is as follows:

MODEL NO.	FILTER AREA (MIN.)
PWC 182	480 sq. in.
PWC 242	480 sq. in.
PWC 302	480 sq. in.

THERMOSTAT

The room thermostat should be located on an inside wall where it will not be subject to drafts, sun exposure or heat from electrical fixtures or appliances. Follow the manufacturer's instructions enclosed with the thermostat for general installation procedures. Color coded insulated wires (#18 AWG) should be used to connect the thermostat to the unit.

POWER AND CONTROL WIRING

ELECTRICAL CONNECTIONS

ALL WIRING SHOULD BE DONE IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE, ANSI/NFPA No. 70 (LATEST EDITION). IN CANADA CSA C22.2 Part 1 (LATEST EDITION), OR WITH LOCAL CODES, WHERE THEY PREVAIL.

Use wiring with a temperature limitation of 75°C min. Run the 208 or 230 volt, 60 hertz electric power supply through a fused disconnect switch to the control box of the unit and connect as shown in the wiring diagram located on the inside of the control access panel.

The unit must be electrically grounded in accordance with local codes or in the absence of local codes with the National Electric Code ANSI/NFPA No. 70 (latest edition) or CSA C22.2 Part 1 (latest edition).

Power supply to the unit must be N.E.C. Class 1, and must comply with all applicable codes. A fused disconnect switch should be field provided for the unit. The switch must be separate from all other circuits. If any of the wire supplied with the unit must be replaced, replacement wire must be of the type shown on the wiring diagram.

Electrical wiring must be sized to minimum circuit ampacity marked on the unit. USE COPPER CONDUCTORS ONLY. Each unit must be wired with a separate branch circuit and be properly fused.

SEQUENCE OF UNIT OPERATION

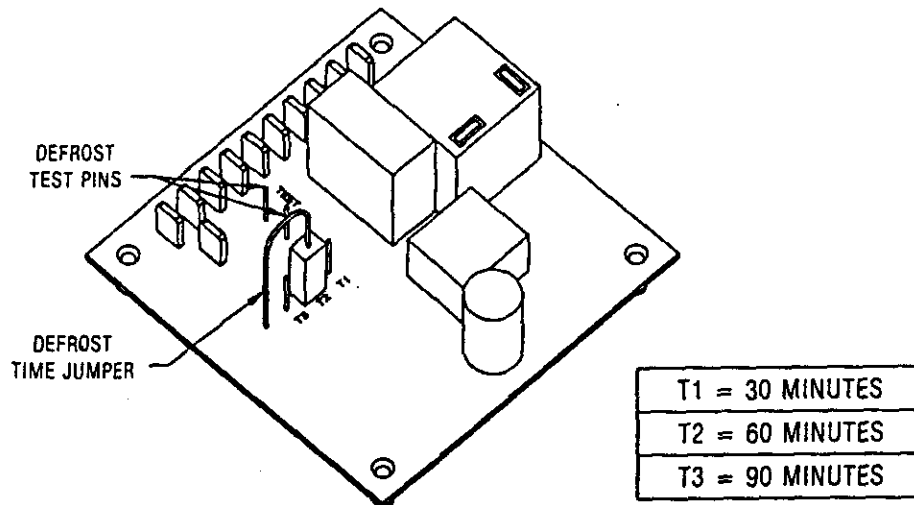
COOLING - When the thermostat is in the cooling mode, the O circuit is powered which energizes the reversing valve. Upon cooling demand, the thermostat closes circuit R to Y and G. Closing R to Y closes the unit contactor, starting the compressor and outdoor fan. The thermostat automatically closes R to G circuit which also brings on the indoor blower at the same time. Upon satisfying cooling demand, the thermostat will open the above circuits and open the main contactor, stopping the compressor and outdoor fan. If the unit is equipped with a time delay, the blower will continue to operate for 90 seconds which improves system efficiency.

HEATING - Upon heating demand the thermostat closes circuit R to Y closing the unit contactor, starting the compressor and outdoor fan. The reversing valve is not energized in the heating mode. The thermostat again automatically brings on the indoor blower at the same time. The second stage of the thermostat closes circuit R to W closing the unit sequencers, bring the auxiliary electric heat on. Upon satisfying heating demand the thermostat opens above circuits and stops unit operation.

DEFROST CYCLE - If outdoor ambient conditions are such that frost forms on the outdoor coil, the defrost control monitors the need for and initiates and terminates defrost cycles as necessary to maintain system performance. The defrost control is time/temperature initiated and temperature terminated with a maximum defrost time (time-out) of 10 minutes. Time between defrost cycles is pre-set at 60 minute intervals at the factory, but can be field adjusted to 30, 60, or 90 minutes. See illustration for field adjustment of defrost timing. For best performance in Region IV, the PWC242 defrost interval should be adjusted to 30 minutes.

The defrost control will initiate a defrost cycle if the time period has elapsed and the defrost sensor detects a temperature below freezing. At the start of the defrost cycle, the defrost control will energize the reversing valve solenoid, shifting the reversing valve and de-energizing the outdoor fan. The defrost relay will also close, energizing auxiliary heat for increased comfort during defrost. The unit will remain in the defrost mode until the defrost sensor has determined that the frost has been removed from the coil or a 10 minute time period has elapsed.

FIGURE 3



The defrost control is also equipped with a set of test pins to aid in trouble shooting of the defrost system. The following is a brief outline of the testing of the defrost system.

The defrost sensor will be closed at 32° F or below. If temperatures are such that the switch is not closed, jumper between the defrost sensor terminals on the defrost control.

