Installation Instructions

RPC

Thru-wall Condensing Unit
Replacement for Skymark Skypak

RETROPAK

REV: 0924

54 Argyle St N, Caledonia, ON N3W 1B9 info@retropak.ca

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IMPORTANT NOTES FOR THE INSTALLER

	A Quick Checklist
	Is the wall sleeve installed square and caulked to the exterior wall?
	Is the grille installed?
	Is the base of the cabinet or sleeve sloped to the outdoors?
	Are the refrigerant lines connected at the air handler and condenser?
	Is the suction line insulated (Including sensing bulb)?
	Is the disconnect properly sized and installed according to local code?
	Is there an installation manual for the homeowner?
	Is low voltage wire connected between the air handler and condenser?
	Are the service panels closed?
	Is the unit accessible? Are there clearances for service?
	Has the refrigerant charge been verified by measuring sub-cooling?

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IMPORTANT!
READ BEFORE PROCEEDING
GENERAL SAFETY GUIDELINES

This equipment is a relatively complicated apparatus. During installation, operation, maintenance or service, individuals may be exposed to certain components or conditions including, but not limited to: refrigerants, oils, materials under pressure, rotating components, and both high and low voltage. Each of these items has the potential, if misused or handled improperly, to cause bodily injury or death. It is the obligation and responsibility of operating/service personnel to identify and recognize these inherent hazards, protect themselves, and proceed safely in completing their tasks. Failure to comply with any of these requirements could result in serious damage to the equipment and the property in which it is situated, as well as severe personal injury or death to themselves and people at the site.

This document is intended for use by owner-authorized operating/service personnel. It is expected that this individual possesses independent training that will enable them to perform their assigned tasks properly and safely. It is essential that, prior to performing any task on this equipment, this individual shall have read and understood this document and any referenced materials. This individual shall also be familiar with and comply with all applicable governmental standards and regulations pertaining to the task in question.

Work on this equipment should only be done by properly trained personnel who are qualified to work on this type of equipment. Failure to comply with this requirement could expose the worker, the equipment and the building and its inhabitants to the risk of injury or property damage. The instructions are written assuming the individual who will perform this work is a fully trained HVAC & R journeyman or equivalent, certified in refrigerant handling and recovery techniques, and knowledgeable with regard to electrical lock out/tag out procedures. The individual performing this work should be aware of and comply with all national, state and local safety and environmental regulations while carrying out this work. Before attempting to work on any equipment, the individual should be thoroughly familiar with the equipment by reading and understanding the associated service literature applicable to the equipment. Should there be any question concerning any aspect of the tasks outlined in this instruction, please consult the manufacturer prior to attempting the work. Please be aware that this information may be time sensitive and that the manufacturer reserves the right to revise this information at any time. Be certain you are working with the latest information.

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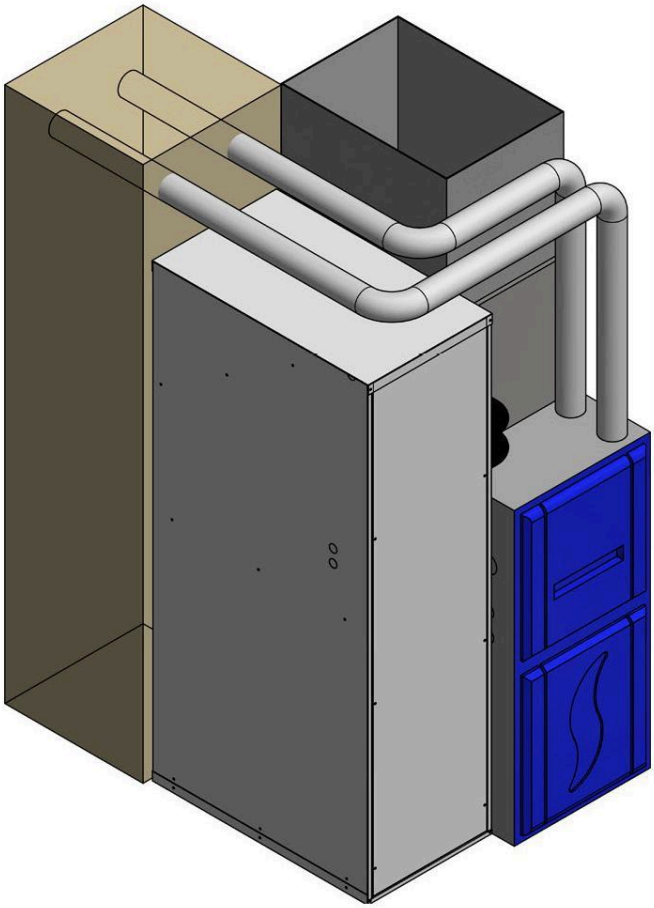
TYPICAL INSTALLATION



IMPORTANT! Furnace to be installed according to furnace manufacturer's recommendations and local building codes and laws.

