



Installation, Operation, and Maintenance

ProSpace™ Packaged Terminal Air Conditioner (PTAC)

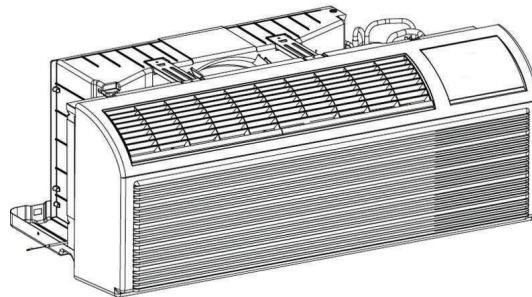
R32 AC/Heat Pump with Electric Heat

208/230 Volts:

PTEG0701GAA
PTHG0701GAA
PTEG0901GAA
PTHG0901GAA
PTEG1201HAA
PTHG1201HAA
PTEG1501HAA
PTHG1501HAA

265 Volts:

PTEG0702GAA
PTHG0702GAA
PTEG0902GAA
PTHG0902GAA
PTEG1202HAA
PTHG1202HAA
PTEG1502HAA
PTHG1502HAA



⚠ SAFETY WARNING

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and air-conditioning equipment can be hazardous and requires specific knowledge and training. Improperly installed, adjusted or altered equipment by an unqualified person could result in death or serious injury. When working on the equipment, observe all precautions in the literature and on the tags, stickers, and labels that are attached to the equipment.



Warnings, Cautions, and Notices

Safety advisories appear throughout this manual as required. Your personal safety and the proper operation of this machine depend upon the strict observance of these precautions.

The three types of advisories are defined as follows:

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, could result in minor or moderate injury. It could also be used to alert against unsafe practices.

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

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. Trane advocates the responsible handling of all refrigerants.

In contrast to common refrigerants, R32 does no harm to the ozonosphere and has a significantly lower greenhouse warming potential when compared to previous refrigerants.

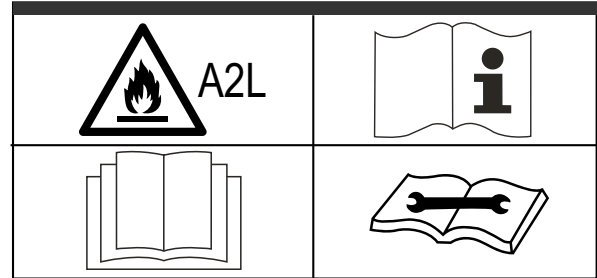
Important Responsible Refrigerant Practices

Trane 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 according to local rules. For the USA, the Federal Clean Air Act (Section 608) sets forth the requirements for handling, reclaiming, recovering and recycling 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

Unit Contains R32 Refrigerant!

Failure to follow proper procedures can result in equipment damage or personal injury.



This unit contains R32 refrigerant which is flammable and odorless. Read the Installation, Operation and Maintenance manual before using this unit. Read the Installation and Service manual before installing or servicing this unit.

WARNING

Safety Hazard!

- Children aged 8 years and above and persons with reduced physical, sensory, or mental capabilities or lack of experience and knowledge are allowed to use this unit only if they are supervised and instructed on how to use the unit in a safe way and understand the hazards involved.
- Children are not permitted to play with this unit.
- Children should not clean or maintain the unit without supervision.
- Keep children from playing or climbing on the air conditioner.

WARNING

Proper Field Wiring and Grounding Required!

Failure to follow code could result in death or serious injury.

All field wiring **MUST** be performed by qualified personnel. Improperly installed and grounded field wiring poses FIRE and ELECTROCUTION hazards. To avoid these hazards, you **MUST** follow requirements for field wiring installation and grounding as described in NEC and your local/state/national electrical codes.

⚠ WARNING**Personal Protective Equipment (PPE) Required!**

Failure to wear proper PPE for the job being undertaken could result in death or serious injury.

Technicians, in order to protect themselves from potential electrical, mechanical, and chemical hazards, **MUST** follow precautions in this manual and on the tags, stickers, and labels, as well as the instructions below:

- Before installing/servicing this unit, technicians **MUST** put on all PPE required for the work being undertaken (Examples; cut resistant gloves/sleeves, butyl gloves, safety glasses, hard hat/bump cap, fall protection, electrical PPE and arc flash clothing). **ALWAYS** refer to appropriate Safety Data Sheets (SDS) and OSHA guidelines for proper PPE.
- When working with or around hazardous chemicals, **ALWAYS** refer to the appropriate SDS and OSHA/GHS (Global Harmonized System of Classification and Labelling of Chemicals) guidelines for information on allowable personal exposure levels, proper respiratory protection and handling instructions.
- If there is a risk of energized electrical contact, arc, or flash, technicians **MUST** put on all PPE in accordance with OSHA, NFPA 70E, or other country-specific requirements for arc flash protection, **PRIOR** to servicing the unit. **NEVER PERFORM ANY SWITCHING, DISCONNECTING, OR VOLTAGE TESTING WITHOUT PROPER ELECTRICAL PPE AND ARC FLASH CLOTHING. ENSURE ELECTRICAL METERS AND EQUIPMENT ARE PROPERLY RATED FOR INTENDED VOLTAGE.**

⚠ WARNING**Safety Precautions!**

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

Before installing and operating the unit, observe the following safety precautions.

- Install, operate, and store the unit in a room with a floor area larger than 43ft² (4m²).
- Store the unit in a room where there are no continuously operating ignition sources (i.e., open flames, an operating gas appliance, or an operating electric heater).
- Store the unit in a well-ventilated area with a room size that matches to the room area specified for operation.
- Store the unit carefully to prevent mechanical damage.
- Ducts connecting to this unit should not have an ignition source.
- Keep any required ventilation openings clear of obstruction.
- Do not pierce or burn this unit.
- Be aware that refrigerants may not contain an odor.
- Do not use means to accelerate the defrosting process or to clean this unit. Only use what is recommended by the manufacturer.
- Any servicing on this unit must be performed only as recommended by manufacturer.
- If repair is necessary, contact an authorized service center only. Any repairs carried out by unqualified personnel may be dangerous.
- Compliance with local and national building codes shall be observed.

⚠ WARNING**Fire Hazard!**

Failure to follow this warning could result in serious injury, death, or property damage.

Though the flammability of the refrigerant is low, it can be ignited by fire. Do **NOT** expose the refrigerant to open flames or any other ignition source.

⚠ WARNING**Follow EHS Policies!**

Failure to follow instructions below could result in death or serious injury.

- All Trane personnel must follow the company's Environmental, Health and Safety (EHS) policies when performing work such as hot work, electrical, fall protection, lockout/tagout, refrigerant handling, etc. Where local regulations are more stringent than these policies, those regulations supersede these policies.
- Non-Trane personnel should always follow local regulations.

⚠ WARNING**Cancer and Reproductive Harm!**

This product can expose you to chemicals including lead and bisphenol A (BPA), which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

⚠ WARNING**Safety Precautions!**

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

Before installing and operating the unit, observe the following safety precautions.

- Do not use an extension cord.
- Specification of fuse on the main board for maximum current to pass must be T3.15AH250V (unit: 208/230V); T3.15A350VAC (unit:265V).
- The external static pressure must be 0MPa for the air conditioner at the test position.
- The minimum clearance from the appliance to combustible surface must be 1.5m.
- For the mode with electric heating, the heater must be installed at the rear of indoor evaporator. Please refer to the Service Manual for details.
- If a STATIONARY APPLIANCE is not fitted with a SUPPLY CORD and a plug, an all-pole disconnection switch with a minimum contact separation of 3mm in all poles should be connected in fixed wiring.
- Confirm that the air outlet and air inlet remain unobstructed.
- Before operation, confirm that power specification complies with the nameplate.
- Turn off air conditioner and pull out the power plug before cleaning or maintaining the air conditioner.
- Confirm that the power cord is not being pressed by hard objects
- Avoid pulling or dragging the power cord to unplug or move the air conditioner.
- Avoid inserting or removing the power plug with wet hands.
- During abnormal situations like burned smell, immediately disconnect power and then contact local dealer.
- When the unit is unattended, turn it off and unplug it or disconnect the power.
- Avoid splashing or pouring water on air conditioner to prevent short circuit or damage to air conditioner.
- Do NOT operate heat equipment around the air conditioner.
- Do NOT operate the unit in rooms with moisture, such as bathroom or laundry room.
- Avoid placing or hanging dripping objects above the air conditioner.
- Do not attempt to repair or disassemble the air conditioner yourself.
- Do not insert any objects into the air conditioner.

⚠ WARNING**Electrical Shock Hazard!**

Failure to follow instructions below could result in death or serious injury.

Properly connect the system's oversized protective earthing (grounding) terminal(s).

⚠ WARNING**Safety Hazards!**

Failure to comply with the instructions below could result in death and/or serious injury.

Choose a safe site to install a unit:

- Do not install the unit in an explosive environment.
- Do not install the unit on flammable material.
- Do not install the unit where it is accessible to the general public.

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Revision History

- Included additional warnings in the front matter.
- Updated power connection options in Electrical chapter.
- Updated to new Parts literature number.



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General Information

The ProSpace™ Packaged Terminal Air Conditioners and heat pumps provide a high standard of quality in performance, workmanship, durability, and appearance as they heat and cool the occupied air space year round.

This manual provides information for ease of installation, operation and maintenance. All models are designed for through-the-wall installation. Separate installation instructions are included with all accessory components.

Read this manual completely and carefully before starting any work. Write down the model and serial number on the

space provided on the product registration card. Locate the model and serial number on the serial number plate attached to the unit. These numbers are required for any service work.

Important: *Confirm this manual is left with the owner for future reference. Observe all local codes and ordinances. Observe all governing codes and ordinances. These instructions must be saved for local inspector's use. Leave these instructions with the owner.*

Table 1. Operating Temperature Range:

	Indoor Side DB/WB (°F/°C)	Outdoor Side DB/WB (°F/°C)
Maximum Cooling	80/67 (26.7/19.4)	115/75 (46.1/23.9)
Maximum RC Heating	80/- (26.7/-)	75/65 (23.9/18.3)
Maximum Electric Heating	77/- (25/-)	77/- (25/-)

- Ambient temperature range (indoor temperature) for cooling is 64-80°F (18-26.7°C),
- Ambient temperature range (outdoor temperature) for cooling is 64-115°F (18-46.1°C),
- Ambient temperature range (indoor temperature) for heat pump is 41-80°F (5-26.7°C),
- Ambient temperature range (outdoor temperature) for Electric Heating is 19-77°F (-7-25°C).
- Ambient temperature range (outdoor temperature) for heat pump is 55-75°F (13-23.9°C),



Model Number Description

Use the following to determine the correct model number:

P T E G 0 7 0 2 G A A

Product Family

PT = Packaged Terminal Unit

Heating Methods

E = Cooling with Electric Heat

H = Heat Pump with Electric Heat

Development Sequence

F = R410A Refrigerant

G = R32 Refrigerant

Size and Cooling

070 = 7,000 Btu

090 = 9,000 Btu

120 = 12,000 Btu

150 = 15,000 Btu

Electrical Voltage

1 = 208/230 Vac

2 = 265 Vac

Electric Heat Size

G = Maximum of 3.5 kW

H = Maximum of 5.0 kW

Design Sequence

AA = First

AB = Second



Air Conditioners with Electric Heat

Performance	Units	PTEG071GAA	PTEG072GAA	PTEG091GAA	PTEG092GAA	PTEG1201HAA	PTEG1202HAA	PTEG1501HAA	PTEG1502HAA
Trade Name:		ProSpace™	ProSpace™	ProSpace™	ProSpace™	ProSpace™	ProSpace™	ProSpace™	ProSpace™
Style/Function:		Cooling Only w/ Heaters	Cooling Only w/ Heaters	Cooling Only w/ Heaters	Cooling Only w/ Heaters	Cooling Only w/ Heaters	Cooling Only w/ Heaters	Cooling Only w/ Heaters	Cooling Only w/ Heaters
Cooling Capacity:	Btu/h	7,200/7,400	7,500	9,900/10,200	10,000	12,100/12,300	12,300	14,400/14,700	14,800
Electric Heat Power Input Only:	W	2,450(2,010)/3,450 (2,830)	2,450/3,450	2,450(2,010)/3,450 (2,830)	2,450/3,450	2,450(2,010)/3,450 (2,830)/5,000(4,090)	2,450/3,450/5,000	2,450(2,010)/3,450 (2,830)/5,000(4,090)	2,450/3,450/5,000
Rated Input (Electric Heat + Fan Motor)	W	2,500(2,040)/3,500 (2,860)	2,500/3,500	2,500(2,040)/3,500 (2,860)	2,500/3,500	2,500(2,040)/3,500 (2,860)/5,050(4,130)	2,500/3,500/5,050	2,500(2,040)/3,500 (2,860)/5,050(4,130)	2,500/3,500/5,050
EER:	(Btu/h)/W	13.3	13.3	12.5	12.5	11.8/11.6	11.6	10.6/10.4	10.6
Dehumidifying Vol:	Pint/h	1.69	1.69	2.11	2.11	2.75	2.75	3.17	3.17
Application Area:	ft ²	108-172	108-172	129-194	129-194	172-258	172-258	226-334	226-334
Electrical									
Rated Voltage:	V~	208/230	265	208/230	265	208/230	265	208/230	265
Rated Frequency:	Hz	60	60	60	60	60	60	60	60
Phases:		1	1	1	1	1	1	1	1
Cooling Power Current:	A	2.6/2.4	2.1	3.9/3.6	3.2	5.0/4.7	4.0	6.5/6.0	5.3
Power Cord:		Refer to Table 2 and Table 3.	Refer to Table 2 and Table 3.	Refer to Table 2 and Table 3.	Refer to Table 2 and Table 3.	Refer to Table 2 and Table 3.	Refer to Table 2 and Table 3.	Refer to Table 2 and Table 3.	Refer to Table 2 and Table 3.
Features									
Sound Pressure Level (L/H):	dB (A)	46/50	46/50	46/50	46/50	50/53	50/53	50/53	50/53
Airflow Volume (L/H):	CFM	282/312	282/312	282/330	282/330	306/341	306/341	306/341	306/341
Warranty:		5-Year Parts/5-Year Sealed System Replacement	5-Year Parts/5-Year Sealed System Replacement	5-Year Parts/5-Year Sealed System Replacement	5-Year Parts/5-Year Sealed System Replacement	5-Year Parts/5-Year Sealed System Replacement	5-Year Parts/5-Year Sealed System Replacement	5-Year Parts/5-Year Sealed System Replacement	5-Year Parts/5-Year Sealed System Replacement
Specifications									
Dim of Package (L x W x H):	Inch	45 x 25 x 19	45 x 25 x 19	45 x 25 x 19	45 x 25 x 19	45 x 25 x 19	45 x 25 x 19	45 x 25 x 19	45 x 25 x 19
Net Weight:	lb	110	110	110	110	115	115	115	115
Refrigerant:		R-32	R-32	R-32	R-32	R-32	R-32	R-32	R-32
Refrigerant Charge:	lb	1.1	1.1	1.1	1.1	1.3	1.3	1.2	1.1



