

INSTALLATION INSTRUCTIONS FOR A/C INDOOR UNITS

(-)HCYA SERIES 6.5, 7.5, 10 (sm & lg), 12.5, 15, & 20 TONS
WITH R-454B REFRIGERANT



UL listing and CSA certification on some models is in process.

Contact your distributor for available models.



Recognize this symbol as an indication of Important Safety Information!

**DO NOT DESTROY THIS MANUAL. PLEASE READ CAREFULLY AND KEEP
IN A SAFE PLACE FOR FUTURE REFERENCE BY A SERVICEMAN.**

WARNING

THESE INSTRUCTIONS ARE INTENDED AS AN AID TO QUALIFIED, LICENSED SERVICE PERSONNEL FOR PROPER INSTALLATION, ADJUSTMENT AND OPERATION OF THIS UNIT. READ THESE INSTRUCTIONS THOROUGHLY BEFORE ATTEMPTING INSTALLATION OR OPERATION. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN IMPROPER INSTALLATION, ADJUSTMENT, SERVICE OR MAINTENANCE POSSIBLY RESULTING IN FIRE, ELECTRICAL SHOCK, PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

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1.0 IMPORTANT SAFETY INFORMATION

⚠WARNINGS:

- These instructions are intended as an aid to qualified, licensed service personnel for proper installation, adjustment, and operation of this unit. Read these instructions thoroughly before attempting installation or operation. Failure to follow these instructions may result in improper installation, adjustment, service, or maintenance possibly resulting in fire, electrical shock, property damage, personal injury, or death.
- The unit must be permanently grounded. Failure to do so can cause electrical shock resulting in severe personal injury or death.
- Turn off electric power at the fuse box or service panel before making any electrical connections.
- Complete the ground connection before making line voltage connections. Failure to do so can result in electrical shock, severe personal injury, or death.
- Disconnect all power to unit before starting maintenance. Failure to do so can cause electrical shock resulting in severe personal injury or death.
- Never assume the unit is properly wired and/or grounded. Always test the unit cabinet with a non-contact voltage detector available at most electrical supply houses or home centers before removing access panels or coming into contact with the unit cabinet.
- Do not use oxygen to purge lines or pressurize system for leak test. Oxygen reacts violently with oil, which can cause an explosion resulting in severe personal injury or death.
- Because of possible damage to equipment or personal injury, installation, service, and maintenance should be performed by a trained, qualified, service personnel. Never operate the unit with the access panels removed.
- The manufacturer's warranty does not cover any damage or defect to the unit caused by the attachment or use of any components, accessories, or devices (other than those authorized by the manufacturer) into, onto, or in conjunction with the heat pump. You should be aware that the use of unauthorized components, accessories, or devices may adversely affect the operation of the heat pump and may also endanger life and property. The manufacturer disclaims any responsibility for such loss or injury resulting from the use of such unauthorized components, accessories, or devices.
- If removal of the blower assembly is required, all disconnect switches supplying power to the equipment must be de-energized and locked (if not in sight of the unit) so the field power wires can be safely removed from the blower assembly. Failure to do so can cause electrical shock resulting in personal injury or death.
- Duct leaks can create an unbalanced system and draw pollutants such as dirt, dust, fumes and odors into the building causing property damage. Fumes and odors from toxic, volatile or flammable chemicals, as well as automobile exhaust and carbon monoxide (CO), can be drawn into the occupied space through leaking ducts and unbalanced duct systems causing personal injury or death.
- If air-moving equipment or ductwork is located in garages or off-garage storage areas - all joints, seams, and openings in the equipment and duct must be sealed to limit the migration of toxic fumes and odors including carbon monoxide from migrating into the living space.
- If air-moving equipment or ductwork is located in spaces containing fuel burning appliances such as water heaters or boilers - all joints, seams, and openings in the equipment and duct must also be sealed to prevent de-pressurization of the space and possible migration of combustion byproducts including carbon monoxide into the occupied space.
- Do not, under any circumstances, connect return ductwork to any other heat producing device such as fireplace insert, stove, etc. Unauthorized use of such devices may result in fire, carbon monoxide poisoning, explosion, personal injury or property damage.
- Do not operate the system without filters. A portion of the dust entrained in the air may temporarily lodge in the duct runs and at the supply registers. Any circulated dust particles could be heated and charred by contact with the heating elements. This residue could soil ceilings, walls, drapes, carpets and other articles in the building.
- The first 36 inches of supply air plenum and ductwork must be constructed of sheet metal with no openings, registers or flexible air ducts located in it as required by NFPA 90B if an electric heater accessory is installed. If flexible supply air ducts are used they may be located only in the vertical walls of a rectangular plenum, a minimum of 6 inches from the solid bottom.

1.0 IMPORTANT SAFETY INFORMATION

⚠CAUTIONS:

- Only match this outdoor unit with a matched indoor coil or air handler approved for use with this outdoor unit per the unit manufacturer's specification sheet. The use of unmatched coils or air handler will likely result in a charge imbalance between the cooling and heating modes which can cause unsatisfactory operation including a high-pressure switch lockout condition.
- When coil is installed over a finished ceiling and/or living area, it is required that a secondary sheet metal condensate pan be constructed and installed under the entire unit. Failure to do so can result in property damage.
- In compliance with recognized codes, an auxiliary drain pan must be installed under all equipment containing evaporator coils that are located in any area of a structure where damage to the building or building contents may occur as a result of an overflow of the coil drain pan or a stoppage in the primary condensate drain piping.

⚠NOTICE:

- When used in cooling applications, excessive sweating may occur when unit is installed in an unconditioned space. This can result in property damage.
- Improper installation, or installation not made in accordance with the Underwriters Laboratory (UL) certification or these instructions, can result in unsatisfactory operation and/or dangerous conditions and are not covered by the unit warranty.

Use of this air-handler during construction is not recommended. If operation during construction is absolutely required, the following temporary installation requirements must be followed:

Installation must comply with all Installation Instructions in this manual including the following items:

- Properly sized power supply and circuit breaker/fuse
- Air-handler operating under thermostatic control;
- Return air duct sealed to the air-handler;
- Air filters must be in place;
- Correct air-flow setting for application
- Clean air-handler, duct work, and components including coil upon completion of the construction process and verify proper air-handler operating conditions according as stated in this instruction manual.
- NOTE: Electric strip heater elements tend to emit a burning odor for a few days if dust has accumulated during construction. Heater elements are easily damaged. Take great care when cleaning them. Low pressure compressed air is recommended for cleaning elements.

⚠REFRIGERANT WARNINGS:

WARNING: Risk of Fire or Explosion. Dispose Of Properly In Accordance with Federal Or Local Regulations. Flammable Refrigerant Used.

DANGER: Risk of Fire Or Explosion due to Flammable Refrigerant Used. Follow Handling Instructions Carefully in Compliance with National Regulations.

WARNING: Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.

WARNING: The appliance shall be stored in a room without continuously operating ignition sourced (for example: open flames, an operating gas appliance or an operating electric heater.)

WARNING: Do not pierce or burn.

WARNING: Be aware that refrigerants may not contain an odor.

WARNING: If this unit is connected via an air duct system to one or more rooms with an area less than Amin, that room shall be without continuously operating flames or other potential ignition sources. See **3.2: A2L Refrigerant Installation Safety Data**.

WARNING: Auxiliary devices which may be a potential ignition source shall not be installed in the duct work.

WARNING: If this unit is connected via duct to one or more rooms, only auxiliary devices approved by the manufacturer are declared suitable with A2L refrigerants shall be installed in the connecting duct work.

WARNING: Appliance shall be installed, operated and stores in a room with a floor area larger than 'X'm2. See **3.2: A2L Refrigerant Installation Safety Data**.

DANGER: Risk of fire or explosion. Flammable refrigerant used. To be repaired only by trained service personnel. Do not puncture refrigerant tubing.

DANGER: Risk of fire or explosion. Flammable refrigerant used. Consult the repair manual/ owner's guide before attempting to service this product. All safety precautions must be followed.

