

Installation, Operation, and Maintenance

Packaged Terminal Air Conditioner



PTEE070/PTHE070 (7,000 Btuh)
PTEE090/PTHE 090 (9,000 Btuh)
PTEE120/PTHE120 (12,000 Btuh)
PTEE150/PTHE150 (15,000 Btuh)

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Model Number Description

Each Packaged Terminal Air Conditioner/Heat Pump is assigned a multiple-character alphanumeric model number that precisely identifies each unit.

An explanation of the identification code that appears on the unit nameplate is shown below.

The model number helps owner/operator, installing contractors, and service technicians to define the operation, components and options for a specific unit.

Refer to the model number printed on the equipment nameplate when ordering replacement parts or requesting service.

P T E E 0 9 0 1 * A A
1 2 3 4 5 6 7 8 9 10 11

Digits 1, 2—Packaged Terminal Air Conditioner

Digit 3—Product Type

- E = Air Conditioner with auxiliary heat
- H = Heat Pump

Digit 4—Development Sequence

- E = Fifth Development Series

Digit 5, 6, 7—Unit Cooling Capacity

- 070 = 7,000 Btu
- 090 = 9,000 Btu
- 120 = 12,000 Btu
- 150 = 15,000 Btu

Digit 8—Main Power Supply

- 1 = 230-208V/60Hz/1phase
- 2 = 265V/60Hz/1phase
- 4 = 115V/60Hz/1phase (Hydronic Only)

Digit 9 —Electric Heat Capacity*

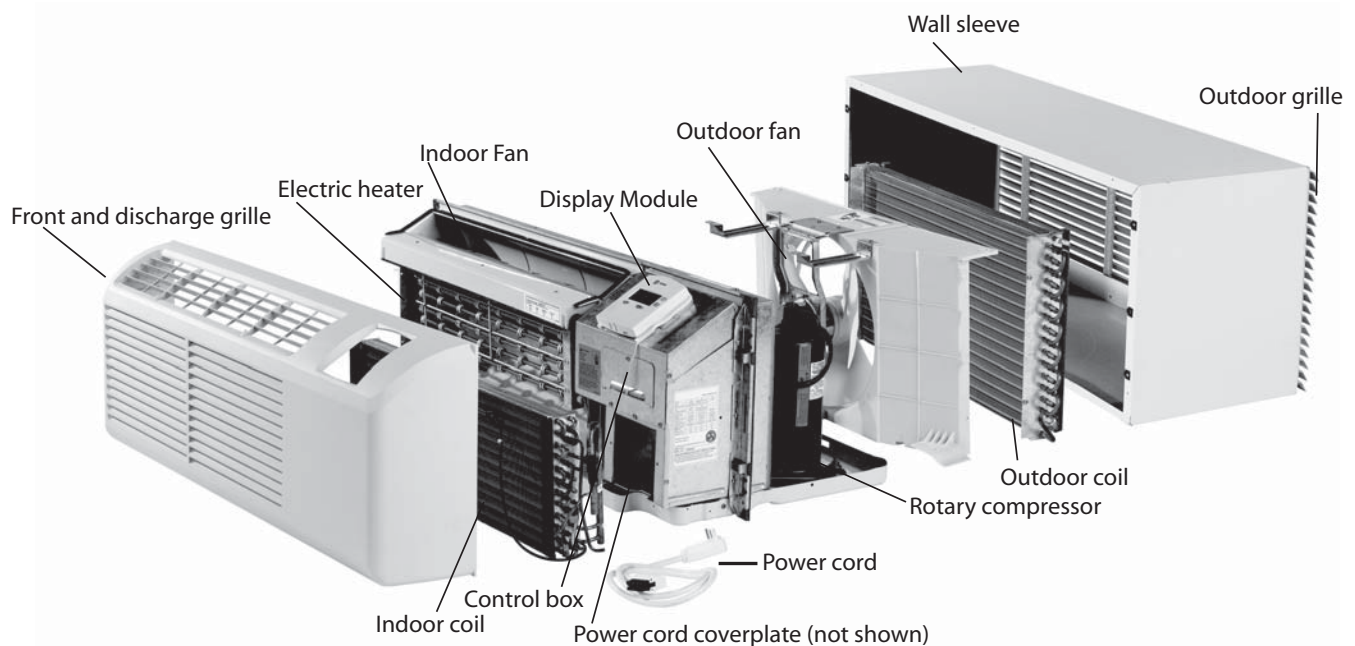
- U = Universal Heater (Heater kW determined by power cord, see Accessories Section)
- W = Hydronic (ships with no front cover & no electric heater)

Digit 10 — Unit Features

- A = Standard
- C = Corrosion Resistant
- D = Internal Condensate Pump

Digit 11—Minor Design Sequence

*All heat pump units must have electric heat.



General Information

NOTICE:

Warnings and Cautions appear in appropriate sections throughout this manual. Read these carefully.

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

CAUTION

Indicates a situation that may result in equipment or property-damage-only accidents.

Overview of Manual

Note: *One copy of this document ships with each unit and is customer property. It must be retained by the customer.*

This booklet describes proper installation, operation, and maintenance procedures for PTACs. By carefully reviewing the information within this manual and following the instructions, the risk of improper operation and/or component damage will be minimized.

It is important that periodic maintenance be performed to help assure trouble free operation. A maintenance schedule is provided at the end of this manual. Should equipment failure occur, contact a service organization with qualified, experienced HVAC technicians to properly diagnose and repair this equipment.

Important Environmental Concerns!

Scientific research has shown that certain man-made chemicals can affect the earth's naturally occurring stratospheric ozone layer when released to the atmosphere.

In particular, several of the identified chemicals that may affect the ozone layer are refrigerants that contain Chlorine, Fluorine and Carbon (CFCs) and those containing Hydrogen, Chlorine, Fluorine and Carbon (HCFCs).

Not all refrigerants containing these compounds have the same potential impact to the environment.

The manufacturer advocates the responsible handling of all refrigerants—including industry replacements for CFCs such as HCFCs and HFCs.

Responsible Refrigerant Practices!

The manufacturer believes that responsible refrigerant practices are important to the environment, our customers, and the air conditioning industry.

All technicians who handle refrigerants must be certified. The Federal Clean Air Act (Section 608) sets forth the requirements for handling, recovering, recycling and reclaiming of certain refrigerants and the equipment that is used in these service procedures.

In addition, some states or municipalities may have additional requirements that must also be adhered to for responsible management of refrigerants. Know the applicable laws and follow them.

WARNING **Hazardous Voltage with Capacitors!**

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

Disconnect all electric power, including remote disconnects and discharge all motor start/run capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power cannot be inadvertently energized. Verify with an appropriate voltmeter that all capacitors have discharged. Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury.

CAUTION **Use Copper Conductors Only!**

Unit terminals are not designed to accept other types of conductors. Failure to use copper conductors may result in equipment damage.

General Information

Refrigerant Handling Procedures

WARNING Contains Refrigerant!

System contains oil and refrigerant under high pressure. Recover refrigerant to relieve pressure before opening the system. See unit nameplate for refrigerant type. Do not use non-approved refrigerants, refrigerant substitutes, or refrigerant additives.

Failure to follow proper procedures or the use of non-approved refrigerants, refrigerant substitutes, or refrigerant additives could result in death or serious injury or equipment damage.

Environmental Accountability Policy

The manufacturer urges that all HVAC servicers make every effort to eliminate, if possible, or vigorously reduce the emission of CFC, HCFC, and HFC refrigerants to the atmosphere. Always act in a responsible manner to conserve refrigerants for continued usage even when acceptable alternatives are available.

Recover and Recycle Refrigerants

Never release refrigerant to the atmosphere!

Always recover and/or recycle refrigerant for reuse, reprocessing (reclaimed), or properly dispose if removing from equipment.

Always determine the recycle or reclaim requirements of the refrigerant before beginning the recovery procedure.

Obtain a chemical analysis of the refrigerant if necessary.

Questions about recovered refrigerant and acceptable refrigerant quality standards are addressed in ARI Standard 700.

Refrigerant Handling and Safety

Consult the manufacturer's material safety data sheet (MSDS) for information on refrigerant handling to fully understand health, safety, storage, handling, and disposal requirements.

Use only approved containment vessels and refer to appropriate safety standards. Comply with all applicable transportation standards when shipping refrigerant containers.

Service Equipment and Procedures

To minimize refrigerant emissions while recovering refrigerant, use the manufacturer's recommended recycling equipment per the MSDS.

Use equipment and methods which will pull the lowest possible system vacuum while recovering and condensing refrigerant. Equipment capable of pulling a vacuum of less than 1,000 microns (1.0 mm) of mercury is recommended.

Do not open the unit to the atmosphere for service work until refrigerant is fully removed/recovered.

When leak-testing with trace refrigerant and nitrogen, use HCFC-22 (R-22) rather than CFC-12 (R-12) or any other fully-halogenated refrigerant.

Be aware of any new leak test methods which may eliminate refrigerants as a trace gas.

Perform evacuation prior to charging with a vacuum pump capable of pulling a vacuum of 1,000 microns (1.0 mm) of mercury or less. Let the unit stand for 12 hours and with the vacuum not rising above 2,500 microns (2.6 mm) of mercury.

A rise above 2,500 microns (2.5 mm) of mercury indicates a leak test is required to locate and repair any leaks. A leak test is required on any repaired area.

Charge refrigerant into the equipment only after equipment does not leak or contain moisture.

Refer to proper refrigerant charge requirements in the maintenance section of this manual to ensure efficient machine operation.

When charging is complete, purge or drain charging lines into an approved refrigerant container.

Seal all used refrigerant containers with approved closure devices to prevent unused refrigerant from escaping to the atmosphere.

Take extra care to properly maintain all service equipment directly supporting refrigerant service work such as gauges, hoses, vacuum pumps, and recycling equipment.

When cleaning system components or parts, avoid using CFC-11 (R-11) or CFC-113 (R-113). Use only cleaning-solvents that do not have ozone depletion factors.

Properly dispose of used materials. Refrigeration system cleanup methods using filters and driers are preferred.

Check for leaks when excessive purge operation is observed.

Keep abreast of unit enhancements, conversion refrigerants, compatible parts, and manufacturer's recommendations that will reduce refrigerant emissions and increase equipment operating efficiencies.

Pre-Installation

Pre-Installation Considerations

Before beginning installation, make the following considerations:

1. Verify the wall opening is in the correct location and the correct size.
2. Drill mounting holes on both sides of the wall sleeve, if equipment requires any of the following options: subbase, leveling legs, or hydronic heat kit.
3. If additional wall sleeve support is required, the leveling leg accessory kit or a subbase kit that includes leveling legs can be used to provide extra support.
4. If installing in a concrete or masonry wall, you must provide a lintel in the wall opening for support. Do not use the wall sleeve as a lintel.

See Figure 1 for a typical lintel construction.

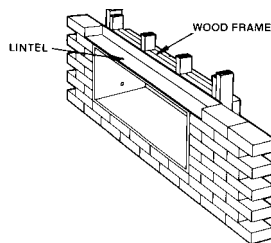


Figure 1. Typical Installation framing with lintel

5. When installing in walls that are deeper than 13 1/2 inches, use an extended wall sleeve. A sleeve without the proper depth will require special care to prevent problems with rain water, condensate drainage, and intake/discharge air.

Under these circumstances, careful jobsite analysis and cautions are required. Consult your local HVAC representative before attempting such installations.

Checklist

The following checklist provides an overview of the factory-recommended pre-installation considerations. Follow the procedures in this section to ensure the installation is complete and adequate for proper unit operation. Verify this checklist is complete before beginning unit installation.

- If unit arrives shipped on its side, do not accept.
- Verify the unit size and tagging with the unit nameplate to ensure the correct unit is received.
- Inspect the unit for possible shipping damage and make any necessary claims with the freight delivery company immediately.
- Verify the installation location is free of airflow obstructions, such as curtains, furniture, trees, or other objects that may block airflow to and from the unit.

WARNING Fire Hazard!

Do not use extension cords. Using extension cords could cause a fire.

- Make provisions for correct supply power and that the electrical receptacle is within 52 inches of the lower right corner of the equipment.
- Ensure the unit wall opening is level.
- Ensure adequate sealing and insulation is around the wall sleeve.

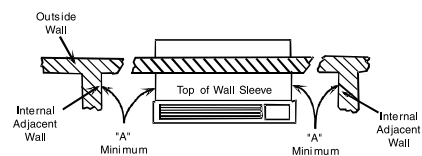


Figure 2. Minimum unit clearance

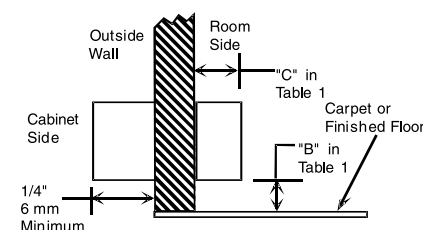


Table 1. Minimum interior and exterior projections

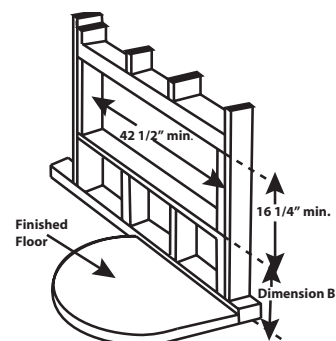


Figure 3. Minimum wall opening dimensions

Pre-Installation

Table 2. Minimum clearances and projections

Option	In.	Mm	In.	Mm	In.	Mm
	Minimum clearances			Minimum projection		
	A		B		C	
Wall sleeve only	3	75	0	0	0	0
Subbase kit	3	75	3 1/4	85	2 3/4	70
Leveling legs kit	3	75	3	75	2	50
Hydronic heat kit ⁽¹⁾	9	230	2-6" ⁽²⁾	50 -150 ⁽³⁾	3-3 1/8 ⁽⁴⁾	76-80 ⁽⁵⁾
Drain kit	3	75	0 ⁽⁶⁾	1 ⁽⁷⁾	0	0
Hardwire kit	3	75	3	75	0	0

⁽¹⁾ Max height is based on skirt options available.

⁽²⁾ This dimension can be from 2-6", but if this dimension exceeds 6" an extended standard kick plate is necessary.

⁽³⁾ This dimension can be from 50-150mm, but if this dimension exceeds 150mm an extended standard kick plate is necessary.

⁽⁴⁾ To achieve a flush fit between the hydronic front and the finished wall, dimension "C" must be between 3" and 3-1/8". If this dimension is more than 3-1/8" there will be a gap between the front and the wall. This gap could permit occupant access to hydronic lines or other dangerous parts.

⁽⁵⁾ To achieve a flush fit between the hydronic front and the finished wall, dimension "C" must be between 76-80mm. If this dimension is more than 80mm there will be a gap between the front and the wall. This gap could permit occupant access to hydronic lines or other dangerous parts.

⁽⁶⁾ If inside mounted then B = 1-1/2 inches

⁽⁷⁾ If inside mounted then B = 40 mm

Receiving and Handling

Shipping Package

The chassis and the cabinet front ship in one carton. Accessories ship separate.

Receiving Checklist

Complete the following checklist immediately after receiving unit shipment to detect possible shipping damage.

- Verify that the unit nameplate data corresponds to the sales order and bill of lading (including electrical data).
- Visually inspect the unit exterior for physical signs of shipping damage or material shortages.
- If a unit appears damaged, inspect it immediately before accepting the shipment. Remove access panels and check for interior component damage. Make specific notations concerning the damage on the freight bill. Do not accept delivery.

- Report concealed damage to the freight line within the allotted time after delivery. Verify with the carrier what their allotted time is to submit a claim.

Note: *Failure to follow these procedures may result in no reimbursement for damages from the freight company.*

- Do not move damaged material from the receiving location. It is the receiver's responsibility to provide reasonable evidence that concealed damage did not occur after delivery.
- Do not continue unpacking the shipment if it appears damaged. Retain all packaging. Take photos of damaged material if possible.
- Notify the carrier's terminal of the damage immediately by phone and mail. Request an immediate joint inspection of the damage by the carrier and consignee.
- Notify your HVAC representative of the damage and arrange for repair. Have the carrier inspect the damage before making any repairs to the unit.

