

SINGLE MOTOR PACKAGED TERMINAL AIR CONDITIONERS

STRAIGHT COOL

Nominal Capacities:

9,000 - 12,000 &
15,000 Btuh

RETROAIRE

The Right Fit for Comfort



RC/RH25



RC/RH30



RC40

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An **ECR** International Brand
An ISO 9001-2000 Certified Company



P/N# 240003989, Rev. 1.5 [02/05]

SINGLE MOTOR PACKAGED TERMINAL AIR CONDITIONERS

INSTALLATION, OPERATION & MAINTENANCE MANUAL

P/N# 240003989, Rev. 1.5 [02/05]

Shipping Damage MUST be Reported to the Carrier IMMEDIATELY!!!

Examine the exterior. Remove cover and examine compressor and piping for signs of damage.

This manual is intended as an aid to qualified service personnel for proper installation, operation, and maintenance of the RetroAire Single Motor Packaged Terminal Air Conditioner (PTAC). Read these instructions thoroughly and carefully before attempting installation or operation. Failure to follow these instructions may result in improper installation, operation, service, or maintenance, possibly resulting in fire, electrical shock, property damage, personal injury, or death.

TO THE INSTALLER

- (1) Retain this manual and warranty for future reference.
- (2) Before leaving the premises, review this manual to be sure the unit has been installed correctly and run the unit for one complete cycle to make sure it functions properly.

To obtain technical service or warranty assistance during or after the installation of this unit, contact your local representative. Visit our website www.retroaire.com for a local representative listing. For further assistance call 1-800-228-9364.

When calling for assistance, please have the following information ready:

- Model Number _____
- Serial Number _____
- Date of Installation _____

DANGER

Do not use the RetroAire Single Motor PTAC with any electrical supply voltage other than the one listed on the rating plate.

Check the rating plate on the unit for the correct voltage rating. Failure to use the correct voltage may result in death, serious bodily injury or property damage. If you have any questions or doubts, consult the factory before installing this unit.

SAFETY INSTRUCTIONS

- ▲ Read all instructions before using the RetroAire Single Motor PTAC. Install or locate this unit only in accordance with these instructions. Use this unit only for its intended use as described in this manual.
- ▲ Check the rating plate on the RetroAire Single Motor PTAC before installation to make certain the voltage shown is the same as the electric supply to the unit.
- ▲ The RetroAire Single Motor PTAC must be connected only to a properly grounded electrical supply. Do not fail to properly ground this unit.
- ▲ Turn off the electrical supply before servicing the RetroAire Single Motor PTAC.
- ▲ Do not use the RetroAire Single Motor PTAC if it has damaged wiring, is not working properly, or has been damaged or dropped.
- ▲ When turning the selector switch on the RC/RH30 for mode of operation, it is very important to make sure the switch position is “**SEATED**” directly on a mode of operation (**clicks into position**). *Do not mistakenly place between two positions.* This can result in a potential fan failure while the system is in a cooling or heating operation. A fan failure could result in the unit overheating (smoke) in an electric heating mode, or freezing coil in a cooling mode.

[Save These Instructions]



 Recognize this symbol as an indication of important safety information 

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INSTALLER RESPONSIBILITIES

This manual has been prepared to acquaint you with the installation, operation and maintenance of this RetroAire Single Motor PTAC and to provide important safety information in these areas.

We urge you to read all of the instructions thoroughly before attempting the installation or operation of this unit. This manual should be kept for future reference.

The manufacturer of this unit will not be liable for any damages caused by failure to comply with the installation and operating instructions outlined in this manual.

A rating plate identifying this RetroAire Single Motor PTAC can be found on the unit. When referring to your unit, always have the information listed on the rating plate readily available.



DANGER

The RetroAire Single Motor PTAC must:

- ▲ **Be connected to a properly grounded electrical supply with the proper voltage as stated on the rating plate.**
- ▲ **Have proper over current protection (i.e. time- delay fuse/HACR-Breaker) as listed on the Rating Plate.**

Failure to follow these instructions can result in a fire, explosion, or electrical shock causing property damage, personal injury, or death.



WARNING

Completely read all instructions prior to assembling, installing, operating, or repairing this product. Inspect all parts for damage prior to installation and start-up. The RetroAire Single Motor PTAC must be installed ONLY by qualified installation personnel.

MODIFICATION AND TAMPERING



DANGER

Tampering with the RetroAire Single Motor PTAC is dangerous and may result in serious injury or death. Tampering voids all warranties. Do not attempt to modify or change this unit in any way.

IMPORTANT SAFETY FEATURE

Power Cord With Integral Safety Protection

All PTACs rated 250V or less that are cord connected to the power supply are equipped with a power cord with integral safety protection as standard. Providing personal shock protection as well as arcing and fire prevention, the device is designed to sense any damage in the line cord and disconnect power before a fire can occur. Tested in accordance with Underwriters Laboratories, the cord set also offers a unique "passive" operation, meaning the unit does not require resetting if main power is interrupted.

WARNING - A DAMAGED POWER SUPPLY CORD MUST BE REPLACED WITH A NEW CORD FROM THE MANUFACTURER, AND NOT REPAIRED.

Each power cord should be checked before every use. Follow the instructions in the order listed on the device.

WARNING - DO NOT USE THE PRODUCT IF THE UNIT FAILS THE TEST.

SINGLE MOTOR PTAC FAMILY

The RetroAire Single Motor Packaged Terminal Air Conditioner family consists of:

- ▲ **RC/RH25** – A straight cool/heat pump replacement for Friedrich/Climate Master model ET packaged terminal units.
- ▲ **RC/RH30** – A straight Cool/Heat Pump replacement for ZoneAire & Keeprite C/CHP series, and Carrier 51P/PH series packaged terminal units.
- ▲ **RC40** – A straight cool ONLY replacement for the Fedders model CMEA packaged terminal units.

The RetroAire Single Motor PTAC family of air conditioners is available in nominal sizes of 9,000 Btuh, 12,000 Btuh, and 15,000 Btuh.

All RetroAire products are backed by Enviromaster International LLC and are rated in accordance with ARI standards 310 and 380 and UL standard 484. A full service parts inventory is always available.