Start the system in heating operation.

Jumper test pins. A 1/4" quick connect terminal crimped onto a solid wire or brazing rod works well for test jumper. Closing test pins speed up time interval by a factor of 256.

DEFROST CONTROL SETTING DEFROST TEST CYCLE TIME

T1-30 minutes	7 seconds
T2-60 minutes	14 seconds
T3-90 minutes	21 seconds

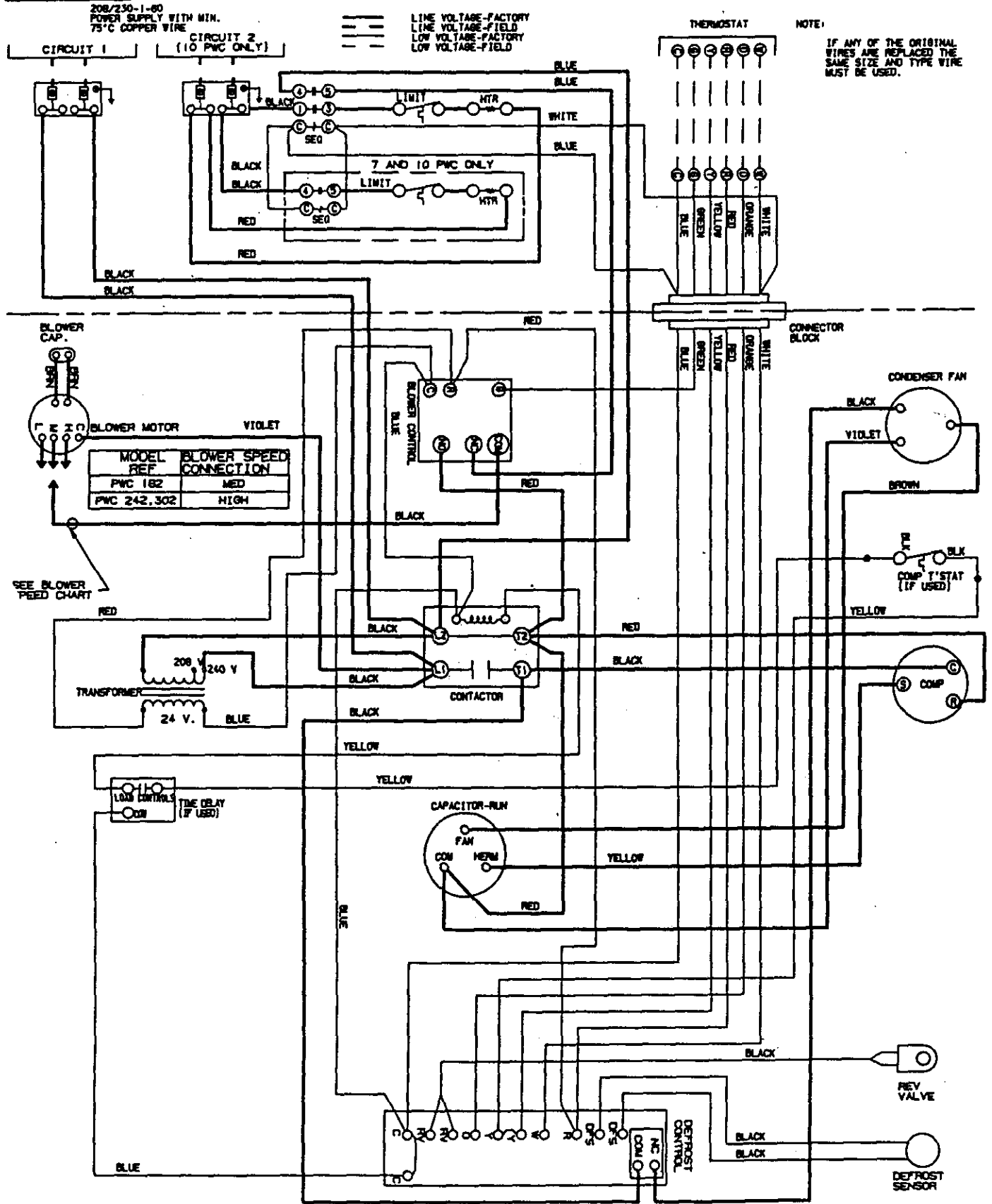
After closing test pins and appropriate cycle time has elapsed, the reversing valve should shift to defrost mode and the outdoor fan should stop. After two seconds of defrost operation, the reversing valve should shift back to heating operation and the outdoor fan should start.

SYSTEM PERFORMANCE

For maximum performance of this heat pump system, the operating temperatures and pressure should be checked and superheat determined at Standard ARI test conditions of 82°F outdoor - 80°F indoor dry bulb/67°F wet bulb. If the superheat measured deviates from the values in the table below, the refrigerant charge should be adjusted accordingly for maximum performance.