Unit Dimensions

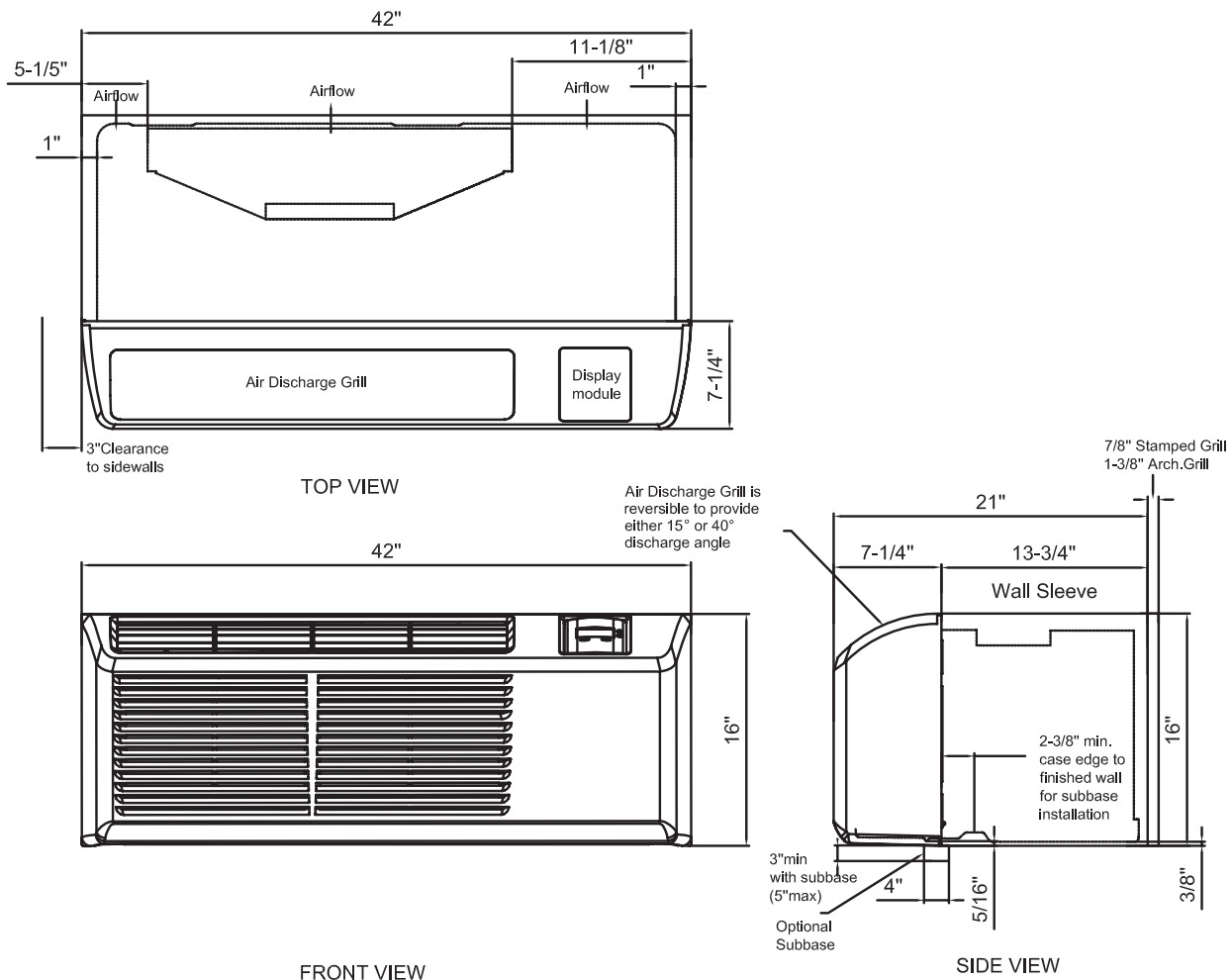


Figure 4. Unit with wall sleeve and subbase accessory

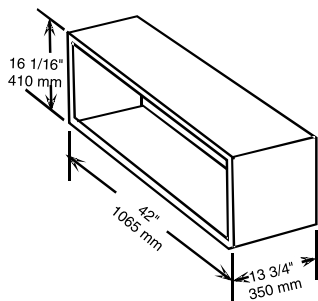


Figure 5. Wall Sleeve

Unit Dimensions

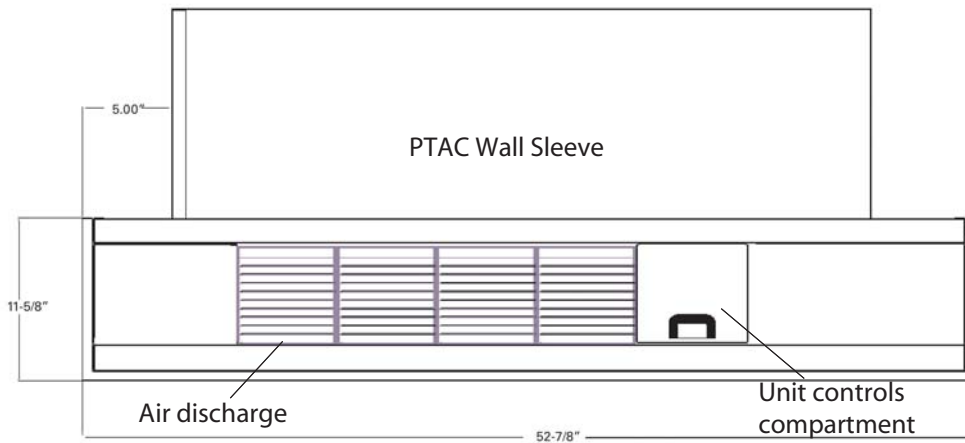


Figure 6. Top view of the hydronic kit

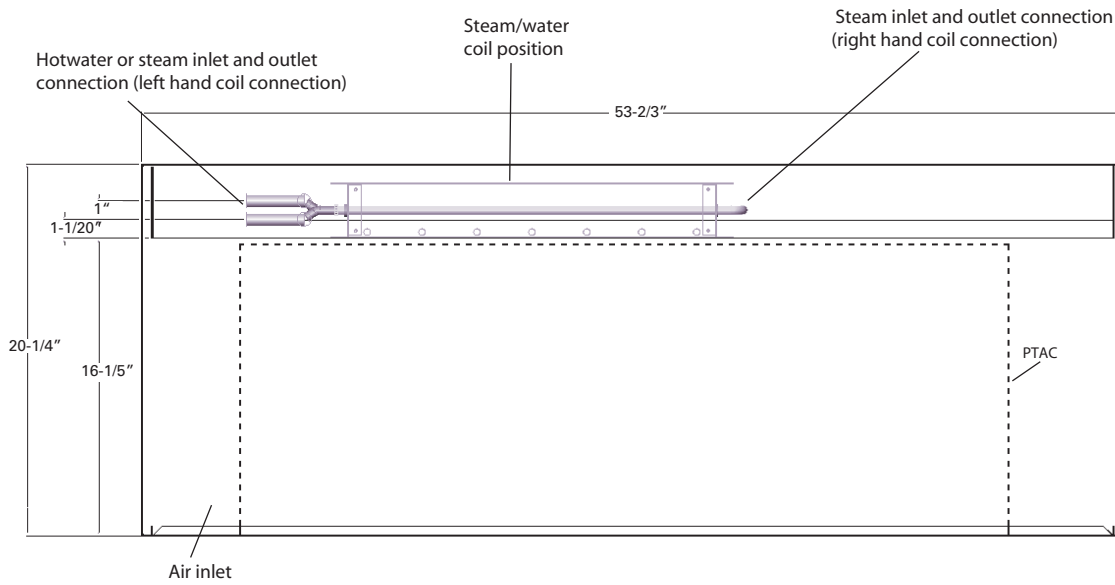


Figure 7. Hydronic kit front view

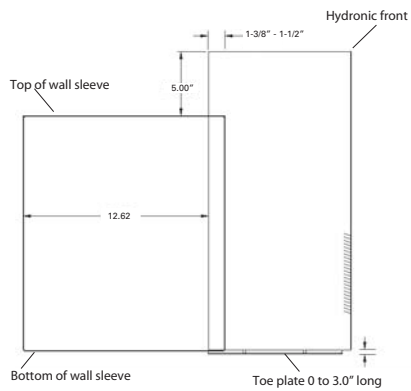


Figure 8. Hydronic kit side view

Installation



WARNING

Live Electrical Components!

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.



WARNING

Fire Hazard!

Do not use an extension cord with this unit. Doing so may cause a fire.

CAUTION

Use Copper Conductors Only!

Unit terminals are not designed to accept other types of conductors. Failure to use copper conductors may result in equipment damage.

Electrical Requirements

The PTAC can be powered by a power cord connected to a receptacle in the wall or in a subbase. It can also be connected directly to the building supply wires with a hard wire kit.

For U.S. approval, 265V units must have a permanent wiring connection. This requirement can be met either by supplying a subbase for concealed cord connection or by direct wiring with the hard wire kit.

The power cord measures 60 inches, with 56 inches usable from the point where the cord exits the unit cabinet and the attached plug.

Installation

Table 3. Electric heat capacity and electrical data, models PTEE and PTHE⁽ⁱ⁾

Voltage ⁽ⁱⁱ⁾	Electric heater Size (kW)	# of stages	Nominal heating			Building circuit requirement			
			Btu/h at 230/208V	Btu/h at 265V	Total watts ⁽ⁱⁱⁱ⁾	Unit total amps	Minimum ampacity ^(iv)	Maximum protection ^(v)	Plug
230/208	2.0/1.6	1	6,800/ 5,500	-	2000/ 1600	8.9/7.9	11.4	15	6 - 15 P
230/208	3.0/2.4	1	10,200/ 8,200	-	3000/ 2400	13.4/11.8	17	20	6 - 20 P
230/208	5.0/4.0	1	17,100/ 13,700	-	5000/ 4000	22.2/19.7	28	30	6 - 30 P
265	2.0	1	-	6,800	2000	7.7	9.8	15	7 - 20 P
265	3.0	1	-	10,200	3000	11.6	14.7	15	7 - 20 P
265	5.0	1	-	17,100	5000	19.3	24.4	25	7 - 30 P

⁽ⁱ⁾ All heat pumps have electric heat.



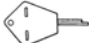







⁽ⁱⁱ⁾ Minimum voltage on 230/208 volt models is 187 volts; maximum is 253 volts. Minimum voltage on 265 volt models is 239 volts; maximum is 292 volts.

⁽ⁱⁱⁱ⁾ Total watts for 7,000 and 9,000 Btu models; add 70 watts for 12,000 and 15,000 Btu models.

^(iv) Minimum branch circuit ampacity ratings conform to the National Electric Code. However, local codes should apply.

^(v) Overcurrent protection for all units without electric heaters is 15 amps. Overcurrent protection on 265 volt models must be cartridge-style time delay fuses.

Table 4. Power receptacle configurations

Unit Voltage Rating	230/208	230/208	230/208	265	265
Unit plug					
Plug amp rating	15	20	30	15/20	30
NEMA designation	6-15P	6-20P	6-30P	7-15P/7-20P	7-30P
Receptacle					
Receptacle amp rating	20	20	30	20	30
NEMA designation	6-20R	6-20R	6-30R	7-20R	7-30R

Installation

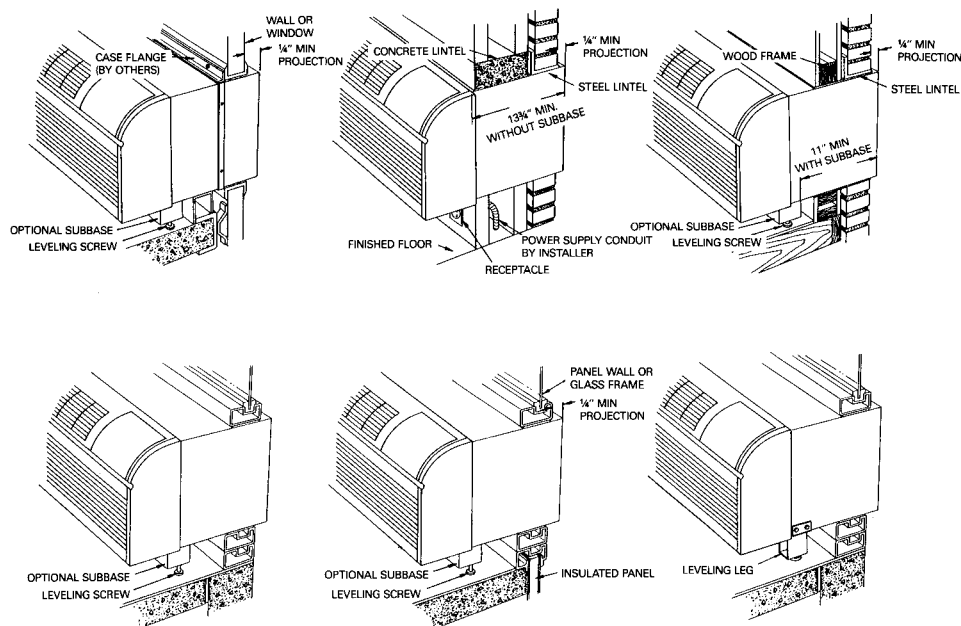


Figure 9. Panel wall installation

Installation Procedure

WARNING Hazardous Voltage w/ Capacitors!

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power cannot be inadvertently energized. For variable frequency drives or other energy storing components provided by Trane or others, refer to the appropriate manufacturer's literature for allowable waiting periods for discharge of capacitors. Verify with an appropriate voltmeter that all capacitors have discharged. Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury. Install components in this order.

1. Remove rear closure panel from wall sleeve.
2. Install drain kit (optional).
3. Install outdoor air grille in wall sleeve.

4. Install wall sleeve in wall opening.
5. Install unit chassis in wall sleeve.
6. Install unit power supply.
 - Power cord
 - Hard wire kit
 - Subbase kit
 - Electrical receptacle
 - Power switch
 - Circuit breaker
7. Install unit controls.
 - Display module
 - Remote wall thermostat
8. Configure display module settings.
9. Programmable settings.

Step 1. Remove rear closure panel from wall sleeve.

1. Remove the zigzag folded cardboard sleeve stiffener. See [Figure 10](#). Remove the rear closure panel by folding the four flaps as indicated in [Figure 11](#)

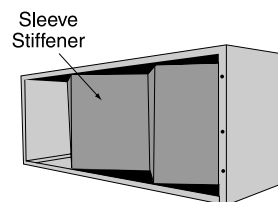


Figure 10. Wall sleeve stiffener

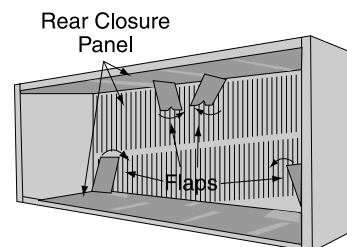


Figure 11. Sleeve rear closure panel

Installation

- Grasping the top and bottom flanges of the rear closure panel as shown in [Figure 12](#), the entire panel is pulled out diagonally from one side.

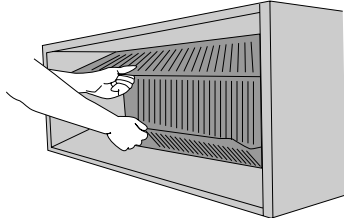


Figure 12. Pull rear closure panel out of wall sleeve

Step 2. Install drain kit in wall sleeve.

Drain kits are available for indoor or outdoor installation to help condensate drain from either the right or left side of the wall sleeve externally, or from the bottom of the sleeve internally.

Note: For installation procedures, please refer to the *Installation Guide that accompanied the accessory*.

If you do not use the drain kit, condensate will drain out of the rear of the wall sleeve. The drain kit must be installed before the outdoor grille is installed.

Step 3. Install outdoor air grille in wall sleeve.

An outdoor air grille directs airflow for proper unit operation and to protect the outdoor coil. Install the grille before installing the chassis.

Outdoor air grille options are either a stamped grille or an architectural grille. When replacing an old chassis with an existing grille, please check with your HVAC representative to determine if the new chassis can be used with the old outdoor grille.

Using the wrong type outdoor grille can decrease cooling or heating capacity, increase energy usage, or shorten compressor life.

Note: For installation procedures, please refer to the *Installation Guide that accompanied the accessory*.

Step 4. Install wall sleeve in wall opening.

For condensate to drain properly inside the unit, the sleeve must be installed properly:

- level from right to left
- with a slight downward pitch from the indoor side to the outdoor side

Note: If equipment is 230/208 volt, verify the electrical receptacle is located within 52 inches of the sleeve's right hand corner. Do not use an extension cord.

Note: For installation procedures, please refer to the *Installation Guide that accompanied the accessory*.

5. Install unit chassis in wall sleeve.



Do not use an extension cord with this unit. Doing so may cause a fire.

- Attach the insulation strip to the upper rear of the wall sleeve. See [Table 13](#). If using an extended wall sleeve, attach the insulation strip between the two baffles, touching the baffle surface facing towards the front.

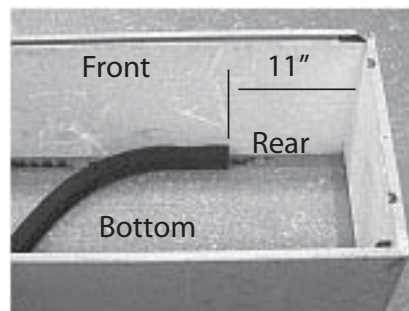


Figure 13. Insulation strip location

- Remove the cabinet front from the chassis by pulling the bottom of the cabinet front away from the chassis until the retaining clips disengage.
- If using a subbase, be sure the right-hand subbase cover is removed before installing the chassis in the wall sleeve.

- Slide the chassis into the wall sleeve until the chassis flanges contact the front edge of the wall sleeve. See [Figure 14](#).
- Secure the chassis to the wall sleeve using three screws on each side of the chassis to ensure a proper seal between the chassis and the wall sleeve. The screws are supplied in a plastic bag which is attached to the power cord. See [Figure 15](#).
- Verify the indoor and outdoor grilles are free of airflow obstructions.
- Make the power supply connections as detailed in the next step.

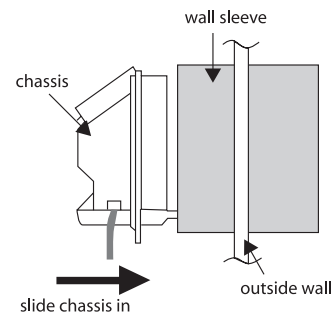


Figure 14. Slide unit chassis into the wall sleeve

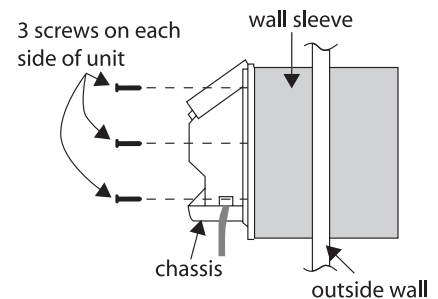


Figure 15. Secure chassis to wall sleeve

Step 6. Install unit power supply.

Note: For installation procedures, please refer to the *Installation Guide that accompanied the accessory*.

Installation

Table 5. Unit power supply

Voltage	Options	Accessory	Accessory part number
115V			
Option 1.	Required:	Universal Power Cord 15 Amp	BAYPCRD007
		A field supplied 115 volt 15 amp receptacle is mounted in the building floor or wall. A Trane 115 volt 15 amp power cord BAYPCRD007 is connected to the PTAC and plugged into the receptacle.	
	Required:	Universal Power Cord 15 Amp	BAYPCRD007
Option 2.		Universal Subbase	BAYSUB001
		A Trane subbase BAYSUB001 is attached to the wall sleeve. A field supplied 115 volt 15 amp receptacle is mounted into the subbase. A Trane 115 volt 15 amp power cord BAYPCRD007 is connected to the PTAC and plugged into the receptacle	
Option 3.	Required:	Hard Wire Kit	BAYHWRK001
		Connector for Hardwire Kit for 15 Amp	BAYCNHK031
		A Trane hardwire kit BAYHRK001 is direct wired to the building power supply and attached to the PTAC. A Trane connector kit BAYCNHK031 is connected to the PTAC and connected to the hard wire kit in the unit mounted junction box	
265 V			
Option 1.	Required:	Universal Subbase	BAYSUB001
		Socket for subbase 20 or 30 Amp	BAYSCKT003, BAYSCKT004
		Universal Power Cord 15,20 or 30 Amp	BAYPCRD004, BAYPCRD005, BAYPCRD006
		Fuses 15, 20 or 30 Amp	BAYFUSE001, BAYFUSE002, BAYFUSE003
	Optional	Power Switch	BAYPSW002
Option 2.	Required:	Hard Wire Kit	BAYHWRK001
		Connector for Hardwire Kit for 15, 20 or 30 Amp	BAYCNHK021, BAYCNHK022, BAYCNHK023
	Optional	Power Switch if 30 Amp	BAYPSW002
230/ 208 V			
Option 1.	Required:	Universal Power Cord 15,20 or 30 Amp	BAYPCRD001, BAYPCRD002, BAYPCRD003
	Optional	Power Switch	BAYPSW002
Option 2.	Required:	Universal Subbase	BAYSUB001
		Socket for subbase 20 or 30 Amp	BAYSCKT001, BAYSCKT002
		Universal Power Cord 15,20 or 30 Amp	BAYPCRD001, BAYPCRD002, BAYPCRD003
	Optional	Circuit Breaker 15, 20 or 30 Amp	BAYCBKR001, BAYCBKR002, BAYCBKR003
		Power Switch	BAYPSW002
Option 3.	Required:	Hard Wire Kit	BAYHWRK001
		Connector for Hardwire Kit for 15, 20 or 30 Amp	BAYCNHK011, BAYCNHK012, BAYCNHK013
	Optional	Power Switch	BAYPSW002

1. All units required either a power cord or hard wire kit to power the unit
2. The Hydronic chassis "W" ships with no electric heat
3. All Hydronic Chassis "W" units required a power cord
4. All 265volt Hydronic chassis "W" required subbase, fuses and socket.