STANDARD CONTROLS AND COMPONENTS

Controls and components installed at the factory or supplied for field installation include:

1. Unit mounted operating controls
 - Thermostat
 - Fan speed control
 - Heat/cool switch (where applicable)
2. Baffle(s)
3. Fan cycle switch
4. Normally open/closed switch (hydronic heat only)
5. Foam strip seal for supply air duct
6. Removable washable mesh filters

OPTIONS & ACCESSORIES

- Long life 3, 3.5, or 5 KW electric heat element with redundant safety controls (not RC 40)
- Continuous/cycling fan control switch
- Motorized fresh air damper with positive pressure seal and override switch
- 115 Volt (RC/RH 25 only)
- Wall sleeve extension for 13" cabinets (RC/RH 30 only)
- 4" and 6" cabinet front (RC/RH 30 only)
- Hydronic heat (RC/RH 30 only)
- Long life 3.2 KW electric heat element with redundant safety controls (RC 40 only)
- Hydronic heat, 1-row coil (RC 40 only)
- Remote thermostat (RC 40 only)

PREPARATION FOR INSTALLATION

1. Remove old unit from wall sleeve and dispose of properly.

IMPORTANT: *It is illegal to discharge refrigerant into the atmosphere. Use proper reclaiming methods and equipment when installing or servicing a RetroAire Single Motor PTAC.*

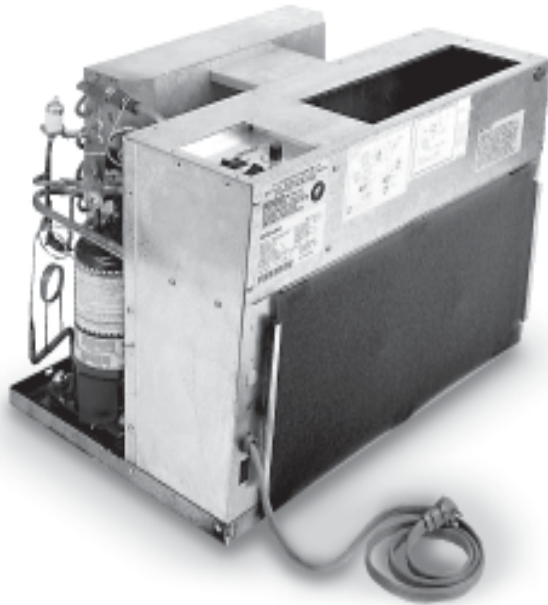
2. Inspect wall sleeve for rust or damage. Clean, replace or repair as necessary.
3. Remove or repair old weather seals and note locations for installation of new seals. Contact factory for weather seals if needed.
4. Make sure wall sleeve is pitched a minimum of 5° (at least ½") to the outside, this will insure proper drainage.
5. Check that the drain holes are clear and free of debris.
6. Inspect exterior louver and remove any obstructions.
7. Inspect indoor supply and return air sections and remove any obstructions (draperies, bedspreads, etc.) that may cause an air restriction during operation.

IMPORTANT: *Do not place any objects on the supply air grille.*

ELECTRICAL WIRING

1. Inspect existing wiring for any deficiencies such as cut or frayed wires.
2. All electrical wiring must be run according to NEC and local codes. Check the unit rating plate for circuit ampacity and breaker or fuse size. **USE ONLY HACR TYPE BREAKERS OR TIME-DELAY FUSES.** Select the proper wire for the ampacity rating.
3. If plug and receptacle are used, be sure to check for proper fit.

RC/RH25 REPLACEMENT CHASSIS



The RetroAire RC/RH25 is available as a cooling only model or, for those who wish to upgrade to a heat pump, the RH25 heat pump chassis will fit the existing wall sleeve. The heat pump version will reduce energy costs during periods of outdoor temperature ranging down to as low as 40° F.

The RC/RH25 uses a high-efficiency rotary compressor protected under a 5-year warranty and an enhanced high-efficiency heat exchanger to make the replacement of worn out and inefficient units a very attractive option.

Whisper quiet operation improves the room ambience and the 20 gauge G-90U galvanized steel construction of the chassis ensures long service life.

The RetroAire RC/RH25 offers two fan speeds with override switch and has an optional motorized fresh air feature with a positive pressure seal, and positive condensate re-evaporation to improve efficiency.

Consult factory for custom wall sleeve kit information and availability.

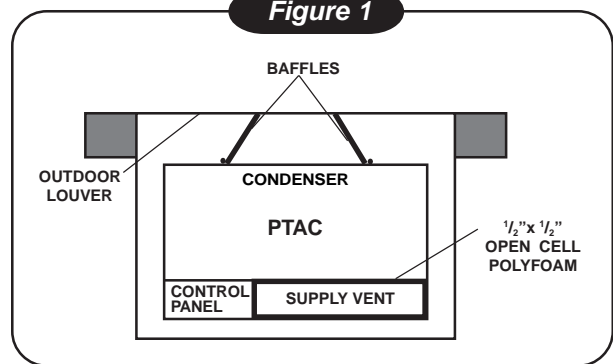
INSTALLATION INSTRUCTIONS

RC/RH25 BAFFLE & FOAM INSTALLATION KIT

- 1 Installation Manual
- 1 Lt. & Rt. Baffles
- Screws
- 1/2" x 1/2" Open Cell Foam Tape
- Filter (foam)

1. Remove baffles from kit bag supplied with unit. Attach the supplied baffles to the condenser coil front using the existing holes in the unit. Make sure the baffles are pointed toward the center of the condenser coil and fasten with the screws provided. (Figure 1)