Heat Pumps with Electric Heaters

Performance	Units	PTHG0701GAA	PTHG0702GAA	PTHG0901GAA	PTHG0902GAA	PTHG1201HAA	PTHG1202HAA	PTHG1501HAA	PTHG1502HAA
Trade Name:		ProSpace™	ProSpace™	ProSpace™	ProSpace™	ProSpace™	ProSpace™	ProSpace™	ProSpace™
Style/Function:		Heat Pump w/ Heaters	Heat Pump w/ Heaters	Heat Pump w/ Heaters	Heat Pump w/ Heaters	Heat Pump w/ Heaters	Heat Pump w/ Heaters	Heat Pump w/ Heaters	Heat Pump w/ Heaters
Cooling Capacity:	Btu/h	7,200/7,400	7,300	9,400/9,700	9,800	11,900/12,100	12,000	14,200/14,600	14,500
Heating Capacity:	Btu/h	5,800/6,000	6,000	8,200/8,500	8,600	10,700/10,900	10,700	13,300/13,800	13,300
Electric Heat Power Input Only:	W	2,450(2,010)/3,450 (2,830)	2,450/3,450	2,450(2,010)/3,450 (2,830)	2,450/3,450	2,450(2,010)/3,450 (2,830)/5,000(4,090)	2,450/3,450/5,000	2,450(2,010)/3,450 (2,830)/5,000(4,090)	2,450/3,450/5,000
Rated Input (Electric Heat + Fan Motor)	W	2,500(2,040)/3,500 (2,860)	2,500/3,500	2,500(2,040)/3,500 (2,860)	2,500/3,500	2,500(2,040)/3,500 (2,860)/5,050(4,130)	2,500/3,500/5,050	2,500(2,040)/3,500 (2,860)/5,050(4,130)	2,500/3,500/5,050
EER:	(Btu/h)/W	13.0	13.0	12.1	12.1	11.8/11.6	11.6	10.4	10.4
Dehumidifying Vol:	Pint/h	1.69	1.69	2.11	2.11	2.75	2.75	3.17	3.17
Application Area:	ft2	108-172	108-172	129-194	129-194	172-258	172-258	226-334	226-334
Electrical									
Rated Voltage:	V~	208/230	265	208/230	265	208/230	265	208/230	265
Rated Frequency:	Hz	60	60	60	60	60	60	60	60
Phases:		1	1	1	1	1	1	1	1
Cooling Power Current:	A	2.6/2.4	2.1	3.9/3.6	3.1	4.9/4.6	4.0	6.5/6.0	5.3
Heating Power Current:	A	2.3/2.1	1.8	3.2/3.1	2.6	4.3/4.1	3.5	5.9/5.6	4.7
Power Cord:		Refer to Table 2 and Table 3.	Refer to Table 2 and Table 3.	Refer to Table 2 and Table 3.	Refer to Table 2 and Table 3.	Refer to Table 2 and Table 3.	Refer to Table 2 and Table 3.	Refer to Table 2 and Table 3.	Refer to Table 2 and Table 3.
Features									
Sound Pressure Level (L/H):	dB (A)	46/50	46/50	46/50	46/50	50/53	50/53	50/53	50/53
Airflow Volume (L/H):	CFM	282/312	282/312	282/330	282/330	306/341	306/341	306/341	306/341
Warranty:		5-Year Parts/5-Year Sealed System Replacement	5-Year Parts/5-Year Sealed System Replacement	5-Year Parts/5-Year Sealed System Replacement	5-Year Parts/5-Year Sealed System Replacement	5-Year Parts/5-Year Sealed System Replacement	5-Year Parts/5-Year Sealed System Replacement	5-Year Parts/5-Year Sealed System Replacement	5-Year Parts/5-Year Sealed System Replacement
Specifications									
Dim of Package (L x W x H):	Inch	45 x 25 x 19	45 x 25 x 19	45 x 25 x 19	45 x 25 x 19	45 x 25 x 19	45 x 25 x 19	45 x 25 x 19	45 x 25 x 19
Net Weight:	lb	112	112	115	115	119	119	120	120
Refrigerant:		R32	R32	R32	R32	R32	R32	R32	R32
Refrigerant Charge:	lb	1.7	1.7	1.5	1.5	1.8	1.8	1.9	1.8



Electrical

⚠ WARNING

Live Electrical Components!

Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

When it is 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.

⚠ WARNING

Power Cord!

If the SUPPLY CORD is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

Power Connection Options

Appropriate power cord accessory kit is determined by the voltage and the amperage of the building branch circuit. The power cord selection affects the unit performance such as electric heater size. This unit ships without a power cord (or hard wire kit). An accessory power cord must be ordered to connect the unit to the outlet.

Notes:

- Confirm the receptacle matches the appropriate prong configuration on the plug. It should be within reach of the service cord. All wiring, including installation of the receptacle, must be in accordance with the NEC™ and all local codes, ordinances and regulations. National codes require the use of an arc fault or leakage current detection device on all 208/230V power cords.
- For 265V units, if power cord accessory option is selected, then the cord is only 18" long and must plug into the accessory electrical 265V sub-base.

⚠ WARNING

Fire Hazard!

Failure to properly size the power cord could result in serious injury, death, or property damage.

All Units

Important: Follow NEC and local electrical codes when installing electrical supply wiring. The following is only shown as a sample.

Use recommended wire size (Table 1) and install a single-branch circuit. All units are designed to operate off only one (1) single branch circuit.

Note: Only use copper conductors. Branch circuit wire is single circuit from main box. AWG wire sizes are based on copper wire at a 140°F (60°C) temperature rating.

Table 2. Common Branch Circuit Wire Sizes

Nameplate Amps	AWG Wire Size
7.0 to 12	14
12.1 to 16	12
16.1 to 24	10

Grounding

For safety and protection, the unit is grounded through the service cord plug or through separate ground wire provided on hard wired units. Confirm the branch circuit or general purpose outlet is grounded.

Voltage Supply

Check voltage supply at outlet. For satisfactory results, the voltage range must always be within the ranges specified on the data information plate. Power cord does not ship with the unit. The cord to order is determined by the unit voltage and the desired electric heat capacity.

Cord/Connected Units

The 250 Vac field supplied outlet must match the plug for standard 208/230V units and be within reach of the service cord.

Note: Do NOT use 30 amp cord with sizes 07 and 09 units.

Table 3. Electric Heater and Cord Information, PTEG and PTHG Sizes 07 and 09







Voltage:	230 Vac ^(a)		265 Vac	
Amps: ^(b)	15	20	15	20
Heater Size:	2.5 kW	3.5 kW	2.5 kW	3.5 kW
Plug Layout:				

Table 3. Electric Heater and Cord Information, PTEG and PTHG Sizes 07 and 09 (continued)

NEMA Plug:	6-15P	6-20P	7-15P	7-20P
Cord #:	PWR00286	PWR00288	PWR00287	PWR00289

- (a) The 250 Vac field supplied outlet must match the plug for standard 208/230V units and be within reach of the service cord.
 (b) Do Not use 30 amp cord with sizes 07 and 09 units.

Table 4. Electric Heater and Cord Information, PTEG and PTHG Sizes 12 and 15

Voltage:	230 Vac			265 Vac		
Amps:	15	20	30	15	20	30
Heater Size:	2.5 kW	3.5 kW	5.0 kW	2.5 kW	3.5 kW	5.0 kW
Plug Layout:						
NEMA Plug:	6-15P	6-20P	6-30P	7-15P	7-20P	7-30P
Cord #^(a):	PWR00286	PWR00288	PWR00290	PWR00287	PWR00289	PWR00291

(a) Power cord does not ship with the unit.

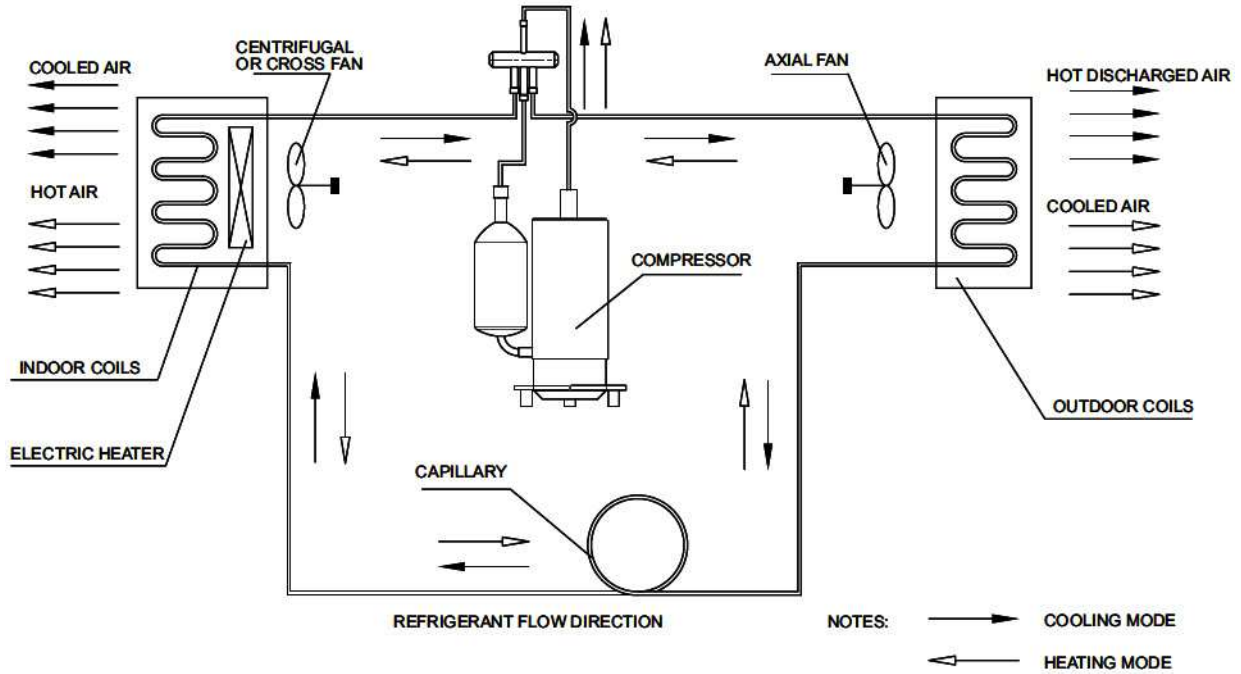
Power Cord Protection

The power cord for 230/208V units provide protection from fire. The unit power automatically disconnects when unsafe conditions are detected. Power to the unit can be restored by pressing the reset button on plug head. Upon completion of unit installation for 230/208V models, an operational check should be performed using the TEST/RESET buttons on the plug head.

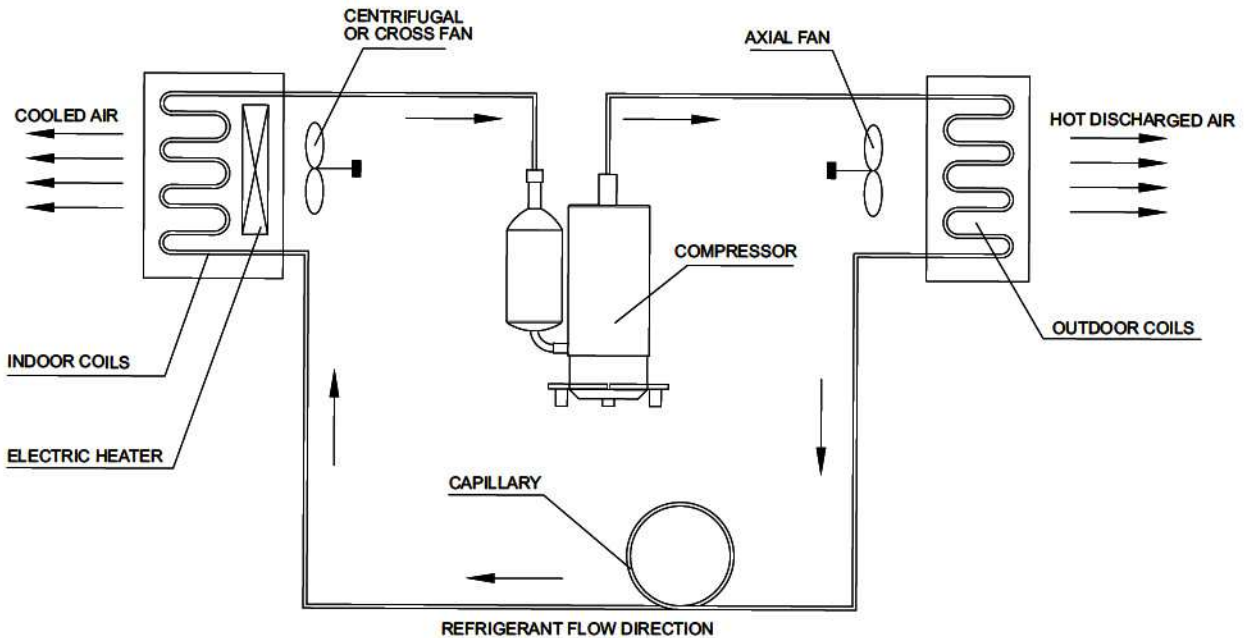
Note: Models with 265V do not incorporate this feature because they require use of an electrical sub-base accessory. Connection to a wall socket is not permitted for 265V units. All 265V units must be hard wired using the hard wire kit or make use of the plug-in receptacle in the standard sub-base.