Step 7. Install the unit controls.

The PTAC controller's normal operation can be operated by using either

- Display module - can be wall-mounted or unit mounted.
- Remote Class 2 thermostat -

For Remote Class 2 Thermostat Installation, read installation, operation, and maintenance booklet carefully.

Look in Wiring Diagram section for information on wiring.

If a remote thermostat is connected, the unit's display will not be present and the controller's normal space temperature control functionality is overridden by the remote device.

When the controller is being directed by a remote thermostat, the following inputs/functions are disabled or not present:

1. User display inputs (setpoint/ mode/fan)
2. Dehumidification
3. Configuration setup (indoor fan, setpoint limits, EMS offset, display units)
4. Energy management system
5. Manual Test

Unit functions that remain under direct supervision of the controller are:

1. Random Restart
2. Heat Pump OAT switchover
3. Tubing burst protection
4. Room freeze protection
5. Indoor coil freeze protection
6. Defrost control

When connected to a remote thermostat, the controller interprets the combination of thermostat inputs as its operating mode and behaves accordingly.

It is recommended to use a small screwdriver to gently pry the removable terminal block "TB2" up and off for easy connection.

Installation

Note: If using a third party thermostat to control the unit, the thermostat must have a clearly marked OFF state or position.

Note: It is important to make sure that the control board's fuse is functioning. The specs for the control board fuse are: 5x20mm, 250V, 315mA, fast acting. For more information on a blown fuse on the control board, check the Troubleshooting section of this document.

Table 6. Maximum wire length for front desk switch and remote control connections

External Interface	Wire Specification	
	Size	Length
Thermostat	#22	100 ft.
	#20	200 ft.
	#18	300 ft.
Energy mgmt system	#20	900 ft.
	#18	1500 ft.
Remote fan	#20	60 ft.
	#18	66 ft.
Display module	#20	100 ft.
	#18	120 ft.

Table 7. Wiring Voltage

Unit	Mode	Voltage at terminal					Corresponding Normal Operation
		GH	GL	W	Y	O	
PTEE Air Conditioner (Auxiliary is Electric, Hot Water, or Steam)	High Heat Pump	24	0	0	24	0	Heat
	High Auxiliary Heat	24	0	24	0	X	Heat
	Low Auxiliary Heat	0	24	24	0	X	Heat
	High Cooling	24	0	0	24	X	Cool
	Low Cooling	0	24	0	24	X	Cool
	High Fan	24	0	0	0	X	Fan Only
	Low Fan	0	24	0	0	X	Fan Only
	Off	0	0	0	0	X	Off – no capacity

Notes: In the event that none of the combinations listed in the table above is present, the input will be deemed invalid and all heating, cooling, and fan operation will be disabled.

Table 7. Wiring Voltage

Unit	Mode	Voltage at terminal					Corresponding Normal Operation
		GH	GL	W	Y	O	
PTHE Heat Pump Auxiliary is Electric only	High Heat Pump	24	0	0	24	0	Heat
	Low Heat Pump	0	24	0	24	0	Heat
	High Emgcy Heat	24	0	24	0	0	Heat
		24	0	24	24	0	Electric Heat Only
	Low Emgcy Heat	0	24	24	0	0	Heat
		0	24	24	24	0	Electric Heat Only
	High Cooling	24	0	0	24	24	Cool
	Low Cooling	0	24	0	24	24	Cool
	High Fan	24	0	0	0	0	Fan Only
	Low Fan	0	24	0	0	0	Fan Only
	Off	0	0	0	0	0	Off – no capacity

Installation

Table 8. Output settings

User Mode / Model	ID Fan High	ID Fan Low	Aux Heat	Comp	Rev Valve (PTHE)	OD Fan	Rmt Fan	Cond Pump (PTHE)	Vent Door / Fan
High Heat Pump (PTHE only)	ON	OFF	OFF	ON	OF	ON	EN	EN	EN
Low Heat Pump (PTHE only)	OFF	ON	OFF	ON	OFF	ON	EN	EN	EN
High Emergency/ Auxiliary Heat	ON	OFF	ON	OFF	N/C	OFF	EN	EN	EN
Low Emergency/ Auxiliary Heat	OFF	ON	ON	OFF	N/C	OFF	EN	EN	EN
High Cooling	ON	OFF	OFF	ON	ON	ON	EN	EN	EN
Low Cooling	OFF	ON	OFF	ON	ON	ON	EN	EN	EN
High Fan	ON	OFF	OFF	OFF	N/C	OFF	EN	EN	EN
Low Fan	OFF	ON	OFF	OFF	N/C	OFF	EN	EN	EN
Off	OFF	OFF	OFF	OFF	N/C	OFF	OFF	EN	OFF

Notes: EN = Enabled - operations based on other logic

Notes: N/C = No change from prior state

Step 8. Configure the display module settings

Indoor Temperature setpoint

The indoor temperature setpoint buttons tell the unit how warm or cool the occupant wants the room.

The setpoint is set by pressing the up/down buttons on the interface module. These buttons do not scroll (i.e. holding the button will not continue to adjust the setpoint value) because each adjustment of the setpoint value requires its own unique button press.

Default setpoint on first power up: 72°F (22.0°C – closest approximation)

Setpoint resolution: ± 1°F (± 0.5°C)

User Mode Selection

Pressing the MODE button on the unit tells the unit which mode the occupant prefers. There are four modes to choose from.

1. COOL
2. HEAT
3. FAN (fan only)
4. OFF (default for first power up)



Figure 16. Digital display module

Fan Speed Selection

Pressing the FAN button on the interface module determines fan speed. There are two fan speeds to choose from.

1. LOW (default for first power up)
2. HIGH

Field commissioning support

Manual Test Mode

A manual test mode is provided to allow a field technician to verify proper output and end device operation through a predetermined, timed sequence.

The sequence will automatically advance through all outputs and exit when the sequence has completed; it is left to the technician to monitor the status of the end devices during the test to verify that each operates properly.

Manual test is initiated by combining the following conditions:

- User Mode = OFF
- Press and hold MODE & SETPOINT DOWN for 5 seconds

During the test process, the word "STEP" and the corresponding step number will be lighted on the display. After the final step has been executed, the controller will exit Manual test and force the controller into a reset.

Manual test mode may be cancelled by pressing any button on the display.

Manual test is not available if there is no interface module, as is in Class 2 control applications.

The test sequence attempts to clear unit diagnostics and restore normal unit operation prior to testing the outputs. If the diagnostics remain after an attempt to clear them, manual test may be affected or disallowed.

Dehumidification

The PTAC controller does not directly measure room humidity.

The PTAC provides dehumidification by combining the following actions in a predefined sequence.

1. The PTAC subcools the room to a preset state, a dehumidification offset below the cooling setpoint.
2. The unit will automatically adjust the fan speed.
3. When incorporating the vent door option, the controller will automatically adjust its position.

Installation

Step 9. Programmable Settings

The controller has a total of six (7) parameters that are user-configurable:

1. Vent Door Configuration
2. Indoor Fan Cycle configuration
3. Temperature Setpoint Limiting configuration
4. Energy Management Setpoint Offset configuration
5. Display Units configuration
6. Indoor Temperature Calibration
7. DH Offset

The interface module texts "SETTING" and "STEP" provide user feedback when the unit is in the configuration mode. The number directly above the word "STEP" indicates the configuration step that is being adjusted. The numbers above the word "SETTING" (XX.x) indicate the value of the parameter.

In order for the user to access the configurable parameters, a digital display module must be present.

The configuration set-up mode is entered by pressing and holding the "MODE" and "FAN" buttons simultaneously for 5 seconds.

Table 9. Set point configuration

Configuration step	Step description	Configuration setting	Setting description
1	Ventilation Enable	0	Ventilation is disabled
		1 (default)	Ventilation is enabled
2	Indoor fan cycle	0 (default)	Cycle with compressor continuously, OFF in OFF mode ON continuously, HIGH in OFF mode
		1	
		2	
3	Temperature Setpoint Limits	0 (default)	cool 50 - 90°F, heat 50 - 90°F
		1	cool 55 - 90°F, heat 50 - 85°F
		2	cool 60 - 90°F, heat 50 - 80°F
		3	cool 65 - 90°F, heat 50 - 75°F
4	Energy Management	Default: 10°F (5.5°C)	
		Range: 0 to 20°F (0.0 to 10.0°C)	
		Resolution: 1.0°F (0.5°C)	
5	Display units	0 (default)	IP (English)
		1	SI (Metric)
6	Indoor Temperature Calibration	Default: 0°F (0.0°C)	
		Range: -9 to 9°F (-5.0 to 5.0°C)	
		Resolution: 1.0°F (0.5°C)	
7	DH offset	Default: 1°F (0.5°C)	
		Range: 0 to 2°F (0.0 to 1.0°C)	
		Resolution 1.0°F (0.5°C)	Value of zero disables DH.

Installation

1. Ventilation Door Function

The power door works based upon control logic functions. When the unit is on, the vent door will open to allow fresh air to be conditioned before entering the room. When the unit is off, the door closes to prevent unconditioned air from entering the room.

For more information on vent door function with dehumidification, refer to the dehumidification chart.

2. Indoor Fan Cycle set up

The indoor fan can be configured to provide different types of operation between its OFF and ON (high/low) states. This setting is adjustable and does not force the unit to reset.

3. Temperature Setpoint Limiting set up

The range of temperature control setpoints can be limited using this configuration parameter. After the controller has determined the desired user setpoint from the display, the resulting value is validated against the setpoint limits. There are four valid combinations of heating and cooling setpoint limits:

These set point limits apply to both the occupied and unoccupied standby, heating and cooling setpoints. This setting is adjustable "on-the-fly" and will not force the unit into a restart condition.

4. Energy Management Setpoint Offset set up

The range of the Energy Management System's effect on setpoints can be adjusted using this configuration parameter. This parameter is adjustable "on-the-fly" and will not force the controller into a restart condition. The range and resolution of available selections is

Range: 0°F to 20°F (0.0°C to 11.0°C)

Resolution: 1.0°F (0.5°C)

5. Display Unit set up

The user can change the way the interface module displays temperature. The symbols °F and °C will not be present on the display; however, the range and precision of the room temperature and setpoint values will make the selection obvious.

6. Indoor temperature calibration

The indoor temperature can be calibrated to match an independent reading. The adjustment range is +/- 10.0°F (6°C) with a resolution of 1°F (0.5°C).

7. Dehumidification Offset

The offset defines the point below the setpoint where the unit will stop running the compressor. A DH display module is required to use this feature.

The PTAC allows the options of 0°F (disable), 1°F (default) and 2°F (optional) for the dehumidification offset. The dehumidification feature will be disabled when the configuration of 0°F is selected.

Last User Setpoint, Mode, and Fan Selections

The controller saves the last inputs that the user has chosen 5 seconds after the user has ceased changing them. These settings will be used after the next power cycle or controller reset.

Operation without configuration

The controller tests the configuration for validity. If the data is corrupted the controller will revert to default values for every parameter. A diagnostic code will be displayed when using the default values.

Table 10. Display units

Selection #	Unit of Measure	Display Example
0	IP (English)	77 (DEFAULT)
1	SI (Metric)	24.5

Table 11. Setpoint limiting

Selection #	Cooling Setpoint		Heating Setpoint	
	Low Limit	High Limit	Low Limit	High Limit
0	50°F	90°F	50°F	90°F (DEFAULT)
1	55°F	90°F	50°F	85°F
2	60°F	90°F	50°F	80°F
3	65°F	90°F	50°F	75°F

Installation

Table 12. Indoor fan cycle configuration

Config #	Indoor Fan Cycle Mode
0	Indoor fan will not run when the user mode is OFF. (DEFAULT)
	Indoor fan will cycle to the user selected speed in conjunction with the compressor or electric heat during HEAT or COOL
	Indoor fan will run continuously at the user selected fan speed during FAN
	EMS has no affect.
1	Indoor fan will normally run continuously at the user selected fan speed.
	Indoor fan will not run when the user mode is OFF.
2	Indoor fan will cycle in conjunction with the compressor or electric heat when the EMS is enabled.
	Indoor fan will normally run continuously at the selected fan speed.
	Indoor fan will run at HIGH speed when the user mode is OFF.
	Indoor fan will cycle in conjunction with the compressor or electric heat when the EMS is enabled.

Energy Management System

Occupancy States

The controller is designed to handle two possible occupancy states:

- occupied
- occupied standby

When the Energy Management System input is present, it is possible for the controller to switch between the two occupancy states.

If the EMS input is not connected, the controller will always assume the occupied state.

Occupied Standby state

When the controller is in occupied standby state, the unit runs space comfort control using the occupied standby setpoints. All heating/cooling/ventilation features are enabled. Because the occupied standby setpoints cover a wider range than the occupied setpoints the demand for heating and cooling the space is reduced.

Table 13. Occupancy arbitration for energy management

EMS Input State	Controller Occupancy State
Open or Not Present	Occupied
Closed	Occupied Standby

Occupied state

When the controller is in the occupied state, the unit runs space comfort control using the occupied setpoints. All heating/cooling/ventilation features are enabled.

Installation

Table 14. PTEE manual test sequence

Step		Indoor Fan High	Indoor Fan Low	Remote Fan	Outdoor Fan	Condensate Pump	Comp	Reversing Valve	Aux. Heat	Ventilation Door/Fan	Time in Step
1	All off	Off	Off	Off	Off	N/A (Off)	Off	N/A (Off)	Off	Off	10 sec
2	Fan high	On	Off	Off	Off	N/A (Off)	Off	N/A (Off)	Off	Off	20 sec
3	Fan Low	Off	On	Off	Off	N/A (Off)	Off	N/A (Off)	Off	Off	20 sec
4	Remote Fan	Off	On	On	Off	N/A (Off)	Off	N/A (Off)	Off	Off	20 sec
5	Outdoor Fan	Off	On	Off	On	N/A (Off)	Off	N/A (Off)	Off	Off	20 sec
6	Compressor	Off	On	Off	On	N/A (Off)	On	N/A (Off)	Off	Off	60 sec
7	Aux Heat	Off	On	Off	OnOff	N/A (Off)	Off	N/A (Off)	On	Off	60 sec
8	Vent Door	Off	On	Off	OnOff	N/A (Off)	Off	N/A (Off)	Off	On	20 sec
Exit											

Table 15. PTHE manual test sequence

Step		Indoor Fan High	Indoor Fan Low	Remote Fan	Outdoor Fan	Condensate Pump	Comp	Reversing Valve	Aux Heat	Ventilation Door/Fan	Time in Step
1	All off	Off	Off	Off	Off	Off	Off	Off	Off	Off	10 sec
2	Fan High	On	Off	Off	Off	Off	Off	Off	Off	Off	20 sec
3	Fan Low	Off	On	Off	Off	Off	Off	Off	Off	Off	20 sec
4	Remote Fan	Off	On	On	Off	Off	Off	Off	Off	Off	20 sec
5	Outdoor Fan	Off	On	Off	On	Off	Off	Off	Off	Off	20 sec
6	Condensate Pump	Off	On	Off	On	On1	Off	Off	Off	Off	20 sec
7	Compressor on Cooling	Off	On	Off	On	Off	On	OffOn	Off	Off	60 sec
8	Compressor Off	Off	Off	On	Off	On	Off	Off	OffOn	Off	60 sec
9	Compressor on Heating	Off	On	Off	On	Off	On	OnOff	Off	Off	60 sec
10	Aux Heat	Off	On	Off	OnOff	Off	Off	OnOff	On	Off	60 sec
11	Vent Door	Off	On	Off	OnOff	Off	Off	Off	Off	On	20 sec
Exit											

Operation

Sequence of Operation

Automatic 3-minute Compressor Lockout

After the compressor cycles off, it will not restart for three minutes. This feature prevents the compressor from short cycling and extends the overall life.

Automatic 2nd Stage Electric Heat (PTHE only)

If the room temperature falls to 2.5°F below the setpoint temperature or the unit compressor fails, the reverse cycle heat is shut off and the electric heat is turned on.

Indoor Room Freeze Protection

When the unit senses room temperatures of 40°F or below, the unit activates the indoor fan motor and either the electric resistance heater or the hydronic heater to help prevent pipes or fixtures from freezing.

This also overrides the Energy Management System input for unit mounted or wall mounted display modules

Random Restart Function

This function allows random restart of the PTAC units in the event of a power outage. The restart delay reduces the initial inrush current from the building to help prevent a second power outage caused by too much current draw.

The random restart function will occur after every power up cycle by delaying the operation of the unit for 0 to 90 seconds. Compressor minimum off time is enforced after the random restart function has completed.

Door Switch Occupancy Sensor

The PTAC can accommodate a field-installed door switch and occupancy sensor to operate the energy management feature.

Remote Thermostat Control

Each unit can be operated from any standard 4 or 5-wire, remote-mounted thermostat. Also, the unit has a built-in low voltage power source that can accommodate either a manual, auto changeover, or programmable thermostat.

Setpoint Limiting

The setpoint limiting feature reduces energy costs by controlling the maximum setpoint in heating and the minimum setpoint in cooling.

Active Defrost (PTHEs only)

PTACs have an active defrost system that removes ice build-up on the outdoor coil, which may occur during the heat pump cycle.

Remote Thermostat Operation

The GL, GH, O, W, Y, R, and C terminals provide control inputs for a remote wall-mounted thermostat.

The terminals listed control the operation of the unit when no display module is used. A display module will take precedence over any of these inputs.

Mode Button Operation

OFF - cooling and heating functions stop.

HEAT - room temperature is maintained by cycling in heat pump mode or electric heat. The model PTHE switches from heat pump mode to electric heat when the outdoor air temperature is below 20°F (approximately), or when the heat pump cannot keep up with the heating load when using a two-stage thermostat.

COOL - room temperature is maintained by cycling the air conditioner.

FAN - the fan runs at the user selected speed or runs as otherwise configured.

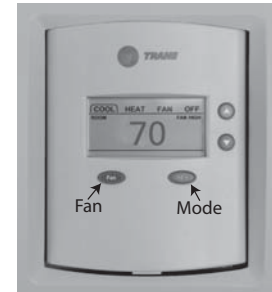


Figure 17. Digital display module

Fan Operation

The fan speed may be user selected as either high or low. Fan cycling versus continuous is operation configurable. See section on configuration for details.

Front Desk Control (FD1, FD2 Inputs)

The energy management input is used to move the setpoint up in the case of cooling and down in the case of heating. This conserves energy by reducing the demand in the space.