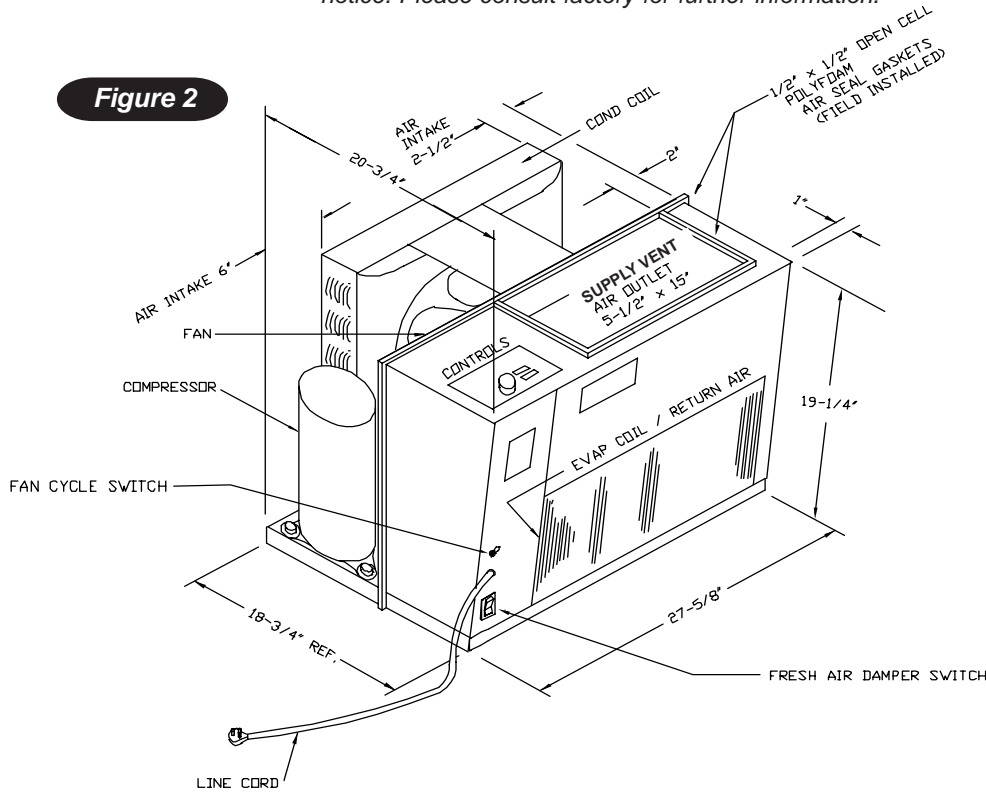
Figure 1



2. Install 1/2" X 1/2" open cell polyfoam around the supply vent. (Figure 1)
3. Also install 1/2" X 1/2" open cell polyfoam (provided) around chassis flange between wall sleeve and cooling chassis to prevent outside air from entering around the chassis into the room from the sides and top of the cabinet. (Figure, 2 page 6)
4. Slide the RC/RH25 into wall sleeve until the supply duct is flush with supply vent on room cabinet.
5. See Final Inspection and Start-up on page 11.

RC/RH25 SPECIFICATIONS AND PERFORMANCE

IMPORTANT: Due to ongoing product development, designs, specifications, and performance are subject to change without notice. Please consult factory for further information.



RC/RH 25 Electrical Specifications										
Model Number	Voltage/hz/ph	Fan Motor		Compressor		Total amps	MCA	Max Fuse	Min Voltage	Line Cord
		FLA	Hp	RLA	LRA					
9	208/230/60/1	1.1	0.18	3.8	20	4.9	5.9	15	197	6-15P
	265/60/1	1.1	0.25	3.3	18.6	4.4	5.2	15	240	7-20P
12	208/230/60/1	1.1	0.18	4.8	26.3	5.9	7.1	15	197	6-15P
	265/60/1	1.1	0.25	4.2	28	5.3	6.4	15	240	7-20P
15	208/230/60/1	1.1	0.18	7.6	45	8.7	10.6	15	197	6-15P
	265/60/1	1.1	0.25	6.3	32	7.4	9.0	15	240	7-20P

RC/RH 25 Optional Electric Heat									
Heater No.	Voltage	Watts	Btuh	Amps	Total Heat Amps	MCA	Max Fuse	Line Cord	
2	208	1963	6700	9.4	10.5	12.9	15	6-15P	
	230	2400	8200	10.4	11.5	14.1	15	6-15P	
	265	3186	10900	12.0	13.1	16.1	20	7-20P	
3	208	2454	8400	11.8	12.9	15.8	20	6-20P	
	230	3000	10300	13.0	14.1	17.4	20	6-20P	
	265	3752	12900	14.2	15.3	18.8	20	7-20P	
4 (3.5)	208	4100	14000	14.8	15.9	19.6	20	7-20P	
	230	2862	9800	13.8	14.9	18.3	20	6-20P	
	265	3500	12000	15.2	16.3	20.1	20	6-20P	
5	208	4646	15900	17.5	18.6	23.0	25	7-30P	
	230	4089	14000	19.7	20.8	25.7	30	6-30P	
	230	5000	17100	21.7	22.8	28.3	30	6-30P	

NEMA Specifications Non-Locking/Receptacles								
VOLTAGE	125V			250V			265V	
	15(A)	20(A)	30(A)	15(A)	20(A)	30(A)	15(A)	30(A)
PLUS								
RECEPTACLE								

RC/RH25 PERFORMANCE DATA						
MODEL	COOLING BTUH	EER	HEATING BTUH	COP	EVAP CFM HIGH/LOW	FRESH AIR CFM
9	9,200	9.8	8,600	3.2	410/305	40/35
12	12,300	9.7	11,800	3.2	410/305	40/35
15	15,100	8	13,700	2.6	410/305	55/45

RC/RH30 REPLACEMENT CHASSIS



The RetroAire RC/RH30 is available as a cooling only model or, for those who wish to upgrade to a heat pump, the RH30 heat pump chassis will fit the existing wall sleeve. The heat pump version will reduce energy costs during periods of outdoor temperature ranging down to as low as 40° F.

The RC/RH30 uses a high-efficiency rotary compressor protected under a 5-year warranty and an enhanced high-efficiency heat exchanger to make the replacement of worn out and inefficient units a very attractive option.

Whisper quiet operation improves the room ambience and the 20 gauge G-90U galvanized steel construction of the chassis ensures long service life.

The RetroAire RC/RH30 with override switch offers three fan speeds, and has an optional motorized fresh air feature with a positive pressure seal, and positive condensate re-evaporation to improve efficiency.

Cabinet fronts are available to match with various wall sleeve depths. (See chart on page 8)

INSTALLATION INSTRUCTIONS

RC/RH30 INSTALLATION KIT

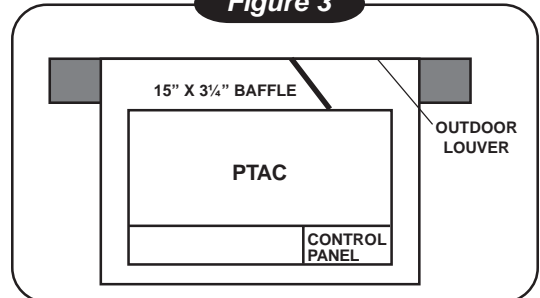
- 1 Installation Manual

- HYDRONIC ONLY**
- 1ea. 2-Position Connector & Pin Mate
 - 14AWG Yellow Wire

IMPORTANT: The RC/RH30 comes with a factory installed indoor supply louver and one factory installed baffle.