Refrigerant System Diagrams

PTHG Cooling, Heat Pump, Auxiliary Electric Heat



PTEG Cooling and Electric Heat

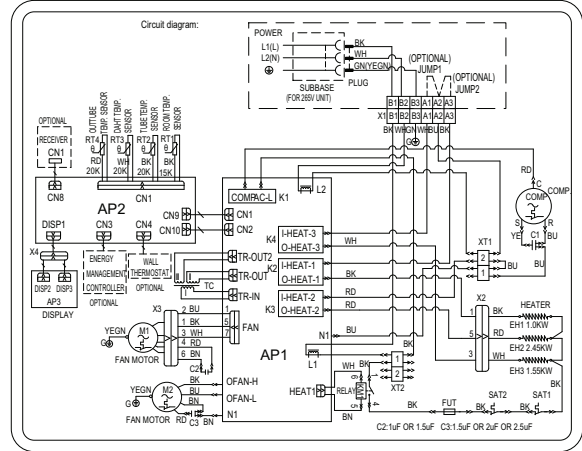




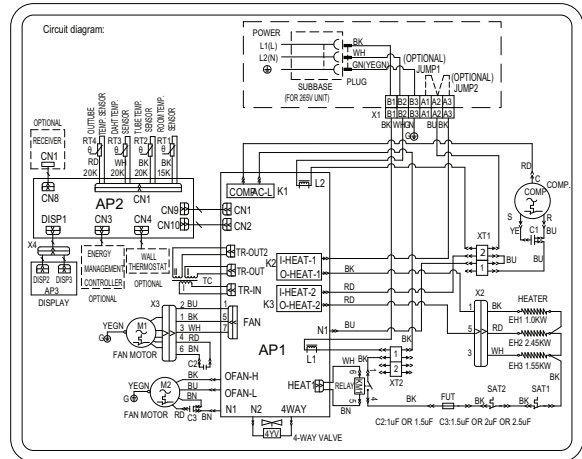
Electrical Wiring Diagrams

Symbol	Color/Name
WH	White
YE	Yellow
RD	Red
YEGN	Yellow/Green
VT	Violet
GN	Green
BN	Brown
BU	Blue
BK	Black
OG	Orange
CAP	Jumper cap
COMP	Compressor
	Grounding Wire

208/230V; PTEG1201 and PTEG1501 265V; PTEG1202 and PTEG1502



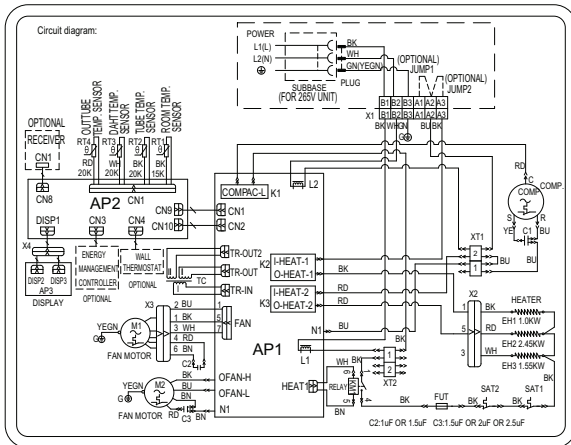
208/230V; PTHG0701 and PTHG0901 265V; PTHG0702 and PTHG0902



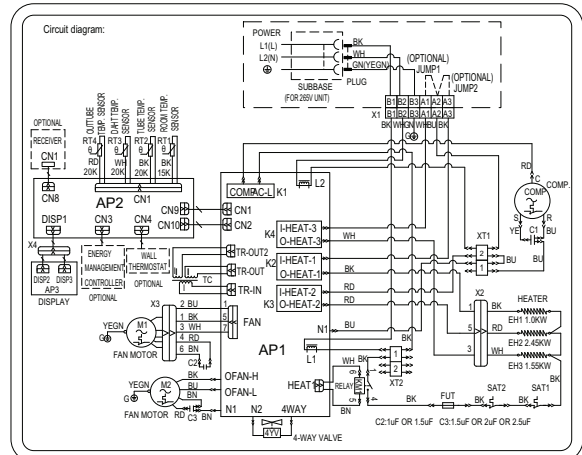
Electrical Wiring Diagrams for 208V/230V and 265

The electrical schematic diagram pictured below is subject to change. Please reference the wiring diagram on the unit.

208/230V; PTEG0701 and PTEG0901 265V; PTEG0702 and PTEG0902



208/230V; PTHG1201 and PTHG1501 265V; PTHG1202 and PTHG1502

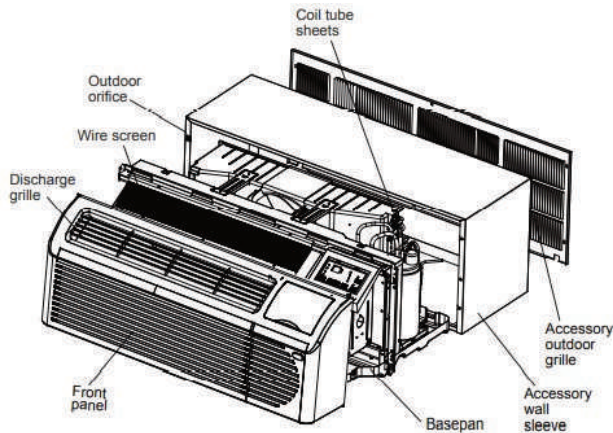




Installation

Trane Wall Sleeve and Grille

The image below shows the typical unit components that are ordered and installed.



Important: Proper installation is the responsibility of the installer. Product failure due to improper installation is not covered under warranty.

Note: To install the Trane Wall Sleeve and Grille, refer to the latest installation instructions, PTAC-SVN028 and PTAC-SVN027.

Considerations for Use of Existing Sleeves

⚠ WARNING

Live Electrical Components!

Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

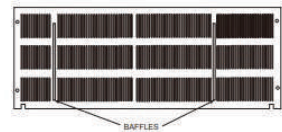
When it is necessary to work with live electrical components, have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks.

In applications when the unit is a replacement, it is recommended to use a Trane sleeve. This unit can be retrofitted to other manufacturers similar sleeves if outdoor unit airflow is not restricted or recirculated.

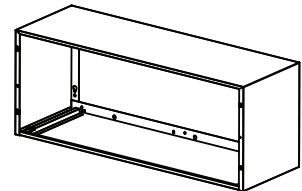
Important: Confirm the outdoor grille is installed on the sleeve. For any sleeve retrofit applications, be sure that the foam seals (factory installed on the tube sheets) provide a good seal between the grille and outdoor coil tube sheets. These foam seals provide a barrier that stops the inside air from mixing with the outside air (known as air recirculation).

Important: Inspect the wall sleeve thoroughly prior to installation. The manufacturer does not assume responsibility for costs or damage due to defects in the sleeve or for improper installation.

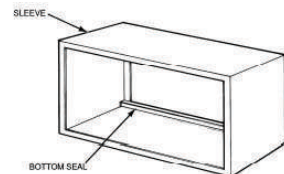
Remove any existing foam baffles installed on competitor's outdoor grille.



General Electric Metal Wall Sleeve; interchangeable with ProSpace wall sleeve.



General Electric Plastic Wall Sleeve; remove bottom seal from plastic sleeve.



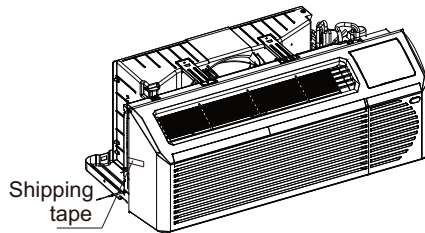
Installing the Chassis into Wall Sleeve

NOTICE

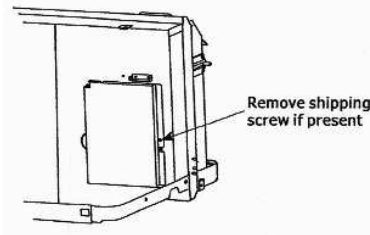
Equipment Damage!

Use spreader bars to prevent straps from damaging the unit. Install the bars between lifting straps, both underneath the unit and above the unit to prevent the straps from crushing the unit cabinet or damaging the finish.

1. Carefully remove shipping tape from the front panel and vent door.

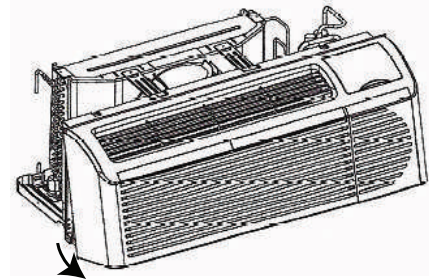


2. Remove shipping screw from the vent door, if present.

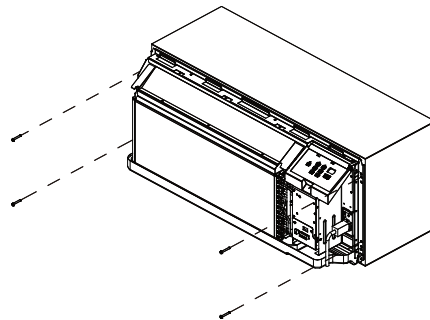


3. Remove front panel. Consider the following electrical guideline before sliding the unit back into the wall.

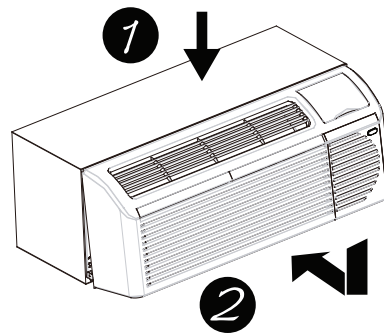
- All units require a cord or a hard-wired kit to be added to complete electrical connection to the building. Follow the instructions provided with those accessories.



4. Lift unit level and slide unit into wall sleeve until foam seal rests firmly against front of wall sleeve.
5. Secure with four screws (supplied) through the unit flange holes.



6. Re-install front panel by first, hooking tabs over top rail of unit (1) and then pushing in on the bottom of the front panel until it snaps into place (2).

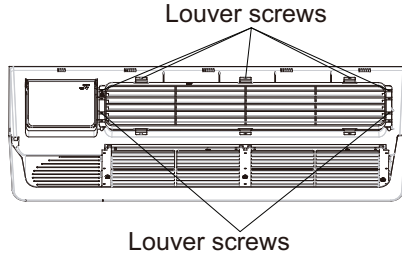




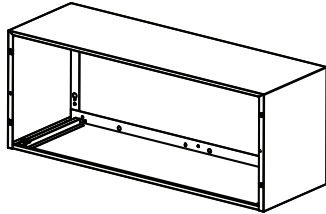
System Configuration

Adjusting Air Direction- Only for Duct Installations

1. Remove front panel.



2. Remove louver screws that hold the louver insert in place on the back side of the front panel.



3. Turn louver insert and rotate it 180°.
4. Replace louver insert.
5. Replace screws and the front panel.

DIP Switches

⚠ WARNING

Hazardous Voltage!

Failure to disconnect power before servicing could result in death or serious injury.

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Verify that no power is present with a voltmeter.

The auxiliary DIP switch controls are located behind the front panel and through an opening below the control panel. To access, you must remove the front panel. The DIP switches are accessible without opening the control box.

Important: Electrical power supply must be disconnected from unit to apply DIP switch changes.

Note: Factory settings for DIP switches will be in the DOWN position. Refer to the following for the functionality of each DIP switch position.

Figure 1. DIP switch/wall thermostat enable

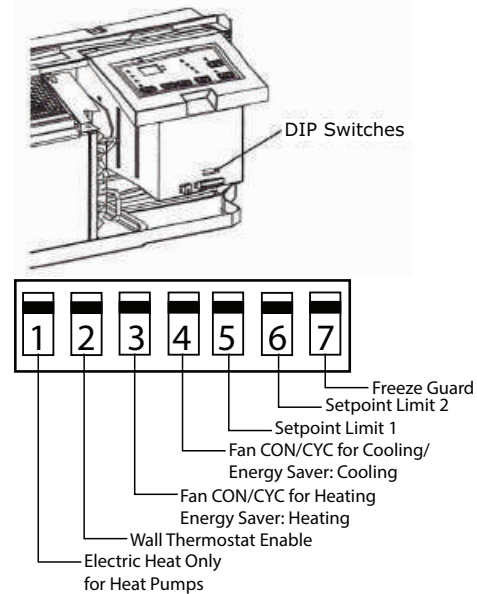


Table 5. DIP Switch Descriptions

DIP Switch Number	Up	Down	Default	Remarks
1: Electric Heating Only/Emergency Heat. This setting is typically used for Emergency Heating.	Electric Heat Only	Heat Pump	Down	For only heat pump units.
2: Wall Thermostat Enable. A wired wall thermostat can be connected to the unit. The DIP switch must be adjusted accordingly in order to allow the wall thermostat control of the unit. When unit is in wall thermostat mode, the control panel is disabled.	Wall Thermostat Enable	Control Panel Enable	Down	
3: Energy Saver DIP Switches. Allows the fan to operate in continuous or cycle mode while the unit is in heating or cooling mode. DIP Switch 3: Continuous and allows the fan to run continuously, circulating air even when the temperature setting has been satisfied. DIP Switch.	Fan Continuous Run for Heating.	Fan Cycle for Heat	Down	

Table 5. DIP Switch Descriptions (continued)

DIP Switch Number	Up		Down		Default	Remarks
4: Energy Saver DIP Switches. Allows the fan to cycle ON and OFF with the compressor or electric heater. The fan stops a short time after the temperature setting is satisfied. This is the most efficient mode for electrical usage.	Fan Cycle for Cool.		Fan Continuous Run for Cooling		Down	
5/6: Setpoint Temperature Limits. Provides a range of temperature control.	Up/Up 68°F to 75°F (20°C to 24°C)	Up/Down 63°F to 80°F (17°C to 28°C)	Down/Up 65°F to 78°F (18°C to 26°C)	Down/Down 61°F to 86°F (16°C to 30°C)	Down/Down	Configurations 5 and 6 combine to select set point range. When setpoint limit set, display always shows full range.
7: Room Freeze Protection. If the unit senses a room temperature below 40°F (4.44°C), the fan motor and electric strip heat turns ON and warms the room to 50°F (10°C). The fan stops a short time after the temperature is satisfied.	Freeze Guard Disable		Freeze Guard Enable		Down	

Keypad Configuration

The Trane ProSpace can be customized by configuring the keypad.