The energy management input is a dry contact closure; typically this is driven from either a occupancy sensor or a front desk control system.

Operation

Table 16. User inputs

Input	Function
TB1	
+	Remote display communications link (+)
-	Remote display communications link (-)
TB2	
EN	Energy management system input
VT	Ventilation input
O	Reversing valve (class 2 thermostat)
GL	Low fan speed (class 2 thermostat)
GH	High speed fan (class 2 thermostat)
Y	Cool (class 2 thermostat)
W	Heat (class 2 thermostat)
R	24VAC common1
C	Ground2
RF	Remote fan relay output

Notes:

1. Connection to R enables input functions W, Y, GL, GH, O, VT, and/or EN.
2. Connect 24VAC, 3VA maximum Remote Fan Control Relay to RF and C

Remote Fan Operation

PTACs can operate a remote fan to provide conditioned air to additional rooms or areas that are not well ventilated. The remote fan operates any time the PTAC indoor fan is operating.

The remote fan requires a 24 VAC, 3 VA maximum relay that connects to the control board RF and C terminal user inputs. The relay and remote fan are field supplied. Refer to the wiring diagrams section for wiring details.

Vent Control

Vent control draws fresh air into the conditioned area to provide ventilation when the indoor fan is operating. However, this may increase heating cooling loads and operating costs.

To obtain access to the vent control, remove the cabinet front and locate the vent control lever on the left side of the chassis. Push the vent control lever up to open the vent or down to close.

The unit ships with the vent door closed and secured by a screw.



CAUTION Freezing Temperatures!

Do not allow liquid refrigerant to contact skin. If it does, treat the injury similar to frostbite. Slowly warm the affected area with lukewarm water and seek immediate medical attention. Direct contact with liquid refrigerant may cause minor or moderate injury.

Air Discharge Grille

The discharge grille can be adjusted to expel air at either a 15° or 40° (40° default) angle. [Figure 18](#).

To change the discharge air airflow angle:

1. Remove the front cabinet.
2. Position the front cabinet so that the backside is accessible.
3. Remove the four screws which secure the discharge air grille to the cabinet front with a phillips-head screwdriver. See [Figure 31](#).
4. Rotate the grille 180° end-for-end.
5. Reinstall the screws securing the discharge air grille to the cabinet front. Reinstall the cabinet front on the unit.



Figure 18. Discharge air grille

Operation

Table 17. Air conditioner performance data

Voltage (V)	PTEE 07				PTEE 09				PTEE 12				PTEE 15		
	115	208	230	265	115	208	230	265	115	208	230	265	208	230	265
Cooling data															
Cooling capacity (Btu/H)	7,200	6,800	7,000	7,300	9,300	8,800	9,000	8,700	12,000	11,600	11,800	11,800	13,700	13,900	14,400
Cooling amps (A)	5.3	2.9	2.7	2.4	7.3	3.9	3.6	3.1	9.7	5.1	4.8	4.1	6.9	6.4	5.7
EER (Btu/H/watt)	12.2	12.0	12.0	12.0	11.5	11.4	11.4	11.3	11.2	11.2	11.2	11.3	10.0	10.0	9.8
Moisture removal (Pts/h)	1.8	2.1	2.1	2.1	2.2	2.5	2.6	2.6	3.0	3.1	3.1	3.1	4.1	4.1	4.1
Heat pump heating data															
Heating capacity (Btu/H)															
	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Heating amps (A)															
	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Heating power (W)															
	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
COP (W/W)															
	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Airflow															
Indoor cfm (wet)															
@0.3 esp (hi)	280	225	256	256	325	225	256	256	350	295	325	325	320	350	350
Indoor cfm (wet)															
@0.3 esp (lo)	250	191	225	225	294	191	225	225	320	266	294	294	290	320	320
Indoor cfm (dry)															
@0.3 esp (hi)	312	260	290	290	350	260	290	290	400	320	350	350	365	400	400
Indoor cfm (dry)															
@0.3 esp (lo)	280	235	266	266	323	235	266	266	360	293	323	323	330	360	360
Electric heat data															
Heater size (kW)															
208V	*	1.6	2.4	*	*	1.6	2.4	4.0	*	1.6	2.4	4.0	1.6	2.4	4.0
230V	*	2.0	3.0	*	*	2.0	3.0	5.0	*	2.0	3.0	5.0	2.0	3.0	5.0
265V	*	2.0	3.0	*	*	2.0	3.0	5.0	*	2.0	3.0	5.0	2.0	3.0	5.0
Btu/H															
208V	*	5,500	8,200	*	*	5,500	8,200	13,700	*	5,500	8,200	13,700	5,500	8,200	13,700
230V	*	6,800	10,200	*	*	6,800	10,200	17,100	*	6,800	10,200	17,100	6,800	10,200	17,100
265V	*	6,800	10,200	*	*	6,800	10,200	17,100	*	6,800	10,200	17,100	6,800	10,200	17,100
Heating watt															
208V	*	1,600	2,400	*	*	1,600	2,400	4,000	*	1,600	2,400	4,000	1,600	2,400	4,000
230V	*	2,000	3,000	*	*	2,000	3,000	5,000	*	2,000	3,000	5,000	2,000	3,000	5,000
265V	*	2,000	3,000	*	*	2,000	3,000	5,000	*	2,000	3,000	5,000	2,000	3,000	5,000
Heating amps															
208V	*	7.9	11.8	*	*	7.9	11.8	19.7	*	7.9	11.8	19.7	7.9	11.8	19.7
230V	*	8.9	13.4	*	*	8.9	13.4	22.2	*	8.9	13.4	22.2	8.9	13.4	22.2
265V	*	7.7	11.6	*	*	7.7	11.6	19.3	*	7.7	11.6	19.3	7.7	11.6	19.3

Notes: Certified in accordance with the Unitary Air-Conditioner Equipment Certification Program, which is based on ARI Standard 310/380.

Operation

Table 18. Heat pump performance

	PTHE 07			PTHE 09			PTHE 12			PTHE 15		
Voltage (V)	208	230	265	208	230	265	208	230	265	208	230	265
Cooling data												
Cooling capacity(Btu/H)	7,200	7,400	7,200	8,900	9,100	8,700	11,700	12,000	11,700	13,300	13,600	13,600
Cooling amps (A)	2.9	2.7	2.3	3.9	3.7	3.1	5.1	4.8	4.2	6.8	6.3	5.5
EER(Btu/H watt)	12.0	12.0	12.0	11.4	11.4	10.8	11.2	11.2	11.0	9.9	9.9	9.9
Moisture removal (Pts/h)	2.1	2.1	2.1	2.5	2.6	2.6	3.0	3.1	3.1	4.1	4.1	4.1
Heat pump heating data												
Heating capacity (Btu/H)	5,900	6,100	6,100	7,600	7,800	7,300	9,900	10,100	10,100	12,200	12,500	12,500
Heating amps (A)	2.6	2.5	2.1	3.4	3.2	2.6	4.3	4.0	3.5	5.8	5.4	4.7
Heating power (W)	540	560	560	695	715	715	935	955	925	1230	1260	1260
COP (W/W)	3.2	3.2	3.2	3.2	3.2	3.0	3.1	3.1	3.2	2.9	2.9	2.9
Airflow												
Indoor cfm (wet) @0.3 esp (hi)	225	256	256	225	256	256	295	325	325	320	350	350
Indoor cfm (wet) @0.3 esp (lo)	191	225	225	191	225	225	266	294	294	290	320	320
Indoor cfm (dry) @0.3 esp (hi)	260	290	290	260	290	290	320	350	350	365	400	400
Indoor cfm (dry) @0.3 esp (lo)	235	266	266	235	266	266	293	323	323	330	360	360
Electric heat data												
Heater size (kW)												
208V	1.6	2.4	*	1.6	2.4	4.0	1.6	2.4	4.0	1.6	2.4	4.0
230V	2.0	3.0	*	2.0	3.0	5.0	2.0	3.0	5.0	2.0	3.0	5.0
265V	2.0	3.0	*	2.0	3.0	5.0	2.0	3.0	5.0	2.0	3.0	5.0
Btu/H												
208V	5,500	8,200	*	5,500	8,200	13,700	5,500	8,200	13,700	5,500	8,200	13,700
230V	6,800	10,200	*	6,800	10,200	17,100	6,800	10,200	17,100	6,800	10,200	17,100
265V	6,800	10,200	*	6,800	10,200	17,100	6,800	10,200	17,100	6,800	10,200	17,100
Heating watt												
208V	1,600	2,400	*	1,600	2,400	4,000	1,600	2,400	4,000	1,600	2,400	4,000
230V	2,000	3,000	*	2,000	3,000	5,000	2,000	3,000	5,000	2,000	3,000	5,000
265V	2,000	3,000	*	2,000	3,000	5,000	2,000	3,000	5,000	2,000	3,000	5,000
Heating amps												
208V	7.9	11.8	*	7.9	11.8	19.7	7.9	11.8	19.7	7.9	11.8	19.7
230V	8.9	13.4	*	8.9	13.4	22.2	8.9	13.4	22.2	8.9	13.4	22.2
265V	7.7	11.6	*	7.7	11.6	19.3	7.7	11.6	19.3	7.7	11.6	19.3

Notes: Certified in accordance with the Unitary Air-Conditioner Equipment Certification Program, which is based on ARI Standard 310/380.

Notes: Shaded area is rating ampere

Operation

Table 19. Cooling temperature change - air conditioners

Room air dry bulb	Room air wet bulb	PTEE0701	PTEE0702	PTEE0901	PTEE0902	PTEE1201	PTEE1202	PTEE1501	PTEE1502
		Temperature across indoor coil (ΔT)		Temperature across indoor coil (ΔT)		Temperature across indoor coil (ΔT)		Temperature across indoor coil (ΔT)	
		Min	Max	Min	Max	Min	Max	Min	Max
	Rating Btu/H	7200	7600	8800	9000	11700	12000	14100	14300
	Rating cfm	230	260	240	270	300	330	315	355
90	85	1	3	2	6	1	5	1	4
	80	8	13	11	14	9	13	8	12
	75	19	22	19	22	18	22	16	20
	70	30	33	28	30	26	30	25	27
85	80	4	9	7	11	5	10	5	8
	75	14	19	15	18	13	18	12	16
	70	23	27	23	25	21	25	20	23
	65	34	36	31	33	29	33	28	30
80	75	9	14	11	14	9	13	8	12
	70	18	21	18	20	15	20	15	18
	65	26	29	24	27	23	26	21	24
	60	35	36	32	33	29	33	29	30
75	70	12	16	13	16	10	15	10	14
	65	18	22	18	21	15	20	15	19
	60	25	28	23	26	21	25	20	24
	55	31	34	28	31	26	30	26	28
70	65	12	15	12	14	9	13	9	13
	60	17	20	16	18	13	17	13	17
	55	22	24	20	22	18	21	17	21

Table 20. Cooling temperature change - heat pumps

Room air dry bulb	Room air wet bulb	PTHE0701	PTHE0702	PTHE0901	PTHE0902	PTHE1201	PTHE1202	PTHE1501	PTHE1502
		Temperature across indoor coil (ΔT)		Temperature across indoor coil (ΔT)		Temperature across indoor coil (ΔT)		Temperature across indoor coil (ΔT)	
		Min	Max	Min	Max	Min	Max	Min	Max
	rating Btu/H	7300	7600	9000	9300	11800	12000	14000	14600
	rating cfm	195	225	240	270	315	355	315	355
90	85	1	3	2	6	1	5	1	4
	80	8	13	11	15	10	13	8	12
	75	19	22	19	22	18	22	17	20
	70	30	33	29	30	26	30	25	28
85	80	4	9	7	11	5	10	5	9
	75	14	19	15	18	14	18	12	16
	70	23	27	23	25	21	25	21	23
	65	33	36	31	33	30	33	28	31
80	75	9	14	11	15	10	13	8	12
	70	18	21	18	20	16	20	16	18
	65	26	29	24	27	23	26	22	25
	60	35	36	32	33	30	33	29	31

Operation

Table 20. Cooling temperature change - heat pumps (continued)

Room airdry bulb	Room air wet bulb	PTHE0701		PTHE0702		PTHE0901		PTHE0902		PTHE1201		PTHE1202		PTHE1501		PTHE1502	
		Temperature across indoor coil (ΔT)				Temperature across outdoor coil (ΔT)				Temperature across indoor coil (ΔT)				Temperature across indoor coil (ΔT)			
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
75	70	12	16	13	16	11	15	10	14								
	65	18	22	18	21	16	20	16	19								
	60	24	28	23	26	21	25	21	24								
	55	31	34	29	31	26	30	26	29								
70	65	12	15	12	15	10	13	9	13								
	60	17	20	16	18	14	17	13	17								
	55	22	24	20	22	18	21	18	21								

Table 21. Cooling amperage – air conditioners

Condenser inlet air temp.	PTEE0701		PTEE0702		PTEE0901		PTEE0902		PTEE1201		PTEE1202		PTEE1501		PTEE1502	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
	2.6	2.9	2.4	2.4	3.6	3.9	3.2	3.2	4.8	5.2	4.2	4.2	6.5	7.1	5.7	5.7
100	2.6	2.9	2.4	2.6	3.4	4.0	2.9	3.1	5.6	5.6	3.9	4.3	6.6	8.0	5.6	6.2
95	2.4	2.8	2.3	2.5	3.2	3.8	2.7	3.0	5.4	5.3	3.7	4.1	6.2	7.6	5.3	5.9
90	2.3	2.7	2.2	2.4	3.1	3.6	2.6	2.9	5.2	5.1	3.6	3.9	5.9	7.2	5.1	5.6
85	2.2	2.6	2.1	2.3	2.9	3.4	2.5	2.7	4.9	4.8	3.4	3.8	5.6	6.8	4.8	5.3
80	2.1	2.4	2.0	2.2	2.8	3.3	2.3	2.6	4.7	4.6	3.2	3.6	5.3	6.4	4.6	5.1

Table 22. Cooling amperage – heat pumps

Condenser inlet air temp.	PTHE0701		PTHE0702		PTHE0901		PTHE0902		PTHE1201		PTHE1202		PTHE1501		PTHE1502	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
	2.6	2.9	2.4	2.4	3.6	3.9	3.2	3.2	4.8	5.2	4.2	4.2	6.5	7.1	6.3	6.3
100	2.6	2.9	2.5	2.7	3.4	4.0	3.0	3.2	5.6	5.5	4.1	4.5	6.6	8.0	5.5	6.8
95	2.4	2.8	2.4	2.6	3.2	3.8	2.8	3.1	5.3	5.2	3.9	4.3	6.2	7.6	5.2	5.8
90	2.3	2.6	2.2	2.5	3.1	3.6	2.7	3.0	5.0	5.0	3.7	4.1	5.9	7.2	5.0	5.5
85	2.1	2.5	2.1	2.3	3.1	3.4	2.6	2.9	4.8	4.7	3.5	3.9	5.6	6.8	4.7	5.2
80	2.1	2.3	2.1	2.2	2.9	3.3	2.5	2.7	4.6	4.5	3.3	3.7	5.3	6.4	4.5	4.9

Notes: Shaded area is rating ampere

Operation

Table 23. Heating total wattage input – heat pumps

Outside air dry-bulb	Room air dry-bulb	PTHE 0701	PTHE 0702	PTHE 0901	PTHE 0902	PTHE 1201	PTHE 1202	PTHE 1501	PTHE 1502
		Min	Max	Min	Max	Min	Max	Min	Max
		520	535	670	685	940	965	1210	1235
50	85	580	620	745	790	1030	1115	1295	1435
	80	565	600	725	775	1010	1095	1275	1410
	75	550	590	710	760	990	1075	1245	1385
	70	535	575	695	740	970	1050	1225	1360
	65	520	560	675	720	945	1025	1200	1335
45	85	565	600	710	760	1000	1080	1240	1375
	80	550	590	695	740	975	1060	1214	1355
	75	630	570	680	730	955	1040	1190	1330
	70	515	555	660	710	930	1010	1160	1305
	65	500	540	640	690	910	995	1145	1280
40	85	545	580	680	725	950	1040	1185	1320
	80	530	570	660	710	940	1020	1160	1300
	75	515	555	640	690	920	1000	1135	1270
	70	500	535	630	675	895	980	1110	1250
	65	480	520	610	675	875	955	1090	1220
35	85	525	565	650	695	925	1010	1130	1270
	80	510	550	630	675	900	985	1110	1240
	75	500	535	610	655	880	965	1080	1220
	70	480	520	600	645	855	940	1060	1190
	65	465	500	580	625	940	922	1030	1265

Notes: Shaded area is rating wattage

Table 24. Heat pump reverse cycle heating capacity

		PTEE07			PTEE09			PTEE12			PTEE15		
Voltage		208	230	265	208	230	265	208	230	265	208	230	265
Amps		2.5	2.4	2.4	3.4	3.2	2.6	4.3	4.0	3.5	5.7	5.3	4.6
Btu/H		6400	6600	6600	7600	7800	8000	10100	10300	10300	12800	13100	13100
COP		3.6	3.6	3.6	3.2	3.2	3.4	3.3	3.3	3.3	3.0	3.0	3.0
Cfm (dry)		220	230	250	240	270	270	330	360	350	350	390	380
Heating Btu/H													
Outdoor Ambient	62	7200	7400	7400	9600	9700	9700	12800	13000	13000	15700	15800	15800
	57	6900	7100	7100	9300	9600	9600	12500	12800	12800	15000	15200	15200
	52	6500	6700	6700	8700	9000	9000	11700	12000	12000	14200	14400	14400
Rating Point	47	6200	6400	6400	8200	8400	8400	10900	11200	11200	13300	13500	13500
	42	5900	6100	6100	7700	7900	7900	10200	10500	10500	12500	12700	12700
	37	5600	5800	5800	7200	7400	7400	9500	9700	9700	11700	11900	11900
	32	5300	5500	5500	6700	6900	6900	9600	8900	8900	10800	11000	11000
	27	5000	5200	5200	6200	6300	6300	7900	8200	8200	10000	10200	10200
	24	4800	5000	5000	5800	6000	6000	7500	7800	7800	9500	9700	9700