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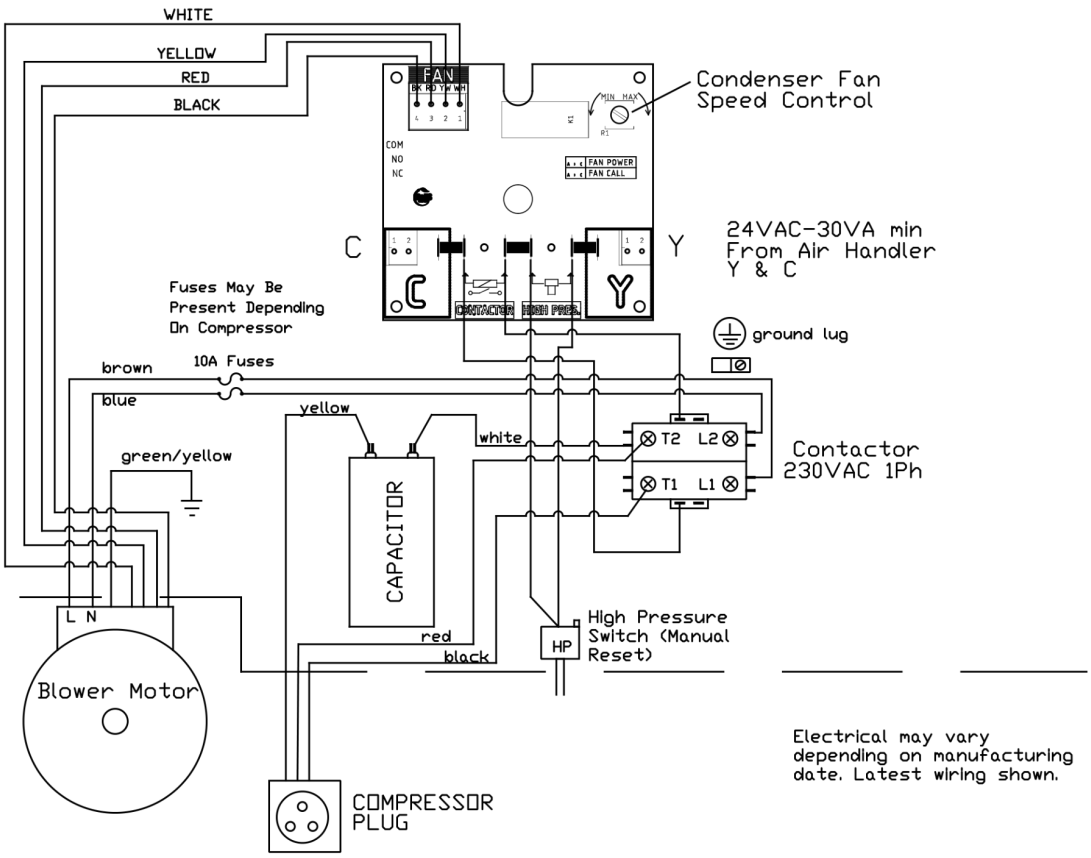
ELECTRICAL WIRING DIAGRAM



This diagram is provided as reference only. Wiring may differ depending on the unit. Always refer to correct wiring diagram located on inside cover of electrical panel

Optional items that may be ordered separately or field installed:

- ICM220 solid state lock out
- Cold weather kit c/w/ fan control
- Low ambient lockout
- Crankcase heater
- Transformer

Transformer may be provided partially pre-connected. It is the installer's responsibility to consult transformer manufactures instructions and ensure all connections are correct and installation conform to all local codes
It is the installer’s responsibility to check voltages prior to powering equipment