- To enter the keypad configuration screen, first power up the unit.
- Within the 30 seconds after power-up press and hold both the **fan speed** and **Cooler button ▼** for five (5) seconds.

Note: If waiting more than 30 seconds after power-up, you cannot access the keypad configuration. Power down and power up the unit again to restart the process.

- To scroll through the available options, press and release the **fan speed** button to select the keypad configurations. The stored value displays.
- To exit the configuration screen, press the **mode** button or after 30 seconds, the unit will automatically exit the configuration screen.
- To modify configuration settings, press and release simultaneously, either the **Setpoint** and **Warmer button ▲** or **Setpoint** and **Cooler button ▼**. Choose from the following four (4) options:
 - Fahrenheit/Celsius Display Switch;** changes between degrees Fahrenheit (F, default) and Celsius (C) on the display.
 - Indoor Air Temperature Sensor Biasing for Cooling Mode;** adjusts the room air temperature reading when in cooling mode (not normally required).
 - Indoor Air Temperature Sensor Biasing for Heating Mode;** adjusts the room air temperature reading when in heating mode (not normally

required).

- Indoor Temperature Display;** changes between showing the setpoint or desired temperature during heating and cooling modes (SP, default) or displaying the actual room temperature during heating and cooling modes (AA).
 - Selecting SP displays the desired setpoint temperature during heating and cooling modes, regardless of what the actual temperature is in the room .
 - Selecting AA displays the room temperature during heating, cooling, and fan-only modes
 - Changing the mode button to either heating or cooling modes displays the setpoint for 10 seconds. After the 10 seconds, the room temperature displays.
 - Depressing the ON-OFF when the unit is OFF, and the last mode was either cooling or heating, the setpoint displays for 10 seconds before displaying the room temperature.
 - Depressing either **Warmer button ▲** or **Cooler button ▼** during heating and cooling mode displays the setpoint for 10 seconds before displaying the room temperature.
- Press **Warmer button ▲** or **Cooler button ▼** to switch between **Emergency Auto Cooling Allowed** (displays as CA) and **Emergency Auto Cooling Rejected** (displays as CD).
- When activating Auto Cooling Operation and room temperature reaches 85°F while the unit is in the **STOP** mode, the unit automatically starts in Air Conditioning Operation and shuts off when the room temperature reaches 80°F.

Auxillary Controls

Wiring the Wall Thermostat

⚠ WARNING

Live Electrical Components!

Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

When it is 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.

NOTICE

Equipment Damage!

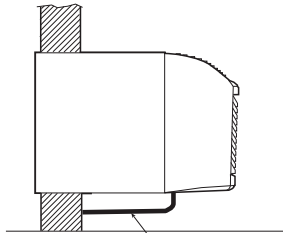
Failure to follow instructions will result in premature failure of the unit.

Improper wiring may damage unit electronics. Common busing is not permitted. Damage or erratic operation may result.

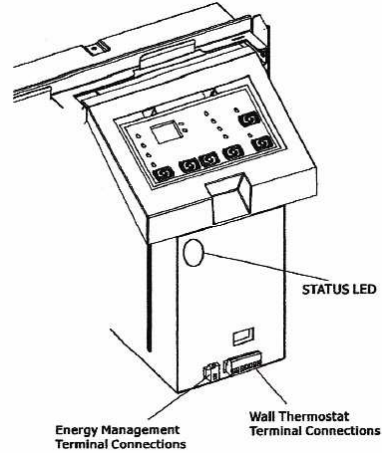
After installing control panel blockoff PLT05872, the previous control board should be retained to access event diagnostic codes, if needed in the future.

To wire the to the thermostat:

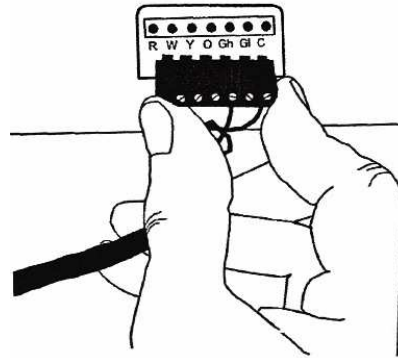
1. Check to be sure power to unit is disconnected.
2. Route the wire through the thermostat under the sleeve and behind the front panel as shown below.



THERMOSTAT WIRE ROUTING
(UNDER SLEEVE, BEHIND FRONT PANEL)



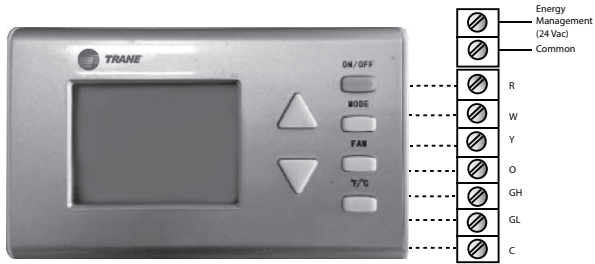
3. Remove the terminal connector to simplify wiring.



4. Connect wires from the thermostat to terminals on unit terminal connector.

Note: Thermostat wire is field supplied. Recommended wire gauge is 18 to 20 gauge, solid thermostat wire.

Important: Thermostat wire should always be routed around or under the wall sleeve, NEVER through the wall sleeve.



- R; 24 Vac
- W; Electric Heat
- Y; Compressor
- O; Reversing Valve (Heat Pump Unit Connection Only)
- GH; High Fan
- GL; Low Fan
- C; Common (Typically for Digital Thermostats)

Note: Any incorrect input combinations are captured as thermostat wiring failures and will light the STATUS LED indicator on main board.

5. Reinstall terminal connector.
6. Confirm the unit is configured for wall thermostat enable. See Table 5, p. 16 (DIP switch setting for wall thermostat).
7. Replace control panel label with control panel guard.
8. Power-up the unit.

General Notes:

- Anytime there is a second-stage call for heating from the wall thermostat,, the unit automatically switches over to electric heating for heat pump models.
- For thermostats with two (2) fan speed output (such as

Low fan or Hi fan), the fan speed is determined by how the terminal connector is wired. When using Low fan speed, wire the GL output from the thermostat to GL on the terminal block. When using Hi fan speed, wire the GH output from the thermostat to GH on the terminal block.

Energy Management Input (Front Desk Control)

The controller can handle a switch signal from remote energy management input, called an EM signal or front desk control. The input must be 24 Vac. When the system receives a 24 Vac signal, it turns OFF the unit; otherwise it is in normal control. This function is disabled under Freeze Guard protection.

Intelligent Self-Checking Control

The PTAC has an on-board computer to continuously check key components of the unit to verify they are operating properly. Under normal operation, the unit status indicator (STATUS, on main PCB), light is steadily ON. If there is a major problem, the unit shuts down and displays a diagnostic failure code on the control. If it is a minor error and the unit can correct it by itself, the diagnostic code is flashed on the status LED that is easily seen when the front panel is removed. Refer to the following table of diagnostic codes.

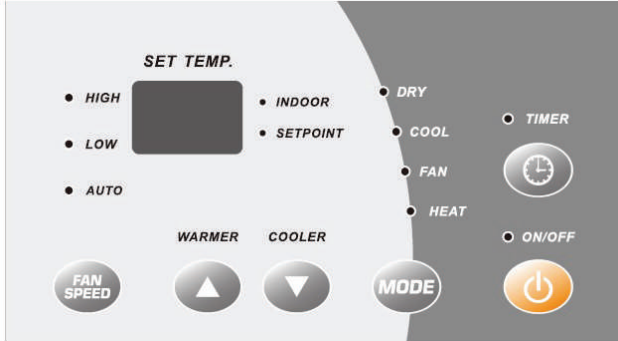
Notes:

- When using a room thermostat, diagnostic codes are not viewable. These codes are only viewable on the unit control board.
- After the compressor cycles three times the F0 code can appear if the refrigerant charge is low.



Operation

The following sections describe the operation of the Trane ProSpace unit.



Control Buttons and Functions

The section describes the buttons and functionality of the Trane ProSpace unit.

- **ON/OFF**; turns the unit ON or OFF.
- **Mode**; switches between Cool, Fan, Heat, or Dry (optional). Pressing this button when in OFF mode and the controller resumes to the operation status before power-off.
- **WARMER or COOLER**; the dual-8 nixie tube displays the indoor temperature for 15 seconds and then turns OFF. It is used to increase/decrease the temperature or timer setting.
- **Fan**; sets the High, Medium, Low or Auto fan speeds.
- **Timer**; sets the timer function by using either of the buttons on the control panel or by the remote controller.
 - **Timer ON function**; the timer can be set to ON when the unit is OFF. Setting range is between 0.5 hours to 24 hours. When timer ON setting is reached, the system stops and operates according to the set mode.
 - **Timer OFF function**; When the unit is off, timer OFF can be set. Setting range is between 0.5 hours, to 24 hours. When timer OFF setting is reached, the system stops operation.
 - **Timer Preview function**: use this function to preview the remaining time of timer.
- **Sleep function**; can only be set only using the remote controller.
- **Dry function**; This operational mode will help to manage and reduce the humidity in the room, making it more comfortable. In Dry mode the unit will operate cooling at low fan speed until the room temperature is 4 degrees F below the room temperature setting regardless of fan mode selection. This operation will drive more moisture out by subcooling the space at low speed until 4 degrees below room set point. The fan will run continuous. No other fan settings will override this

continuous fan operation of the Dry mode. Dry mode is NOT available when a wall thermostat is installed. This Dry mode is only available via the unit mounted controls. These unit mounted controls are disabled and may even be removed when wall thermostats are installed. Dry mode or function should not be considered a substitute for a stand-alone dehumidifier.

- **Buzzer option**; when the controller is energized, or when a valid remote control signal or /button signal is received, the buzzer beeps.
- **Auto Fan Speed function**; can be automatically selected according to different modes or indoor temperature to achieve a higher comfort level.
- **Emergency Cooling Operation function**; When the indoor ambient temperature is $\geq 86^{\circ}\text{F}$ (30°C), the unit starts cooling automatically. When the indoor ambient reaches 80.6°F (27°C), the unit stops operation.
- **F-code Remote Controller function**; optional.

LED Display and Digital Display

LEDs

The unit has two (2) 8-segment nixie tubes and eleven (11) LEDs on the main board. Each LED is lit for the corresponding set mode. Indicators LEDs are:

- High
- Low
- Auto
- Indoor Temperature
- Setpoint Temperature
- Dry
- Cool
- Constant Fan
- Heat
- Timer
- ON/OFF

Digital Display

When in cooling or heating mode, the digital display defaults to the set temperature. In Fan Mode, it displays indoor ambient temperature. When the display has three digits, the digital is rolling to display values.

When there is error or protection code displayed, the STATUS LED blinks. In OFF mode, the digital does not display the error code (except the low temperature protection). The unit does not display protection status codes 8, 9, or 10. When multiple protection codes overlap, they cycle through the display without priority. Refer to [Table 8, p. 33](#) for a list of error codes.

Note: *If there is an error with the temperature sensor, only the indoor fan responds in cooling mode. Other loads do not respond, but the buttons are still valid.*

Mode Functions

Cooling Mode Functions

- When the ambient temperature is 2°F above setpoint, the unit operates under cooling. Both the outdoor fan and indoor fan operate in the set speed. When the starting condition of compressor is reached, outdoor fan operates and compressor begins operation 10 seconds later.
- When the ambient temperature reaches 2°F below setpoint, the unit stops operation, whereby, the compressor and outdoor fan stop operation. Under indoor fan cycle mode, the indoor fan stops operation after operating at set fan speed for 60 seconds (except when it requires the indoor fan to operate in protection mode). If the fan cycle mode is not selected, the indoor fan operates at the set fan speed.
- When the indoor fan is set at high speed, the outdoor fan operates at high speed.
- When the indoor fan is set at low speed, outdoor fan operates at low speed.
- When the unit starts in cooling mode for the first time and the indoor fan is set to low speed, the outdoor fan starts at high speed. After operating for 3-1/2 minutes and the outdoor tube temperature is below 140°F (60° C), the outdoor fan switches over to low speed. First time start-up includes, when switching to low speed cooling from non-cooling mode or when the unit starts low speed cooling for the first time or enter low speed cooling after a power failure.
- During cooling mode, and when there is no outdoor condenser high temperature condition, the unit stops:
 - When it reaches the setpoint.
 - When the unit stops for a temperature sensor error.
 - When the unit stops for freeze protection.
 - When the start-up condition of outdoor fan is met.
 - When the indoor fan operates at high fan speed for 3 seconds and then turn to set fan speed.

If high temperature protection occurs during cooling mode, the outdoor fan is forced to operate at high speed. When the start-up condition of outdoor fan in heating mode is met, the outdoor fan operates at high fan speed for 3 seconds and then turns ON to set the fan speed. When the indoor fan starts operation, the indoor fan operates at high fan speed for 3 seconds and then turns ON to set fan speed.
- Press the Constant Fan button when in cooling or heating mode to turn ON/OFF the constant fan function. this function is invalid in wired controller mode. If constant fan mode is ON, the fan motor constantly operates. If constant fan mode is OFF, the

fan stops as the load stops. The fan speed is controlled by the Fan Speed button (if a wired controller is connected, the fan speed follows the command of wired controller). The controller controls whether the fan is operating or not. The status does not change when:

- Switching modes.
- When turning the unit ON/OFF.
- Switching to wired controller mode.
- Switching to panel mode.
- Energizing after a power failure.

Heating Mode Functions

When the heating mode LED is lit, and the set fan speed LED is ON. The digital display shows the set temperature. If select displaying ambient temperature in additional function setting, the digital display shows as described in this mode. The set temperature and fan speed will keep the same when switching modes.

Function

For Heat Pump (General Type)

Note: *The electric heater and compressor cannot operate at the same time.*

- When ambient temperature of the space is 2°F below setpoint, the compressor operates in heating mode. The four-way valve and both the indoor/outdoor fans start operation at set speed. After 10 seconds, the compressor begins operation. If the compressor operates and satisfies the setpoint and minimum operation time of the compressor, then both the compressor and indoor/outdoor fans de-energize. If the compressor does not meet setpoint and the ambient temperature drops to 5°F below setpoint, the compressor de-energizes and after one second, the electric heater starts. The electric heater remains in operation until the setpoint +2°F is satisfied.
- **Note:** *The minimum compressor run time is 6 minutes*
- When there is a call for heat and the compressor cannot be energized due to the protection function, the electric heat energizes after 15 seconds and remains energized until the setpoint +2°F is satisfied.