2.0 GENERAL INFORMATION

⚠ WARNING:

Improper installation, or installation not made in accordance with these instructions, can result in unsatisfactory operation and/or dangerous conditions and can cause the related warranty not to apply.

2.1 Introduction

The information contained in this manual has been prepared to assist in the proper installation, operation, and maintenance of the air conditioning system by a qualified installer.

Read this manual and any instructions packaged with separate equipment required to make up the system prior to installation. Owner should retain this manual for future reference.

The images contained within this document may not be an exact representation of every unit, accessory, installation, etc. All dimensions contained in this document are approximations. We reserve the right to change the content of this document at any time.

2.2 Importance of Quality Installation

The equipment must be stored in a way that prevents mechanical damage from occurring.

A quality installation is critical to assure safety, reliability, comfort, and customer satisfaction. Strict adherence to applicable codes, the information in this installation manual, the outdoor unit installation manual, and the thermostat installation manual are key to a quality installation. Read the entire instruction manuals before starting the installation.

IMPORTANT: This product has been designed and manufactured to meet certified AHRI capacity and efficiency ratings with the appropriate outdoor units. However, proper refrigerant charge, proper airflow, and refrigerant line sizing are critical to achieve optimum capacity and efficiency and to assure reliable operation. Installation of this product should follow the manufacturer's refrigerant charging and airflow instructions located in this installation manual and the charging chart label affixed to the outdoor unit. Failure to confirm proper charge and airflow may reduce energy efficiency and shorten equipment life.

The equipment has been evaluated in accordance with the Code of Federal Regulations, Appendix A to Subpart F of Part 431, Title 10.

Install the unit in accordance with applicable national, state, and local codes. Latest editions are available from: "National Fire Protection Association, Inc., Batterymarch Park, Quincy, MA

02269." These publications are:

- ANSI/NFPA No. 70-(Latest Edition) National Electrical Code.
- NFPA90A Installation of Air Conditioning and Ventilating Systems.
- NFPA90B Installation of warm air heating and air conditioning systems.
 - UL 60335-2-40 4th Edition
 - CSA C22.2 No. 60335-2-40 4th Edition

Manufacturer Qualifications: ISO 9001: 2015

Install the indoor unit in such a way as to allow necessary access to the coil/filter rack and blower/control compartment.

If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment must be on site. A dry powder CO2 fire extinguisher must be near the charging area at all times during installation, commissioning, service, and decommissioning.

2.3 System Sizing and Selection

Before specifying any air-conditioning equipment, a survey of the structure and heat gain calculation must be made. A heat gain calculation involves identifying all surfaces and openings that gain heat from the surrounding air and quantifying that heat to determine the amount of heat that needs to be removed. A heat gain calculation also calculates the extra heat load caused by sunlight and for humidity removal. These factors must be considered before selecting an air-conditioning system to provide year-round comfort. The Air Conditioning Contractors of America (ACCA) Manual N method of load calculation is one recognized procedure for determining the cooling load for commercial buildings.

After the proper equipment combination has been selected, satisfying both sensible and latent requirements, the system must be properly installed. Only then can the system provide the comfort it was designed to provide.

There are several factors that installers must consider.

- Outdoor unit location
- Indoor unit blower speed and airflow
- Proper equipment evacuation
- Supply and return air duct design and sizing
- Refrigerant charge
- System air balancing
- Diffuser and return air grille location and sizing

2.0 GENERAL INFORMATION

IMPORTANT: Excessive use of elbows in the refrigerant line set can produce excessive pressure drop. Follow industry best practices for installation. Installation and commissioning of this equipment is to be performed by trained and qualified HVAC professionals. For technical assistance, contact your Distributor Service Coordinator.

2.4 Importance of Proper Indoor/Outdoor Match-Ups

To assure many years of reliable operation and optimum customer comfort and to assure the outdoor unit warranty remains valid, an air-handler model or indoor coil should be selected that is properly matched to the outdoor unit. The recommended approach is to select an air-handler or indoor coil that has an AHRI match with the outdoor unit. Refer to the AHRI directory at www.ahridirectory.org to confirm the air-handler and outdoor unit are a certified combination in the AHRI Directory.

2.5 Checking Product Received

Upon receiving unit, inspect it for any shipping damage. Claims for damage, either apparent or concealed, should be filed immediately with the shipping company. Check model number, electrical characteristics, and accessories to determine if they are correct. Check system components (outdoor unit, air handler, etc.) to make sure they are properly matched.

2.6 Efficiency Testing Notice

For purposes of verifying or testing efficiency ratings, the test procedure in Title 10, Chapter II, Subchapter D, Part 431, Subpart F, Section 96 and the clarifying provisions provided in the AHRI Operations Manual 340/360 that were applicable at the date of manufacture should be used for test set up and performance.

2.7 Compressor Break-In Notice

Prior to agency testing, unit must be charged at 95°F [35°C] dry bulb outdoor and 80°F [26.7°C] dry bulb/67°F [19.4°C] wet bulb Indoor then unit must be run for 16 hours at 115°F [46.1°C] outdoor ambient temperature with 80°F [26.7°C] dry bulb/75°F [23.9°C] wet bulb indoor ambient temperature to break the compressor in. After the 16 hours break-in bring the rooms down to 95°F [35°C] dry bulb outdoor 80°F [26.7°C] dry bulb/67°F [19.4°C] wet bulb Indoor and perform the final charge based on sub-cooling listed on the charging chart.

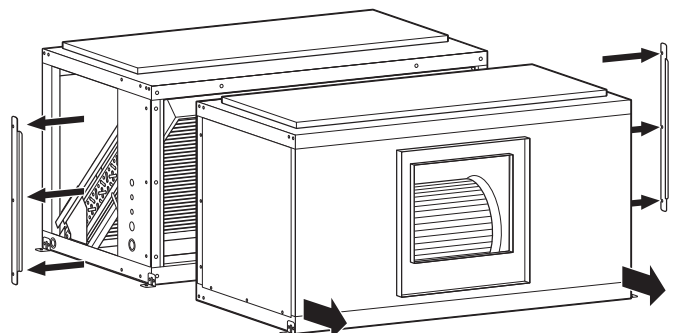
2.8 Optional Separability

For ease of installation into the indoor space, the air handler unit is separable. If required to move into the space, follow the steps below to separate and reconnect the two halves of the air handler.

NOTE: Separation and reconnection should be completed on a flat, stable surface. Do not attempt while unit is suspended from the ceiling.

1. Unscrew and remove the two metal brackets on each side of the air handler.
2. Remove access panels.
3. Remove the 3/8 inch bolts from the frame. The unit can now be pulled apart.
4. Move the air handler into place.
5. If gasketing is damaged, use included replacement gasketing to repair the unit.
6. Align the two sides. Reattach the metal brackets and access panels - these brackets should help align the connecting holes - then insert and fasten the 3/8 inch bolts. The unit can now be reconnected and installation and set-up can commence.