Operation

Table 25. Unit accessory model numbers

Description	Part Number
Architectural Grilles	
ARCHITECTURAL ALUMINUM GRILLE	BAYAAGL001
ARCHITECTURAL ALUMINUM GRILLE -DARK BRONZE	BAYAAGL002
ARCHITECTURAL ALUMINUM GRILLE - SOFT DOVE	BAYAAGL003
ARCHITECTURAL ALUMINUM GRILLE - SPECIAL COLOR	BAYAAGL004
Circuit breakers	
CIRCUIT BREAKER - 208/230 15AMP	BAYCBKR001
CIRCUIT BREAKER 208/230 20AMP	BAYCBKR002
CIRCUIT BREAKER - 208/230 30AMP	BAYCBKR003
Condensate pump	
CONDENSATE PUMP 208/230	BAYCPMP001
CONDENSATE PUMP 265	BAYCPMP002
Drain Kit	
DRAIN KIT	BAYDRAN001
Filters	
SPARE FILTERS 10 PACK	BAYFLTR009
Hard Wire Kit	
HARD WIRE KIT	BAYHWRK001
Leveling Legs	
LEVELING LEG	BAYLVLG001
Power Switch⁽¹⁾	
POWER SWITCH -115V, 208/230V 265V 30 AMP	BAYPSW002
Stamped grille	
STAMPED ALUMINUM GRILLE - SINGLE PACK	BAYSAG001
STAMPED ALUMINUM GRILLE - TEN PACK	BAYSAG002
Wall Sleeve	
13 INCH WALL SLEEVE	BAYWSLV001
18 INCH WALL SLEEVE	BAYWSLV002
24 INCH WALL SLEEVE	BAYWSLV003
Power Cord	
UNIVERSAL POWER CORD 115 VOLT- 15 Amp	BAYPCRD007
UNIVERSAL POWER CORD 230 VOLT - 15 AMP	BAYPCRD001
UNIVERSAL POWER CORD 230 VOLT - 20 AMP	BAYPCRD002
UNIVERSAL POWER CORD 230 VOLT - 30 AMP	BAYPCRD003
UNIVERSAL POWER CORD 265 VOLT - 15 AMP	BAYPCRD004
UNIVERSAL POWER CORD 265 VOLT - 20 AMP	BAYPCRD005
UNIVERSAL POWER CORD 265 VOLT - 30 AMP	BAYPCRD006
Display Module	
DISPLAY MODULE (AMERICAN STANDARD LOGO STANDARD)	BAYAMDM001
DISPLAY MODULE (AMERICAN STANDARD LOGO & DEHUMIDIFICATION)	BAYAMDM002
DISPLAY MODULE (TRANE LOGO STANDARD)	BAYTRDM001
DISPLAY MODULE (TRANE LOGO & DEHUMIDIFICATION)	BAYTRDM002
Escutcheon Cover⁽²⁾	
ESCUTCHEON COVER FOR FRONT PANEL (AMSTD LOGO)	BAYACVR001
ESCUTCHEON COVER FOR FRONT PANEL (TRANE LOGO)	BAYTCVR001
Plastic Front Cover⁽³⁾	

Table 25. Unit accessory model numbers

Description	Part Number
PLASTIC FRONT COVER FOR PTAC	BAYPCVR001
Connector for Hardwire⁽⁴⁾	
CONNECTOR FOR HARDWIRE KIT 208/230V - 15 AMP	BAYCNHK011
CONNECTOR FOR HARDWIRE KIT 208/230V - 20 AMP	BAYCNHK012
CONNECTOR FOR HARDWIRE KIT 208/230V - 30 AMP	BAYCNHK013
CONNECTOR FOR HARDWIRE KIT 265V - 15 AMP	BAYCNHK021
CONNECTOR FOR HARDWIRE KIT 265V - 20 AMP	BAYCNHK021
CONNECTOR FOR HARDWIRE KIT 265V - 30 AMP	BAYCNHK023
CONNECTOR FOR HARDWIRE KIT 115V - 15 AMP	BAYCNHK031
Subbase⁽⁵⁾ (6)	
UNIVERSAL SUBBASE	BAYSUB001
SOCKET FOR SUBBASE 208/230 20 AMP	BAYSCKT001
SOCKET FOR SUBBASE 208/230 30 AMP	BAYSCKT002
SOCKET FOR SUBBASE 265 20 AMP	BAYSCKT003
SOCKET FOR SUBBASE 265 30AMP	BAYSCKT004

- (1) The power switch can be installed on the hard wire junction box and provides a way to shut on and off the PTAC unit. It is an optional accessory when using the power cord to power the PTAC unit. Check local codes for approval
- (2) This escutcheon cover should be ordered whenever the display module is wall mounted or a thermostat or third party provider unit controls are ordered. This escutcheon includes a control cover plate that covers the normal unit mounted nomenclature. It comes 5 pieces per pack.
- (3) All hydronic PTAC chassis come standard without a plastic front cover. If a unit is required to work without heat and without a hydronic kit the plastic front cover should be ordered.
- (4) Not required when using a Hard Wire Kit.
- (5) Provides a space to tie into a building's wiring with a receptacle to plug the unit into. It gives additional leveling and support capabilities and provides a place for fuses, a circuit breaker or a mechanical disconnect to be mounted. (30A is for units with 5kW electric heat, 20A for 3kW or less electric heat.)
- (6) All subbases require a socket. For 15 and 20 amp, the 20amp socket can be used on either the 208/230V or the 265V.

Operation

Table 26. Hydronic heat options

Kit Description	
H	Hydronic
Coil Type	
W	Water Coil
S	Steam Coil
Accessory Type	
K	Kit
Power Voltage	
01	208-230 VAC
02	265 VAC
04	115 VAC
Coil Positioning	
L	Left hand hot water coil connection (Standard/ Stocked)
R	Right hand hot water coil connection (Not Stocked)
Kick Plate	
S	Standard 2" to 6" adjustable kick plate
E	Extended standard base kick plate 7" to 13"
M	Upgraded kick plate standard height 2" to 6" (Like the unit ventilator design)
U	Upgraded kick plate extended height 7" to 13" (Like the unit ventilator design)
Color	
S	Standard Soft Dove II
C	Special Color

Maintenance

Maintenance Procedures

Perform the following maintenance procedures to ensure proper unit operation.



WARNING

Live Electrical Components!

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.



WARNING

Hazardous Voltage!

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

Chassis

Clean the chassis every four months or more often as the atmospheric conditions require. Use water and detergent to clean the basepan, center partition and coils.

Using harsh cleaning materials may cause a deterioration of the coil fins or end plates.

Do not use a high pressure cleaner as it could cause severe damage to the PTAC fins and coils.

Note: *It is very important to not get any of the electronic parts wet.*

A hose is okay to use to clean the coils, but make sure to cover the control with a blanket or plastic bag to prevent it from getting wet.

Wall Sleeve

Clean the wall sleeve every four months or more often as the atmospheric conditions require.

Remove any debris from the bottom of the panel, and from around any internal or external drain kit accessory item prior to using water or detergent. This will ensure that no debris clogs up the drain holes.

The use of harsh cleaning materials may cause a deterioration of the bottom panel over time. Do not use a high pressure cleaner because it could spray the side or top panel insulation material and cause future air quality problems like mold and mildew.

Clean side and top panel insulation material with a lint brush or piece of tape. Press tape against insulation lightly and slowly peel away to remove dirt and debris.

Compressor/Fan Motor

The compressor and fan motor are hermetically sealed, permanently lubricated, and require no additional oiling.

Cabinet Front

The cabinet front and discharge air grille can be cleaned with a mild soap or detergent.

Under NO circumstances should hydrocarbon based cleaners (e.g. acetone, benzene, naphtha gasoline, etc.) be used to clean the front or air grilles.

Use care when cleaning the control area. Do not use an excessively wet cleaning cloth.

Intake Air Filter

The intake air filter and vent door filter are both constructed of durable polypropylene. Clean filters monthly to ensure proper unit operation.

The fan must be off before the filters are cleaned.

To remove the air filters, grasp the top of the filter and lift out of the front cabinet (Figure 19.) Reverse the procedure to reinstall the filters.



Figure 19. Intake air filter removal is through top of unit. Inspect and clean filters monthly for proper unit operation.

Vent Filter

Before cleaning the vent filter, disconnect power to the unit by unplugging the power cord at the wall outlet or subbase, or disconnect power at the fuse box or circuit breaker. If unit is operated with vent door closed, the vent filter does not need to be cleaned.

1. Remove the cabinet front as described in front removal.
2. Remove the six screws securing the chassis to the wall sleeve with a Phillips-Head screwdriver.
3. Slide the chassis out of the wall sleeve far enough so that the vent filter is accessible as shown in Figure 20.
4. Remove the vent filter by unscrewing the two screws at the top of the filter and gently pulling the filter away from the partition panel. Refer to Figure 21. The filter can be cleaned by running under a low pressure hose or sink faucet.

Maintenance

- Reinstall the filter by reattaching the hook to the bottom of the vent door and replacing the two screws, slide the chassis back into the wall sleeve, secure it in place with six screws and reinstall the front cabinet.

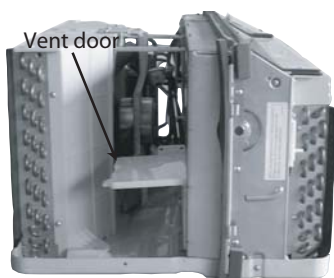


Figure 20. Vent (left side of unit)

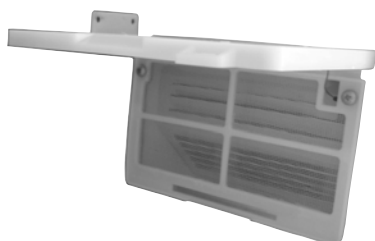


Figure 21. Vent filter removal

Scheduled Maintenance

To achieve top performance and high efficiency, a cleaning/ inspection schedule must be established for this unit. Maintaining this schedule can be accomplished by either a local maintenance staff or an authorized servicer and must follow the instructions described in this manual.

- If the unit is operated in a dusty climate, dust may collect in the basepan and clog the condenser coil. It is advisable to remove the unit from the sleeve and thoroughly clean the basepan and condenser coil on a periodic basis.

- If the unit is installed ocean side or in a corrosive atmosphere, its life may be greatly reduced by the corrosive environment. Under these conditions the unit should be removed from the sleeve and completely cleaned at least four times per year. At that time any scratches or blisters on the painted surfaces should be sanded and repainted.

Refrigeration System Service

WARNING
Ensure Terminal Cover is in Place!

Do not plug in this product or apply power to the compressor if the compressor terminal cover is removed or is not firmly in place. Failure to follow these instructions could result in a fire that could cause death, personal injury, or property damage.

Service operations requiring opening of the hermetically sealed refrigeration system should be taken to a well equipped shop where special equipment for evacuating, dehydrating, charging and testing is available. The following equipment is necessary:

- Nitrogen of no more than 0.0012 grains of moisture.
- Vacuum pump capable of evacuating to a minimum of 50 microns.
- Micron gauge to check vacuum
- Refrigerant charging cylinder accurate to within 1/4 oz.
- Electronic leak detector
- Electrical equipment to test compressors, capacitors, voltage relays, and overload protectors
- Voltmeter, ammeter, and wattmeter
- Silver soldering and brazing equipment - Pinch off tools 1/4 in to 5/8 in
- Thermocouple tester

WARNING
Hazardous Pressures!

If a heat source is required to raise the tank pressure during removal of refrigerant from cylinders, use only warm water or heat blankets to raise the tank temperature. Do not exceed a temperature of 150°F. Do not, under any circumstances apply direct flame to any portion of the cylinder. Failure to follow these safety precautions could result in a violent explosion, which could result in death or serious injury.

CAUTION
Freezing Temperatures!

Do not allow liquid refrigerant to contact skin. If it does, treat the injury similar to frostbite. Slowly warm the affected area with lukewarm water and seek immediate medical attention. Direct contact with liquid refrigerant may cause minor or moderate injury.

Dehydrating and Evacuating Refrigeration System

A rather popular misconception exists that since air conditioners normally operate with a refrigerant temperature above 32°F, moisture in the system is harmless. Nothing could be further from the truth.

Oxygen from moisture plus normal compressor and motor heat reacts chemically with the refrigerant and oil to form corrosive hydrochloric and hydrofluoric acids. These acids contribute to the break down of motor winding insulation and the corrosion of compressor working parts and cause unnecessary compressor failure.

Sludge, which is a residue of the chemical reaction, coats all compressor parts, the inside of refrigerant tubing, and may even restrict refrigerant flow through the capillary tube(s).

Maintenance

Leak Testing

Refrigerant leaks are best detected with a halide or electronic leak detector.



WARNING Use of Pressure Regulator – Valves – Gauges!

Always use pressure regulators, valves, and gauges to control drum and line pressures when pressure testing equipment. Failure to follow these instructions could result in an explosion causing death, serious injury, or equipment damage.



WARNING Leak Testing!

Do not exceed 200 psig when leak testing system. Failure to follow these instructions could result in an explosion causing death or serious injury.

The importance of careful leak testing cannot be over emphasized. Undetected leaks invariably lead to repeated calls and eventually result in system contamination, restrictions and burned out compressors.

For a system that contains a refrigerant charge and is suspected of having a leak, stop the operation, check all tubing and fittings. Soap suds may also be used.

Note: *The flame of the halide detector will glow green in the presence of R22 refrigerant.*

If a leak is detected, do not attempt to apply more brazing material to the joint. Recover the charge, unbrazed the joint, clean and rebraze.

For a system that has been newly repaired and does not contain a charge, connect a cylinder of refrigerant, through a gauge manifold, to the process tube of the compressor and liquid line strainer. Open the valve on the cylinder and manifold and allow the pressure to build up within the system. Check for and handle leaks as described above.

After the test has been completed, recover the test charge, evacuate the system, and recharge with clean refrigerant.

Brazing



WARNING Hazard of Explosion!

Use only dry nitrogen with a pressure regulator for pressurizing unit. Do not use acetylene, oxygen or compressed air or mixtures containing them for pressure testing. Do not use mixtures of a hydrogen containing refrigerant and air above atmospheric pressure for pressure testing as they may become flammable and could result in an explosion. Refrigerant, when used as a trace gas should only be mixed with dry nitrogen for pressurizing units. Failure to follow these recommendations could result in death or serious injury or equipment or property-only damage.



CAUTION High Temperatures!

Brazing requires high temperatures. Direct contact with hot surfaces may cause minor or moderate injury.

Satisfactory brazing results require cleanliness, experience and the use of proper material and equipment. Verify brazing connections are properly sized, free of rough edges, and clean.

Use of these generally accepted brazing materials:

- SIL-FOS (Alloy of 15% silver, 80% copper, 5% phosphorus): use without flux on copper to copper.

Note: *DO NOT USE FOR A COPPER TO STEEL CONNECTION.*

Recommended heat is approximately 1400°F.

- SILVER SOLDER (Alloy of 30% silver, 38% copper, 32% zinc): use with fluoride base flux on copper to steel, brass to copper, steel to steel, or brass to steel. Recommended heat is approximately 1200°F.

Maintenance

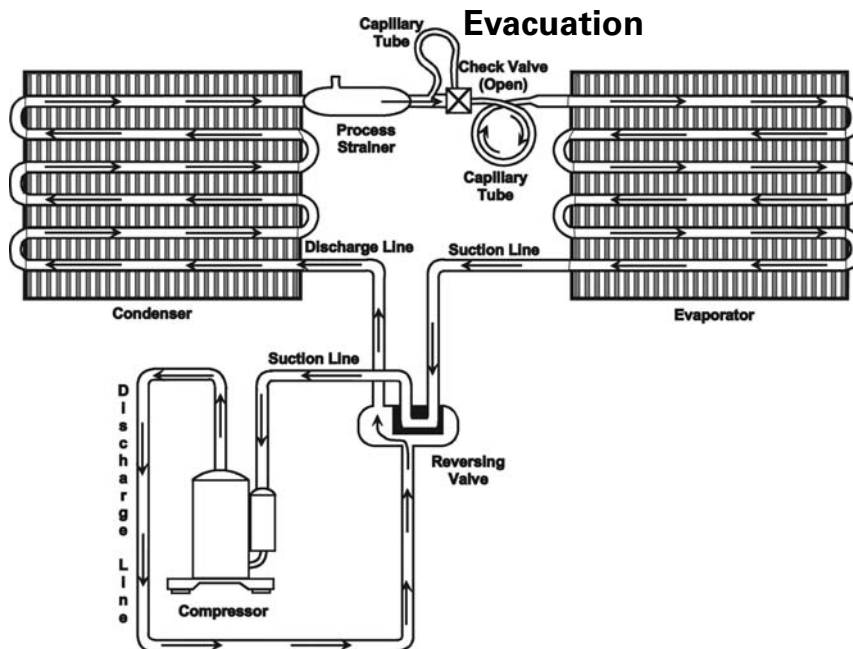


Figure 22. Refrigeration sealed system – heat pump (air conditioning model)

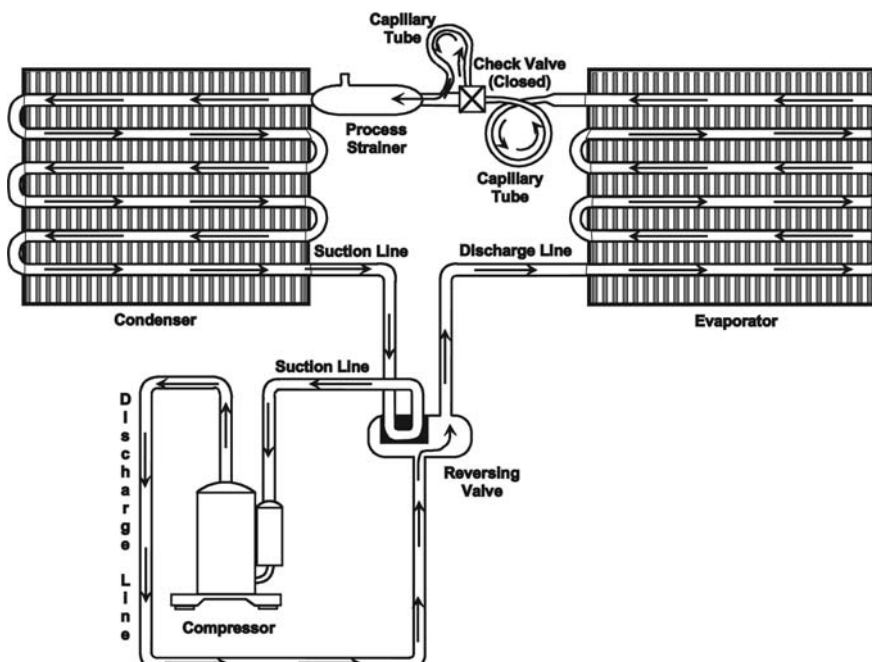


Figure 23. Refrigeration sealed system – Heat pump (heat pump model)

CAUTION Fan Motor Overheat!

Never test operation without the unit in the wall sleeve. A serious change in design specifications for air movement through the evaporator and condenser compartments, causing the fan motor to over heat and the refrigeration system to become unbalanced will occur when the unit is not installed in the wall sleeve.

⚠ CAUTION High Temperatures!

Do not allow sludge or oil to contact skin when evacuating refrigerant from equipment. Direct contact with sludge or oil may cause minor or moderate injury.

Thoroughly evacuate the system using a high vacuum pump, capable of producing a vacuum equivalent to 50 microns and a thermocouple vacuum gauge to give a true reading of the vacuum in the system.