PWC SUCTION SUPER HEAT -TABLE 2

Outdoor Unit Model	Suction Superheat @ A.R.I. Conditions
PWC182	18° - 20°F
PWC242	17° - 19°F



CONNECTION DIAGRAM

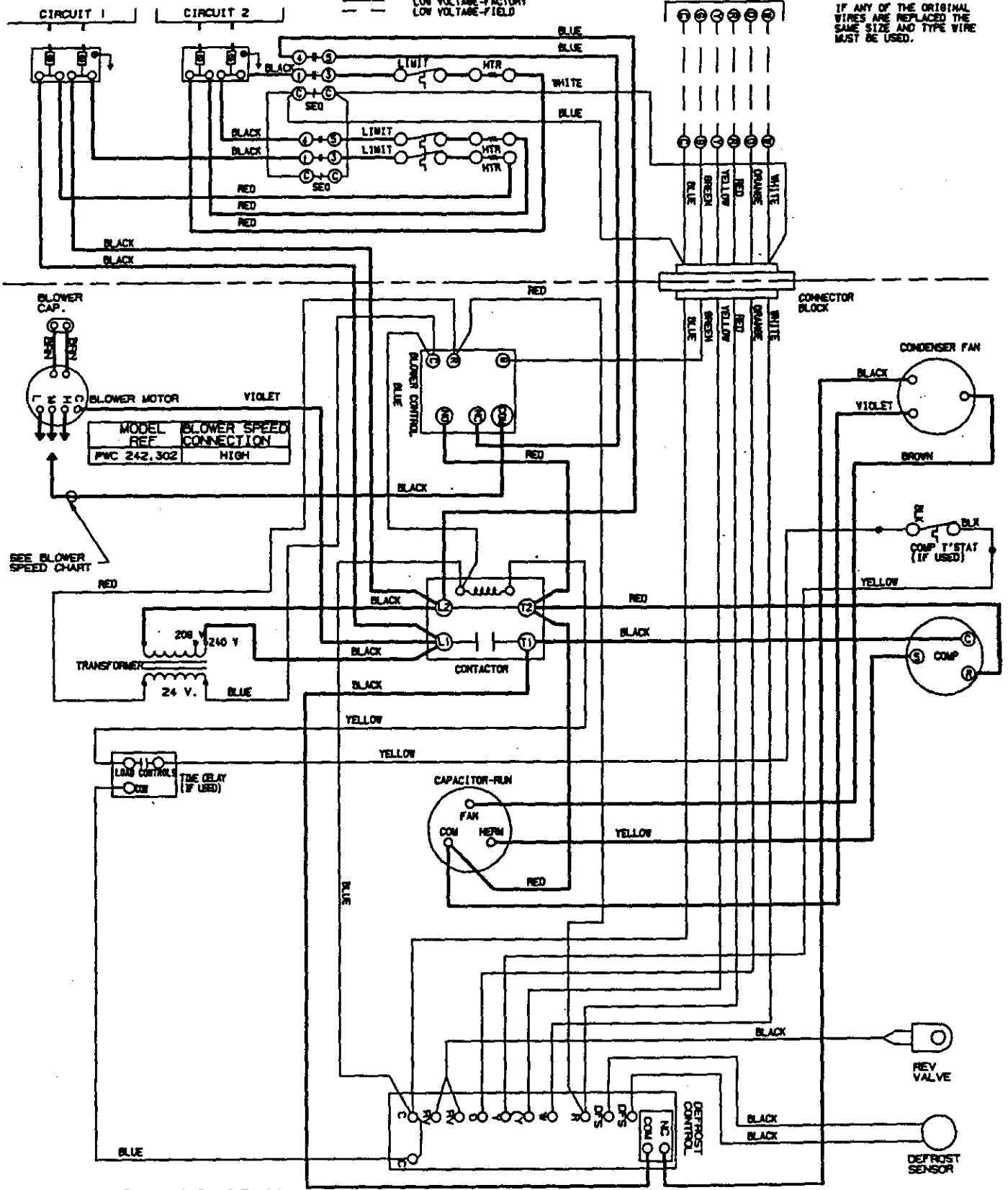
208/230-1-60
POWER SUPPLY WITH MIN.
75°C COPPER WIRE

==== LINE VOLTAGE-FACTORY
==== LINE VOLTAGE-FIELD
----- LOW VOLTAGE-FACTORY
----- LOW VOLTAGE-FIELD

THERMOSTAT

NOTE:

IF ANY OF THE ORIGINAL
WIRES ARE REPLACED THE
SAME SIZE AND TYPE WIRE
MUST BE USED.