1. Please verify that the baffle is installed so that it points to the middle of the condenser coil. (Figure 3)

Figure 3



2. Slide the RC30 into the wall sleeve until the supply duct is flush with the supply louver on the room cabinet.

Hydronic Only: Remove the 2-position connector assembly from kit bag supplied with unit (this will have 2 yellow wires attached). Connect this 2-position connector to the 2-position connection located on the bottom of the control box panel.

To Connect Aquastat:

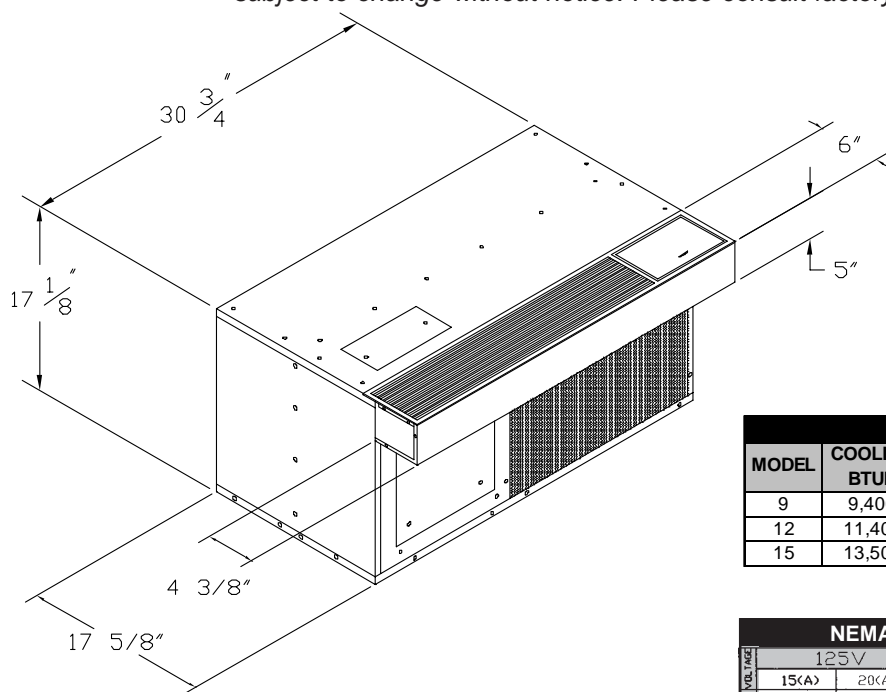
- A. Remove the black jumper wire located on the bottom panel of the control box (this is also terminated with a 2-position connector).
- B. Cut the jumper wire in the middle and splice the Aquastat to the jumper.
- C. Place the connector back into original location. Refer to wire diagram on the unit for details.

3. See Final Inspection and Startup on page 11.

RC/RH30 SAFETY NOTE: When turning the selector knob on the RC/RH30 for mode of operation, it is very important to make sure the knob position is "**SEATED**" directly on a mode of operation (**clicks into position**). Do not mistakenly place between two positions. This can result in a potential fan failure while the system is in a cooling or heating operation. A fan failure could result in the unit overheating (smoke) in an electric heating mode, or freezing coil in a cooling mode. (See page 11)

RC/RH30 SPECIFICATIONS AND PERFORMANCE

IMPORTANT: Due to ongoing product development, designs, specifications, and performance are subject to change without notice. Please consult factory for further information.



PLEASE NOTE EXISTING WALL SLEEVE DEPTH!

- For 13" sleeve, use wall sleeve extension and 6" cabinet front.
- For 15" sleeve, use 6" cabinet front only.
- No accessories are required for a 17" wall sleeve.

MODEL	COOLING BTUH	EER	HEATING BTUH	COP	EVAP CFM HI/MED/LOW	FRESH AIR CFM
9	9,400	10.3	8,500	3.1	305/275/260	40/35
12	11,400	9	10,800	3.1	305/275/260	40/35
15	13,500	8.6	12,700	2.8	305/275/260	40/35

NEMA TYPE	125V			250V			265V		
	15(A)	20(A)		15(A)	20(A)	30(A)	15(A)	20(A)	30(A)
PLUG	5-15 P	5-20 P		6-15 P	6-20 P	6-30 P	7-15 P	7-20 P	7-30 P
RECEPTACLE	5-15 R	5-20 R		6-15 R	6-20 R	6-30 R	7-15 R	7-20 R	7-30 R



Model Number	Voltage/hz/ph	Fan Motor		Compressor		Total amps	MCA	Max Fuse	Min Voltage	Line Cord
		FLA	Hp	RLA	LRA					
9	115/60/1	2	0.125	7.4	44	9.4	11.3	15	104	5-15P
	208/230/60/1	0.8	0.125	3.8	20	4.6	5.6	15	197	6-15P
	265/60/1	1.1	0.25	3.3	18.6	4.4	5.2	15	240	7-20P
12	115/60/1	2	0.125	9.7	54	11.7	14.1	20	104	5-15P
	208/230/60/1	0.8	0.125	4.8	26.3	5.6	6.8	15	197	6-15P
	265/60/1	1.1	0.25	4.2	28	5.3	6.4	15	240	7-20P
15	208/230/60/1	0.8	0.125	6.4	38	7.2	8.8	15	197	6-15P
	265/60/1	1.1	0.25	5.4	32	6.5	7.9	15	240	7-20P