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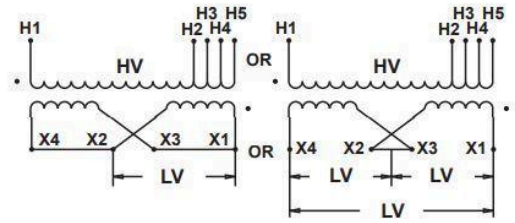
SCHEMATIC



CONNECTIONS

Primary Volts	Connect lines to	Inter-connect
277	H1, H5	-
240	H1, H4	-
208	H1, H3	-
120	H1, H2	-
Secondary Volts	**Connect lines to**	**Inter-connect**
240	X1, X4	X2-X3
120/240	X1, X2, X4	X2-X3
120	X1, X2	X2-X4, X1-X3

L1 connects to transformer H1

If 230V L2 connects to Transformer H4
If 208V L2 connects to Transformer H3

On the secondary side one leg must be designated neutral and grounded. Generally X2/X4 is designated the neutral connection and grounded

120L connects to X1/X3
Transformer primary and secondary to be fused.

After wiring power with fuses removed and test for 208 or 230 V on primary and confirm that H3 or H4 is connected for correct voltage

Then install fuses and check for 120 V to and from secondary fuses

Once 120 volts is confirmed furnace can be wired downstream of 120V fuses
Transformer Ground to be bonded to unit ground

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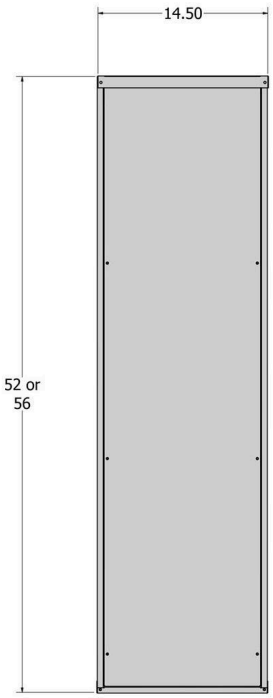
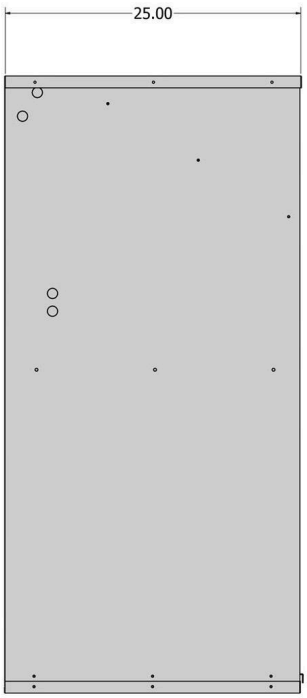
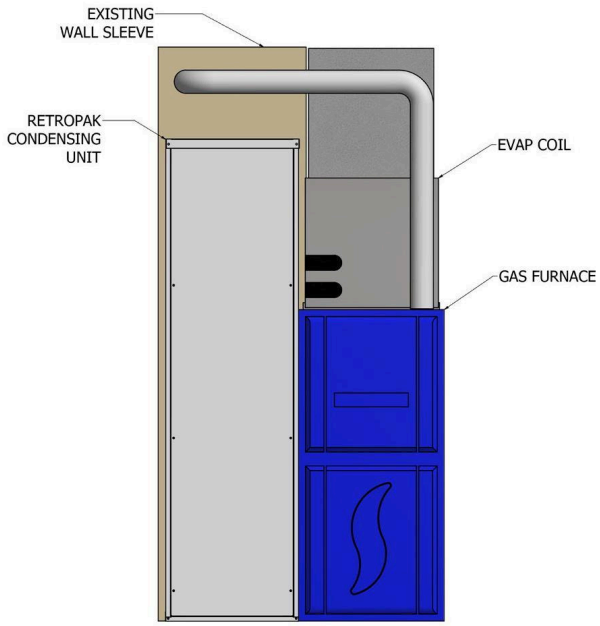
PHYSICAL PROPERTIES







IMPORTANT! Furnace to be installed according to furnace manufacturer's recommendations and local building codes and laws.

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INTRODUCTION

RPC wall-sleeve condensers provide the cooling capabilities of regular air conditioning condensers (“cubes” or “slim-line”) but can be installed through the wall and serviced from inside the dwelling. They are ideally suited to high-rise buildings where exterior space and accessibility can be major issues.