Heat/Cool (Pure Electric Heating)

- When the ambient temperature of the space is 2°F below setpoint, the electric heater starts operating and the indoor fan operates at the set fan speed. When the setpoint +2°F is satisfied, the electric heater stops operating. When in fan cycle mode, the indoor fan operates at the condition of circulating residual heat. If the fan cycle mode is not selected, the indoor fan operates at the set fan speed.

Auto Fan Speed Mode

- **Cooling Mode:**



Operation

Note: Under Auto Fan Speed control in any mode, there is a 3-1/2 minute delay when switching the speed of the indoor fan.

- High Speed; when the ambient temperature is 4°F higher than setpoint.
 - Low Speed; when ambient temperature is less than setpoint.
 - Not Change; when the ambient temperature is 1°F to 4°F higher than setpoint.
- **Heating Mode:**
 - High Speed; when the ambient temperature is 4°F lower than setpoint.
 - Low Speed; when ambient temperature is more than setpoint.
 - Not Change; when the ambient temperature is 1°F to 4°F lower than setpoint.

Additional Functions

After the unit is turned ON for 30 seconds, press and hold **Cooling Button ▼** for 5 seconds to start up the configuration mode. After entering this mode, if adjusting the temperature compensation value by buttons to turn to unit ON/OFF condition, the load will be activated after 3 seconds. While if entering unit on or off condition due to the change of the ambient temperature, it can be activated only after quitting the configuration mode. The following functions are available when selecting the **Low Button**:

- Fahrenheit/Celsius Mode: press **Warming Button ▲** or **Cooling Button ▼** to switch between F° or C°.
- Adjusting Cooling or Heating Values: press **Warming Button ▲** or **Cooling Button ▼** to increase/decrease the temperature values in 1° increments. The adjusting range of the indoor ambient temperature compensation value is between -6°F and 6°F (-3°C and 3°C). The compensation temperature defaults to 0°F in either cooling or heating mode. The unit can allocate different compensation temperatures in cooling or heating mode, respectively.

Note: Trane recommends leaving the compensation value set to its default of 0°F.

- Display Switchover Between Set Temperature/Ambient Temperature Mode: press **Warming Button ▲** or **Cooling Button ▼** to set either set temperature or ambient temperature.
- Set Temperature Display: the digital display shows SP. After quitting configuration mode, the set temperature displays constantly in either heating or cooling mode.

- Ambient Temperature Display: The digital display shows AA. After quitting configuration mode, the ambient temperature displays constantly in either heating or cooling mode. Under certain circumstances, the unit displays the set temperature for 10 second and then switches to display ambient temperature as follows:
 - Press mode button (mode button includes Cool button and Heat button).
 - Re-energize after power failure.
 - Restart the unit.
 - Turn on the unit after EM turns off unit.
 - Adjust the set temperature using the **Warming Button ▲** or **Cooling Button ▼**.
- Quitting Configuration Mode: is stopped when pressing the mode button or if no button is pressed within 30 seconds.

Resetting Timer

Press **Warming Button ▲** or **Cooling Button ▼** simultaneously for 3 seconds under the protection for compressor and electric heater minimum stop time or the protection for compressor minimum operation time, reduces the protection time.

Memory

The controller runs to the last mode set prior to a power failure. The following settings are also retained prior to a power failure:

- Operation mode.
- Set fan speed.
- Set temperature.
- value in minimum stop time of compressor.
- Fahrenheit/Celsius display mode.
- Cooling compensation temperature.

The unit operates in default Fan Mode when there is no memory. Fan speed is set to high with the T-value of 0 and Fahrenheit display mode. Cooling compensation temperature is 0 and heating compensation temperature is 0. The default set temperature is 71°F (22°C). The digital display shows the set temperature under cooling and heating mode.

Restore Factory Settings

When pressing the Low button and p for 3 seconds, the digital display shows 00 for 3 seconds in standby and OFF status. This indicates that the factory settings have been restored. The configuration information defaults to display:

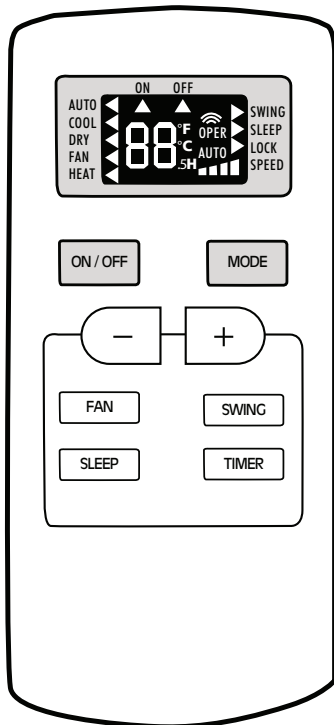
- Fahrenheit.
- Heating compensation temperature of 0.
- Cooling compensation of 0.
- Set temperature.

The T-value is 0, the Fan Speed is set to High, and the set temperature is 71°F (22°C).

Operating the Remote Control

The optional ProSpace remote control has many of the features that are accessible through the ProSpace front panel. Ensure that there are no obstructions between the receiver and the remote controller.

Important: Do not drop or throw the remote control. Do not spill any liquids in the remote control. Do not put the remote control directly into the sunlight or near hot surfaces.



- **ON / OFF;** press to turn **ON** the unit and press again to turn **OFF** the unit. When turning ON / OFF the unit, the **Timer** and **Sleep** functions are cancelled, but the pre-setting time is retained.

- **MODE;** press to cycle through the mode selections in the following order: *Cool to Dry to Fan to Heat*. In Heat mode, the initial value is 82°F (28°C) and in other modes, the initial value is 77°F (25°C).

Note: Heat Mode is only for cooling/heating units. If in Cooling Mode, there is no action taken when the unit receives a call for heating. **Blow-over heat:** when the unit is running in Heat Mode or Auto Heat Mode, the compressor and indoor fan running, to turn the unit off, the compressor, outdoor fan will stop running. The upper and lower guide boards rotate to a horizontal position, the indoor fan run at LOW FAN speed, and the 10 seconds later, the unit turns OFF.

- **FAN;** press to cycle through the fan speed selection in the following order: *AUTO to FAN 1 to FAN 2*. The speeds are represented on the remote as vertical bars increasing in size for each speed. When initializing the fan, the AUTO setting is default.

Note: Only LOW Fan Mode can be selected in DRY mode. Pressing this key can not adjust the fan speed, but can send message to the unit.

- **SLEEP;** Press to select SLEEP ON/OFF. When powering the unit, the SLEEP OFF setting is default. After setup is complete, the signal for SLEEP Mode displays on the unit. While in SLEEP Mode, the TIMER setting can be adjusted. SLEEP Mode is not available in FAN and AUTO Modes. Once the unit is turned OFF, the SLEEP Mode is cancelled.
- **SWING;** not used.
- **TIMER;** in SWITCH OFF state, press this key to set the time for AUTO SWITCH ON state. The range of setting is between 0.5 hours to 24 hours. The characters T-ON and H flash for 5 seconds and within this 5-second flash, press this key once to complete the setting and send the message to the unit. If this setting is valid, the set time displays for 2 seconds before displaying the temperature message. During the 5-second flash, press + key to increase the time value and - to decrease the value. The values increase/decrease in increments of 0.5 hours with each press of the key. Pressing this key in rapid successions to increase/decrease the values will advance the increments quickly. The remote controller can increase the set time by 0.5 hours every 0.25 seconds. After energizing the unit, the default is NO TIMER setting and the T-ON or H characters do not display. When the temperature display becomes constant, press this key again to display the remaining set time. The time values, T-ON and H, display constantly for 2 seconds. After 2 seconds, the preset temperature displays. Within these 2 seconds, press this key again to CANCEL the AUTO SWITCH ON and send the message. Pressing this key in SWITCH ON state allows the time to be set to AUTO SWITCH OFF. Press ON/OFF key to switch on the unit and CANCEL the AUTO SWITCH ON state.



Note: The +/- buttons are used to increase/decrease value settings for either time or temperature. Refer to the sub-sections below about how to use the +/- buttons to set temperature values.

- **+ Button;** press this button to set increased temperature values when unit is ON. Continuously press and hold this button for more than 2 seconds until °F (°C) displays. In AUTO Mode, the temperature can not be set up, but this button can send the signal. Temperature ranges are between 61°F and 86°F (16°C and 30°C).

Note: To switch between Fahrenheit and Celsius, press and hold the - and **MODE** keys simultaneously while in **SWITCH OFF** state.

- **- Button;** press this button to set decreased temperature values when unit is ON. Continuously press and hold this button for two seconds to decrease the temperature value. The temperature adjustment is unavailable in AUTO Mode, but this button can send the signal.
- **LOCK;** to LOCK and UNLOCK (default) the keypad, press and hold the - or + and **MODE** keys simultaneously while in either **SWITCH ON** or **SWITCH OFF** states. The unit show the LOCK icon when in LOCK Mode, in which case, the lock icon flashes three (3) times upon operation of any key. The LOCK icon does not display when the unit is in UNLOCK Mode.

Changing Batteries in the Remote Control

The remote requires two AAA, 1.5V batteries.

1. From the back side of the remote, gently press down on the battery cover and slide it towards the bottom of the unit.
2. Remove the old batteries from the battery compartment.
3. Insert two new batteries into the battery compartment. Confirm the batteries poles match the polarity when inserting them into the battery compartment: + to + and - to -.

Note: Only use the recommended battery type. If the remote has not been used for an extended period of time, check the expiration date on the batteries or check for battery leakage.

4. Slide the battery cover back onto the remote until the tab clicks.

BEST PRACTICE:

Check your local city/state for proper recycling procedures. A battery is an electrochemical device with the ability to convert chemical energy to electrical energy to provide power to electronic devices. Batteries contain heavy metals such as mercury, lead, cadmium, and nickel, which can contaminate the environment when batteries are improperly disposed of. When incinerated, certain metals might be released into the air or can concentrate in the ash produced by the combustion process. Batteries may produce the following potential problems or hazards:

- Pollute the lakes and streams as the metals vaporize into the air when burned
- Contribute to heavy metals that potentially may leach from solid waste landfills.
- Expose the environment and water to lead and acid.
- Contain strong corrosive acids. May cause burns or danger to eyes and skin.



Care and Cleaning

Periodic care and cleaning of the ProSpace unit is essential to keep it running efficiently.

Front Panel and Case

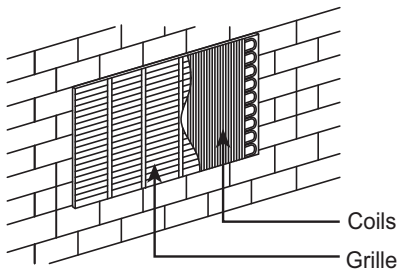
Turn unit off and disconnect power supply. To clean, use a soft brush, water, and a mild detergent. **DO NOT** use bleach or abrasives. Some commercial cleaners may damage the plastic parts.

Outdoor Coil

Important: Product failure due to improper care or lack of maintenance is not covered under warranty. Airflow restriction may cause damage to the unit.

Coil on outdoor side of unit should be checked regularly. Unit will need to be removed from its sleeve to inspect dirt build-up that can occur inside of the coil. If clogged with dirt or soot, the coil should be professionally cleaned. Clean inside and outside of outdoor coils regularly.

Note: Never use a high-pressure sprayer on the coil.



Base Pan

In some installations, dirt or other debris may be blown into unit from outside and settle in the base pan (bottom of the unit). Check the base pan periodically and clean if required.

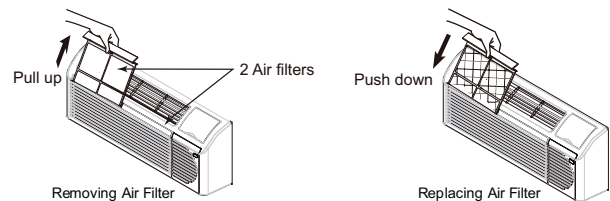
Air Filter

Important: Do not the operate unit without filters in place. If a filter becomes torn or damaged, it should be replaced immediately. Operating without filters in place or with damaged filters will allow dirt and dust to reach indoor coil and reduce cooling, heating, airflow, and the efficiency of the unit. Airflow restriction may cause damage to unit.

This unit contains two air filters. To maintain unit efficiency, clean the filter at least every 30 days (or sooner depending on application). Keeping filter clean:

- Decreases the cost of operation.
- Saves energy.
- Prevents a clogged indoor coil.
- Reduces the risk of premature component failure.

To clean the air filter, vacuum off any heavy soil and contaminates. Run water through the filter and then dry thoroughly before replacing them back into the unit.



Use the following checklist to verify proper care of the ProSpace unit. Equipment operation should be checked and verified several times during each year.

- Clean both sides of outdoor coil. (Never use high pressure spray on coils.)
- Clean base pan and outdoor vent filter.
- Clean outdoor orifice and fan.
- Clean indoor coil. (Never use high pressure spray on coils.)
- Clean indoor fan, wire screen and front panel.
- Clean or install new indoor - air inlet filter(s).
- Clean wall sleeve and outdoor grille.
- Inspect cord and receptacle.
- Secure electrical connections.
- Confirm the front panel is properly mounted and not damaged.
- Confirm the wall sleeve is installed properly.
- Confirm the heat and cool cycles operate properly.

Service Installation

⚠ WARNING

Unit Contains R32 Refrigerant!

Failure to follow proper procedures can result in equipment damage or personal injury.



This unit contains R32 refrigerant which is flammable and odorless. Read the installation manual properly before installing or servicing this unit.

⚠ WARNING

Hazardous Service Procedures!

Failure to follow all precautions in this manual and on the tags, stickers, and labels could result in death or serious injury.

Technicians, in order to protect themselves from potential electrical, mechanical, and chemical hazards, **MUST** follow precautions in this manual and on the tags, stickers, and labels, as well as the following instructions: Unless specified otherwise, disconnect all electrical power including remote disconnect and discharge all energy storing devices such as capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. When necessary to work with live electrical components, have a qualified licensed electrician or other individual who has been trained in handling live electrical components perform these tasks.

⚠ WARNING

Hazardous Voltage!

Failure to disconnect power before servicing could result in death or serious injury.