Heater No.	Voltage	Watts	Btuh	Amps	Total Heat Amps	MCA	Max Fuse	Line Cord
2	208	1636	5600	7.9	8.7	10.6	15	6-15P
	230	2000	6900	8.7	9.5	11.7	15	6-15P
	265	2655	9100	10.0	11.1	13.6	15	7-20P
2 (2.4)	208	1963	6700	9.4	10.2	12.6	15	6-15P
	230	2400	8200	10.4	11.2	13.8	15	6-15P
	265	3186	10900	12.0	13.1	16.1	20	7-20P
3	208	2454	8400	11.8	12.6	15.5	20	6-20P
	230	3000	10300	13.0	13.8	17.1	20	6-20P
	265	3752	12900	14.2	15.3	18.8	20	7-20P
	277	4100	14000	14.8	15.9	19.6	20	7-20P
4 (3.5)	208	2862	9800	13.8	14.6	18.0	20	6-20P
	230	3500	12000	15.2	16.0	19.8	20	6-20P
	265	4646	15900	17.5	18.6	23.0	25	7-30P
5	208	4089	14000	19.7	20.5	25.4	30	6-30P
	230	5000	17100	21.7	22.5	28.0	30	6-30P

RC40 REPLACEMENT CHASSIS



RC40 BAFFLE & FOAM INSTALLATION KIT

- 1 Installation Manual
- 1 Right Baffle
- 1 Left Baffle
- 1" x 1" Open Cell Foam Tape
- 1/2" x 1/2" Open Cell Foam Tape
- Screws
- 2 Sets Of Baffles Are Supplied W/15,000 Btuh Units Only*

HYDRONIC ONLY

- 1ea. 2-Position Connector & Pin Mate
- 14AWG Yellow Wire
- 1/4" Varflex, Non-Fray Sleeving

The RetroAire RC40 is a cooling only replacement chassis designed to upgrade room comfort through higher efficiency and enhanced reliability.

The RetroAire RC40 uses a high-efficiency rotary compressor protected under a 5-year warranty and an enhanced high-efficiency heat exchanger to make the replacement of worn out and inefficient units a very attractive option.

Whisper quiet operation improves the room ambience and the 20 gauge G-90U galvanized steel construction of the chassis ensures long service life.

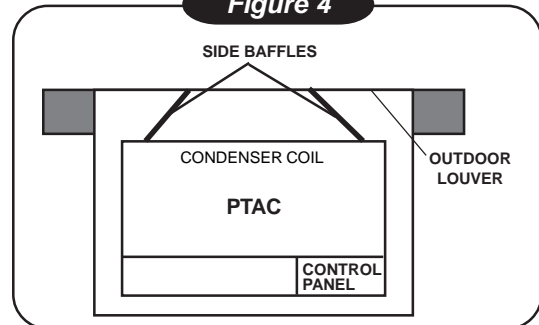
The RetroAire RC40 9,000, 12,000 and 15,000 Btuh units are all available in a 21" chassis. ***Depending on wall-sleeve depth, the RC 15,000 Btuh may need deeper baffles installed for proper operation (baffles supplied in kit bag).** The 9,000 and 12,000 Btuh units are single motor applications, while the 15,000 Btuh unit is a dual-motor application. All three capacities have two fan speeds and come equipped with a fan cycle switch.

All three capacities come equipped with a fan cycle switch. These units offer an optional motorized fresh air feature with a positive pressure seal, and positive condensate re-evaporation which improves efficiency.

INSTALLATION INSTRUCTIONS

1. To test the alignment, slide the RC40 into the wall sleeve until the supply duct is flush with the supply louver on the room cabinet.
2. Slide unit out of wall sleeve.

Figure 4



3. Remove baffles from the kit bag supplied with unit. Condenser baffles must be secured tightly to the condenser coil and the baffles need to come in contact with the outdoor louver. To install the baffles point both baffles toward the center of the condenser and fasten using the existing holes and screws provided. (Figure 4)
4. 1/2" X 1/2" open cell polyfoam must be placed around the supply air duct on top of the cooling chassis. Failure to do so will result in re-circulation of the conditioned air around the wall sleeve and through the unit, causing the unit to short cycle. (Figure 5 page 10)
5. 1" X 1" open cell polyfoam is provided to prevent outside air from entering around the chassis to the room from the sides and top of the cabinet. Install between well sleeve and cooling chassis. (Figure 5 page 10)

Hydronic Only: Remove the 2-position connector assembly from kit bag supplied with unit (this will have 2 yellow wires attached). Connect this 2-position connector to the 2-position connection located on the bottom of the control box panel.

To Connect Aquastat:

- A. Remove the black jumper wire located on the bottom panel of the control box (this is also terminated with a 2-position connector).
- B. Cut the jumper wire in the middle and splice the Aquastat to the jumper.
- C. Place the connector back into original location. Refer to wire diagram on the unit for details.

6. See Final Inspection and Startup on page 11.

RC40 SPECIFICATIONS AND PERFORMANCE

IMPORTANT: Due to ongoing product development, designs, specifications, and performance are subject to change without notice. Please consult factory for further information.

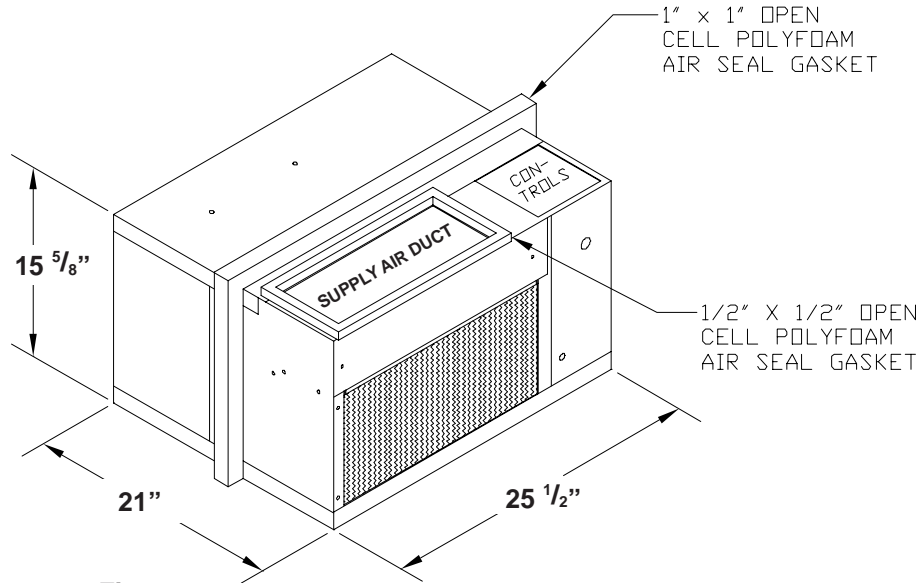


Figure 5

RC40 PERFORMANCE DATA				
Model	Cooling Btuh	EER	EVAP CFM High/Low	FreshAir CFM
09	8,700	9.0	305/275	40/35
12	11,000	8.5	305/275	55/45
15	14,300	8.0	305/275	55/45