The cabinets are narrow to maximize exterior wall and window space and allow for closet installations of side by side AC, air handler and water heater.

PRODUCT DESCRIPTION

Cabinet

All cabinets have a tough, durable low maintenance G90 galvanized finish.

Cabinet dimensions are compact and narrow to provide maximum installation flexibility. Refer to product specifications and installation requirements for more details.

A variety of grilles are available to compliment the building exterior.

Coil

All coils and internal piping conform to ASTM B68 or ASTM B88 standards.

High-density aluminum fins provide maximum heat transfer for small coil surface.

Fan and Motor

All fans are wide body dynamically balanced for extra quiet operation.

Compressor

Small compressors are available to closely match room loads in small or energy-efficient spaces.

EQUIPMENT SELECTION AND SIZING

Proper sizing of system components is crucial for proper operation.

Steps for sizing and selection:

1) Obtain room by room heat gain
2) Select a condenser equal to 80%-120% of the total heat gain.
3) Select a matching evaporator coil for capacity and refrigerant.
5) Select an air handler of suitable air capacity based on pressure drop of the coil.

Note: over-sizing of cooling equipment results in inefficiency, short cycles and poor humidity control.

INSTALLATION

WARNING !

Installation should only be performed by qualified personnel. In addition to this manual, all local codes shall be followed.
Improper installation may void all warranties.

Detailed instructions are shipped with all accessory items and should be followed.

Inspection

Carefully uncrate the equipment. Ensure that the rated voltage and capacity on the nameplate matches the requirement for the installation. If there is damage to the machine, a claim must be made to your carrier immediately. Shipping damage is the responsibility of the purchaser to file all necessary documents with their carrier. Remove any shipping materials.

Location

Consideration must be given to location. The machine must be mounted in an area with adequate clearance and access for servicing. Consideration must also be given to noise and vibration that is normal for operation of this unit. Additional isolation may be required in occupant sensitive locations.

If the machine is installed in a closet or behind a sealed panel, there must be adequate provision for service (2 ft./60cm).

For installation in a concrete, brick or block wall; the wall sleeve must be used.

For installation in a wood frame wall, including face brick with proper lintel, the wall sleeve can be omitted. The entire base of the condenser unit must be supported. The cabinet shall be caulked in place at the exterior.

Allow at least six feet clearance in front of the grille outdoors for proper air circulation and heat dissipation.

Operating Environment

Do not install in a corrosive environment containing chlorine, fluorine, solvents or other corrosive chemicals. Do not install in any atmosphere containing explosive or flammable vapours.

Internal controls should not be exposed to temperatures above 105ºF/41ºC and should not operate in a condensing environment.

If the cooling unit is to be operated at temperatures below 50ºF/10ºC, a cold weather kit must be installed.

Mounting – Wall Sleeve

Assemble and install the wall sleeve according to the instruction sheet provided with the wall sleeve. The wall sleeve should be square and installed

flush to the outdoor finished wall surface. The wall sleeve can be fastened through the inside face of the sides to the building framing with #10 pan head screws. Do not screw through the base of the wall sleeve. The base of the wall sleeve has the required slope built in to match the slope of the Wall sleeve condenser to provide adequate drainage. There is no need to slope the condenser outward for drainage. The entire base of the wall sleeve should be properly supported. Provide flashing and seal outside edge of cabinet to wall to ensure a watertight finish. Make sure drip edge at bottom extends beyond wall finish.

Remember to rough-in refrigerant lines, power wire and control wire before completing interior finishes. Looking at the cabinet through the access panel, the preferred rough-in location is left side for refrigerant lines and right side for electrical.

The interior may be finished tight to the wall sleeve. Cabinet is designed to fit flush with the back of the wall sleeve when installed.

REFRIGERANT LINES – CHARGING

WARNING !

Refrigerant lines are to be connected by qualified personnel only. Improper installation can result in injury or improper operation of the equipment.

Slide the condenser into the wall sleeve. Remove all three service panels.
The RPC comes with the refrigerant lines stubbed out of the cabinet .The service valves are located in the exterior of the cabinet accessible through the lower access panel.