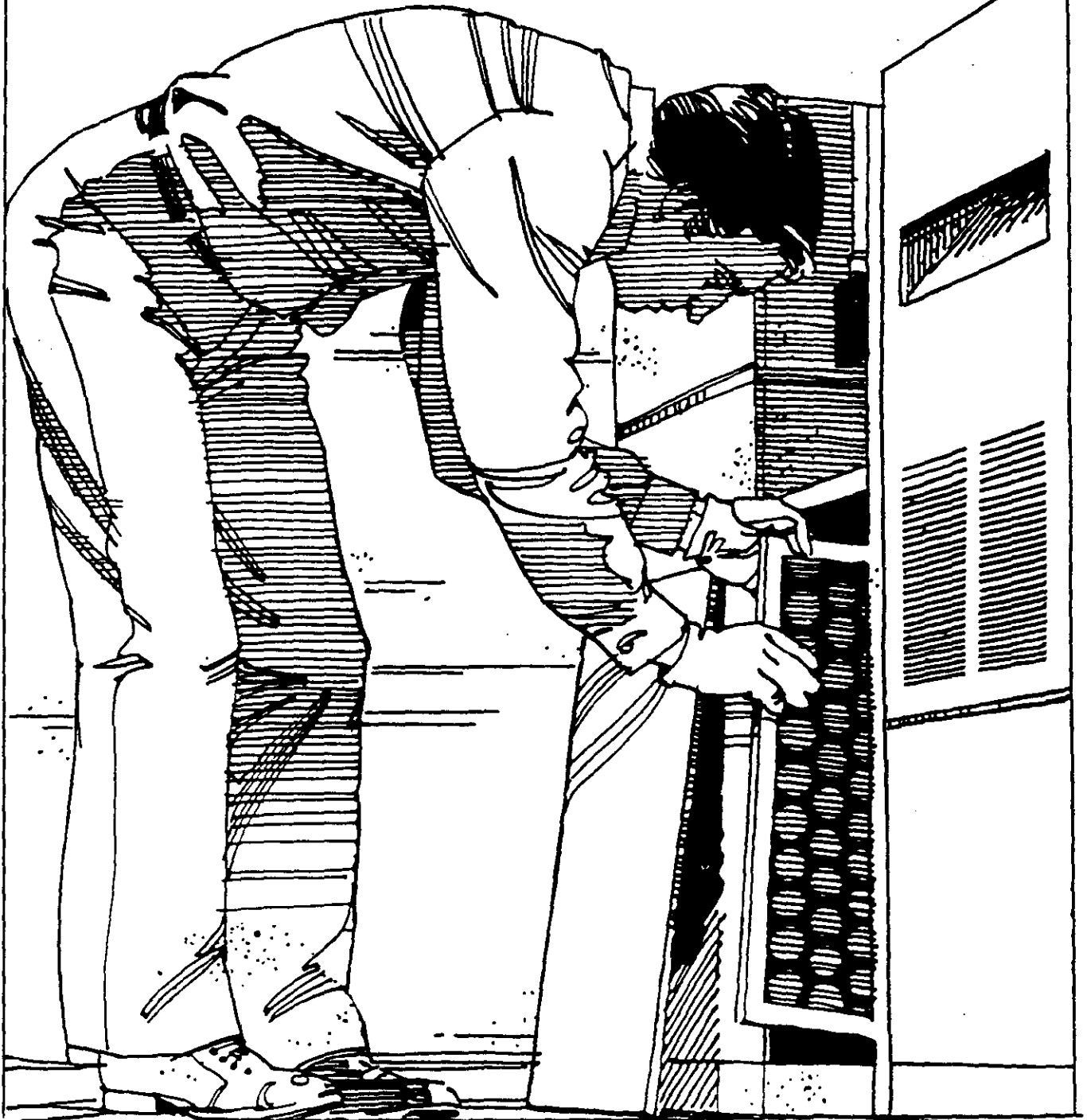
CONNECTION DIAGRAM

PWC
SELF CONTAINED
THRU-THE-WALL HEAT PUMP

Part No. 30790F089 Date 6-1-89

Supersedes 30790G082 Page 1 of 12

Installation and Maintenance Instructions



ARMSTRONG

Part No. 30790F089 Date 6-1-89

Supersedes 30790G082 Page 2 of 12

FORWARD

This is a self-contained heat pump designed for installation through an exterior wall. The unit is Underwriters' Laboratories listed under heat pumps and is in compliance with Underwriters Standard, UL 559.

The unit is also certified to the Air Conditioning and Refrigeration Institute as complying to ARI Standard 240.

To simplify the proper installation and to assure that the unit will operate in conformity with general accepted safety regulations, you should read carefully the instructions outlined in this manual.

Failure to comply with the Installation Instructions, Operating Instructions or Maintenance Instructions, or Alterations of internal wiring or parts not specifically outlined within this manual will void the Agency Listing's and Manufacturer's limited warranty.

KEEP THIS MANUAL IN A SAFE PLACE FOR READY REFERENCE.

INTRODUCTION

This manual is intended to familiarize the installer, serviceman, and the user with the installation, operation and maintenance of this thru-the-wall heat pump.

This unit is shipped from the factory in one package completely assembled and wired. A specially designed trap assembly is shipped, secured to the air return area in lower front of unit.

Check the rating plate to confirm heating and cooling capacities are as ordered and are as shown on the packaging label.

When this unit is unpacked, a check should be made for any damage. If any damages are discovered, **DO NOT INSTALL THE UNIT.** Notify the transportation company and make proper notation on the carriers freight bill. Damage claims must be filed with the carrier at once.

The manufacturer can assume no responsibility for damages which occur in transit or for improper operation of the unit as a result of shipping damages.

TABLE OF CONTENTS

	Page
INSTALLATION	
Site Preparation	5
Condensate and Defrost Drain	6
Electrical Connections	7-8
Thermostat	9
Air Filter	9
Duct Work	9
Unit Checkout Procedure	10
OPERATION INSTRUCTIONS	
Heating Operation	11
Cooling Operation	11
System Shutdown	11
MAINTENANCE AND SERVICE	
Air Filter	12
Chassis Removal	12

INSTALLATION

Site Preparation

This unit is approved for thru-the-wall installation, with zero clearance to combustible material. The unit must be installed within a conditioned space to prevent freezing of defrost water in trap assembly and to avoid jacket heat loss and surface condensation problem.

This unit must be installed with the wall sleeve specified for this unit. Refer to the manufacturer's specification sheet for complete information and demensions.