RC40 OPTIONAL ELECTRIC HEAT SPECIFICATIONS								
Heater	Voltage	Watts	Btuh	AMPS	Total Heat AMPS	MCA	Max Fuse	Line Cord
3 (3.2)	208	2,617	9,000	12.6	13.4	16.5	20	6-20P
	230	3,200	11,000	13.9	14.7	18.2	20	6-20P

RC 40 Electrical Specifications												
Model Number	Voltage/hz/ph	Evap Motor		Cond Motor		Compressor		Total amps	MCA	Max Fuse	Min Voltage	Line Cord
		FLA	Hp	FLA	Hp	RLA	LRA					
09	208/230/60/1	0.8	1/8	N/A	N/A	4.1	20	4.9	5.9	15	197	6-15P
12	208/230/60/1	0.8	1/8	N/A	N/A	5.1	28	5.9	7.2	15	197	6-15P
15	208/230/60/1	0.8	1/8	0.71	0.09	6.4	38	7.9	9.5	15	197	6-15P

NEMA Specifications Non-Locking/Receptacles					
VOLTAGE	125V		250V		
	15(A)	20(A)	15(A)	20(A)	30(A)
PLUG					
RECEPTACLE					

FINAL INSPECTION AND START-UP

1. Make sure the chassis is level. Check by pouring water into the drain pan and making certain it flows through the drain hoses to the condenser side of the unit.
2. Plug or hard wire line voltage to unit.

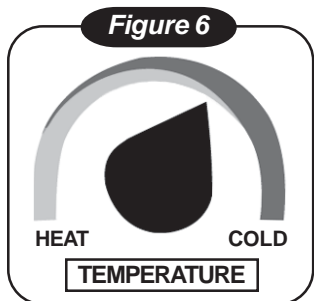
IMPORTANT: Follow the information provided on the rating plate for voltage and amperage/fuse size for proper supply.

3. Turn the power on.
4. Check for proper operation (i.e., cooling, optional fresh air, and heating if supplied).

RETROAIRE PTAC OPERATION

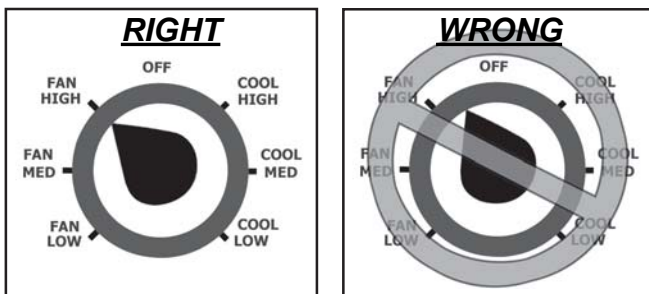
UNIT MOUNTED AND REMOTE THERMOSTAT CONTROLS

RetroAire units can be equipped with unit mounted or remote controlled thermostats. Turning the unit mounted thermostat knob to the far left will produce the warmest room temperature while turning it all the way to the right will produce the coolest. These settings can be adjusted for personal comfort.



RC/RH30 SAFETY NOTE

When turning the selector knob on the RC/RH30 for mode of operation, it is very important to make sure the knob position is "**SEATED**" directly on a mode of operation (**clicks into position**). Do not mistakenly place between two positions. This can result in a potential fan failure while the system is in a cooling or heating operation. A fan failure could result in the unit overheating (smoke) in an electric heating mode or freezing coil in a cooling mode.



Units with remote thermostats will require operation according to standard thermostat settings. Refer to the operating instructions for the specific thermostat used.

CHOOSING A THERMOSTAT

EMI offers a thermostat that is compatible with your PTAC/PTHP unit. Select EMI part number 240-2960 from the latest Retroaire price list for this option. This is a single stage, cool/heat, mercury bulb thermostat that can be used in all Retroaire cooling, heating or heat pump applications. The thermostat has an adjustable set-point range of between 55°F and 95°F. There are two independent, adjustable stops that can limit the heating or cooling range of the thermostat. If a non-mercury, electronic thermostat is needed, then choose EMI part number 240-3926.

SELECTING A THERMOSTAT "By Others"

When selecting a thermostat other than those offered by EMI, it is important to choose a single stage heat/cool, 24V thermostat. For models 09-17, do NOT select a thermostat that requires connection to a "C" terminal since these units do not have provisions for connecting to a "C" terminal. Only models 19 and 24 have provisions for connecting a "C" terminal to the unit.

If a thermostat without a "C" terminal is used in a models 19 or 24, then it is important to insulate the unused BROWN "C" low volt wire to prevent it from shorting at the thermostat.

COOLING ONLY WITH ELECTRIC HEAT OR HYDRONIC HEAT

Select a thermostat that is compatible with a cooling - electric heat system. The thermostat should have "R", "Y", "W" and "G" terminals

HEAT PUMP WITH ELECTRIC HEAT (RH - PTHP'S)

Select a thermostat that is compatible with a cooling - single stage heat - heat pump system. The thermostat should have "R", "Y", "O" and "G" terminals. Retroaire units are single stage heating only. The electric heat and heat pump will not operate simultaneously.

FAN OPERATION

Some thermostats are equipped with an **auto/on** fan switch. When this switch is placed in the **on** position the indoor fan will run continuous. When the switch is in the **auto** position the indoor fan will cycle with the call for heating or cooling.

RETROAIRE PTAC OPERATION (Continued)

FAN PURGE (Optional)

After the room thermostat has been satisfied, the purge feature allows the indoor fan to remain on for an additional 60 seconds. This increases efficiency by pulling the remaining energy from the unit.

COOLING OPERATION

After connecting the thermostat to the unit place the system switch in **cool** mode. Adjust the set-point temperature below the room temperature. The compressor and fan motors will start and cooling will begin. Place the set-point temperature above the room temperature. The compressor and condenser fan will stop and the indoor fan will remain on for an additional sixty seconds.

the set-point remains above room temperature. Next place the set-point temperature below room temperature. The Electric heater will switch off and the indoor fan will remain on for an additional sixty seconds.