Connect refrigerant lines on top of the cabinet using appropriate air conditioning brazing methods and materials. Protect pie seals where pipes enter the condenser cabinet. Refer to the specification table for line sizes.
The compressor is pre-charged with refrigerant for a 10 foot line-set. For other line-set lengths, add or subtract 0.4 oz of refrigerant per foot of line.
Where the evaporator and RPC unit are separated by more than 20 feet vertically, loop the refrigerant to form a trap every 16 feet. The evaporator height above or below the compressor shall not exceed 40 feet vertically.
The equivalent length from the condenser to the evaporator shall not exceed 140 feet, including elbows and fittings. For the RPC12 rotary compressor, the line lengths shall not exceed 40 feet. And the evaporator height above or below the RPC 12 compressor shall not exceed 15 feet vertically.

Insulate the vapour (suction) line with suitable pipe insulation. The correct refrigerant charge is listed on the rating plate for each unit. Information for charging is contained on the inside panel of the unit

Test ports are available at the middle service panel so the system can be run with gauges hooked up and the doors on. All Retropak matched coils use a TX valve for refrigerant expansion. The correct charge is verified by measuring the sub-cooling at the condenser discharge.

Space is allowed at the top of the sleeve to clip on temperature sensor. Once system is operating check that the correct charge is installed by measuring liquid line from condenser. Sub cooling should be 10F +5F /- 3F. If it is outside of this range, add or remove refrigerant from the liquid side as required.

Model	Liquid Line	Suction Line (Vapor)		
		Up to 40 feet	40-80 feet	80 - 140 feet
RPC12	1/4 in.	1/2 in.	NA	NA
RPC18	3/8 in.	5/8 in.	5/8 in.	5/8 in.
RPC24	3/8 in.	5/8 in.	5/8 in.	3/4 in.

ADJUSTMENT FOR CAPACITY FOR LONG LINE SETS

Nominal capacity (Btuh)	Vapor line diameter (in.)	Equivalent Line Length (FT)				
		50	75	100	125	140
12,000	1/2	NA	NA	NA	NA	NA
18,000	5/8	0.99	0.97	0.96	0.95	0.95
24,000	5/8	1.00	0.99	0.99	0.98	0.97

Equivalent lengths of fittings (Add to measured length)

Type of elbow fitting	Inside Diameter (in.)		
	5/8	*3/4*	*7/8*
90° short radius	1.4	1.7	2
90° long radius	1.3	1.5	1.7
45°	0.6	0.7	0.8

ELECTRICAL

WARNING !

Make sure unit is properly grounded. Locate condensing unit on a separate electric circuit. Provide a line of site disconnect according to local code requirements.

The wiring diagram is located on the service door. A copy is provided in this document for reference only. Nameplate data is located on the side of the unit. Ampacity is also shown in the specification table. If there is a difference in ampacity and circuit size between the rating plate and this document, the rating plate shall be followed.

All condensers operate on 230VAC/1ph/60hz line voltage. All control circuits are 24 VAC.
Use copper conductors only. Connect power wires to terminal lugs in the control (middle) panel. Protect and seal wires where they enter the condenser cabinet.

Low Voltage Control Wiring

Connect low voltage control wire, such as thermostat wire, between the low voltage terminals of the middle panel and the terminals of the air handler. Typical air handler terminal labels would be AC or Y & C. Protect and seal wires where they enter the condenser cabinet.

Transformer Wiring

Transformer may be provided partially pre-connected. It is the installer's responsibility to consult transformer manufactures instructions and ensure all connections are correct and installation conforms to all local codes. It is the installers responsibility to check voltages prior to powering equipment

START-UP PROCEDURES

1.Verify power is connected to the condensing unit and the air handler. Follow transformer instructions on Page 7.

2.Verify control wire is connected from the air handler to the condenser unit. Verify that the thermostat is installed.

3.Verify that refrigerant lines are connected between the air handler and condenser unit, evacuated and properly charged.

4.Install the upper and lower service panel of the condenser unit. Install all panels and filters at the air handler.

5.Turn on the power to the air handler and condenser unit. Set the room thermostat for cooling to energize the fan and condenser. Note: some thermostats and air handlers have a five minute lockout delay

6. Adjust condensing fan speed dial, pictured, as required.

7. Compressor plate may be fastened during shipping. Compressor plate fastener should be removed prior to startup. Compressor plate should float.

SERVICE AND MAINTENANCE

WARNING !