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Verify that no power is present with a voltmeter.

⚠ WARNING

Live Electrical Components!

Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

When it is 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.

⚠ WARNING

Personal Protective Equipment (PPE) Required!

Failure to wear proper PPE for the job being undertaken could result in death or serious injury. Technicians, in order to protect themselves from potential electrical, mechanical, and chemical hazards, **MUST** follow precautions in this manual and on the tags, stickers, and labels, as well as the instructions below:

- Before installing/servicing this unit, technicians **MUST** put on all PPE required for the work being undertaken (Examples; cut resistant gloves/sleeves, butyl gloves, safety glasses, hard hat/bump cap, fall protection, electrical PPE and arc flash clothing). **ALWAYS** refer to appropriate Safety Data Sheets (SDS) and OSHA guidelines for proper PPE.
- When working with or around hazardous chemicals, **ALWAYS** refer to the appropriate SDS and OSHA/GHS (Global Harmonized System of Classification and Labelling of Chemicals) guidelines for information on allowable personal exposure levels, proper respiratory protection and handling instructions.
- If there is a risk of energized electrical contact, arc, or flash, technicians **MUST** put on all PPE in accordance with OSHA, NFPA 70E, or other country-specific requirements for arc flash protection, **PRIOR** to servicing the unit. **NEVER PERFORM ANY SWITCHING, DISCONNECTING, OR VOLTAGE TESTING WITHOUT PROPER ELECTRICAL PPE AND ARC FLASH CLOTHING. ENSURE ELECTRICAL METERS AND EQUIPMENT ARE PROPERLY RATED FOR INTENDED VOLTAGE.**

⚠ WARNING

Hazardous Voltage and Gas!

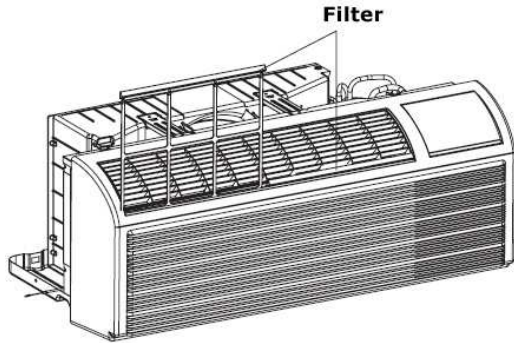
Failure to turn off gas or disconnect power before servicing could result in an explosion or electrocution which could result in death or serious injury.

Turn off the gas supply and disconnect all electric power, including remote disconnects, before servicing the unit. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized.

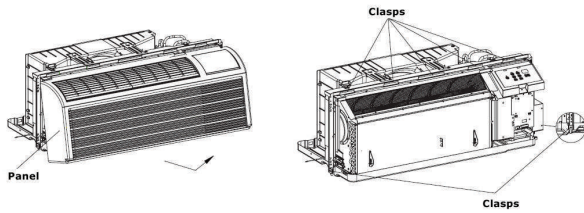


Disassembling the Unit

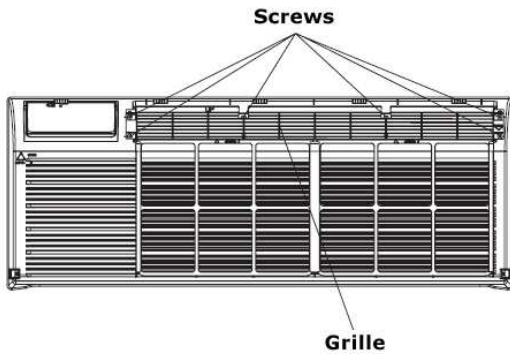
1. Grasp filter and pull upwards to remove it from the unit.



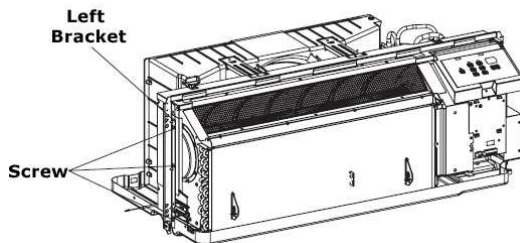
2. Remove the front panel from the unit by grasping the bottom corners and gently pushing in to release the cantilever snap joints.



3. Remove the seven (7) screws holding the grille.

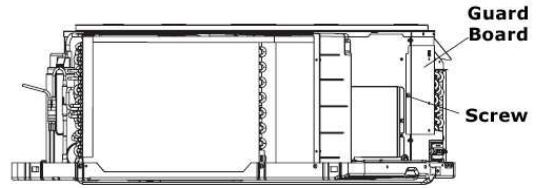


4. Remove the three (3) screws holding the left bracket and then remove the left bracket.

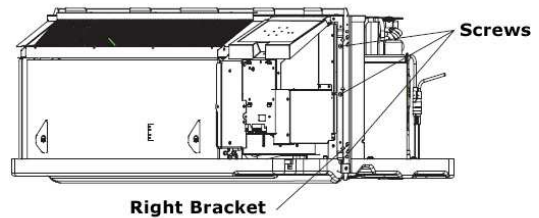


5. Remove the screw holding the guard board and pull it

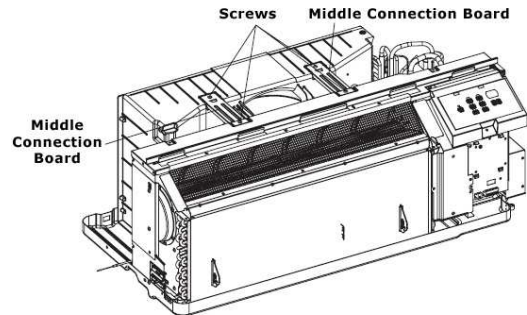
upwards to remove it.



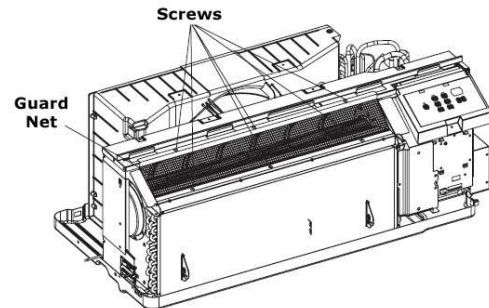
6. Remove the three (3) screws holding the right bracket and then remove the right bracket.



7. Remove the four (4) screws holding the middle connection board and then remove the middle connection board.

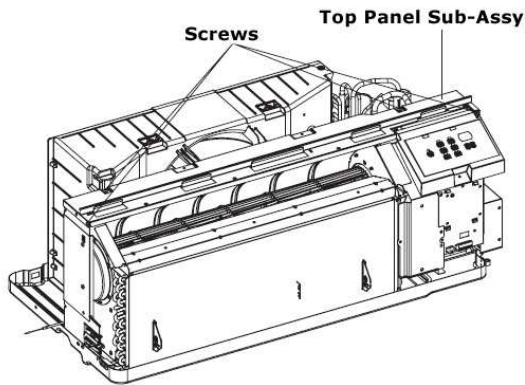


8. Remove the six (6) screws holding the guard net and then remove the guard net.

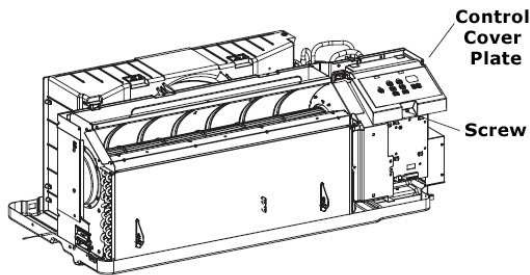


9. Remove the four (4) screws holding the top panel sub-assembly and then remove the sub-assembly.

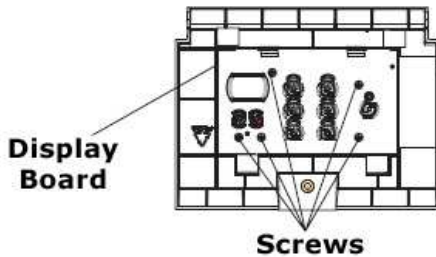
Disassembling the Unit



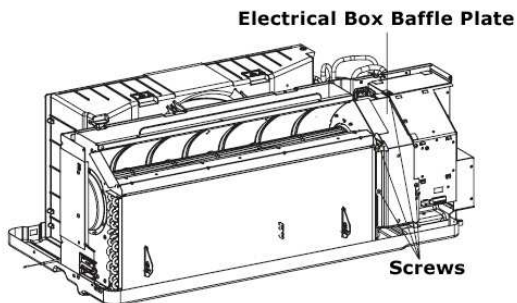
10. Remove the screw holding the control cover plate and pull out the wiring terminal connecting the control cover plate and the electric box. Then, remove the cover plate and electric box.



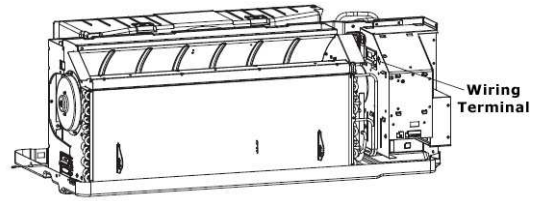
11. Remove four (4) screws holding the display board and then remove the display board.



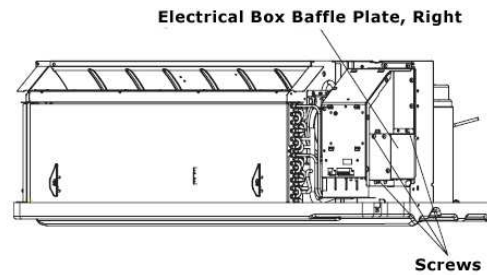
12. Remove four (4) screws holding the baffle plate for the electric box and then remove the baffle plate.



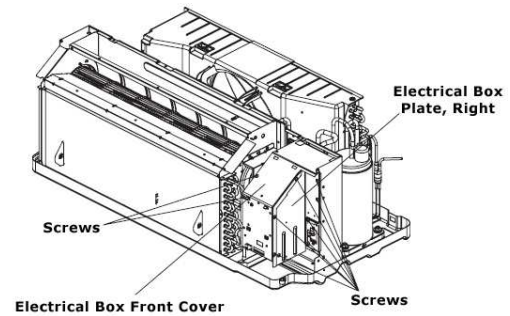
13. Pull out the motor wiring terminal.



14. Remove four (4) screws holding the right-side baffle plate for the electric box and then remove the right-side baffle plate.

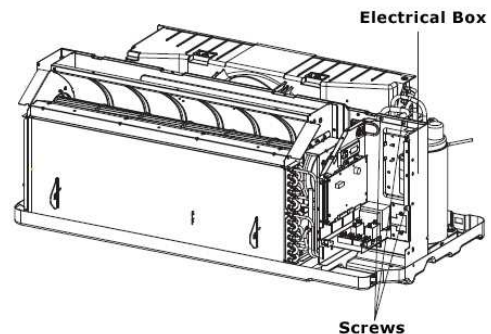


15. Remove seven (7) screws holding the right-side plate for the electric box and then remove the right-side plate.



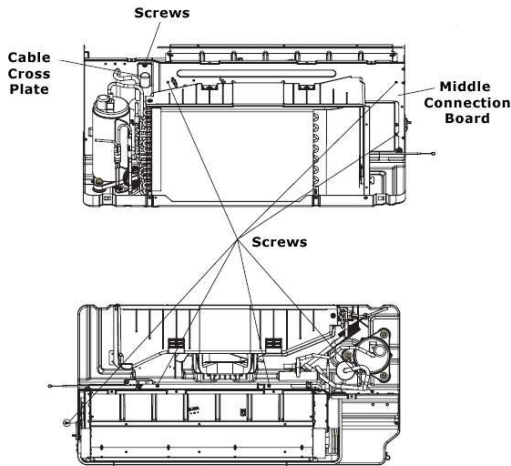
16. Remove two (2) screws holding the front cover of the electric box and then remove the front cover.

17. Remove three (3) screws holding the electric box and then remove the electric box.



18. Remove seven (7) screws holding the middle

connection board and then remove the middle connection board.



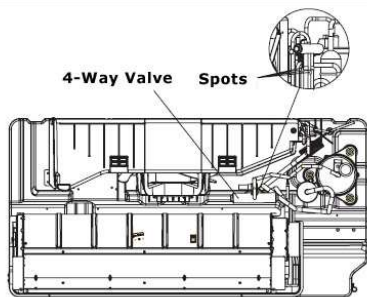
19. Remove the screw holding the cable cross and then remove the cable cross.

⚠ WARNING

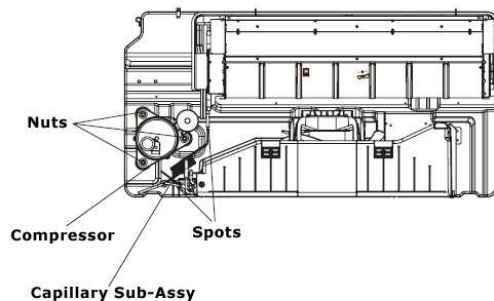
Recover Refrigerant!

Please be sure to recover refrigerant per standard procedures and guidelines before proceeding with additional steps below.

20. Unsolder the spot weld between the 4-way valve and the compressor, condenser, and the evaporator. Remove the 4-way valve.