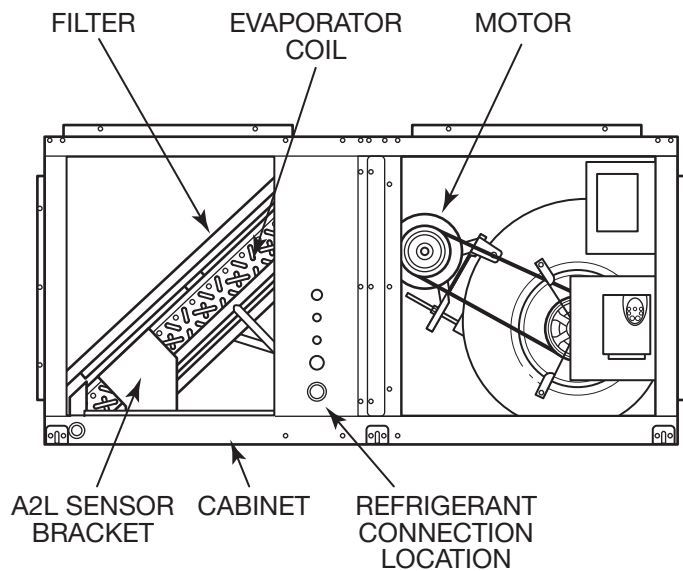
FIGURE 1
SEPARABLE AIR HANDLER



2.0 GENERAL INFORMATION

2.9 Major Components

FIGURE 2



**UNIT SHOWN WITH SIDE PANELS REMOVED FOR
COIL CONNECTIONS AND AIR FILTER ACCESS.**

3.0 UNIT SPECIFICATIONS

3.1 Electrical and Physical Data

Model (-)HCYA2 Series	090C	090D	090Y
Indoor Coil - Fin Type	Louvered	Louvered	Louvered
Tube Type	Rifled	Rifled	Rifled
Tube Size in. [mm]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]
Face Area sq. ft. [sq. m]	10.2 [0.9]	10.2 [0.9]	10.2 [0.9]
Rows / FPI [FPcm]	4 / 15 [10 / 38]	4 / 15 [10 / 38]	4 / 15 [10 / 38]
Refrigerant Control	TX Valves	TX Valves	TX Valves
Indoor Fan - Type	FC Centrifugal	FC Centrifugal	FC Centrifugal
Diameter in. [mm]	12x12 [305 x 305]	12x12 [305 x 305]	12x12 [305 x 305]
Drive Type	Belt (Adjustable)	Belt (Adjustable)	Belt (Adjustable)
No. Speeds (Standard / VFD)	Single / Multiple	Single / Multiple	Single / Multiple
No. Motors	1	1	1
Motor HP			
R - Low Static Drive	2	2	2
S - Medium Static Drive	2	2	2
T - High Static Drive	3	3	3
Motor RPM	1725	1725	1725
Weights			
Net Weight lbs. [kg]			
R - Low Static Drive	409 [186]	409 [186]	409 [186]
S - Medium Static Drive	409 [186]	409 [186]	409 [186]
T - High Static Drive	419 [190]	419 [190]	419 [190]
Ship Weight lbs. [kg]			
R - Low Static Drive	429 [195]	429 [195]	429 [195]
S - Medium Static Drive	429 [195]	429 [195]	429 [195]
T - High Static Drive	439 [199]	439 [199]	439 [199]

3.0 UNIT SPECIFICATIONS

3.1 Electrical and Physical Data

Model (-)HCYA2 Series	120C	120D	120Y	121C	121D
Indoor Coil - Fin Type	Louvered	Louvered	Louvered	Louvered	Louvered
Tube Type	Rifled	Rifled	Rifled	Rifled	Rifled
Tube Size in. [mm]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]
Face Area sq. ft. [sq. m]	10.2 [0.9]	10.2 [0.9]	10.2 [0.9]	16.5 [1.5]	16.5 [1.5]
Rows / FPI [FPcm]	4 / 15 [10 / 38]	4 / 15 [10 / 38]	4 / 15 [10 / 38]	3 / 15 [8 / 46]	3 / 15 [8 / 46]
Refrigerant Control	TX Valves	TX Valves	TX Valves	TX Valves	TX Valves
Indoor Fan - Type	FC Centrifugal	FC Centrifugal	FC Centrifugal	FC Centrifugal	FC Centrifugal
Diameter in. [mm]	12x12 [305 x 305]	12x12 [305 x 305]	12x12 [305 x 305]	18x15 [457x381]	18x15 [457x381]
Drive Type	Belt (Adjustable)	Belt (Adjustable)	Belt (Adjustable)	Belt (Adjustable)	Belt (Adjustable)
No. Speeds (Standard / VFD)	Single / Multiple	Single / Multiple	Single / Multiple	Single / Multiple	Single / Multiple
No. Motors	1	1	1	1	1
Motor HP					
R - Low Static Drive	2	2	2	2	2
S - Medium Static Drive	2	2	2	2	2
T - High Static Drive	3	3	3	3	3
Motor RPM	1725	1725	1725	1725	1725
Weights					
Net Weight lbs. [kg]					
R - Low Static Drive	409 [186]	409 [186]	409 [186]	575 [261]	575 [261]
S - Medium Static Drive	409 [186]	409 [186]	409 [186]	585 [265]	585 [265]
T - High Static Drive	419 [190]	419 [190]	419 [190]	595 [270]	595 [270]
Ship Weight lbs. [kg]					
R - Low Static Drive	429 [195]	429 [195]	429 [195]	595 [270]	595 [270]
S - Medium Static Drive	429 [195]	429 [195]	429 [195]	605 [274]	605 [274]
T - High Static Drive	439 [199]	439 [199]	439 [199]	615 [279]	615 [279]

3.0 UNIT SPECIFICATIONS

3.1 Electrical and Physical Data

Model (-)HCYA2 Series	150C	150D	150Y
Indoor Coil - Fin Type	Louvered	Louvered	Louvered
Tube Type	Rifled	Rifled	Rifled
Tube Size in. [mm]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]
Face Area sq. ft. [sq. m]	16.5 [1.5]	16.5 [1.5]	16.5 [1.5]
Rows / FPI [FPcm]	3 / 15 [8 / 38]	3 / 15 [8 / 38]	3 / 15 [8 / 38]
Refrigerant Control	TX Valves	TX Valves	TX Valves
Indoor Fan - Type	FC Centrifugal	FC Centrifugal	FC Centrifugal
Diameter in. [mm]	18x15 [457x381]	18x15 [457x381]	18x15 [457x381]
Drive Type	Belt (Adjustable)	Belt (Adjustable)	Belt (Adjustable)
No. Speeds (Standard / VFD)	Single / Multiple	Single / Multiple	Single / Multiple
No. Motors	1	1	1
Motor HP			
R - Low Static Drive	2	2	2
S - Medium Static Drive	3	3	3
T - High Static Drive	5	5	5
Motor RPM	1725	1725	1725
Weights			
Net Weight lbs. [kg]			
R - Low Static Drive	575 [261]	575 [261]	575 [261]
S - Medium Static Drive	585 [265]	585 [265]	585 [265]
T - High Static Drive	595 [270]	595 [270]	595 [270]
Ship Weight lbs. [kg]			
R - Low Static Drive	595 [270]	595 [270]	595 [270]
S - Medium Static Drive	605 [274]	605 [274]	605 [274]
T - High Static Drive	615 [279]	615 [279]	615 [279]

3.0 UNIT SPECIFICATIONS

3.1 Electrical and Physical Data

Model (-)HCYA2 Series	180C	180D	180Y
Indoor Coil - Fin Type	Louvered	Louvered	Louvered
Tube Type	Rifled	Rifled	Rifled
Tube Size in. [mm]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]
Face Area sq. ft. [sq. m]	16.5 [1.5]	16.5 [1.5]	16.5 [1.5]
Rows / FPI [FPcm]	4 / 15 [10 / 38]	4 / 15 [10 / 38]	4 / 15 [10 / 38]
Refrigerant Control	TX Valves	TX Valves	TX Valves
Indoor Fan - Type	FC Centrifugal	FC Centrifugal	FC Centrifugal
Diameter in. [mm]	18x15 [457x381]	18x15 [457x381]	18x15 [457x381]
Drive Type	Belt (Adjustable)	Belt (Adjustable)	Belt (Adjustable)
No. Speeds (Standard / VFD)	Single / Multiple	Single / Multiple	Single / Multiple
No. Motors	1	1	1
Motor HP			
R - Low Static Drive	2	2	2
S - Medium Static Drive	3	3	3
T - High Static Drive	5	5	5
Motor RPM	1725	1725	1725
Weights			
Net Weight lbs. [kg]			
R - Low Static Drive	690 [313]	690 [313]	690 [313]
S - Medium Static Drive	700 [318]	700 [318]	700 [318]
T - High Static Drive	710 [322]	710 [322]	710 [322]
Ship Weight lbs. [kg]			
R - Low Static Drive	710 [322]	710 [322]	710 [322]
S - Medium Static Drive	720 [327]	720 [327]	720 [327]
T - High Static Drive	730 [331]	730 [331]	730 [331]