Service should only be provided by qualified personnel. Disconnect electrical supply before opening service panels.

Wiring
Examine wires for signs of pinching, fraying or charring. Replace as necessary.

Coil
Examine the condenser coil for lint, debris or damage Wash or vacuum if necessary.

Fan and motor
Check fan for dust once a year. The fan is accessible and removable through the top panel. If dirty, vacuum to remove dust.

Keeping the fan blades clean will reduce noise and improve the capacity and efficiency of the cooling system.

If oil ports are present on the motor, the fan motor requires oil. Oil with an SAE 20 non-detergent oil. Plastic caps on the end bell of the motor must be removed and five drops of oil added. Failure to oil the motor may result in its seizing up and over oiling can cause secondary bearing damage or a buildup of lint and debris that can adversely affect the operation of the motor and fan

TROUBLESHOOTING

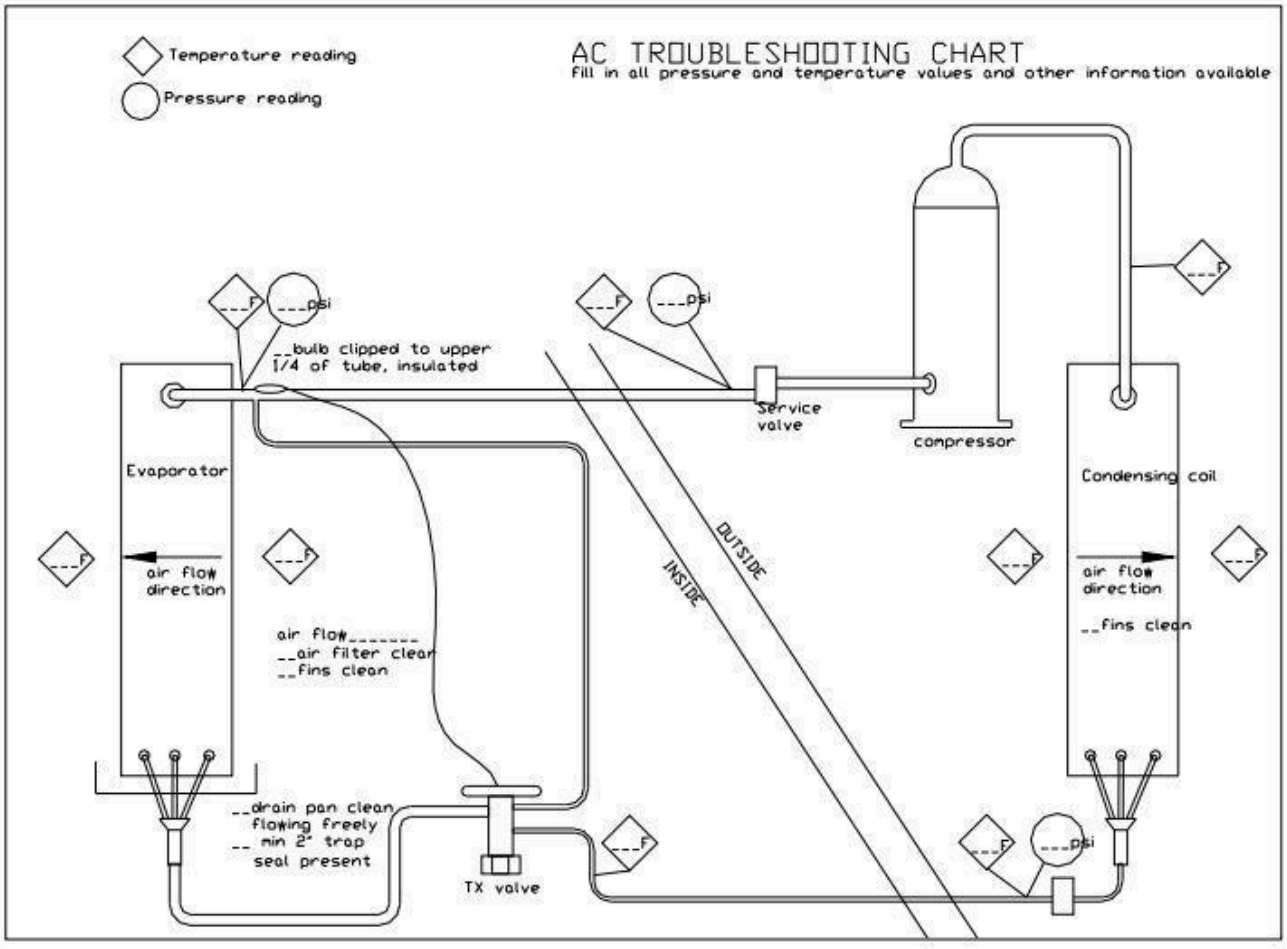
WARNING !