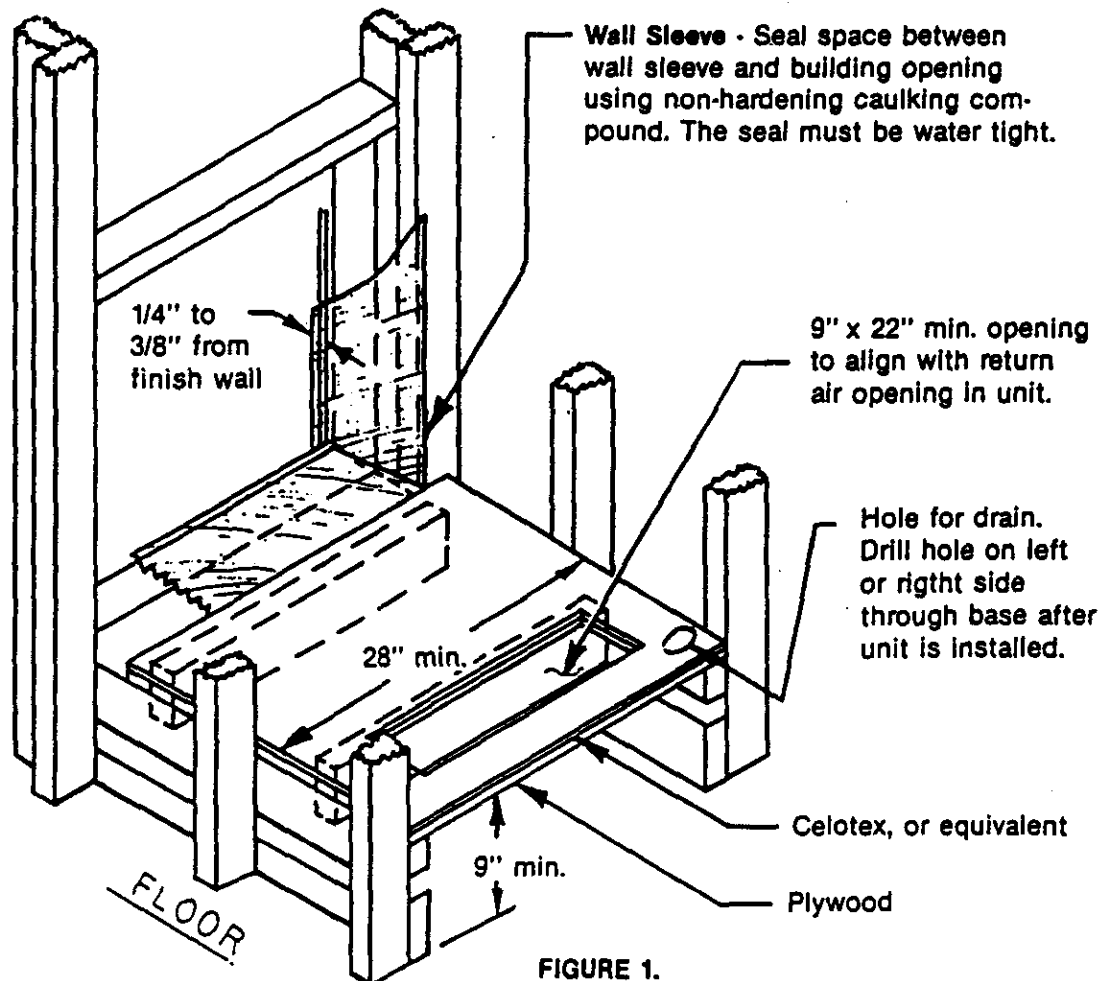
Assemble the wall sleeve in accordance with the instructions furnished with each wall sleeve.

Install the wall sleeve level and square in all corners. It is to extend a minimum of 1/4" to 3/8" maximum beyond finished wall to permit caulking all around the sleeve without blocking drain holes at bottom front of sleeve.

Before installing unit, inspect wall sleeve. Make sure the gaskets located on the inside of the outer flanges are firmly attached to the sleeve and are not damaged. Damage or loose gaskets must be repaired before installing unit.

The sleeve is not intended as the sole support for the thru-the-wall unit. An additional support must be provided beneath the front of the unit for adequate support. The use of vibration insulation material between the unit and the support is recommended.

See Figure 1.