3.0 UNIT SPECIFICATIONS

3.1 Electrical and Physical Data

Model (-)HCYA2 Series	240C	240D	240Y
Indoor Coil - Fin Type	Louvered	Louvered	Louvered
Tube Type	Rifled	Rifled	Rifled
Tube Size in. [mm]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]
Face Area sq. ft. [sq. m]	16.5 [1.5]	16.5 [1.5]	16.5 [1.5]
Rows / FPI [FPcm]	4 / 15 [10 / 38]	4 / 15 [10 / 38]	4 / 15 [10 / 38]
Refrigerant Control	TX Valves	TX Valves	TX Valves
Indoor Fan - Type	FC Centrifugal	FC Centrifugal	FC Centrifugal
Diameter in. [mm]	18x18 [457x457]	18x18 [457x457]	18x18 [457x457]
Drive Type	Belt (Adjustable)	Belt (Adjustable)	Belt (Adjustable)
No. Speeds (Standard / VFD)	Single / Multiple	Single / Multiple	Single / Multiple
No. Motors	1	1	1
Motor HP			
R - Low Static Drive	5	5	5
S - Medium Static Drive	7.5	7.5	7.5
T - High Static Drive	7.5	7.5	7.5
Motor RPM	1725	1725	1725
Weights			
Net Weight lbs. [kg]			
R - Low Static Drive	700 [318]	700 [318]	700 [318]
S - Medium Static Drive	710 [322]	710 [322]	710 [322]
T - High Static Drive	710 [322]	710 [322]	710 [322]
Ship Weight lbs. [kg]			
R - Low Static Drive	720 [327]	720 [327]	720 [327]
S - Medium Static Drive	730 [331]	730 [331]	730 [331]
T - High Static Drive	730 [331]	730 [331]	730 [331]

3.0 UNIT SPECIFICATIONS

3.1 Electrical and Physical Data

- A. Cooling Performance is rated at 95°F ambient, 80°F entering dry bulb, 67°F entering wet bulb. Gross capacity does not include the effect of fan motor heat. AHRI capacity is net and includes the effect of fan motor heat. Units are suitable for operation to 20% of nominal CFM. Units are certified in accordance with the Unitary Air Conditioner Equipment certification program, which is based on AHRI Standard 210/240 or 360.
- B. EER and Integrated Efficiency Ratio (IEER) are rated at AHRI standards 340/360 and in accordance with DOE test procedures.
- C. Outdoor Sound Rating shown is tested in accordance with AHRI Standard 270.

Model Number	CONNECTIONS				Unit					
	Liquid		Vapor		W (Width)		H (Height)		L (Length)	
	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
(-)HCYA2090	1/2	12.70	1 1/8	28.58	52	1320.8	27	685.8	52	1320.8
(-)HCYA2120	5/8	15.88	1 3/8	34.93	52	1320.8	27	685.8	52	1320.8
(-)HCYA2121	5/8	15.88	1 3/8	34.93	59.5	1511.3	34.25	869.95	72	1828.8
(-)HCYA2150	5/8	15.88	1 3/8	34.93	59.5	1511.3	34.25	869.95	72	1828.8
(-)HCYA2180	7/8	22.23	1 5/8	41.28	59.5	1511.3	34.25	869.95	72	1828.8
(-)HCYA2240	7/8	22.23	1 5/8	41.28	59.5	1511.3	34.25	869.95	72	1828.8

3.0 UNIT SPECIFICATIONS

3.1 Electrical and Physical Data (cont.)

ELECTRICAL DATA – (-)HCYA2 SERIES									
		090C	090D	090Y	120C	120D	120Y	121C	121D
Unit Information	Unit Operating Voltage Range	187-253	414-506	541-610	187-253	414-506	541-610	187-253	414-506
	Volts	208/230	460	575	208/230	460	575	208/230	460
	Minimum Circuit Ampacity								
	R - Low Static Drive	8	4	3	8	4	3	8	4
	S - Medium Static Drive	8	4	3	8	4	3	8	4
	T - High Static Drive	12	6	5	12	6	5	12	6
	Maximum Overcurrent Protection Device Size								
	R - Low Static Drive	15/15	15/15	15/15	15/15	15/15	15/15	15/15	15/15
	S - Medium Static Drive	15/15	15/15	15/15	15/15	15/15	15/15	15/15	15/15
	T - High Static Drive	15/20	15/15	15/15	15/20	15/15	15/15	15/15	15/15
Motor Information	No.	1	1	1	1	1	1	1	1
	Volts	208/230	460	575	208/230	460	575	208/230	460
	Phase	3	3	3	3	3	3	3	3
	Rating Plate Amps								
	R - Low Static Drive	6.2	3	2.4	6.2	3	2.4	6.2	3
	S - Medium Static Drive	6.2	3	2.4	6.2	3	2.4	6.2	3
	T - High Static Drive	9.2	4.6	3.5	9.2	4.6	3.5	9.2	4.6
	LRA (Amps)								
	R - Low Static Drive	47	24	22.72	47	24	22.72	47	24
	S - Medium Static Drive	47	24	22.72	47	24	22.72	47	24
	T - High Static Drive	74.5	38.1	30	74.5	38.1	30	74.5	38.1

3.0 UNIT SPECIFICATIONS

3.1 Electrical and Physical Data (cont.)

ELECTRICAL DATA – (-)HCYA2 SERIES										
		150C	150D	150Y	180C	180D	180Y	240C	240D	240Y
Unit Information	Unit Operating Voltage Range	187-253	414-506	541-610	187-253	414-506	541-610	187-253	414-506	541-610
	Volts	208/230	460	575	208/230	460	575	208/230	460	575
	Minimum Circuit Ampacity									
	R - Low Static Drive	8	4	3	8	4	3	16	8	7
	S - Medium Static Drive	12	6	5	12	6	5	24	12	10
	T - High Static Drive	16	8	7	16	8	7	24	12	10
	Maximum Overcurrent Protection Device Size									
	R - Low Static Drive	15/15	15/15	15/15	15/15	15/15	15/15	20/25	15/15	15/15
	S - Medium Static Drive	15/15	15/15	15/15	15/15	15/15	15/15	30/40	15/20	15/15
	T - High Static Drive	20/25	15/15	15/15	20/25	15/15	15/15	30/40	15/20	15/15
Motor Information	No.	1	1	1	1	1	1	1	1	1
	Volts	208/230	460	575	208/230	460	575	208/230	460	575
	Phase	3	3	3	3	3	3	3	3	3
	Rating Plate Amps									
	R - Low Static Drive	6.2	3	2.4	6.2	3	2.4	12.6	6.3	5.1
	S - Medium Static Drive	9.2	4.6	3.5	9.2	4.6	3.5	19.2	9.6	7.7
	T - High Static Drive	12.6	6.3	5.1	12.6	6.3	5.1	19.2	9.6	7.7
	LRA (Amps)									
	R - Low Static Drive	47	24	22.72	47	24	22.72	95	47.5	38
	S - Medium Static Drive	74.5	38.1	30	74.5	38.1	30	127	63.5	58
	T - High Static Drive	95	47.5	38	95	47.5	38	127	63.5	58

3.0 UNIT SPECIFICATIONS

3.1 Electrical and Physical Data (cont.)

Models Number (-)HCYA2	Heater Kit Model	Rated Heater KW @208/230	Heat Kit Amps (FLA) Only	Heater Kit	
	RXHE-			HEATER KIT MIN. CKT. AMPACITY	HEATER KIT MAX FUSE OR CKT. BKR. SIZE
090CAR	DE020CA	15.6/20.2	43.1/48.9	67/73	70/80
090CAS	DE030CA	22.0/29.6	60.8/70.2	89/100	90/100
090CAT					
120CAR	DE020CA	15.6/20.2	43.1/48.9	67/73	70/80
120CAS	DE030CA	22.0/29.6	60.8/70.2	89/100	90/100
120CAT					