Note: Never use the system compressor as a vacuum pump or run when under a high vacuum. Motor damage could occur.

Evacuation Procedure

1. Connect the vacuum pump, vacuum tight manifold set with high vacuum hoses, thermocouple vacuum gauge, and charging cylinder.
2. Connect the low side line to the process tube of the compressor.
3. Connect the high side line to the process tube of the liquid line strainer.

Note: If either process tube is not long enough to receive the compression or flare fitting and still leave room for a pinch-off, swag the tube and braze in an extra length of tubing.

Maintenance

4. Start the vacuum pump and open the shut-off valve to the high vacuum gauge manifold only. After the compound gauge (low side) has dropped to approximately 29 inches of vacuum, open the valve to the vacuum thermocouple gauge. See that the vacuum pump will bank-off to a minimum of 50 microns. A high vacuum pump can only produce a good vacuum if its oil is not contaminated.
5. If the vacuum pump is working properly, close the valve to the vacuum thermocouple gauge and open the high and low side valves or the high vacuum manifold set. With the valve on the charging cylinder closed, open the manifold valve to the cylinder.
6. Evacuate the system to at least 29 inches gauge before opening valve to thermocouple vacuum gauge.
7. Continue to evacuate to a minimum of 250 microns. Close valve pump and watch rate of rise. If vacuum does not rise above 1500 microns in three minutes, system can be considered properly evacuated.
8. If thermocouple vacuum gauge continues to rise and levels off at about 5000 microns, moisture and non-condensables are still present. A leak is present if the gauge continues to rise. Repair and re-evacuate.
9. Close valve to the thermocouple vacuum gauge and vacuum pump. Shut off pump and prepare to charge.

Charging the System

Charge the system with the exact amount of refrigerant. Refer to the unit nameplate for the correct refrigerant charge. An inaccurately charged system will cause future problems.

Charging Procedure

1. When using an ambient-compensated calibrated charging cylinder, allow liquid refrigerant only to enter the high side.
2. After the system receives all the refrigerant it requires, close the valve on the high side of the manifold.
3. Start the system and charge the balance of the refrigerant through the low side. Do not charge in a liquid form.
4. Close the low side valve on the manifold and pinch-off both process tubes. Remove the manifold set. Crimp shut the open ends of the process tubes and braze.
5. Recheck for refrigerant leaks.

Refrigerant

Do not use a refrigerant other than that shown on the unit nameplate. Follow all precautionary measures recommended by the refrigerant manufacturers.

Line Piercing Valves

Line piercing valves may be used for diagnosis but are not suitable for evacuating or charging due to the minute holes pierced in the tubing.

Line piercing valves must not be left on the refrigerant system. The connection between the valve and the refrigerant tubing is not hermetically sealed and will eventually leak.

Open Lines

Never leave refrigerant lines open to the atmosphere when processing the refrigeration system. Water vapor may enter the lines and cause improper evacuation.

Operating Test

The final step in a successful repair is an accurate operating test. Follow the cooling and heating performance tests on pages 36 - 37 to make sure the product is performing to design standards.

WARNING **Hazardous Voltage!**

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

WARNING **Live Electrical Components!**

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

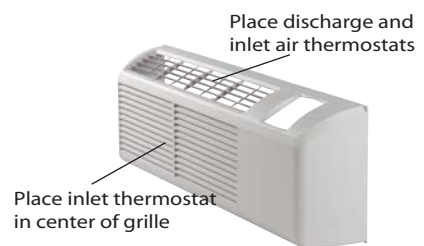


Figure 24. Proper placement of discharge and inlet air thermostats

Maintenance

Cooling Performance Test

Thermometers

The following precautions are necessary in observing the thermometer readings in the cooling performance test.

1. Use two accurately calibrated refrigeration type thermometers or a thermocouple potentiometer.
2. Thermometers are affected by body heat or changes in airflow. Therefore, secure the thermometers in proper locations with masking tape, wire, or other applicable retainers.
3. Observe readings without touching or moving the thermometers.

Sling Psychrometer

Use a sling psychrometer to obtain the wet-bulb temperature and determine the percent relative humidity.

To obtain the wet-bulb, follow this procedure using the sling psychrometer.

- Saturate the wick (only once during procedure of obtaining wet-bulb readings) with clean water slightly below room temperature.
- Obtain the psychrometer reading five to six feet in front of the unit and approximately four feet off the floor.

Note: *Direct discharge airflow away from the sling psychrometer.*

Do not perform the cooling performance test when the outside temperature is 20°F below the room temperature. For best results, perform the test under peak load conditions.

The air conditioner must operate at least 20 minutes on the HIGH COOL position before testing.

Cooling Performance Test

Record the following temperatures for the cooling performance test:

- Dry-bulb temperature of return air at conditioner. Locate thermometer as illustrated on previous page.
- Dry-bulb temperature of discharge air. Locate the thermometer as illustrated on previous page.
- The dry-bulb thermometer temperature on the sling psychrometer should be plus or minus 1°F within reading obtained on thermometer in the return air. Check wet-bulb temperature on sling psychrometer and record same.
- After recording the wet-bulb temperature, dry-bulb temperature, and return air temperature, calculate the temperature difference as follows.
- Subtract temperature obtained in Step B from temperature obtained in Step A. Use the remainder temperature to calculate from the cooling change of temperature in the Maintenance general information section.

Example: Assume a PTHE1501 unit is under test and the temperature readings indicated below were obtained.

1. Return air dry-bulb temperature: 80°F, Step A.
2. Discharge air dry-bulb temperature: 69°F, Step B.
3. Return air, wet and dry-bulb temperature as recorded in Step C: dry-bulb 80°F, wet-bulb 75°F.
4. In left hand column of cooling capacity charge headed dry-bulb, find the 80° value in [Table 20, p. 25](#).
5. In column headed wet-bulb find the 75° value and find the value "8 -13" in the cooling range column under model "PTHE1501"

This data shows the temperature of the air passing through the cooling coil is reduced at least 8°F but not more than 13°F. This example unit is operating normally for the existing conditions.

For the example unit under test, the temperature difference was 11°F (80°F, return air, minimum 69°F discharge air). Because the value is within the listed cooling range 8 - 13, this unit is considered to be operating normally.

Note: *Never test operation without the unit in the wall sleeve. A serious change in design specifications for air movement through the evaporator and condenser compartments, causing the fan motor to over heat and the refrigeration system to become unbalanced will occur when the unit is not installed in the wall sleeve.*

Electric Heat Test

For the electric heat test, the following readings must be recorded after the unit is interconnected with a wattmeter or by recording the total amp draw to the unit.

Note: *The cabinet front must be in place during this test.*

- Record supply voltage to unit.
- Operate unit in highest heat setting.
- Record wattage recorded on wattmeter or total amp draw to unit.
- Refer to the electric heat capacity and electrical data section (whichever is applicable for voltage rating on the unit being tested.)
- The total watts or amps recorded should fall within the minimum and maximum watts/amps listed on these charts

Example: Assume that a PTHE1501 230/208V with 3.5 kW electric heater is under test.

1. Supply voltage as recorded - 208V.
2. Watts recorded -2750W or amps recorded - 13.5 amps.

Maintenance

3. Locate the readings listed in the Operation section of this manual. You will note that these readings fall within the voltage, watts and amp draw minimum and maximum ranges listed. Therefore, the unit heating performance would be considered normal.

Heating Power Consumption Test

(Heat Pump Mode Only)

For the heating wattage, record the following readings after the unit is interconnected with a wattmeter.

- Outside coil inlet air dry-bulb temperature.
- Inside coil inlet air dry-bulb temperature.
- Total watts input measured by wattmeter.

Calculating procedure

1. Locate temperature obtained in Step A of cooling performance test in first column of Heating Wattage Chart.
2. Locate in second column the inside coil inlet dry-bulb temperature.
3. The total watts input should come between minimum and maximum values indicated for each model.

Example: Assume that a PTHE1501 is under test. Proceed as follows and observe test readings as simultaneously as possible.

1. Outside coil inlet dry-bulb temperature readings as described above: 45°F.
2. Check watts input: 1370 W
3. Inside coil inlet dry-bulb temperature reading as described in Step B: 75°F.

Read to the right from the 75° inside coil inlet dry-bulb value in the column and note the minimum and maximum wattage of 1335 - 1470.

Since the wattage reading (1370) obtained in the test is within the prescribed range, the total power input in watts is considered to be normal.



WARNING **Live Electrical Components!**

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.



WARNING **Hazardous Voltage!**

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.



WARNING **Hazardous Voltage w/Capacitors!**

Disconnect all electric power, including remote disconnects and discharge all motor start/run capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power cannot be inadvertently energized. Verify with an appropriate voltmeter that all capacitors have discharged. Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury.

Resistance Check

Discharge capacitor and remove wire leads. Use a DC volt meter to verify there is no power.

Testing Capacitor Resistance

1. Set an ohmmeter on its highest ohm scale and connect the leads to the capacitor.
 - a. Good Condition - indicator swings to zero and slowly returns to infinity. (Start capacitor with bleed resistor will not return to infinity. It will still read the resistance of the resistor).
 - b. Shorted - indicator swings to zero and stops there - replace.
 - c. Open - no reading - replace. (Start capacitor would read resistor resistance).
2. Testing for ohms between either capacitor terminal and the capacitor body must show infinite ohms.

Capacitance Check

Using a hookup as shown below, take the amperage and voltage readings and use them in the formula below the diagram.

Overloads

1. With no power to the unit, remove the overload lead from the compressor terminal.
2. Using an ohmmeter: Test continuity between terminals of the overload. If not continuous, the overload is open, replace the overload.

Compressor Windings



WARNING **Electrical Shock!**

Do not connect electrical power to this unit or to the compressor if the compressor terminal cover has been removed or is not firmly in place. Doing so could result in death, serious injury, or property damage.

If the test indicates shorted, grounded or open windings, see procedure for the next steps to be taken.

Maintenance

Resistance Test

1. With no power, remove the leads from the compressor terminals.
2. Touch the leads of an ohmmeter to terminals C-S, start windings and C-R, run winding.

If either winding does not test continuous, replace the compressor.

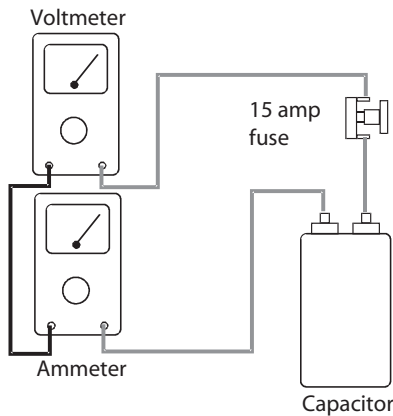


Figure 25. Testing capacitor resistance

Testing capacitance
capacitance (MFD) =
 $\frac{2650 \times \text{amperage}}{\text{voltage}}$

Note: Replace the capacitor if the value obtained is not within 10% of the rating printed on the capacitor.

Ground Test



WARNING Live Electrical Components!

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

With no power and compressor leads removed:

Set an ohmmeter on its highest scale. Touch one lead to the compressor body (clean point of contact, as a good connection is a must) and the other probe to each compressor terminal in turn. If a reading is obtained, then compressor is grounded and must be replaced.

If the voltage, capacitor, overload and motor windings test fail to show the cause for failure:

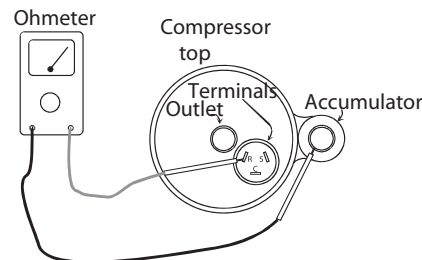


Figure 26. Compressor ground test

1. With no power, wire a test cord to line voltage (Line & N).

Note: The wire size of the test cord must equal the line size, and the fuses in the test line must be of the proper size and type.

2. Connect a good capacitor of the right MFD and voltage rating into the circuit as shown in Figure 40.

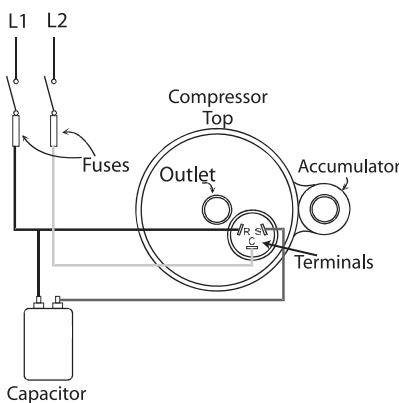


Figure 27. Test cord connections

3. Carefully apply line voltage.
 - a. If the compressor starts and continues run, the cause for failure is somewhere else in the system.

- b. If the motor fails to start - replace. Since all single phase compressors are of the permanent split capacitor design the high and low side pressure must be approximately equal or the low torque compressor may not start.

Indoor Coil and Air Thermistors

1. Remove the Indoor Coil Thermistor leads from the circuit board.
2. Check the resistance of the Indoor Coil Thermistor against the table on the next page. The leads of the ohm meter will need to contact the ends of the thermistors that connect to the board.
3. Replace the Indoor Coil Thermistor if it does not test as above.

Outdoor Coil and Air Thermistors

1. Remove the outdoor coil thermistor leads from the circuit board.
2. Check the resistance of the outdoor coil thermistor against the table on the next page. The leads of the ohm meter will need to contact the ends of the thermistors that connect to the board.
3. Replace the outdoor coil thermistor if it does not test as above.

Heater Assembly with Power OFF to the Unit and Heater

1. Remove the heaters in question and visually inspect the element for broken condition. Refer to the disassembly procedures for information on disassembling the heater.
2. Test the thermal fuse (one time fuse). If open, replace the heater assembly.

Maintenance

Table 27. Thermistor indoor coil resistance

x (C°)	Rmin (kΩ)	Rnom (kΩ)	Rmax (kΩ)
-40.0	327.6037	342.7771	358.6311
-39.0	306.4713	320.4512	335.0471
-38.0	286.8464	299.7818	313.1748
-37.0	268.6117	380.4928	292.8787
-36.0	251.6597	262.6189	274.0353
-35.0	235.8919	246.0045	258.5312
-34.0	221.2181	230.5528	240.2626
-33.0	207.5554	216.1750	225.1344
-32.0	194.8276	202.7896	211.0696
-31.0	182.9649	190.3219	197.9580
-30.0	171.9031	178.7032	186.7663
-29.0	161.5829	167.8703	174.3869
-28.0	161.9502	157.7652	163.7880
-27.0	142.9647	148.3344	163.9026
-26.0	134.5504	139.5289	144.6781
-25.0	126.6948	131.3031	126.0653
-24.0	119.3487	123.6155	128.0227
-23.0	112.4758	116.4275	120.5064
-22.0	106.0429	109.7036	113.4795
-21.0	100.0191	103.4109	106.9073
-20.0	94.3758	97.5193	100.7575
-19.0	89.0868	92.0070	95.0050
-18.0	84.1276	86.8293	89.6087
-17.0	79.4758	81.9811	84.5569
-16.0	75.1104	77.4341	79.8216
-15.0	71.0121	73.1677	75.3810
-14.0	67.1629	69.1629	71.2151
-13.0	63.5463	65.4021	67.3053
-12.0	60.1468	61.8691	63.6342
-11.0	56.9501	68.6487	60.1860
-10.0	53.9430	55.4269	56.9458
-9.0	51.1130	52.4905	53.8998
-8.0	48.4488	49.7278	51.0353
-7.0	45.9395	47.1271	48.3404
-6.0	43.5756	44.6782	45.8041
-5.0	41.3475	42.3713	43.4161
-4.0	39.2467	40.1974	41.1670
-3.0	37.2652	38.1480	39.0478
-2.0	35.3956	36.2153	37.0504
-1.0	33.6309	34.3920	35.1569
0.0	31.9646	32.6713	33.3904
1.0	30.3900	31.4600	31.7132
2.0	28.9023	29.5113	30.1303
3.0	27.4964	28.0617	28.6358
4.0	26.1673	26.6919	27.2244

Table 27. Thermistor indoor coil resistance (continued)

x (C°)	Rmin (kΩ)	Rnom (kΩ)	Rmax (kΩ)
5.0	24.9103	25.3971	25.8909
6.0	23.7211	24.1727	24.6306
7.0	22.5967	23.0148	23.4391
8.0	21.5303	21.9188	22.3122
9.0	20.5214	20.8816	21.2461
10.0	19.5667	19.8995	20.2371
11.0	18.6600	18.9693	19.2819
12.0	17.8015	18.0880	18.3773
13.0	18.9874	17.2527	17.5204
14.0	16.2153	16.4608	16.7083
15.0	16.4827	16.7098	16.9385
16.0	14.7874	14.9973	16.2087
17.0	14.1272	14.3212	14.5164
18.0	13.5003	13.6794	13.8595
19.0	12.9048	13.0700	13.2381
20.0	12.3389	12.4912	12.6442
21.0	11.8010	11.9413	12.0821
22.0	11.2895	11.4187	11.5482
23.0	10.8031	10.9219	11.0408
24.0	10.3404	10.4494	10.5585
25.0	9.9000	10.0000	10.1000
26.0	9.4726	9.5724	9.6724
27.0	9.0659	9.1656	9.2652
28.0	8.6790	8.7781	8.8774
29.0	8.3106	8.4091	8.6078
30.0	7.9600	8.0577	8.6078
31.0	7.6280	7.7229	7.8203
32.0	7.3078	7.4089	7.5004
33.0	7.0047	7.0997	7.1952
34.0	6.7157	6.8087	6.9042
35.0	6.4402	6.5330	6.6264
36.0	6.1775	6.2691	6.3614
37.0	5.9269	6.0173	6.1083
38.0	5.6878	6.7769	5.8667
39.0	5.4598	5.5474	5.6359
40.0	5.2418	5.3282	5.4154
41.0	5.0388	5.1188	5.2047
42.0	4.8351	4.9188	5.0033
43.0	4.6454	4.7275	4.8107
44.0	4.4640	4.5449	4.6268
45.0	4.2907	4.3701	4.4504
46.0	4.1300	4.2050	4.2850
47.0	3.9665	4.0432	4.1207
48.0	3.8161	3.8902	3.9663
49.0	3.6701	3.7438	3.8185

Table 27. Thermistor indoor coil resistance (continued)

x (C°)	Rmin (kΩ)	Rnom (kΩ)	Rmax (kΩ)
50.0	3.5314	3.6037	3.6770
51.0	3.3982	3.4691	3.6410
52.0	3.2707	3.3402	3.4107
53.0	3.1487	3.2169	3.2860
54.0	3.0320	3.0967	3.1665
55.0	2.9201	2.9856	3.0519
56.0	2.8130	2.8771	2.9422
57.0	2.7104	2.7732	2.8370
58.0	2.6121	2.6736	2.7380
59.0	2.5179	2.5781	2.6393
60.0	2.4276	2.4855	2.5464
61.0	2.3410	2.3986	2.4573
62.0	3.2579	2.3144	2.3719
63.0	2.1782	2.2335	2.2898
64.0	2.1018	2.1559	2.2110
65.0	2.0284	2.0813	2.1353
66.0	1.9580	2.0098	2.0628
67.0	1.8904	1.9411	1.9928
68.0	1.8255	1.8750	1.9257
69.0	1.7631	1.8116	1.8612
70.0	1.7631	1.8116	1.8512
71.0	1.6456	1.6921	1.7395
72.0	1.5903	1.6357	1.6822
73.0	1.5371	1.5816	1.6270
74.0	1.4860	1.5816	1.6270
75.0	1.4368	1.4793	1.5229
76.0	1.3895	1.4311	1.4737
77.0	1.3440	1.3847	1.4284
78.0	1.3003	1.3400	1.3809
79.0	1.2581	1.2970	1.3370
80.0	1.2176	1.2558	1.2947
81.0	1.1785	1.2158	1.2540
82.0	1.1409	1.1773	1.2148
83.0	1.1047	1.1403	1.1770
84.0	1.0698	1.1047	1.1405
85.0	1.0362	1.0703	1.1054
86.0	1.0038	1.0372	1.0715
87.0	0.9726	1.0052	1.0388
88.0	0.9425	0.9744	1.0073
89.0	0.9135	0.9447	0.9769
90.0	0.8858	0.9161	0.9476

Maintenance

WARNING **Hazardous Voltage!**

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

Reversing Valve

Occasionally the reversing valve may stick in the heating or cooling position or in the mid-operation.