INSTALLATION

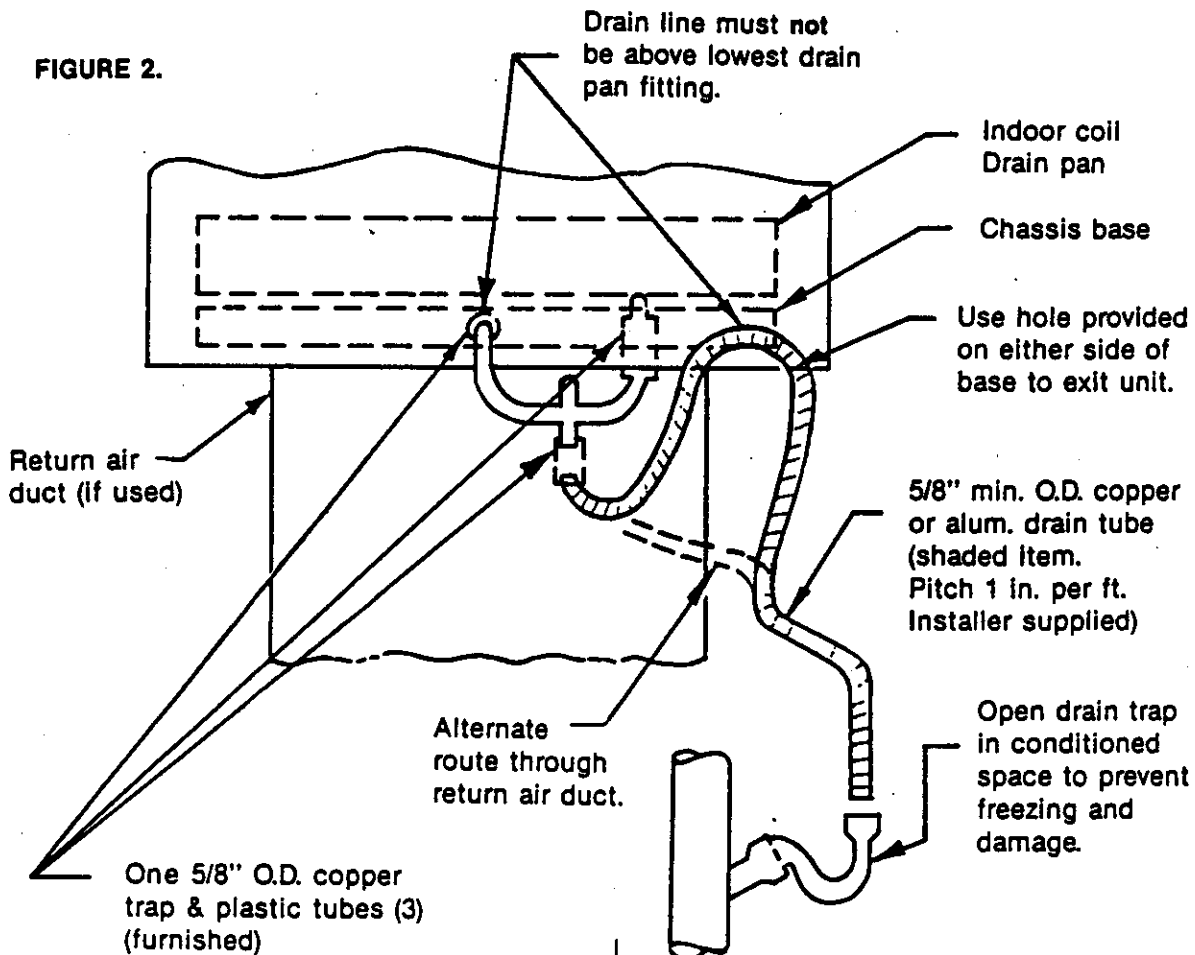
Before sliding unit into sleeve, remove 5 screws and washers from top panel. Slide unit into sleeve until the angle on top of the unit lines up with the top flange of the sleeve, and should almost touch. Fasten unit to sleeve with the 5 screws and washers above.

Condensate and Defrost Drain

The condensate drain trap furnished with the unit is a copper tube assembly and is furnished with three pieces of plastic tubing.

To install condensate drain (Reference Figure 2.), connect one of the plastic tube ends over the 5/8" O.D. fitting welded to the center of indoor condensate drain pan and another end to the 5/8" O.D. fitting on the chassis base. Connect the third plastic tube end to the open drain trap.

The drain line should pitch gradually downward at least 1 inch per foot of horizontal run to open drain trap. Be certain that plastic drain tube has free drainage and is not crimped or flattened at any bend. Test drainage by pouring water into drain pan under indoor coil and see that it is removed rapidly through the drain tubing. The plastic drain connection is provided so that it may be disconnected from the permanent drain tubing in the building without unsoldering in the event it becomes necessary to remove the refrigeration drawer assembly. **TOTAL DEFROST DRAIN SYSTEM MUST BE LOCATED IN THE CONDITIONED AREA TO AVOID FREEZING.**



INSTALLATION

Electrical Connections

All wiring to unit must comply with the national Electrical Code NFPA No. 70 or local codes, where they prevail.

ANY ALTERATION OF INTERNAL WIRING CAN VOID UNDERWRITER'S APPROVAL, ARI CERTIFICATION AND MANUFACTURE'S LIMITED WARRANTY.

The series and rating plates indicate the operating voltages, phase, ampacities and maximum fuse size and electric heater ratings. Units must never be installed where voltage exceeds 110% of higher voltage indicated on rating plate, or less than the minimum operating voltage on rating plate.

Ratings and BTU output are based on 230 V, 60 HZ supply. Voltages other than this rated voltage will alter the BTU output of this unit. For specific ratings at voltages or frequencies other than that designated contact your distributor or the manufacture.

FAILURE OF THE COMPRESSOR AS A RESULT OF OPERATION ON IMPROPER VOLTAGE VOIDS THE COMPRESSOR REPLACEMENT WARRANTY.

Multiple power supply connections must be used when total unit amp draw is over 48 amps. If multiple power supply connections are used, separate fused disconnects must be installed for each circuit between the main panel and the supply terminals in the unit.

Circuit No. 1, terminals L1 and L2 on the terminal block is always used to supply power to the heat pump section. See Figure 3, 4, and 5.

Circuit No. 2, terminals L3 and L4 on terminal block (units up to 11.0 KW) or fuse block (units over 11.0 KW) is always used to supply power to electric heaters.

Single entry supply may be used on units, when total amp draw, (heat pump plus heaters) is less than 48 amps, and is not in violation of prevailing electrical codes.

Units with 7.2 KW heaters or less are supplied with internal jumpers between L1 & L3, and L2 & L4 for single entry supply. Remove jumpers between L1 & L3 and L2 & L4 when multiple entry supply is to be used.

Fuse and wire sizing must be in accordance with prevailing electrical codes. See Product Specification sheets or Unit Series and Rating Plate for ampacities and maximum fuse.