HYDRONIC HEAT OPERATION (Optional)

An optional hydronic heat package may be selected in lieu of electric heat. Heating operation is essentially the same as that of units with electric heat. With the thermostat **system switch** set to **heat** and the set-point temperature above room temperature, the hydronic valve will open allowing water to flow through the coil. The indoor fan will also switch on and warm air will flow from the unit. Heating will continue so long as the set-point remains above room temperature. Place the set-point temperature below room temperature. The hydronic valve will close and indoor fan will switch off after the sixty-second purge time has elapsed. The hydronic valve is a 24Vac normally open valve. Should power be lost to the unit, the valve will default to the open position.

HEAT PUMP (Cooling Mode)

Cooling operation in a heat pump unit is described in "Cooling operation" above. The unit is equipped with a reversing valve that is energized for cooling and de-energized in heating mode.

HEAT PUMP (Heating Mode)

Heat pump units are "Limited Range" equipped with backup electric resistance heat. Limited Range heat pumps are designed to operate when outdoor temperatures are between 75°F and 40°F and with a maximum indoor temperature of 80°F. When the outdoor temperature falls below approximately 40°F the unit will switch from heat pump to electric resistance heat. Electric heat will then remain as the heat source until the outdoor temperatures rise above 50°F. Retroaire heat pumps (RH – PTHP) are single-stage heating units. The electric heat and heat pump will NOT operate simultaneously.

To operate the unit in heating mode, it must first be connected to an appropriate heat pump thermostat. (See choosing a thermostat). Select **heat** on the thermostat system switch. Then, adjust the set-point temperature above the room temperature. The compressor and fan motors will start and heating will begin. If the outdoor temperature is below approximately 40°F the heat pump system will not operate. Electric heat will then take over the heating demand. Heating will continue so long as the set-point temperature remains above the room temperature. Place the set-point temperature below the room temperature. The heating mode will cease and the indoor fan will remain on for an additional sixty seconds.

NOTE: *The start of the compressor will not take place until the anti-short/random start time period has elapsed.*

HEAT PUMP (Emergency Heat)



WARNING!

Before accessing the control compartment, disconnect power to the unit. Failure to do so could result in serious injury or electrical shock.

Should the heat pump system fail, it is possible to force the control board into electric heat mode. This is a temporary solution until the heat pump system can be repaired. Locate the circuit board in the control section of the unit. Locate the terminals where the outdoor sensor connects to the circuit board. Using a small needle nose type pliers, disconnect one side of the sensor from the circuit board. This will appear to the circuit board as an outdoor coil freeze condition there-by energizing the electric resistance heater on the call for heat.

**HEAT PUMP
(Thermostatic Drain Pan Valve)**

Heat pump units are equipped with a thermostatic drain valve that will open when outdoor temperatures fall below 50°F. This keeps the base pan free of condensate water where it may otherwise freeze during colder outdoor temperatures. As part of its normal operation, the unit will produce condensate and collect it in the base pan of the unit. There it will be picked up by the condenser fan slinger ring and deposited onto the condenser coil. During the cooling season, this improves the unit's efficiency by maintaining adequate refrigeration system pressures.

**ANTI-SHORT CYCLE TIMER
Random Start Feature (Optional)**

This feature will prevent compressor short cycling and also prevent multiple units in a single facility from simultaneously starting following a power outage. This delay on break feature ensures that the compressor remains off, between cycles, until the three-minute time delay period has elapsed allowing system pressures to equalize before re-starting.

The random start feature, initiated after a power failure, will add a random time delay (between 5-120 seconds) to the three-minute anti short cycle time following a power outage. This will stagger the starting of multiple units in a single facility allowing a building to slowly go back on line when power is restored.

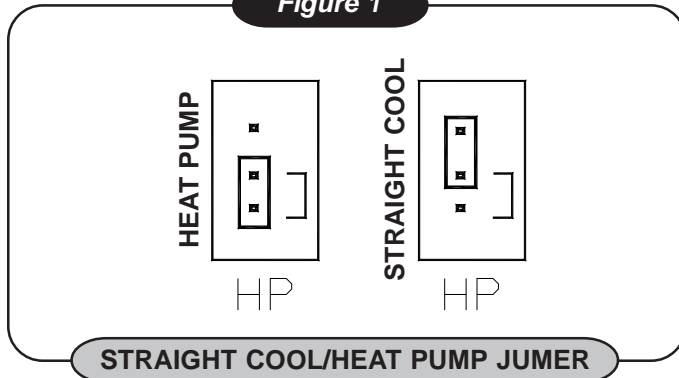
INDOOR COIL FREEZE PROTECTION (Optional)

This feature will prevent the indoor coil from freeze up in the cooling mode. Indoor coil freeze up can occur due to a dirty air filter, low refrigerant charge or low room or outdoor temperatures. This in turn can cause compressor damage. Should a freeze condition be detected, the compressor and condenser fan will be switched off for a minimum of three minutes and until the freeze condition is satisfied. **During this time the indoor fan will continue to run to aid in the defrost process.**

AJ4004 CONTROL BOARD (Optional)

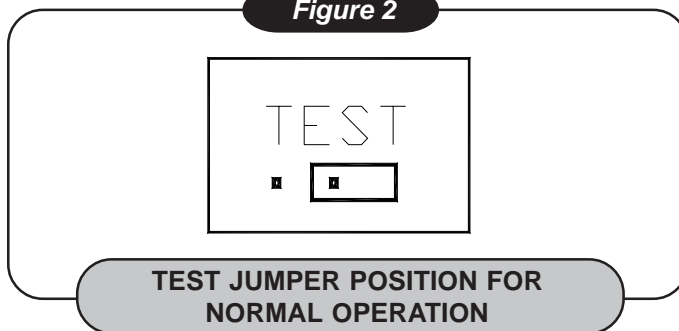
There are two sets of jumper pins on the control board that are factory set so there should no need to set them later on in the field. The first is a set of three pins labeled "HP" for selection of either a "Straight Cool" or "Heat Pump" unit. For "Straight Cool" the center pin and outer most pin (usually on the top) are to be jumped together. For Heat Pump units the center pin and the pin closest to the relay are to be jumped together. (Figure 1)

Figure 1



The second is a set of two pins labeled "TEST". When these two pins are jumped together, all timers are eliminated (i.e. anti-short, purge, ect.). This is mainly used for production line testing however it may also be useful for field-testing as well. The units are shipped with the "TEST" jumper on only one of the pins. Please, do not leave a unit with the test jumper in the test mode. (Figure 2)

Figure 2



The LED Blink Codes Are As Listed In Below.