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.

Check the operation of the valve by starting the system and switching the operation from COOLING to HEATING and then back to COOLING.

If no voltage is registered to the coil, check the operation of the reversing relay and the continuity of the connecting wires.

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 position, remove the coil connector cap and wiring and test the continuity of the valve coil. If the coil does not test continuous replace it.

If the valve is inoperative, replace.

Component Replacement

Replacement of the compressor, evaporator, condenser, capillary tubes and reversing valve must be in accordance with accepted service practices. These procedures include a complete evacuation of both high and low sides, and changing of the capillary tube assembly whenever the refrigerant system is opened.

Before replacing a component in the sealed system, make sure that the cause for complaint does not lie in the electrical circuit, control, overload or is due to some other reason. The serviceman must be familiar with the operational characteristics of the product and should not jump to conclusions.

Temperature-Actuated Drain Valve (model PTHE Only)

The PTHE is equipped with a temperature-actuated drain valve located in the base pan. As the outdoor ambient decreases to 55°F, the drain valve will begin to open. The valve will be completely open when the outdoor ambient temperature falls to 50°F.

WARNING **Hazardous Voltage!**

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

Unit Disassembly Procedures

1. Disconnect power to the unit.
2. Remove the unit front cover.
3. Remove the three screws on each side of the chassis that secure the chassis to the wall sleeve.
4. Carefully slide the chassis out of the wall sleeve and place on floor or a protected cart.

WARNING **Hazardous Voltage!**

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

Note: *ALL phases of this installation must comply with NATIONAL, STATE AND LOCAL CODES. Improper wiring or installation may damage thermostat.*

Power Cord Removal

1. Disconnect power to the unit.
2. Remove the unit front cover.
3. Remove two screws of power cord connector front cover.
4. Remove the power cord strain relief.
5. Remove power cord from connector.

Power cord Installation

1. Install power cord to connector. Gently press the connector into position until top and bottom latches engage.
2. Reinstall the power cord strain relief.
3. Reinstall power cord connector front cover.
4. Reinstall the unit front cover.

Capacitor Removal

1. Remove the control box. Refer to the power cord disassembly for instructions on removing the control box.
2. Remove the screw securing the capacitor to the control box.

Heater Assembly Removal

1. Remove the strain relief.
2. Remove the three screws securing the discharge screen to the chassis.
3. Unplug the power cord connector and remove the power cord.

Removing the Indoor Coil and Indoor Air Thermistors

1. Remove the front cabinet.
2. Remove the control box cover.
3. Disconnect the indoor coil/air thermistor wiring from the control board.
4. Locate the indoor coil/air thermistor on the suction tube or evaporator. Gently pull the thermistor from the housing.
5. Remove the indoor coil/air thermistor from the unit.

Maintenance

Removing the Outdoor Coil and Outdoor Air Thermistors

1. Remove the chassis from the wall.
2. Remove the front cabinet.
3. Remove the control box cover.
4. Disconnect the outdoor coil/air thermistor wiring from the control board.
5. Gently pull outdoor coil thermistor from the bracket near the capillary tube.
6. Gently remove outdoor air thermistor which is located at the drain valve.
7. Remove the outdoor coil/air thermistor from the unit.

Indoor Fan and Motor

1. Remove the chassis from the wall.
2. Remove the front cabinet.
3. Remove the heater/discharge deck assembly. (Refer to the heater disassembly instructions)
4. Remove the control box cover. Disconnect the control wiring. Remove the control box. Refer to the power cord disassembling for instructions on disassembling the control box.
5. Remove the indoor fan motor bracket screws (3) as shown.
6. Remove the set screw (you will need a long Allen wrench) securing the indoor fan to the motor shaft and remove the indoor fan and motor.

Outdoor Fan and Motor

1. Follow the directions for removing the condenser except don't braze or remove the tubing connecting to the condenser. Capturing the system refrigerant is also not necessary.
2. Remove the screw on the right side of the unit (If you are looking at the back of the PTAC) toward the bottom of the PTAC near the lip of the basepan.

3. Lift the condenser up and over the lip of the basepan and move just enough to gain access to the outdoor fan and motor. Be careful not to damage the bottom of the condenser by sitting it on the lip of the basepan. Also, use caution when bending the condenser to gain access to the outdoor fan and motor. The tubing is very fragile and must be treated with care.
4. Remove the fan.
5. Remove the fan motor by removing the two screws securing it to the fan motor bracket.
6. Disconnect the fan motor wiring from the control by removing the wire junction box cover on the partition panel above the control panel cover.

Control Board Replacement Procedure

WARNING **Hazardous Voltage!**

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

Note: *Before replacing the whole control board, make sure that the control board's fuse is still functioning. The specs for the control board fuse are: 5X20mm, 250V, 315mA, fast acting. For more information on a blown fuse on the Control Board, check the Troubleshooting section of this document.*

1. Remove plastic cabinet front and the metal cover that encloses the control board
2. Remove the replacement board from its package and set the power jumper to match the unit voltage .

3. There are two different pin connections, one for 230/208 VAC and another for 265 VAC . The jumper for the 115 VAC board is pre-installed in the P8 to P9 position.

Note: *This is a very important step, and it might lead to damage of the control board if the jumper is not properly set.*

4. Remove connections from the existing control board, tagging wires as required to ensure correct re-assembly.
5. Remove 2 screws from the front plastic mounting ears. Remove the screw from the green wire ground. Slide plastic chassis and board back and lift out of place.
6. Engage catches on bottom of plastic chassis of replacement assembly with sheet metal control box and slide forward to lock in position. Re-install two screws through the front plastic mounting ears. Re-install green ground wire.
7. Re-connect the wiring harness to the new assembly in the same positions that they were before removal. This includes temperature thermistors, as well as the thermostats, zone sensors and energy management.
8. Reinstall the sheet metal cover over the control board.
9. Position the front cabinet over the chassis and push the sides until the retaining clips engage.

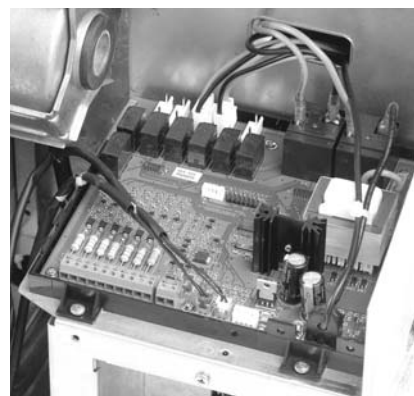


Figure 28. Power jumper

Troubleshooting

Diagnostics

The controller is equipped to display a diagnostic code through the interface module; if the display is not present (Class 2 control), there is no method to retrieve the diagnostic codes from the unit.

If there is no interface module to indicate the presence of a diagnostic, service will only be triggered by a comfort or operational complaint.

The controller will only display the most severe diagnostic present.

Translating Multiple Diagnostics

The controller senses and records each diagnostic independently of other diagnostics. It is possible to have multiple diagnostics affect the operation of the unit, but only the most severe diagnostic will be displayed.

Resetting Diagnostics

A reset clears any latching diagnostics and allows the control to try to run the PTAC normally. If the latching condition is still present after the reset, the control will shut down the PTAC. A reset will reset a unit that is running normally. A reset is just like cycling power to the unit.

There are two ways to reset diagnostics:

1. Manual output test at the controller
2. Cycling power to the controller

Manual Output Test

When manual test has been initiated, the controller exercises all outputs in a predefined sequence. The last step of the sequence resets the controller. See the Manual output test section on page 22 for more information about the manual output test.

Cycling Power

When someone turns off the controller's power, then re-applies power, the unit cycles through a power up sequence. By default, the controller will attempt to reset all diagnostics at power up.

Diagnostics present at power up and those that occur after power up will be handled according to the defined unit diagnostics sequences (see Diagnostics table below)

Table 28. Diagnostic codes

Severity Level	Diagnostic Code	Diagnostic Description	Compressor	Auxiliary Heat	Indoor Fan
1 (severest)	C1	Compressor Failure	DISABLED	ENABLED	ENABLED
2	C2	Indoor Temperature Unit Sensor Failure1	ENABLED	ENABLED	ENABLED
3	C3	Indoor Temperature Display Sensor Failure	ENABLED	ENABLED	ENABLED
4	C4	Indoor Coil Temperature Failure	ENABLED2	ENABLED	ENABLED
5	C5	Outdoor Temperature Failure	ENABLED, run as PTEE	ENABLED, run as PTEE	ENABLED, run as PTEE
6	C6	Outdoor Coil Temperature Failure	ENABLED, run as PTEE	ENABLED, run as PTEE	ENABLED, run as PTEE
7	C7	Configuration Corrupted	ENABLED	ENABLED	ENABLED
8	-	No diagnostic present	ENABLED	ENABLED	ENABLED

Table 29. Latching diagnostics, reset required

Code	Diagnostic Description	Description
C1	Compressor Failure	OLP has had multiple trips (3)
C7	Configuration Corrupted	configuration failure

Table 30. Automatically resetting diagnostics

Code	Diagnostic Description	Description
C1	Indoor Temperature - No Backup Available	No source of indoor temperature is available
C2	Indoor Temperature - Unit Sensor Failure1	Unit indoor temperature valid then not valid
C3	Indoor Temperature - Display Sensor Failure1	Display indoor temperature valid then not valid
C4	Indoor Coil Temperature Failure	Indoor Coil Temperature valid then not valid
C5	Outdoor Temperature Failure	Outdoor Temperature valid then not valid
C5	Outdoor Coil Temperature Failure	Outdoor Coil temp valid then not valid

Troubleshooting

Table 31. Compressor output does not energize

Probable cause	Explanation
Random restart timer	All controller outputs remain off until the timer expires.
Selected mode OFF	When off is selected at the display to the controller, the unit controls all outputs off.
Selected mode FAN ONLY	When fan only is selected at the display to the controller, the unit only allows the indoor fan to energize.
Diagnostic present	A specific list of diagnostics affects compressor operation. For more information, see the Diagnostics section in the manual.
No power to the controller	If the controller does not have power, the compressor does not operate. For the controller to operate normally, it must have an input voltage of 115 or 230/208, 265 VAC.
Manual output test	The controller includes a manual output test sequence you can use to verify output operation and associated output wiring. However, based on the current step in the test sequence, the compressor may not be on. Refer to the Manual Output Test section.
Unit wiring	The wiring between the controller output and the compressor must be present and correct for normal operation.
Indoor Coil Freeze protection	The compressor has been turned off because the indoor coil temperature has fallen below 35°F and has not risen above 50°F

Table 32. Indoor/remote fan outputs do not energize

Probable cause	Explanation
Random restart timer	All controller outputs remain off until the timer expires.
Normal operation	Depending on the configuration selected the fan(s) may be only cycle with the compressor output
Selected mode OFF	When off is selected at the display to the controller, the unit controls all outputs off.
Diagnostic present	A specific list of diagnostics affects fan operation. For more information, see the Diagnostics section in the manual.
No power to the controller	If the controller does not have power, the compressor does not operate. For the controller to operate normally, it must have an input voltage of 230/208, 265 VAC.
Manual output test	The controller includes a manual output test sequence you can use to verify output operation and associated output wiring. However, based on the current step in the test sequence, the fan(s) may not be on. Refer to the Manual Output Test section.
Unit wiring	The wiring between the controller outputs and the fan relays and contacts must be present and correct for normal fan operation.

Table 33. Outdoor fan output does not energize

Probable cause	Explanation
Random restart timer	All controller outputs remain off until the timer expires.
Selected mode OFF	When off is selected at the display to the controller, the unit controls all outputs off.
Selected mode FAN ONLY	When fan only is selected at the display to the controller, the unit only allows the indoor fan to energize.
Diagnostic present	A specific list of diagnostics affects compressor and therefore the outdoor fan operation. For more information, see the Diagnostics section in the manual.
No power to controller	If the controller does not have power, the compressor does not operate. For the controller to operate normally, it must have an input voltage of 115 or 230/208, 265 VAC.
Manual output test	The controller includes a manual output test sequence you can use to verify output operation and associated output wiring. However, based on the current step in the test sequence, the outdoor fan may not be on. Refer to the Manual Output Test section.
Unit wiring	The wiring between the controller output and the outdoor fan must be present and correct for normal operation.
Coil Burst Protection	The outdoor fan has been turned off because the indoor coil temperature has risen above 140°F and has not fallen below 125°F
Normal operation	The outdoor fan cycles with the compressor output
Defrost Cycle	During the active defrost cycle the outdoor fan is controlled off. See the section on defrost control.
Unit wiring	The wiring between the controller outputs and the fan relays and contacts must be present and correct for normal fan operation.

Troubleshooting

Table 34. Reversing valve output does not energize

Random restart timer	Explanation
Power up control wait	All controller outputs remain off until the timer expires.
Selected mode OFF, FAN ONLY	Reversing valve held in current state because compressor use is not allowed.
Diagnostic present	A specific list of diagnostics affects compressor operation. For more information, see the Diagnostics section in the manual.
No power to the controller	If the controller does not have power, the reversing valve does not operate. For the controller to operate normally, it must have an input voltage of 115 or 208-230, 265 VAC.
Manual output test	The controller includes a manual output test sequence you can use to verify output operation and associated output wiring. However, based on the current step in the test sequence, the reversing valve may not be energized. Refer to the Manual Output Test section.
Unit wiring	The wiring between the controller output and the reversing valve must be present and correct for normal operation.
Normal operation	PTHE unit is in heating mode.
Diagnostic present	A specific list of diagnostics affects unit operation. For more information, see the Diagnostics section in the manual.

Table 35. Auxiliary heat output does not energize

Probable cause	Explanation
Random restart timer	All controller outputs remain off until the timer expires.
Selected mode OFF	When off is selected at the display to the controller, the unit controls all outputs off.
Selected mode FAN ONLY	When fan only is selected at the display to the controller, the unit only allows the indoor fan to energize.
Diagnostic present	A specific list of diagnostics affects unit operation. For more information, see the Diagnostics section in the manual.
No power to the controller	If the controller does not have power, the compressor does not operate. For the controller to operate normally, it must have an input voltage of 115 or 230/208, 265 VAC.
Manual output test	The controller includes a manual output test sequence you can use to verify output operation and associated output wiring. However, based on the current step in the test sequence, the auxiliary heat may not be on. Refer to the Manual Output Test section.
Unit wiring	The wiring between the controller output and the auxiliary heat must be present and correct for normal operation.
Indoor Coil Freeze protection	The compressor has been turned off because the indoor coil temperature has fallen below 35°F and has not risen above 50°F.
Normal operation	Auxiliary heat may not be needed to meet the load conditions see the section dealing with Auxiliary Heat Control.
Defrost Cycle	During the active defrost cycle the auxiliary heat is controlled off. See the section on defrost control. Reversing Valve output does not energize.

Table 36. Ventilation output does not energize

Probable cause	Explanation
Random restart timer	All controller outputs remain off until the timer expires.
Selected mode OFF	When off is selected at the display to the controller, the unit controls all outputs off.
Diagnostic present	A specific list of diagnostics affects unit operation. For more information, see the Diagnostics section in the manual.
No power to controller	If the controller does not have power, the compressor does not operate. For the controller to operate normally, it must have an input voltage of 115 or 230/208, 265 VAC.
Manual output test	The controller includes a manual output test sequence you can use to verify output operation and associated output wiring. However, based on the current step in the test sequence, the ventilation output may not be on. Refer to the Manual Output Test section.
Unit wiring	The wiring between the controller output and the ventilation must be present and correct for normal operation.
Normal operation	See the section on Ventilation operation.
Defrost Cycle	During the active defrost cycle the outdoor fan is controlled off. See the section on defrost control.

Troubleshooting

Table 37. Condensate pump does not energize

Probable cause	Explanation
Random restart timer	All controller outputs remain off until the timer expires.
Selected mode OFF	When off is selected at the display to the controller, the unit controls all outputs off.
No power to controller	If the controller does not have power, the compressor does not operate. For the controller to operate normally, it must have an input voltage of 115 or 230/208, 265 VAC.
Manual output test	The controller includes a manual output test sequence you can use to verify output operation and associated output wiring. However, based on the current step in the test sequence, the condensate Pump may not be enabled. Refer to the Manual Output Test section.
Unit wiring	The wiring between the controller output and the Condensate Pump must be present and correct for normal operation.
Normal operation	Condensate Pump is available only with Heat Pumps. Unit is in active defrost, or outdoor temperature is below enable point.
Unit wiring	The wiring between the controller outputs and the fan relays and contacts must be present and correct for normal condensate pump operation.
Defrost Cycle	During the active defrost cycle the condensate pump power is removed. See the section on defrost control.