Models Number (-)HCYA2	Heater Kit Model	Rated Heater KW @208/230	Heat Kit Amps (FLA) Only	Heater Kit	
	RXHE-			HEATER KIT MIN. CKT. AMPACITY	HEATER KIT MAX FUSE OR CKT. BKR. SIZE
121CAR	CE030CC	60/70	21.6/28.8	105/115	110/125
121CAS	CE040CC	83/96	30/40	134/148	150/150
121CAT					
150CAR	CE030CC	60/70	21.6/28.8	105/115	110/125
150CAS	CE040CC	83/96	30/40	134/148	150/150
150CAT					
180CAR	CE030CC	60/70	21.6/28.8	105/115	110/125
180CAS	CE040CC	83/96	30/40	134/148	150/150
180CAT					
240CAR	CE030CC	60/70	21.6/28.8	105/115	110/125
240CAS	CE040DC	83/96	30/40	134/148	150/150
240CAT					

3.0 UNIT SPECIFICATIONS

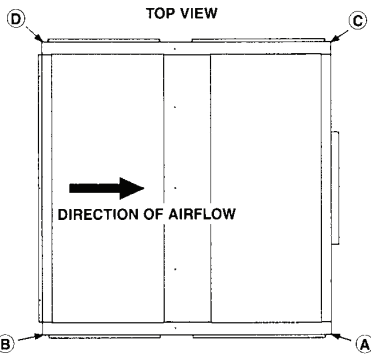
3.1 Electrical and Physical Data (cont.)

Models Number (-)HCYA2	Heater Kit Model	Rated Heater KW @480	Heat Kit Amps (FLA) Only	Heater Kit	
	RXHE-			HEATER KIT MIN. CKT. AMPACITY	HEATER KIT MAX FUSE OR CKT. BKR. SIZE
090DAR 090DAS 090DAT	DE020DA	24.7	20.2	37	40
	DE030DA	35	29.7	50	50
120DAR 120DAS 120DAT	DE020DA	24.7	20.2	37	40
	DE030DA	35	29.7	50	50

Models Number (-)HCYA2	Heater Kit Model	Rated Heater KW @480	Heat Kit Amps (FLA) Only	Heater Kit	
	RXHE-			HEATER KIT MIN. CKT. AMPACITY	HEATER KIT MAX FUSE OR CKT. BKR. SIZE
121DAR 121DAS 121DAT	CE030DC	35	28.8	58	60
	CE040DC	48	40	74	80
150DAR 150DAS 150DAT	CE030DC	35	28.8	58	60
	CE040DC	48	40	74	80
180DAR 180DAS 180DAT	CE030DC	35	28.8	58	60
	CE040DC	48	40	74	80
240DAR 240DAS 240DAT	CE030DC	35	28.8	58	60
	CE040DC	48	40	74	80

3.0 UNIT SPECIFICATIONS

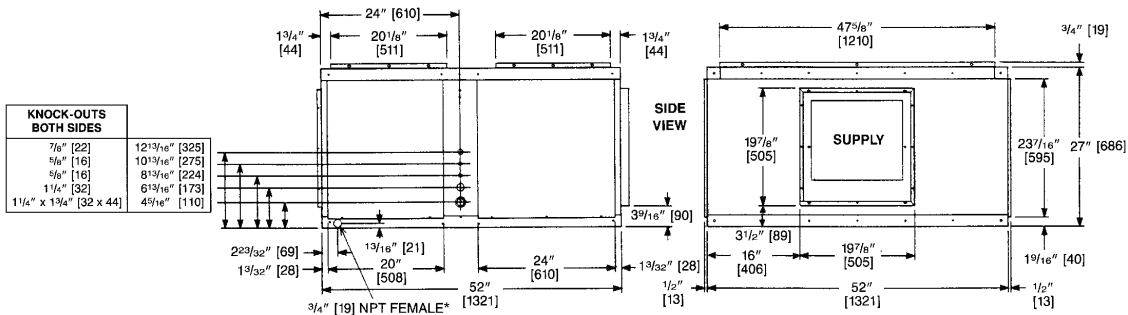
3.1 Electrical and Physical Data (cont.)



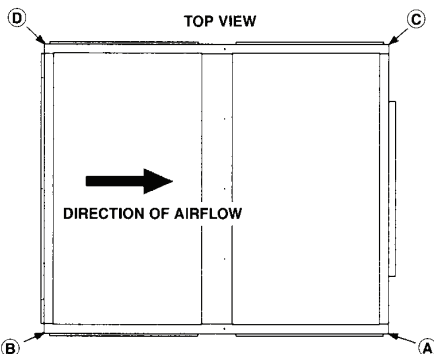
RETURN AIR OPENINGS = 47³/₈" [1203] WIDTH x 19⁷/₈" [505] HEIGHT

MODEL	REFRIGERANT STUB SIZES, IN. [mm]			
	DUAL LIQ.	DUAL SUC.	SINGLE LIQ.	SINGLE SUC.
090	1/2, 1/2 [13, 13]	7/8, 7/8 [22, 22]	1/2 [13]	1 1/8 [29]
120	1/2, 1/2 [13, 13]	7/8, 7/8 [22, 22]	5/8 [16]	1 3/8 [35]

MODEL	CORNER WEIGHTS LBS. [kg]				OPERATING WEIGHT	SHIPPING WEIGHT
	A	B	C	D		
090	75.75 [34.36]	133.31 [60.49]	106.04 [48.10]	93.92 [42.60]	409 [185.52]	429 [194.60]
120	75.75 [34.36]	133.31 [60.49]	106.04 [48.10]	93.92 [42.60]	409 [185.52]	429 [194.60]



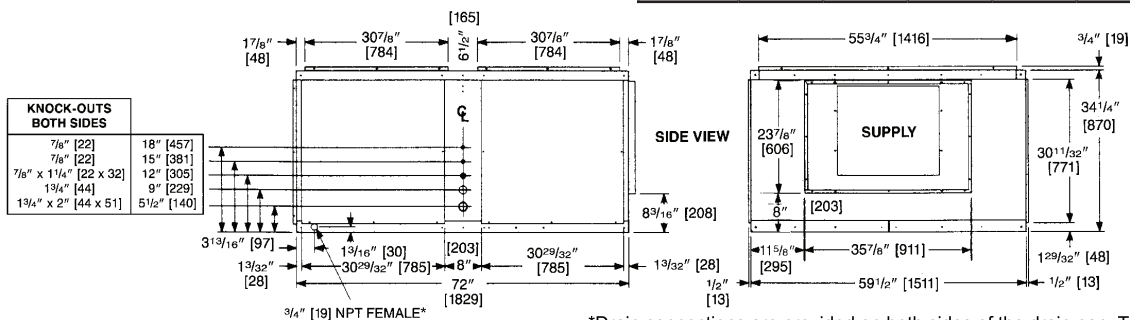
*Drain connections are provided on both sides of the drain pan. The drain can be connected to either side of the drain pan, but not both. The drain must be trapped.



RETURN AIR OPENINGS = 55¹/₂" [1410] WIDTH x 30⁹/₁₆" [776] HEIGHT

MODEL	REFRIGERANT STUB SIZES, IN. [mm]			
	DUAL LIQ.	DUAL SUC.	SINGLE LIQ.	SINGLE SUC.
121	1/2, 1/2 [13, 13]	1 1/8, 1 1/8 [29, 29]	5/8 [16]	1 5/8 [41]
150	1/2, 1/2 [13, 13]	1 1/8, 1 1/8 [29, 29]	5/8 [16]	1 5/8 [41]
180	5/8, 5/8 [16, 16]	1 3/8, 1 3/8 [35, 35]	7/8 [22]	1 5/8 [41]
240	5/8, 5/8 [16, 16]	1 3/8, 1 3/8 [35, 35]	7/8 [22]	1 5/8 [41]

MODEL	CORNER WEIGHTS LBS. [kg]				OPERATING WEIGHT	SHIPPING WEIGHT
	A	B	C	D		
121	139.42 [63.24]	184.62 [83.74]	79.81 [36.20]	171.15 [77.63]	575 [260.82]	585 [265.35]
150	139.42 [63.24]	184.62 [83.74]	79.81 [36.20]	171.15 [77.63]	575 [260.82]	595 [269.89]
180	227.08 [103.0]	155.93 [70.73]	159.83 [72.50]	147.16 [66.75]	690 [312.98]	710 [322.05]
240	230.37 [104.49]	158.19 [71.75]	162.15 [73.55]	149.29 [67.72]	700 [317.52]	720 [326.59]



[] Designates Metric Conversions

*Drain connections are provided on both sides of the drain pan. The drain can be connected to either side of the drain pan, but not both. The drain must be trapped.