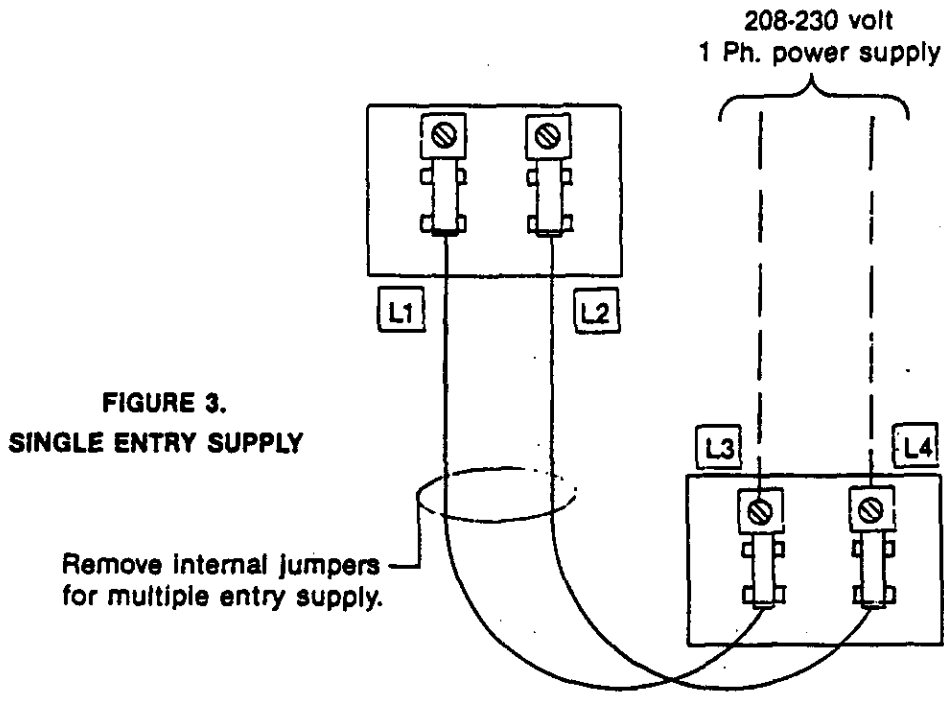


FIGURE 3.
SINGLE ENTRY SUPPLY

PWC18E4.8, PWC18E7.2
PWC24E4.8, PWC24E7.2

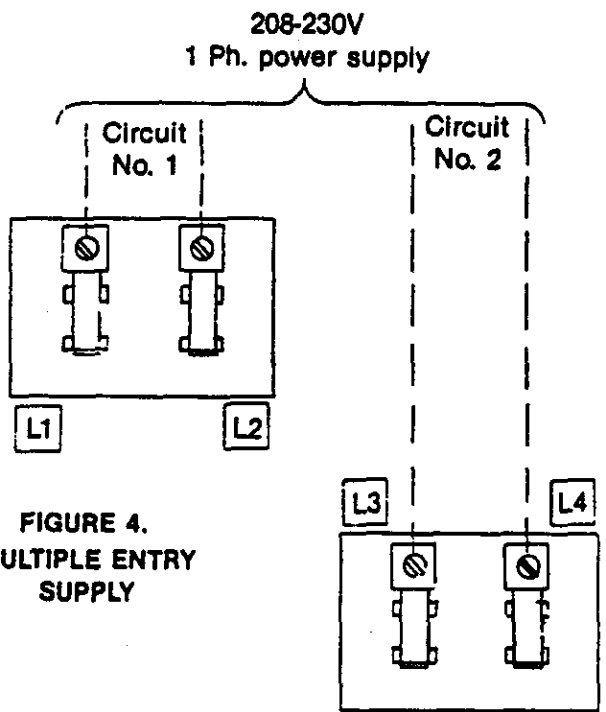


FIGURE 4.
MULTIPLE ENTRY SUPPLY

PWC18E9.2, PWC18E10.7
PWC24E9.2, PWC24E10.7

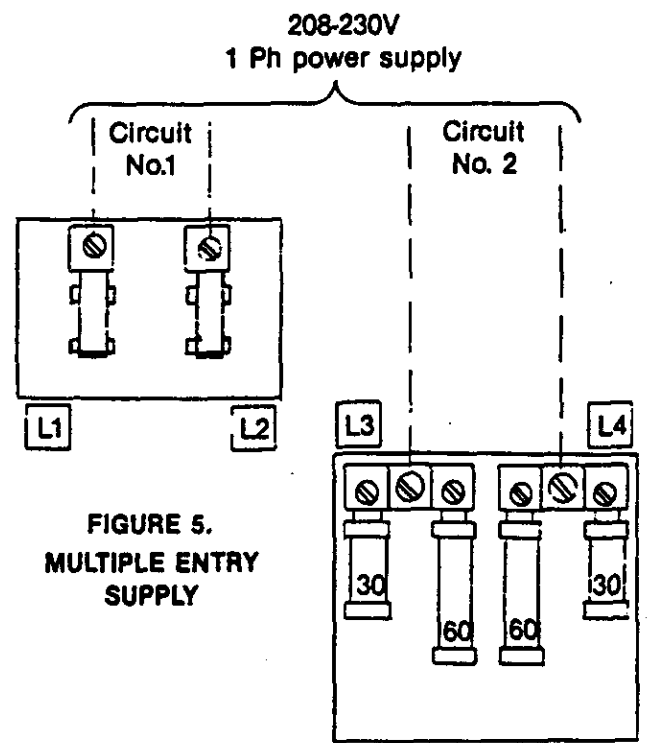


FIGURE 5.
MULTIPLE ENTRY SUPPLY

PWC18E14.7
PWC24E14.7

Thermostat

This unit requires special thermostat for operation. See product specification sheets or label on unit for manufacture's part number. Install the thermostat according to directions furnished with it. Select a location in a room having the most wall or window area exposed to the outside. Locate on an inside wall, away from drafts, sunlight or any heat producing appliances. Connect thermostat wires to pigtail leads on unit with wire nuts following wire diagrams attached to unit.