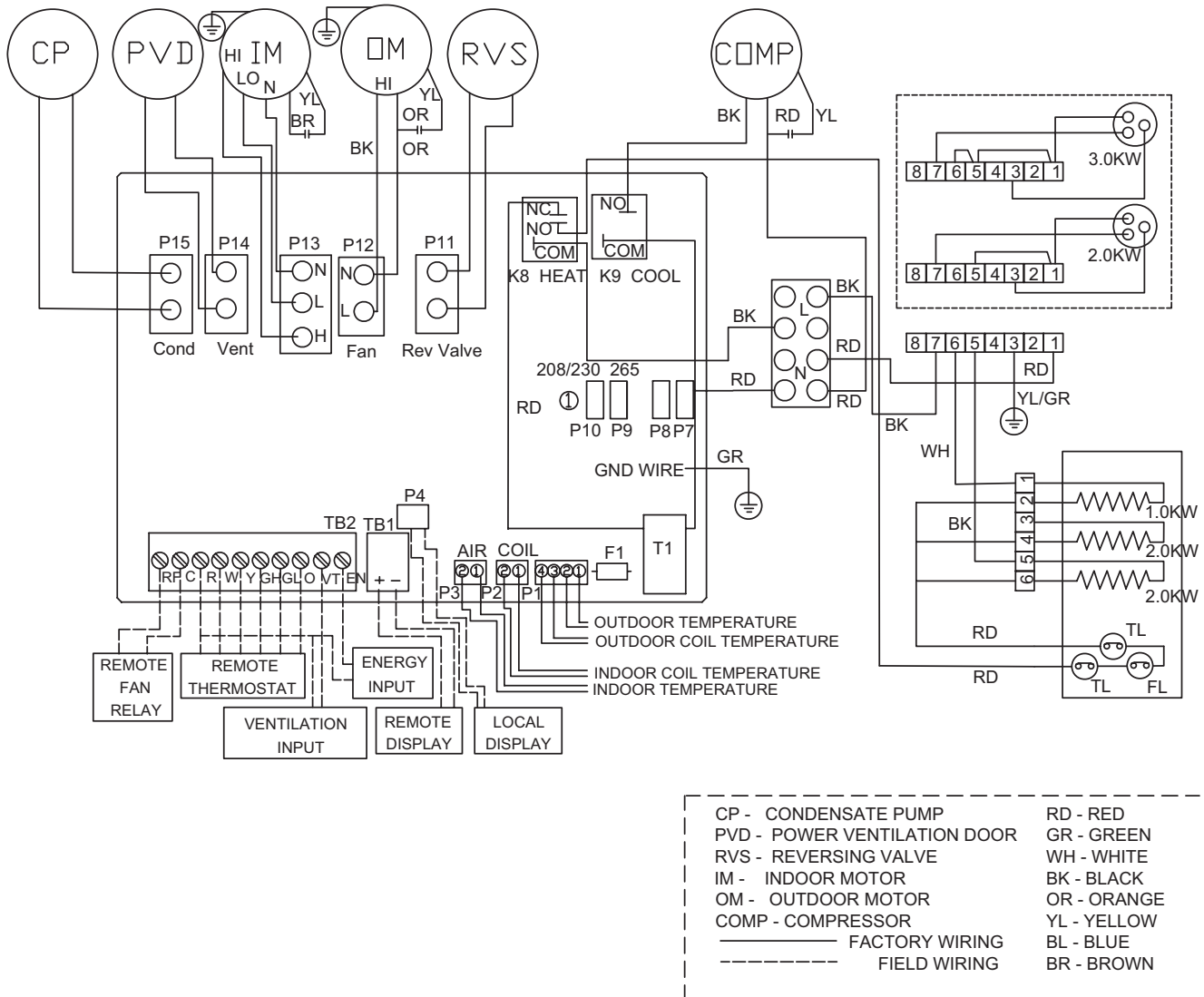
Table 38. Output on when the mode is off

Probable cause	Explanation
Fan Configuration	Fan is configured to run on high in off mode (see configuration section).
Freeze Protection	While in off mode, freeze protection may be active. This will cause the indoor fan to run at high speed, and the remote fan and auxiliary heat will be on.
Fan Delay Off	The indoor fan continues to run after the compressor or auxiliary heat will be on.

Table 39. Control fuse is blown

Symptom
The generic thermostat does not work
The energy input does not work
The ventilation input does not work
The remote fan output does not work

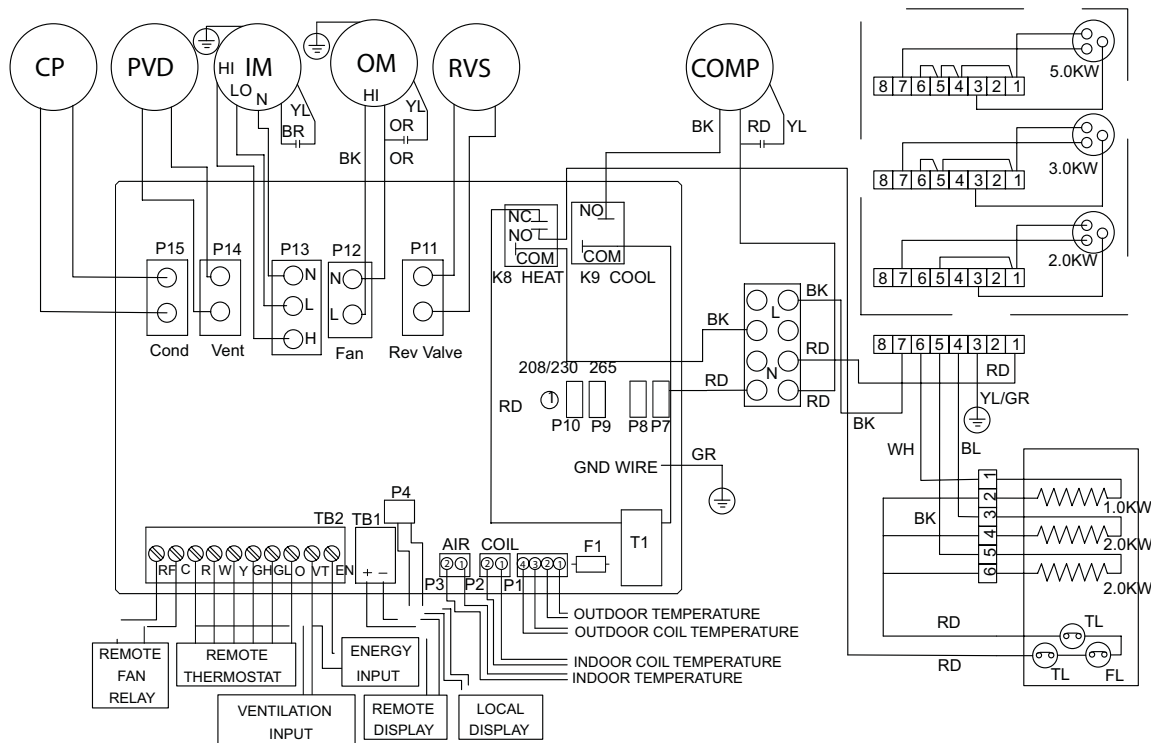
Wiring Diagram



- 1) For 208/230 VAC unit, connect P8 and P10.
- 2) For cooling only unit, there is no outdoor temperature sensor and reversing valve.
- 3) For different electric heater capacity, refer to IOM for power cord selection.
- 4) The specs for the control board fuse are: 5 x 20mm, 250V, 315mA, fast acting.

Figure 29. 230/208V wiring diagram (07 models)

Wiring Diagram

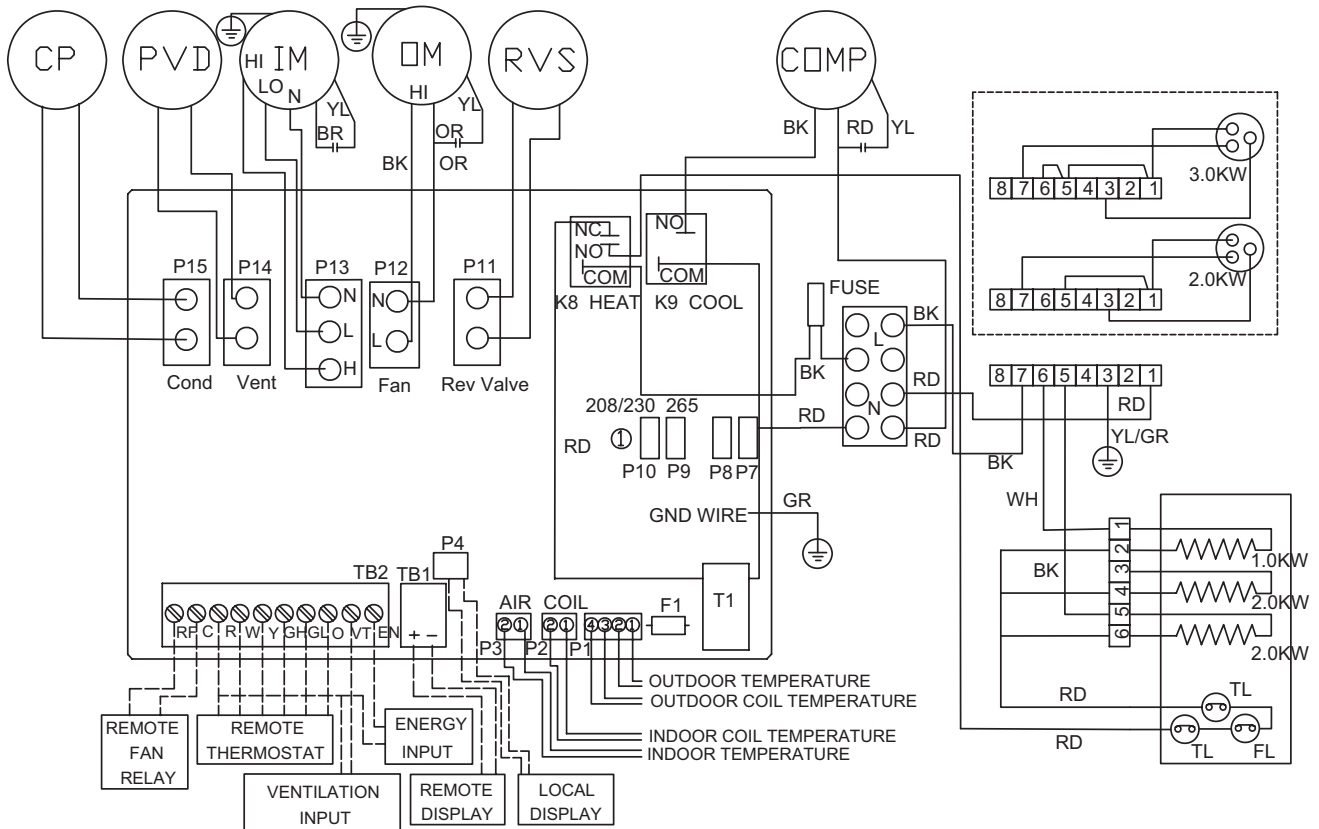


- | | |
|------------------------------|-------------|
| CP - CONDENSATE PUMP | RD - RED |
| PVD - POWER VENTILATION DOOR | GR - GREEN |
| RVS - REVERSING VALVE | WH - WHITE |
| IM - INDOOR MOTOR | BK - BLACK |
| OM - OUTDOOR MOTOR | OR - ORANGE |
| COMP - COMPRESSOR | YL - YELLOW |
| _____ FACTORY WIRING | BL - BLUE |
| _____ FIELD WIRING | BR - BROWN |

- 1) For 208/230 VAC unit, connect P8 and P10.
- 2) For cooling only unit, there is no outdoor temperature sensor and reversing valve.
- 3) For different electric heater capacity, refer to IOM for power cord selection.
- 4) The specs for the control board fuse are: 5 x 20mm, 250V, 315mA, fast acting.

Figure 30. 230/208V Wiring diagram (09, 12, 15 models)

Wiring Diagram

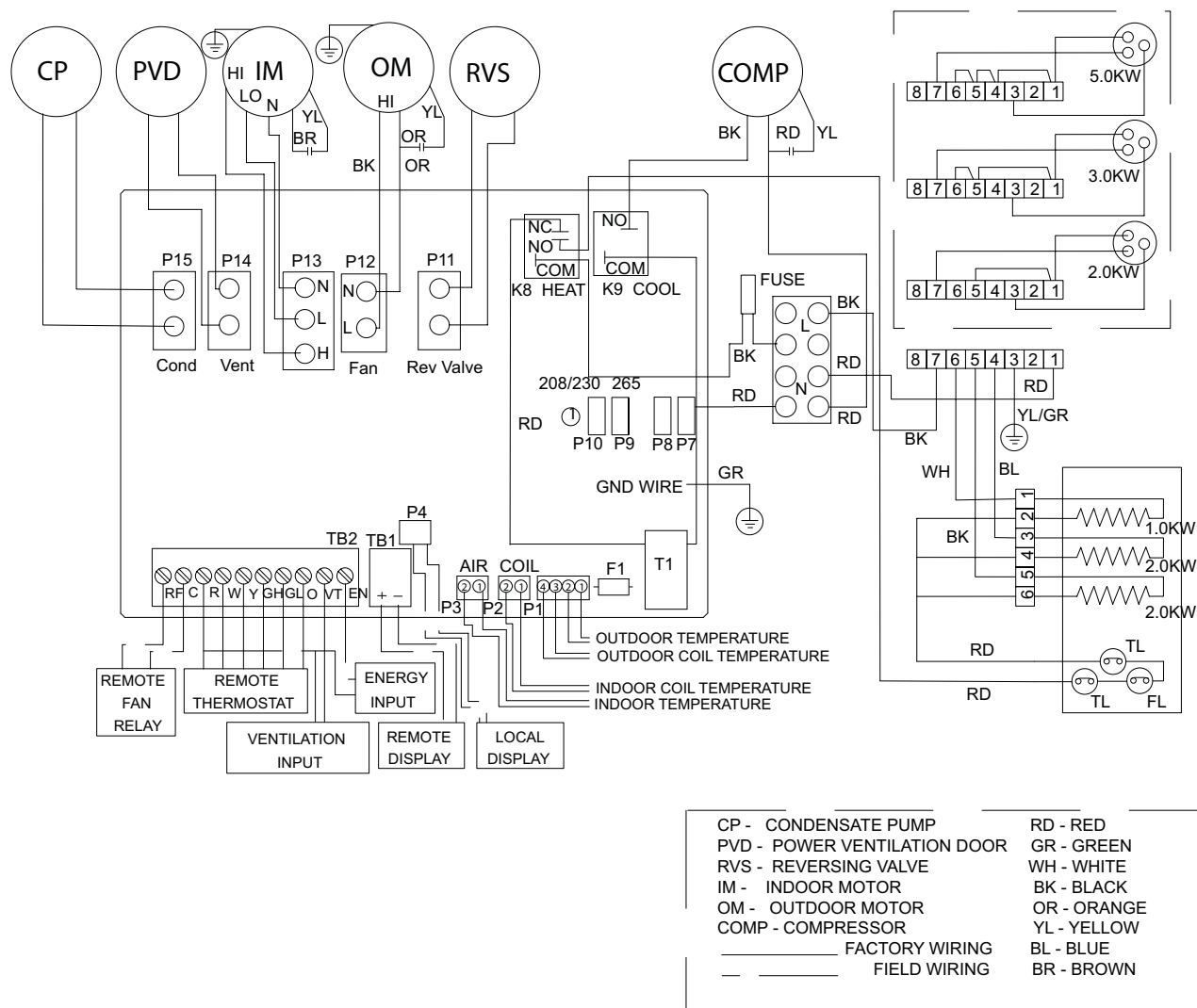


CP - CONDENSATE PUMP	RD - RED
PVD - POWER VENTILATION DOOR	GR - GREEN
RVS - REVERSING VALVE	WH - WHITE
IM - INDOOR MOTOR	BK - BLACK
OM - OUTDOOR MOTOR	OR - ORANGE
COMP - COMPRESSOR	YL - YELLOW
————— FACTORY WIRING	BL - BLUE
- - - - - FIELD WIRING	BR - BROWN

- 1) For 265 VAC unit, connect P8 and P9.
- 2) For cooling only unit, there is no outdoor temperature sensor and reversing valve.
- 3) For different electric heater capacity, refer to IOM for power cord selection.
- 4) The specs for the control board fuse are: 5 x 20mm, 250V, 315mA, fast acting.

Figure 31. 265V Wiring diagram (07 models)

Wiring Diagram



- 1) For 265 VAC unit, connect P8 and P9.
- 2) For cooling only unit, there is no outdoor temperature sensor and reversing valve.
- 3) For different electric heater capacity, refer to IOM for power cord selection.
- 4) The specs for the control board fuse are: 5 x 20mm, 250V, 315mA, fast acting.

Figure 32. 265V Wiring diagram (09, 12, 15)

Wiring Diagram

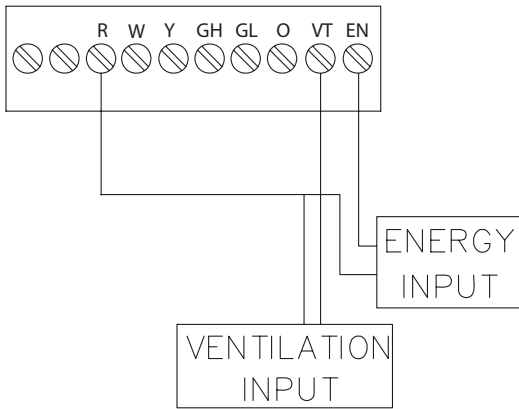


Figure 33. Energy management system

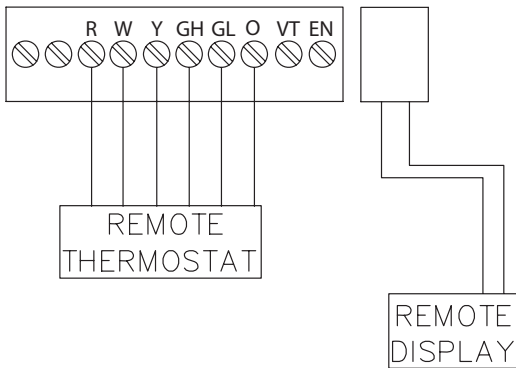


Figure 34. 3rd party class 2 thermostat wiring

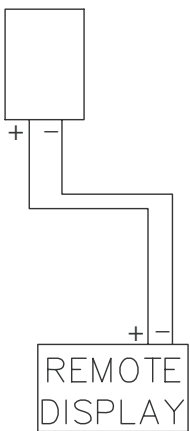


Figure 35. Remote display wiring

Warranty

Full 1st Year Warranty

Trane will repair or replace any part which proves to be defective due to workmanship or materials, free of charge. This includes parts and labor.

Full 2nd - 5th Sealed System Warranty

Trane will repair or replace the evaporator, condenser, compressor, or connecting tubing which proves to be defective due to workmanship or materials, free of charge. This includes parts and labor.

Limited 2nd through 5th Year Functional Parts Warranty

During the 2nd through 5th year, Trane will provide functional parts which prove to be defective due to workmanship or materials. Components covered are switches, solenoids, fan motors, thermistors, circuit boards, factory installed heaters, blower wheel, fan propeller, capacitors, compressor overloads and drain valves.

This limited warranty does not include diagnostic time, labor or any transportation and/or reinstallation charges that may be required.

Literature Order Number	PTAC-SVX01C-EN
Date	09/06
Supersedes	PTAC-SVX01B-EN
Stocking Location	Webb/Mason

The manufacturer has a policy of continuous product and product data improvement and reserves the right to change design and specifications without notice.