3.0 UNIT SPECIFICATIONS

3.2 A2L Refrigerant Installation Safety Data

Qmin at Rating Plate Charge Weight [0' - 200' 1/2" Line Set]						
(-)HCYA2	090 [0']	090 [50']	090 [100']	090 [150']	090 [200']	
Refrigerant Chart Weight (oz)	338.0	388.0	438.0	488.0	538.0	
Minimum Total Room Area, TAmin (ft2)	317.0	364.0	410.0	457.0	504.0	
Minimum circulation airflow, Qmin (cfm)	572	614	698	783	868	
Installed Altitude (ft above sea level)	Altitude Adjustment Factor	Minimum Total Conditioned Room Area, TAmin (sq ft)				
0	1.000	317	364	410	457	504
1000	1.025	325	373	421	469	517
2000	1.051	333	382	431	481	530
3000	1.078	342	392	443	493	544
4000	1.107	351	403	454	506	558
5000	1.138	360	414	467	520	574
6000	1.170	371	425	480	535	590
6500	1.187	376	432	487	543	598

Qmin at Rating Plate Charge Weight [0' - 200' 5/8" Line Set]						
(-)HCYA2	120 [0']	120 [50']	120 [100']	120 [150']	120 [200']	
Refrigerant Chart Weight (oz)	373.5	411.0	486.0	561.0	636.0	
Minimum Total Room Area, TAmin (ft2)	350.0	397.0	444.0	491.0	537.0	
Minimum circulation airflow, Qmin (cfm)	632	716	801	885	970	
Installed Altitude (ft above sea level)	Altitude Adjustment Factor	Minimum Total Conditioned Room Area, TAmin (sq ft)				
0	1.000	350	385	455	526	596
1000	1.025	325	373	421	469	517
2000	1.051	333	382	431	481	530
3000	1.078	342	392	443	493	544
4000	1.107	351	403	454	506	558
5000	1.138	360	414	467	520	574
6000	1.170	371	425	480	535	590
6500	1.187	376	432	487	543	598

3.0 UNIT SPECIFICATIONS

3.2 A2L Refrigerant Installation Safety Data

Qmin at Rating Plate Charge Weight [0' - 200' 1/2" Line Set]						
(-)HCYA2	121 [0']	121 [50']	121 [100']	121 [150']	121 [200']	
Refrigerant Chart Weight (oz)	328.0	378.0	428.0	478.0	528.0	
Minimum Total Room Area, TAmin (ft2)	307.0	354.0	401.0	448.0	495.0	
Minimum circulation airflow, Qmin (cfm)	555	639	724	808	893	
Installed Altitude (ft above sea level)	Altitude Adjustment Factor	Minimum Total Conditioned Room Area, TAmin (sq ft)				
0	1.000	307	354	401	448	495
1000	1.025	325	373	421	469	517
2000	1.051	333	382	431	481	530
3000	1.078	342	392	443	493	544
4000	1.107	351	403	454	506	558
5000	1.138	360	414	467	520	574
6000	1.170	371	425	480	535	590
6500	1.187	376	432	487	543	598

Qmin at Rating Plate Charge Weight [0' - 200' 5/8" Line Set]						
(-)HCYA2	150 [0']	150 [50']	150 [100']	150 [150']	150 [200']	
Refrigerant Chart Weight (oz)	381.5	456.5	531.5	606.5	681.5	
Minimum Total Room Area, TAmin (ft2)	358.0	404.0	451.0	498.0	545.0	
Minimum circulation airflow, Qmin (cfm)	645	730	814	899	983	
Installed Altitude (ft above sea level)	Altitude Adjustment Factor	Minimum Total Conditioned Room Area, TAmin (sq ft)				
0	1.000	358	428	498	568	639
1000	1.025	325	373	421	469	517
2000	1.051	333	382	431	481	530
3000	1.078	342	392	443	493	544
4000	1.107	351	403	454	506	558
5000	1.138	360	414	467	520	574
6000	1.170	371	425	480	535	590
6500	1.187	376	432	487	543	598

3.0 UNIT SPECIFICATIONS

3.2 A2L Refrigerant Installation Safety Data

Qmin at Rating Plate Charge Weight [0' - 200' 5/8" Line Set]						
(-)HCYA2	180 [0']	180 [50']	180 [100']	180 [150']	180 [200']	
Refrigerant Chart Weight (oz)	681.5	756.5	831.5	906.5	981.5	
Minimum Total Room Area, TAmin (ft2)	639.0	686.0	732.0	779.0	829.0	
Minimum circulation airflow, Qmin (cfm)	1153	1237	1322	1406	1491	
Installed Altitude (ft above sea level)	Altitude Adjustment Factor	Minimum Total Conditioned Room Area, TAmin (sq ft)				
0	1.000	639	709	779	850	920
1000	1.025	325	373	421	469	517
2000	1.051	333	382	431	481	530
3000	1.078	342	392	443	493	544
4000	1.107	351	403	454	506	558
5000	1.138	360	414	467	520	574
6000	1.170	371	425	480	535	590
6500	1.187	376	432	487	543	598

Qmin at Rating Plate Charge Weight [0' - 200' 7/8" Line Set]						
(-)HCYA2	240 [0']	240 [50']	240 [100']	240 [150']	240 [200']	
Refrigerant Chart Weight (oz)	537.5	692.5	847.5	1002.5	1157.5	
Minimum Total Room Area, TAmin (ft2)	504.0	551.0	597.0	644.0	691.0	
Minimum circulation airflow, Qmin (cfm)	909	994	1078	1163	1247	
Installed Altitude (ft above sea level)	Altitude Adjustment Factor	Minimum Total Conditioned Room Area, TAmin (sq ft)				
0	1.000	504	649	794	940	1085
1000	1.025	325	373	421	469	517
2000	1.051	333	382	431	481	530
3000	1.078	342	392	443	493	544
4000	1.107	351	403	454	506	558
5000	1.138	360	414	467	520	574
6000	1.170	371	425	480	535	590
6500	1.187	376	432	487	543	598

4.0 INSTALLATION

4.1 Tools and Refrigerant

4.1.1 Tools Required for Installing and Servicing R-454B Models

Manifold Sets:

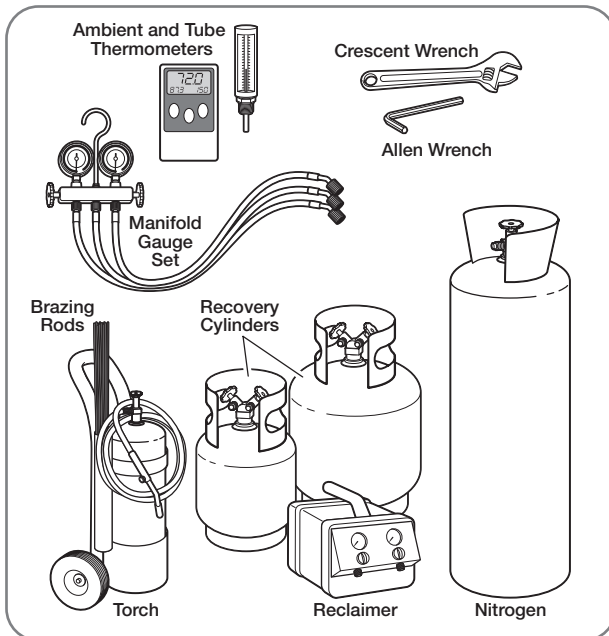
- Up to 800 PSIG High-Side
- Up to 250 PSIG Low-Side
- 550 PSIG Low-Side Retard

Manifold Hoses:

- Service Pressure Rating of 800 PSIG

Recovery Cylinders:

- 400 PSIG Pressure Rating



CAUTION: Any and all equipment must be compatible with refrigerant R-454B.