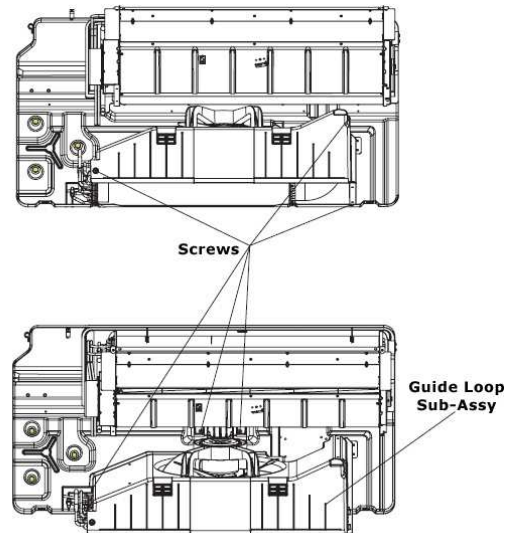


21. Remove three (3) nuts holding the compressor and then remove the compressor.

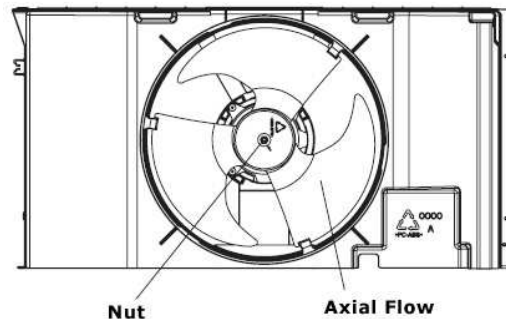


22. Unsolder the spot weld between the capillary sub-assembly and condenser. Remove the capillary.

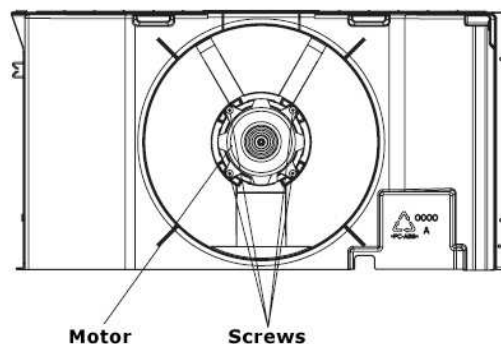
23. Remove six (6) screws holding the guide loop sub-assembly and then pull upwards to remove the guide loop sub-assembly.



24. Remove the nuts holding the axial flow blade and the pull outwards to remove the axial flow blade.

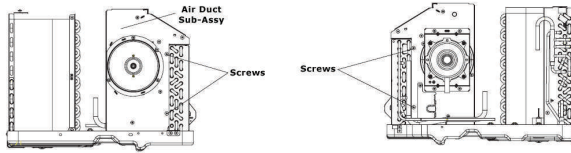


25. Remove four (4) screws holding the motor and then remove the motor.

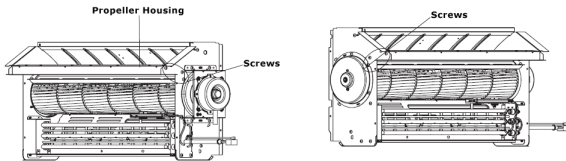


Disassembling the Unit

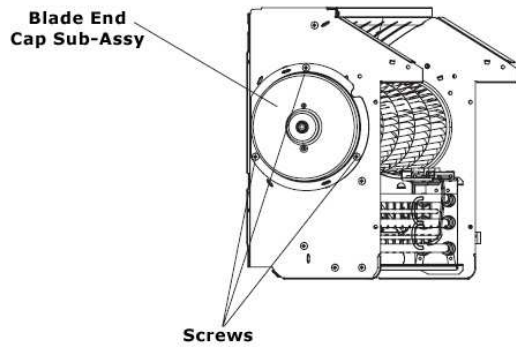
26. Remove four (4) screws holding the middle connection board and then remove the middle connection board.



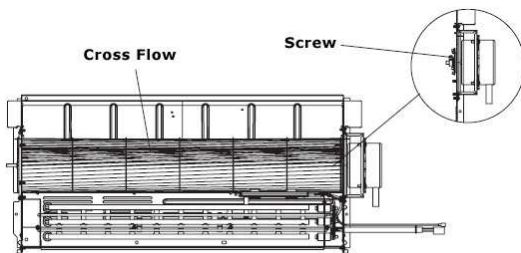
27. Remove four (4) screws holding the propeller housing and then remove the propeller housing.



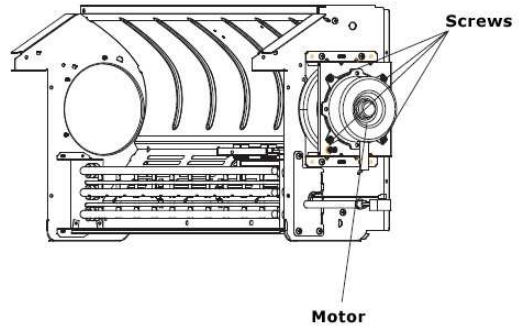
28. Remove three (3) screws holding the blade end cap sub-assembly and then remove the blade end cap sub-assembly.



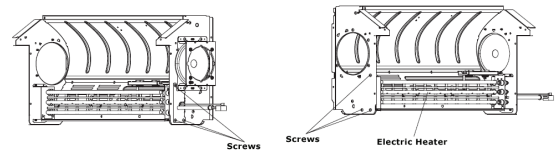
29. Remove screw holding the cross-flow blade and then remove the cross-flow blade.



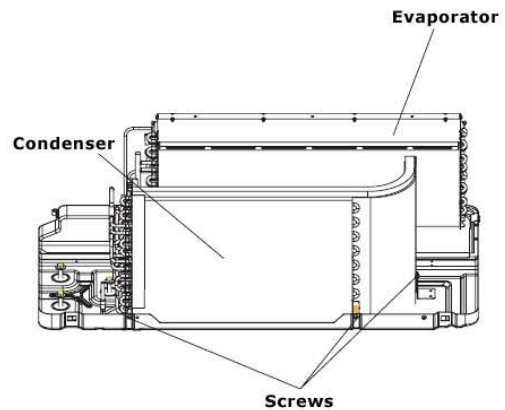
30. Remove four (4) screws holding the motor and then remove the motor.



31. Remove six (6) screws holding the electric heater and then remove the electric heater.



32. Pull the evaporator upwards to remove, the remove three (3) screws holding the condenser. Pull upwards to remove the condenser.





Temperature and Resistance Charts

Table 6. Ambient Temperature Sensors for Indoor/Outdoor, 15K

Temp.(°F)	Resistance(kΩ)	Temp.(°F)	Resistance(kΩ)	Temp.(°F)	Resistance(kΩ)	Temp.(°F)	Resistance(kΩ)
-2.2	138.1	68	18.75	138.2	3.848	208.4	1.071
-0.4	128.6	69.8	17.93	140	3.711	210.2	1.039
1.4	121.6	71.6	17.14	141.8	3.579	212	1.009
3.2	115	73.4	16.39	143.6	3.454	213.8	0.98
5	108.7	75.2	15.68	145.4	3.333	215.6	0.952
6.8	102.9	77	15	147.2	3.217	217.4	0.925
8.6	97.4	78.8	14.36	149	3.105	219.2	0.898
10.4	92.22	80.6	13.74	150.8	2.998	221	0.873
12.2	87.35	82.4	13.16	152.6	2.896	222.8	0.848
14	82.75	84.2	12.6	154.4	2.797	224.6	0.825
15.8	78.43	86	12.07	156.2	2.702	226.4	0.802
17.6	74.35	87.8	11.57	158	2.611	228.2	0.779
19.4	70.5	89.6	11.09	159.8	2.523	230	0.758
21.2	66.88	91.4	10.63	161.6	2.439	231.8	0.737
23	63.46	93.2	10.2	163.4	2.358	233.6	0.717
24.8	60.23	95	9.779	165.2	2.28	235.4	0.697
26.6	57.18	96.8	9.382	167	2.206	237.2	0.678
28.4	54.31	98.6	9.003	168.8	2.133	239	0.66
30.2	51.59	100.4	8.642	170.6	2.064	240.8	0.642
32	49.02	102.2	8.297	172.4	1.997	242.6	0.625
33.8	46.6	104	7.967	174.2	1.933	244.4	0.608
35.6	44.31	105.8	7.653	176	1.871	246.2	0.592
37.4	42.14	107.6	7.352	177.8	1.811	248	0.577
39.2	40.09	109.4	7.065	179.6	1.754	249.8	0.561
41	38.15	111.2	6.791	181.4	1.699	251.6	0.547
42.8	36.32	113	6.529	183.2	1.645	253.4	0.532
44.6	34.58	114.8	6.278	185	1.594	255.2	0.519
46.4	32.94	116.6	6.038	186.8	1.544	257	0.505
48.2	31.38	118.4	5.809	188.6	1.497	258.8	0.492
50	29.9	120.2	5.589	190.4	1.451	260.6	0.48
51.8	28.51	122	5.379	192.2	1.408	262.4	0.467
53.6	27.18	123.8	5.197	194	1.363	264.2	0.456
55.4	25.92	125.6	4.986	195.8	1.322	266	0.444
57.2	24.73	127.4	4.802	197.6	1.282	267.8	0.433
59	23.6	129.2	4.625	199.4	1.244	269.6	0.422
60.8	22.53	131	4.456	201.2	1.207	271.4	0.412
62.6	21.51	132.8	4.294	203	1.171	273.2	0.401
64.4	20.54	134.6	4.139	204.8	1.136	275	0.391
66.2	19.63	136.4	3.99	206.6	1.103	276.8	0.382



Temperature and Resistance Charts

Table 7. Tube Temperature Sensors for Indoor/Outdoor, 20K

Temp.(°F)	Resistance(kΩ)	Temp.(°F)	Resistance(kΩ)	Temp.(°F)	Resistance(kΩ)	Temp.(°F)	Resistance(kΩ)
-2.2	181.4	68	25.01	138.2	5.13	208.4	1.427
-0.4	171.4	69.8	23.9	140	4.948	210.2	1.386
1.4	162.1	71.6	22.85	141.8	4.773	212	1.346
3.2	153.3	73.4	21.85	143.6	4.605	213.8	1.307
5	145	75.2	20.9	145.4	4.443	215.6	1.269
6.8	137.2	77	20	147.2	4.289	217.4	1.233
8.6	129.9	78.8	19.14	149	4.14	219.2	1.198
10.4	123	80.6	18.13	150.8	3.998	221	1.164
12.2	116.5	82.4	17.55	152.6	3.861	222.8	1.131
14	110.3	84.2	16.8	154.4	3.729	224.6	1.099
15.8	104.6	86	16.1	156.2	3.603	226.4	1.069
17.6	99.13	87.8	15.43	158	3.481	228.2	1.039
19.4	94	89.6	14.79	159.8	3.364	230	1.01
21.2	89.17	91.4	14.18	161.6	3.252	231.8	0.983
23	84.61	93.2	13.59	163.4	3.144	233.6	0.956
24.8	80.31	95	13.04	165.2	3.04	235.4	0.93
26.6	76.24	96.8	12.51	167	2.94	237.2	0.904
28.4	72.41	98.6	12	168.8	2.844	239	0.88
30.2	68.79	100.4	11.52	170.6	2.752	240.8	0.856
32	65.37	102.2	11.06	172.4	2.663	242.6	0.833
33.8	62.13	104	10.62	174.2	2.577	244.4	0.811
35.6	59.08	105.8	10.2	176	2.495	246.2	0.77
37.4	56.19	107.6	9.803	177.8	2.415	248	0.769
39.2	53.46	109.4	9.42	179.6	2.339	249.8	0.746
41	50.87	111.2	9.054	181.4	2.265	251.6	0.729
42.8	48.42	113	8.705	183.2	2.194	253.4	0.71
44.6	46.11	114.8	8.37	185	2.125	255.2	0.692
46.4	43.92	116.6	8.051	186.8	2.059	257	0.674
48.2	41.84	118.4	7.745	188.6	1.996	258.8	0.658
50	39.87	120.2	7.453	190.4	1.934	260.6	0.64
51.8	38.01	122	7.173	192.2	1.875	262.4	0.623
53.6	36.24	123.8	6.905	194	1.818	264.2	0.607
55.4	34.57	125.6	6.648	195.8	1.736	266	0.592
57.2	32.98	127.4	6.403	197.6	1.71	267.8	0.577
59	31.47	129.2	6.167	199.4	1.658	269.6	0.563
60.8	30.04	131	5.942	201.2	1.609	271.4	0.549
62.6	28.68	132.8	5.726	203	1.561	273.2	0.535
64.4	27.39	134.6	5.519	204.8	1.515	275	0.521
66.2	26.17	136.4	5.32	206.6	1.47	276.8	0.509



Troubleshooting and Resources

Troubleshooting Error Codes and Malfunctions

Table 8. Digital Display Error Codes

Control Board Display	Status LED - Number of Flashes Followed by 3 second delay	Code Description	Explanation	Troubleshooting
F0	Green Light On Constant (Normal Operation)	Refrigerant loss or sensor issue	Indoor ambient sensor or indoor tube sensor failure or disconnected. (yellow/white wire black plug) or (white plug, black wire).	<ol style="list-style-type: none"> 1. Inspect the unit, specifically the refrigerant system for leaks or visible damage. 2. Observe the refrigerant circuit temperatures. 3. On the condenser coil there is a "tube temperature sensor". It is inserted into a sleeve that is brazed to coil. Verify that the tube temperature sensor is inserted snugly into the sleeve. If it is not, insert into the sleeve. 4. Inspect the ambient temperature sensor located in front of the evaporator coil. Confirm the sensor is secure in the plastic holders and that it is not touching the evaporator coil. 5. Inspect the board located inside the compartment that is located below the on board mounted controls. Verify that the inner tube temp. and the outer tube temp. Sensors are plugged into the board correctly and not reversed. (If they are reversed, it can cause the code to appear.)
F1	1 Flash	Indoor ambient temperature sensor open or short circuited	Indoor ambient sensor (RT2) at 77 degrees F = 15K ohms (yellow/white wire black plug).	<ol style="list-style-type: none"> 1. Check the sensor wiring and connections to the main board. 2. Test the resistance of the sensor while disconnected. 3. Replace the main board if needed.
F2	2 Flashes	Indoor coil tube temperature sensor open or short circuited	Indoor Coil Tube sensor (RT1) at 77 degrees F = 20K ohms (black plug, black wire).	<ol style="list-style-type: none"> 1. Check the sensor wiring and connections to the main board. 2. Test the resistance of the sensor while disconnected. 3. Replace the main board if needed.
F4	4 Flashes	Outdoor coil tube temperature sensor open or short circuited	Outdoor Tube sensor (RT3) at 77 degrees F = 20K ohms (white plug, black wire).	<ol style="list-style-type: none"> 1. Check the sensor wiring and connections to the main board. 2. Test the resistance of the sensor while disconnected. 3. Replace the main board if needed.
FJ ^(a)	Green Light On Constant (Normal Operation)	Outlet air temperature sensor failure	Outlet air temperature sensor (DAHT) at 77 degrees = 20K ohms (red plug, black wire).	<ol style="list-style-type: none"> 1. Check the sensor wiring and connections to the main board. 2. Test the resistance of the sensor while disconnected. 3. Replace the main board if needed.
FP ^(a)	Green Light On Constant (Normal Operation)	Low temperature prevention protection	Indoor ambient temperature below 40 degrees F	<ol style="list-style-type: none"> 1. Check the sensor wiring and connections to the main board. 2. Test the resistance of the sensor while disconnected. 3. Replace the main board if needed.