- 1 Blink Normal Operation
- 2 Blinks Compressor Lockout (ASCT)
- 3 Blinks Outdoor freeze condition
- 4 Blinks Indoor freeze condition
- 5 Blinks Simultaneous W & Y Call

**Important Sensor Resistances
Are As Follows**

- 77 °F - 10K ohms
- 50 °F - 19.9K ohms
- 35 °F - 30K ohms
- 30 °F - 34.4K ohms

RETROAIRE PTAC OPERATION (Continued)

MOTORIZED FRESH AIR DAMPER (Optional)

The optional motorized damper allows fresh air to be brought into the room. By moving the “Fresh Air” switch to the **Yes** position, outside air will be brought into the room when the indoor fan is circulating air. To circulate indoor air without fresh air, set the “Fresh Air” switch to the **No** position.

CHANGEOVER T-STATS (Heat pump only)

On units with a changeover thermostat, the compressor will run until just above freezing (40° F) and then shut off. Electric heat will then energize and assume the heating demand until the temperature of the outdoor air rises to approximately 50° F.

CLEANING AND MAINTENANCE



WARNING

RetroAire Single Motor PTACS are designed and constructed for reliability and long life with minimal maintenance but service or repairs should only be performed by qualified service personnel.

IMPORTANT: *The Single-Motor PTAC is equipped with a permanently lubricated motor. Although oiling is not necessary, adding a few drops through the oiling ports twice yearly will extend the life of the motor. Do NOT over oil!!*

CLEANING THE INTERIOR OF THE UNIT

1. Disconnect power from unit.
2. Remove access panels and do a visual inspection of the unit, making sure to check for obvious problems such as broken wires, damaged coils, or evidence of extended wear on any moving part.
3. Check for unusual odors, oil leaks, or stains on or around the coil and refrigerant lines. The presence of oil here may indicate a potentially serious problem such as a refrigerant leak.
4. Inspect all electrical connections. Look for frayed wires and poor connections. Terminal ends that are loose will eventually fail, causing a loss of performance or worse.
5. Check fan motors and blower assemblies. Some units may require a drop of light oil to motors and/or bearing assemblies (look for oil cups). Check setscrews and motor mounting hardware, making sure they are tight.

6. Brush and/or vacuum the centrifugal fan blades and blower cage assemblies. These parts must be clean to operate efficiently.
7. Inspect and clean the indoor and outdoor coils, using a fin comb, if necessary, to straighten any damaged fins. These coils must be clean for proper operation.

IMPORTANT: *Do not use a solvent-based cleaner when cleaning the indoor or outdoor coils. Some solvents can produce a noxious odor when starting the fan or electric heat.*

8. Inspect and clean the drain pan and drain line (if any). Use of an anti-fungicide tablet is recommended to keep the condensate system free from bacterial contaminants.
9. Check the pitch of the unit and wall sleeve. Over time, the building and equipment may settle, causing a shift in the direction of the condensate flows. Ideally, the unit should pitch a minimum of 5° (at least ½”) to the outside to allow for proper drainage.
10. Replace panels and reconnect electrical power.
11. Test unit operation.

CLEANING AND MAINTENANCE (Continued)

CLEANING THE EXTERIOR OF THE UNIT

1. Clean the air filter at least once a month by removing it from the unit and washing or vacuuming any dust from its surface. Allowing dust to collect on the filter will cause the PTAC to lose efficiency and eventually malfunction.
2. When cleaning the filter, be sure to vacuum any dust from the return air grille surface as well.
3. Clean the exterior of the cabinet as desired with a mild soap or household cleaner.

TROUBLESHOOTING

NO HEAT OR COOLING: Check to see if the unit has power and if the thermostat is satisfied. If the thermostat is not satisfied, refer to the wiring diagram and check control components for continuity.

DANGER

Before servicing the RetroAire Single Motor PTAC, be sure to turn off electrical power to the unit. Failure to do so can result in a fire, explosion or electrical shock causing property damage, personal injury, or death.

ALL PRODUCT LIMITED WARRANTY

Enviromaster International LLC (EMI) warrants to the purchaser/owner that EMI products will be free from defects in material and workmanship under the normal use and maintenance for a period of twelve months for all components and sixty months on unit compressors from the date of original installation, or fifteen months for all components and sixty-three months on unit compressors from the date of manufacture, whichever comes first.

WHAT WE WILL COVER

EMI will replace any defective part returned to EMI's approved service organization with a new or rebuilt part at no charge. The replacement part assumes that unused portion of this warranty.

WHAT WE DON'T COVER

THIS WARRANTY DOES NOT INCLUDE LABOR or other costs incurred for repairing, removing, installing, shipping, servicing, or handling of either defective or replacement parts.

EMI IS NOT RESPONSIBLE FOR:


- Normal maintenance
- Damage or repairs required as a consequence of faulty installation or application by others.
- Failure to start due to voltage conditions, blown fuses, open circuit breakers, or other damages due to the inadequacy or interruption of electrical service.
- Damage or repairs needed as a consequence of any misapplication, abuse, improper servicing, unauthorized alteration, or improper operation.
- Damage as a result of floods, winds, fires, lightening, accidents, corrosive atmosphere, or other conditions beyond the control of EMI.
- Parts not supplied or designated by EMI.
- Products installed outside the United States or Canada.
- Any damages to person or property of whatever kind, direct or indirect, special or consequential, whether resulting from use or loss of use of the product.

LIMITATION OF WARRANTIES

This warranty is exclusive and in lieu of any implied warranties of merchantability and fitness for a particular purpose and all other warranties express or implied. The remedies provided for in this warranty are exclusive and shall constitute the only liabilities on the part of EMI including any statements made by any individual which shall be of no effect.

FOR SERVICE OR REPAIR:

- (1) Contact the Installer
- (2) Call the Nearest Distributor
- (3) Call or Write:


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