DANGER: Risk Of Fire Or Explosion. Flammable Refrigerant Used. Consult Repair Manual/Owner's Guide Before Attempting To Service This Product. All Safety Precautions Must Be Followed.

A leak detection system is installed in this unit. The unit must be powered at all times except during service.

The unit is equipped with electrically powered safety measures. To be effective, the unit must be electrically powered at all times after installation, other than when servicing.

4.1.2 Working Personnel

DANGER: Risk of Fire or Explosion. Flammable Refrigerant Used. To Be Repaired Only By Trained Service Personnel. Do Not Puncture Refrigerant Tubing.

Every installation, maintenance, service, and repair working procedure must be conducted by qualified personnel who have been trained in operating and servicing units that employ flammable refrigerants such as R-454B.

Examples of working procedures include but are not limited to:

- Breaking into the refrigeration circuit
- Opening sealed components
- Opening ventilated encloses

This appliance is not intended for use by persons (including children) with reduced physical, sensory, or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning the use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

4.1.3 Specifications of R-454B

Application: R-454B is not a drop-in replacement for R-410A. Equipment designs must accommodate the safety group A2L of R-454B. It cannot be retrofitted into R-410A units.

Physical Properties: R-454B has an atmospheric bubble point of -59.6F [50.9C] and an atmospheric dew point of -58.0F [-50.0C]. Its bubble point saturation pressure at 77F [25C] is 213 psig [1469 kPa] and dew point saturation pressure at 77F [25C] is 205 psig [1415 kPa].

Pressure: The pressure of R-454B is similar to that of R-410A. Recovery and recycle equipment, pumps, hoses, and the like must have design pressure ratings appropriate for R-454B. Manifold sets need to range up to 800 psig [5,516 kPa] high-side and 250 psig [1,724 kPa] low-side with a 550 psig [3,792 kPa] low-side retard. Hoses need to have a service pressure rating of 800 psig [5,516 kPa]. Recovery cylinders need to have a 400 psig [2,758 kPa] service pressure rating, DOT 4BA400 or DOT BW400.

Flammability: R-454B is classified as safety group A2L, where the 2L flammability class indicates mild flammability.

R-454B and air should never be mixed in cylinders or supply lines or be allowed to accumulate in storage cylinders. Leak checking should never be done with a mixture of R-454B and air.

4.0 INSTALLATION

4.1.4 Quick-Reference Guide for R-454B

- Ensure that service equipment is designed to operate with R-454B.
- Refrigerant R-454B operates at pressures similar to R-410A. However, it is classified in safety group A2L. Ensure that servicing equipment is compatible with R-454B.
- Refrigerant cylinders are no longer color-coded. R-454B refrigerant cylinders are light green grey in color with a red band on the shoulder or top of the cylinder to indicate flammability.
- R-454B is only compatible with POE oils.
- Vacuum pumps will not remove moisture from POE oil used in R-454B systems.
- R-454B systems are to be charged with liquid refrigerants.
- Do not install a suction line filter drier in the liquid line.
- A factory-approved biflow liquid line filter drier is shipped with every unit and must be installed in the liquid line at the time of installation. Only manufacturer-approved liquid line filter driers can be used. These filter driers are rated for a minimum working pressure of 600 PSIG. The filter drier will only have adequate moisture-holding capacity if the system is properly evacuated.
- Desiccant (drying agent) must be compatible for POE oils and R-454B refrigerant

4.1.5 Minimum Room Area

Because this unit uses refrigerant R-454B, UL requires a minimum room area for the total conditioned space (TAmin) that is supplied by this equipment.

The UL Safety Standard defines an individual room area as the room area enclosed by floors, walls, partitions, and doors of the space where the unit is installed, also as the room area into which refrigerant can leak. Each room/ conditioned space will need to be considered for the total area requirements.

The minimum room area of the total conditioned space for each base model is listed in **3.2 A2L Refrigerant Installation Safety Data**.

4.1.6 No Ignition Sources

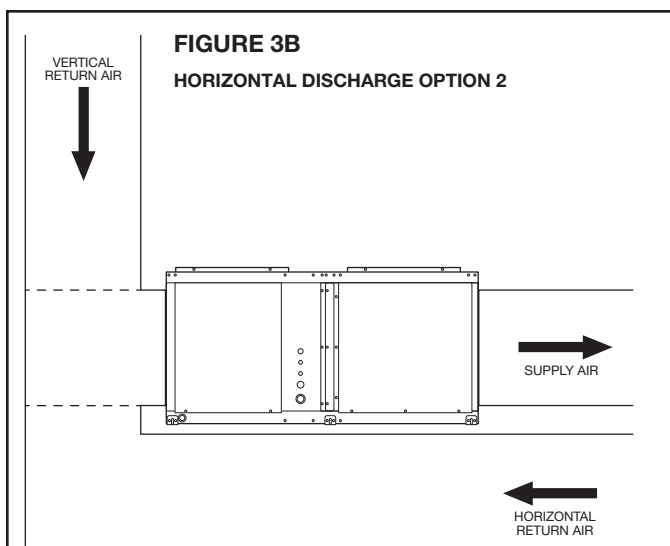
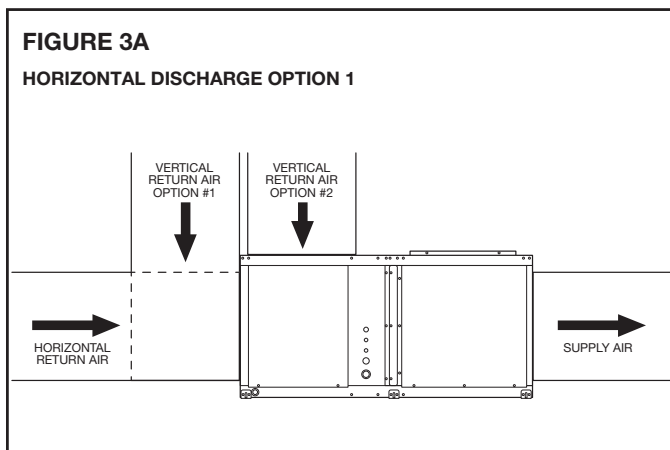
When performing work that involves exposing any pipework, no person working on or near the refrigerating system may use any ignition sources that could lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept far away from the site during installation, repair, removal, or disposal, during which refrigerant can possibly be released into the surrounding space. Before work takes place, the area around the equipment must be surveyed to ensure that there are no flammable hazards or ignition risks. Additionally, “No Smoking” signs must be displayed.

4.0 INSTALLATION

4.2 Appliances & Orientation

IMPORTANT: The air-handler is suitable for indoor applications only.

The split air handling units can be installed in various horizontal positions. The **Figures 3A and 3B** shows the recommended suspension rigging using properly sized all-thread and metal c-channel. All components required to suspend the air handler must be field-supplied. Refer to the unit's total weight, center of gravity, and corner weight before beginning suspension rigging.