Troubleshooting and Resources

Table 8. Digital Display Error Codes (continued)

Control Board Display	Status LED - Number of Flashes Followed by 3 second delay	Code Description	Explanation	Troubleshooting
H3 ^(a)	Green Light On Constant (Normal Operation)	Overload protection detection	Voltage is too low / condenser coil dirty / outdoor fan damaged / compressor failed	<ol style="list-style-type: none"> 1. Power supply voltage is low. 2. Condenser coil is dirty. 3. Outdoor fan is damaged or failed. 4. Compressor failed.
E5 ^(a)	Green Light On Constant (Normal Operation)	Overcurrent protection of compressor	Voltage is too low / condenser coil dirty / outdoor fan damaged / compressor failed	<ol style="list-style-type: none"> 1. Power supply voltage is low. 2. Condenser coil is dirty. 3. Outdoor fan is damaged or failed. 4. Compressor failed.
A2 ^(a)	Green Light On Constant (Normal Operation)	Malfunction protection for electric heat	Unit current is too high / electric heater is damaged / open circuit	<ol style="list-style-type: none"> 1. Power supply voltage is high. 2. Check for any breaks in the wires. 3. Replace the main board number two. 4. The indoor fan is damaged. 5. Replace the electric heater.
U5 ^(a)	Green Light On Constant (Normal Operation)	Unbalanced electric current	All loads are stopped	<ol style="list-style-type: none"> 1. Wires are not connected or inserted correctly. 2. Electric heater is short-circuited or not connected tightly. 3. There is an electric leakage.
A0 ^(a)	Green Light On Constant (Normal Operation)	Electric heater combination wrong	All loads are stopped	<ol style="list-style-type: none"> 1. Wires are not inserted correctly. 2. Electric heater is broken.
A4 ^(a)	Green Light On Constant (Normal Operation)	Electric heater current abnormal	All loads are stopped	<ol style="list-style-type: none"> 1. Part of electric heater is broken or short-circuited. 2. Electric Heater is abnormal.
C7 ^(a)	Green Light On Constant (Normal Operation)	Temperature protection time too long	All loads are stopped	<ol style="list-style-type: none"> 1. Temperature limiter is broken. 2. Connection wire of loads of electric heater is broken.
	5 flashes (unit remains operational)	Freeze prevention protection for evaporator	Indoor tube temperature is too low in cooling mode	
	6 flashes	High temperature protection for outdoor condenser		
	7 flashes	Frost prevention (heat pump)	Outdoor tube temperature is low in heat pump mode. This is normal operation in cold outdoor ambient temperatures. Electric heat will cycle as needed.	
	8 flashes	High temperature protection for evaporator	Indoor tube temperature is high in heat pump mode.	
	9 flashes	Wrong wire connection indicated for wired controller		

^(a) These codes will only be shown on the unit display board. When a unit is being operated from a wireless or wired thermostat, the codes won't be visible. Change Dip Switch 2 (down - disabling thermostat) to diagnose with controller. Remove power and power back up.

Table 9. Malfunction Causes and Solutions

Status	Cause	Solution
Air Conditioner Cannot Be Started		
After energizing, operation indicator is not bright and the buzzer does not sound.	No power supply or poor connection for power plug.	Check for power failure. If so, wait for power recovery. If not, check power supply circuit and verify the power plug is complete inserted into wall outlet.

Table 9. Malfunction Causes and Solutions (continued)

Status	Cause	Solution
Under normal power supply situations, the operation indicator is not bright after energizing.	Poor connection for wiring terminals.	Check the circuit according to the circuit diagram and properly connect the wires. Confirm all wiring terminals are tightly connected.
After energizing, the room circuit breakers immediately trips OFF.	Electric short.	Confirm the unit is properly grounded. Confirm the wires inside the unit are properly connected. Check the wiring inside the unit and whether the insulation layer of the power cord is not damaged. If so, replace the power cord.
After energizing, the air switch trips OFF.	Improper model selection for the air switch.	Select the proper air switch.
After energizing, the operation indicator is bright while there is no display on the remote controller or the buttons have no action.	Malfunction of remote controller.	Replace the remote controller batteries. Repair or replace the remote controller.
Air Conditioner Is Cooling Poorly		
Fan motor not operating.	Fan motor malfunction.	Refer to the table section below, "Fan Motor Does Not Operate" .
Filter blockage.	Filter is blocked.	Clean the filter.
Unit is not heating or cooling properly in heat pump mode or cool pump mode.	Capillary malfunction.	Replace the capillary.
Unit is not heating or cooling properly in heat pump mode or cool pump mode.	Refrigerant is leaking.	Investigate the cause of the leaks and repair. Add any necessary refrigerant.
Compressor is not operating.	Compressor malfunction.	Refer to the table section below, "Compressor Does Not Operate" .
Electric Heater Provides Poor Heating		
Electric heat elements not energizing.	Heating relay on main board is damaged.	Replace main board.
Electric heat element not energizing.	Wiring harness between the main board and display board is loose.	Check wiring harness connection.
Protection of temperature limiter.	Air inlet blocked by objects.	Clean the filter and remove any objects obstructing the inlet.
When turning ON the unit, the heating effect is poor.	Malfunction of temperature limiter. Use a universal meter to measure the two contact points of the temperature limiter. If the resistance value is too large, the temperature limiter is damaged.	Replace the temperature limiter.
Unit is not heating.	Fuse is burned out.	Measure resistance across fuse, if fuse is bad, replace.
Fan Motor Does Not Operate		
Wrong wire connection or a poor connection.	Check the wiring status according to the circuit diagram.	Connect the wires according to the wiring diagram to verify all wiring terminals are connected securely.
Wire harness connected to main board has a poor connection.	Check wire harness connection.	Confirm wire harness is connected securely.
Using a universal multi-meter measure the capacitance of the capacitor in micro farads. If the measured capacitance is not the same as rated capacitance the capacitor is damaged.	Fan capacitor is damaged.	Replace the fan capacitor.
Compressor Does Not Operate		
Wrong wire connection or a poor connection.	Check the wiring status according to the wiring diagram.	Connect the wires according to the wiring diagram to confirm all wiring terminals are connected securely.
Compressor relay on main board is damaged or the wire harness of the compressor is loose.	Confirm the relay is functioning correctly in cooling/ heat pump mode.	Replace the main board.
Compressor capacitor is damaged.	Using a universal meter measure the micro-farad rating of the capacitor if it is not the same as the rating listed on the capacitor it is damaged.	Replace the compressor capacitor.
Compressor coil burnt out.	Measured resistance between compressor terminals is 0 or open.	Replace the compressor.
Compressor cannot operate.	Compressor cylinder may be blocked.	Open compressor to investigate. Replace the compressor.
Air Conditioning Leaking		
There is water leakage indoors.	Drainage duct blocked.	Eliminate any debris inside drainage duct.
There is water leakage indoors.	Unit has incorrect pitch.	Confirm unit is pitched a 1/4" downward from inside to outside the wall.

Technicians Guidelines

Aptitude requirement for maintenance man (repairs should be done only by specialists).

1. Any person who is involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which authorises their competence to handle refrigerants safely in accordance with an industry recognised assessment specification
2. Servicing shall only be performed as recommended by the equipment manufacturer. Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of the person competent in the use of flammable refrigerants.

Safety preparation work

The maximum refrigerant charge amount is shown on the table below:

Note: Please refer to the nameplate for the charging quantity of R32.

Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to verify that the risk of ignition is minimized. For repair to the refrigerating system, the following precautions shall be complied with prior to conducting work on the system.

- Work procedure
 - Work is undertaken under a controlled procedure to minimize the risk of a flammable gas or vapor present while the work is being performed.
- General work area
 - All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided. The area around the workspace shall be sectioned off. Verify the conditions within the area have been made safe by control of flammable material.
- Checking for presence of refrigerant
 - The area shall be checked with an appropriate refrigerant detector prior to and during work, to confirm the technician is aware of potentially toxic or flammable atmospheres. Confirm the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.
- Presence of fire extinguisher
 - If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO₂ fire extinguisher adjacent to the charging area.
- No ignition sources
 - No person carrying out work in relation to a refrigeration system which involves exposing any pipe work shall use any sources of ignition in such a

manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs shall be displayed.

- Ventilated area
 - Confirm the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.
- Checks to the refrigeration equipment
 - Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt, consult the manufacturer's technical department for assistance.
 - The following checks are applied to installations using flammable refrigerants:
 - The actual refrigerant charge is in accordance with the room size within which the refrigerant containing parts are installed.
 - The ventilation machinery and outlets are operating adequately and are not obstructed.
 - If an indirect refrigerating circuit is being used, check the secondary circuit for the presence of refrigerant.
 - Marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected.
 - Refrigeration pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.
- Checks to electrical devices
 - Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be

used. This shall be reported to the owner of the equipment so all parties are advised.

Initial safety checks shall include:

- That capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking.
- That no live electrical components and wiring are exposed while charging, recovering or purging the system.
- That there is continuity of earth bonding.

Repairs to sealed components

During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc. If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn of a potentially hazardous situation.

Particular attention shall be paid to the following to confirm that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc.

- Confirm the apparatus is mounted securely.
- Confirm seals or sealing materials have not degraded to the point that they no longer serve the purpose of preventing the ingress of flammable atmospheres. Replacement parts shall be in accordance with the manufacturer's specifications

Repair to intrinsically safe components

Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use.

Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere. The test apparatus shall be at the correct rating.

Replace components only with parts specified by the manufacturer. Other parts may result in the ignition of refrigerant in the atmosphere from a leak.

Note: *The use of silicon sealant can inhibit the effectiveness of some types of leak detection equipment. Intrinsically safe components do not have to be isolated prior to working on them.*

Cabling:

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

Detection of flammable refrigerants

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant

leaks. A halide torch (or any other detector using a naked flame) shall not be used.

The following leak detection methods are deemed acceptable for all refrigerant systems.

Electronic leak detectors may be used to detect refrigerant leaks but, in the case of FLAMMABLE REFRIGERANTS, the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Confirm the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25 percent maximum) is confirmed.

Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

Notes: *Examples of leak detection fluids are:*

- *bubble method,*
- *fluorescent method agents.*

If a leak is suspected, all naked flames shall be removed/ extinguished.

If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak. Removal of refrigerant shall be according to Clause Removal and evacuation.

Removal and evacuation

When breaking into the refrigerant circuit to make repairs or for any other purpose, conventional procedures shall be used. For flammable refrigerants it is important that best practice be followed, since flammability is a consideration. The following procedure shall be adhered to:

1. Safely remove refrigerant following local and national regulations.
2. Purge the circuit with inert gas.
3. Evacuate (optional for A2L).
4. Purge with inert gas (optional for A2L).
5. Open the circuit by cutting or brazing.

The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems.

For appliances containing flammable refrigerants, refrigerants purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum (optional for A2L). This process shall be repeated

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until no refrigerant is within the system (optional for A2L). When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place.

Confirm the outlet for the vacuum pump is not close to any potential ignition sources and that ventilation is available.

Charging procedures

In addition to conventional charging procedures, the following requirements shall be followed.

- Confirm contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimise the amount of refrigerant contained in them.
- Cylinders shall be kept in an appropriate position according to the instructions.
- Confirm the refrigeration system is earthed prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the refrigeration system.

Prior to recharging the system, it shall be pressure tested with the appropriate purging gas.

The system shall be leak-tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

Decommissioning

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to reuse of reclaimed refrigerant. It is essential that electrical power is available before the task is commenced.

1. Become familiar with the equipment and its operation.
2. Isolate system electrically.
3. Before attempting the procedure, confirm:
 - mechanical handling equipment is available, if required, for handling refrigerant cylinders;
 - all personal protective equipment is available and being used correctly;
 - the recovery process is supervised at all times by a competent person;
 - recovery equipment and cylinders conform to the appropriate standards.
4. Pump down refrigerant system, if possible.
5. If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
6. Make sure that cylinder is situated on the scales before recovery takes place.

7. Start the recovery machine and operate in accordance with manufacturer's instructions.
8. Do not overfill cylinders. (No more than 80 percent volume liquid charge).
9. Do not exceed the maximum working pressure of the cylinder, even temporarily.
10. When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
11. Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.

Labelling

Equipment shall be labelled stating that it has been decommissioned and emptied of refrigerant. The label shall be dated and signed. For appliances containing flammable refrigerants, verify there are labels on the equipment stating the equipment contains flammable refrigerant.

Recovery

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.

When transferring refrigerant into cylinders, verify only appropriate refrigerant recovery cylinders are employed. Confirm the correct number of cylinders for holding the total system charge are available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of all appropriate refrigerants including, when applicable, flammable refrigerants. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.

The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

If compressors or compressor oils are to be removed, confirm they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the

suppliers. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.

Resources

Refer to the latest revision of literature numbers below:

- *Packaged Terminal Air Conditioner Mechanical Specification* (PTAC-PRD001)
- *Packaged Terminal Air Conditioner Product Data Sheet* (PTAC-PRD002)
- *Control Block-off Plate Installation Instructions* (PTAC-SVN024)
- *Power Cord Assembly Installation Instructions* (PTAC-SVN025)
- *Drain Kit Installation Instructions* (PTAC-SVN026)
- *Grille Installation Instructions* (PTAC-SVN027)
- *Wall Sleeve Installation Instructions* (PTAC-SVN028)
- *Knock-Down Wall Sleeve Installation Instructions* (PTAC-SVN029)
- *Wired Controller Installation Instructions* (PTAC-SVN030)
- *265 Volt Hardwire Kit Installation Instructions* (PTAC-SVN031)
- *Subbase Installation Instructions* (PTAC-SVN032)
- *Disconnect Switch Installation Instructions* (PTAC-SVN033)
- *Leveling Legs Installation Instructions* (PTAC-SVN034)
- *Wireless Remote Control with Receiver Installation and Operation* (PTAC-SVU003)
- *Packaged Terminal Air Conditioner Warranty* (PTAC-SVW003)
- *Packaged Terminal Air Conditioner Installation, Operation, and Maintenance* (PTAC-SVX002)
- *Wireless Thermostat Installation, Operation, and Maintenance* (PTAC-SVX003)



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