Service should only be performed by qualified personnel. Take proper care to disconnect voltage supply. Use caution when working near charged capacitors.

Symptom	Cause	Check
Fan and compressor will not operate	1. Power off 2. Improperly wired 3. Loose connections 4. 24vac supply 5. Thermostat 6. Firestat/Freezestat	1. Check main fuse/circuit breaker and remote disconnect. Measure power and control voltages at condenser. 2. Check power and control wiring. Refer to wiring diagram. 3. Check wiring.
		4. Measure voltage and check ampacity (should be at least 40VA, replace transformer if faulty or under-sized. 5. Thermostat or air handler may have a delay of up to five minutes. Check thermostat settings. Disconnect thermostat and apply 24vac directly from air handler. If it operates, fault is at thermostat or a.h. control. 6. Determine cause of trip. Repair/reset/replace Firestat/freezestat if necessary.
Fan operates, compressor does not	Safety lock-out	1. Reset thermostat
Compressor hums, won't start	1. Low voltage or wrong voltage 2. Capacitor problem	1. Check wiring and voltage at unit, check wire size, check for loose wires. 2. Test compressor capacitor, replace if necessary
Fan starts but cuts out	1. Incorrect or low voltage 2. Capacitor problem 3. Doesn't turn freely 4. Seized 5. High internal amperage	1. Check wiring and voltage at unit, check wire size, check for loose wires. 2. Test fan capacitor, replace if necessary 3. Oil motor, check bearings, replace fan motor if necessary. 4. Replace fan motor 5. Change to lower fan speed

High suction pressure	1. Excessive evap. Air 2. Excessive load 3. High latent heat	1. Confirm correct amount of evap. Air, adjust air handler air flow. 2. Estimate space cooling load and compare to unit capacity. Replace with larger cooling unit if necessary. 3. Estimate space cooling latent load and compare to unit latent capacity.
High discharge pressure	1. Insufficient air over condenser. 2. Plugged or restricted air over condenser coil	1. Adjust condenser fan speed. 2. Wash or vacuum condenser coil.

START UP INFORMATION AND TROUBLESHOOTING CHART



If you require diagnostic assistance, complete the Troubleshooting chart and send to your distributor.

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WARRANTY

This product is warranted by Retropak to be free from defects in materials and workmanship that affect product performance under normal use and maintenance within the applicable periods specified below. Replacements furnished will carry only the unexpired portion of the original warranty.

Two-Year Parts
Retropak will provide replacement parts for ANY part that fail within two years of purchase, subject to the **terms** below.

Five-Year Parts
Retropak will provide replacement parts for compressor, refrigerant coil, cabinetry and piping that fail within five years of purchase, subject to the **terms** below.

Terms
Reasonable proof of original purchase date must be provided in order to establish the effective date of the warranty, failing which, the effective date will be based on the date of manufacture plus thirty days.
The warranty does not cover failure or damages caused
by: improper installation or operation
accident, abuse or alteration
operation of device at temperatures or pressures outside of the rated capacities
corrosive operating environment
equipment moved from original installation location
Replacements furnished under this warranty will be F.O.B. Retropak product distribution points in the United States and Canada. They will be invoiced at regular prices. The account will be credited the full amount when the defective part is received by Retropak, examined and approved as a valid warranty.

Warranty applies to the original purchaser, but may be transferred to another owner provided the equipment is not moved from the original installation site.
This warranty does not apply to labour, freight or any other cost associated with the service repair or operation of the product.
Retropak shall not be liable for any direct, special, incidental or consequential damages caused by the use, misuse, or inability to use this product.

Retropak is under no legal obligations to rectify, including but not limited to, lost profits, downtime, good will, damages to, or replacement of equipment and property.

Purchaser assumes all risk and liability of loss, damage or injury to purchaser and purchaser’s property and to others and their property arising out of the use, misuse or inability to use this product.