Air Filter

This unit is supplied with a permanent type high filtration filter, located in front of the indoor coil. If an installation is made in which it is more desirable to mount the filter exterior to the unit in the return duct, the permanent filter supplied can be used or a disposable filter may be used. If a different filter or filters are used the minimum total filter area required is 375 sq. in. of nominal 1/2 inch thick media. If a remote filter is installed, the permanent filter supplied with this unit must be removed.

Duct Work

Provide duct work sufficiently large enough to handle the air volume at the total external static pressure not exceeding the rating of the unit published in the Product Specification sheet for the rated cooling air volume.

Connect supply duct to top of unit using canvas connections or other flexible connection to prevent sound transmission into the duct system.

To connect the return duct to the unit, use a straight piece of duct 21 3/4" by 9".

Insert duct into return opening in bottom of unit and flange duct over existing flanges around opening inside unit. Make sure that all sides of the duct are flanged over to permit removal of cooling chassis if required. Use a flexible connection to attach remainder of return air duct.

Adjustments

No adjustments are required or should be attempted regarding any of the components of the heat pump chassis and supplementary electric heaters.

The unit should be checked to see that none of the wiring is loose or missing. The plug-in electrical connectors between the cooling chassis and the main control compartment should be checked to make sure the plugs are firmly seated and none of the wires are loose.

INSTALLATION

A. Unit Check-Out Procedure - IMPORTANT

1. Filter(s) must be clean and in place as to filter all air passing over indoor coil.
2. Set thermostat to "OFF" position.
3. Check that correct size fuses are installed for unit.
4. All panels must be in place.
5. Turn on main power to unit.

B. Heating Check

1. Set fan switch to "AUTO".
2. Set thermostat lever to lowest temperature.
3. Set thermostat switch to "HEAT" position (if indoor ambient temperature is near or colder than thermostat setting, heat pump will start immediately).
4. Slowly adjust thermostat to warmer temperature until first stage heat is activated (compressor will start).
5. If possible, check outdoor fan to make sure it's rotating (this is especially important if heat pump has been installed for sometime and not running in the winter such that the outdoor fan plenum could be clogged with snow or ice build-up).
6. Check indoor air outlet to verify indoor fan is blowing air and getting warmer.
7. Adjust thermostat lever to at least 5°F warmer temperature so that second stage heat will activate.
8. Check indoor air outlet for increased heating (higher temperature).

C. Cooling Check

1. Set thermostat switch to "OFF" position for minimum of 5 minutes to allow heat pump pressures to equalize.
2. Set thermostat lever to lowest temperature for cooling.
3. Set thermostat switch to "COOL" position (compressor should start unless indoor ambient is near or colder than thermostat setting).

D. Blower Operation

1. Set thermostat switch to "OFF" position.
2. Set fan switch to "ON". Indoor fan only will operate.
3. Return fan switch to "AUTO". Indoor fan will stop.

OPERATION INSTRUCTIONS

The following instructions are to be followed to obtain years of trouble free operation of your year-around comfort system.

To start unit turn on main power (may have two disconnect switches). If the outdoor temperature is below indoor temperature, the main power should be turned on 24 hours before starting unit in order to assure no liquid refrigerant is in the compressor crankcase, and to prevent valve damage of compressor.

Operation of this unit is automatic and will provide heating or cooling depending on the setting of the thermostat.

Heating Operation

1. Set thermostat system switch to "HEAT".
2. Set thermostat lever to desired temperature.
3. Set fan switch to "ON" for continuous indoor blower operation or to "AUTO" for indoor blower to cycle corresponding with thermostat cycling.

Cooling Operation

1. Set thermostat system switch to "COOL".
2. Set thermostat lever to desired temperature.
3. Set fan switch to "ON" for continuous indoor blower operation or to "AUTO" for indoor blower to cycle corresponding with thermostat cycling.

System Shutdown

1. For temporary or short periods of shut-down, set thermostat system to "OFF" and fan switch to "AUTO".
2. For a prolonged period of shut-down, set thermostat system switch to "OFF" and fan switch to "AUTO". Turn off electric power supply. (Two disconnect switches may supply unit.)

OPERATION INSTRUCTIONS

The following instructions are to be followed to obtain years of trouble free operation of your year-around comfort system.

To start unit turn on main power (may have two disconnect switches). If the outdoor temperature is below indoor temperature, the main power should be turned on 24 hours before starting unit in order to assure no liquid refrigerant is in the compressor crankcase, and to prevent valve damage of compressor.

Operation of this unit is automatic and will provide heating or cooling depending on the setting of the thermostat.

Heating Operation

1. Set thermostat system switch to "HEAT".
2. Set thermostat lever to desired temperature.
3. Set fan switch to "ON" for continuous indoor blower operation or to "AUTO" for indoor blower to cycle corresponding with thermostat cycling.

Cooling Operation

1. Set thermostat system switch to "COOL".
2. Set thermostat lever to desired temperature.
3. Set fan switch to "ON" for continuous indoor blower operation or to "AUTO" for indoor blower to cycle corresponding with thermostat cycling.

System Shutdown

1. For temporary or short periods of shut-down, set thermostat system to "OFF" and fan switch to "AUTO".
2. For a prolonged period of shut-down, set thermostat system switch to "OFF" and fan switch to "AUTO". Turn off electric power supply. (Two disconnect switches may supply unit.)