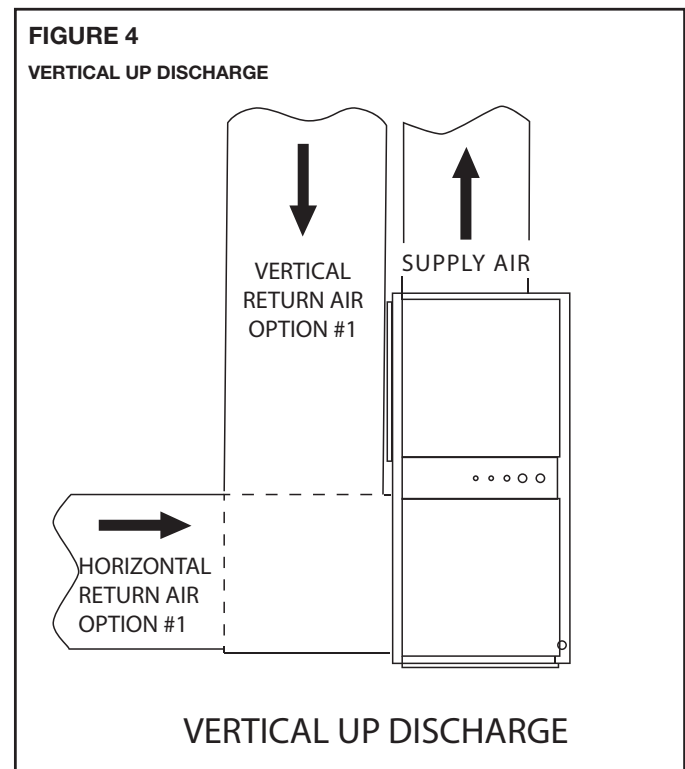


4.2.1 Horizontal Discharge

The air-handler may be installed in the horizontal discharge configuration with either a vertical or horizontal return duct as shown in **Figure 3**. For a vertical return duct, relocate the return air panel on top of the air-handler to cover the side return air opening.

4.2.2 Vertical Up Discharge

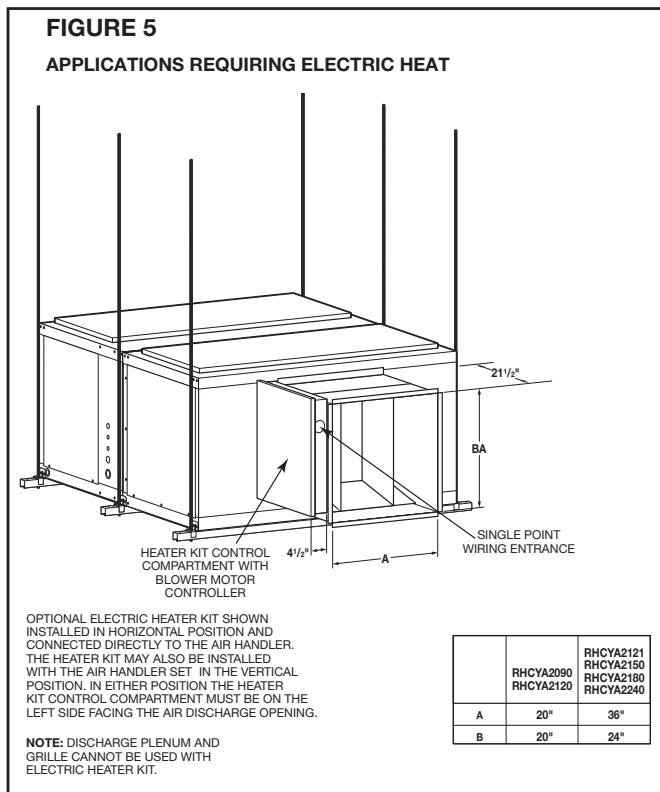
The air-handler may be installed in the vertical discharge configuration with a horizontal return duct as shown in **Figure 4**. Relocate the return air panel to cover the other return air opening to allow for the horizontal return duct.



4.0 INSTALLATION

4.2.3 Applications Requiring Electric Heat

For applications that require resistance electric heat, field installed heater kits are available that attaches to the discharge side of the air-handler. **See Figure 5.** The heater kit is compatible for both horizontal and vertical discharge applications. The supply duct must be attached to the discharge end of the heater kit. The blower motor contactor and supply wiring is provided with the heater kit. See the unit's specification sheets for information concerning the available heater kits.



4.2.4 Suspending Unit

Six heavy gauge brackets are mounted to the air handler and the pallet for shipping the air-handler. These brackets can be reused for supporting the unit on the appropriately-sized C-channel (with an aluminum host member of 1/8" is the min. recommendation for this application). 3/8" GR. 5 minimum support rods are recommended. When using "All Thread" rods, two nuts and two lock washers must be tightened securely against the suspension angles.

Fasteners shall be of a corrosion-resistant material or have a corrosion-resistant coating and/or plating, and shall comply with any applicable federal, state, and/or local codes.

Fasteners as designed herein shall be positioned with a minimum edge distance of 3x the fastener Ø to any edges of the member(s) in contact and with a minimum spacing of 3x the fastener Ø from adjacent fasteners.

4.2.5 Installation in an Unconditioned Space

The exterior cabinet of an air handler has a greater risk of sweating when installed in an unconditioned space than when it is installed in the conditioned space. This is primarily due to the temperature of the conditioned air moving through the air handler and the air circulating around the unit where it is installed. For this reason, the following is recommended for all air handler applications, but special attention should be paid to those installed in unconditioned spaces:

- Duct sizing and airflow are critical and must be based on the equipment selected.
- Supply and return duct attachment: If other than the factory flanges are used, the attachment of ducting must be insulated and tight to prevent sweating.
- Apply caulking around all cabinet penetrations such as power wires, control wires, refrigerant tubing and condensate line where they enter the cabinet. Seal the power wires on the inside where they exit conduit opening. Sealing is required to prevent air leakage into the unit which can result in condensate forming inside the unit, control box, and on electrical controls. Take care not to damage, remove or compress insulation when applying the caulk.
- In some cases, the entire air handler can be wrapped with insulation. This can be done as long as the unit is completely enclosed in insulation, sealed and service access is provided to prevent accumulation of moisture inside the insulation wrap.
- An auxiliary overflow pan is recommended to protect the structure from excessive cabinet sweating or a restricted coil drain line (**See Section 4.3**).

4.2.6 Installation in Unventilated Areas

If the unit is installed in an unventilated area, the area or space must not allow refrigerant to stagnate, creating a fire or explosion hazard in case of a leak.

4.2.7 Installation in Corrosive Environments

The metal parts of this unit may be subject to rust or deterioration if exposed to a corrosive environment which can shorten its life. In addition to exposure to the exterior of the cabinet, chemical contaminants inside the building that can be drawn into the unit from the return air grille and attack structural metal parts, electrical components and the indoor coil, causing premature failure of the unit. If the unit is to be installed in an area where contaminants are likely to be a problem, special attention should be given to isolate the unit and return grille from contaminants.

4.0 INSTALLATION

4.3 Auxiliary Overflow Pan

In compliance with recognized codes, an auxiliary overflow pan must be installed under all equipment containing evaporator coils that are located in any area of a structure where damage to the building or building contents may occur as a result of an overflow of the coil drain pan or a blockage in the primary condensate drain piping.

4.4 Clearances

A minimum of 24" is required on both sides of the air-handler for servicing the unit.

4.5 Ductwork

Field ductwork must comply with the National Fire Protection Association NFPA 90A, NFPA 90B and any applicable local ordinance.

WARNING: Do not, under any circumstances, connect return ductwork to any other heat producing device such as fireplace insert, stove, etc. Unauthorized use of such devices may result in fire, carbon monoxide poisoning, explosion, personal injury, or property damage.

Sheet metal ductwork run in unconditioned spaces must be insulated and covered with a vapor barrier. Fibrous ductwork may be used if constructed and installed in accordance with SMACNA Construction Standard on Fibrous Glass Ducts. Ductwork must comply with National Fire Protection Association as tested by U/L Standard 181 for Class I Air Ducts. Check local codes for requirements on ductwork and insulation.

- Duct system must be designed within the range of external static pressure the unit is designed to operate against. It is important that the system airflow be adequate. Make sure supply and return ductwork, grills, filters, accessories, etc. are accounted for in total resistance. Refer to the airflow performance tables in this manual to determine the available external static pressure for the particular air-handler model being installed.
- Design the duct system in accordance with "ACCA" Manual "Q" – Low Pressure, Low Velocity Duct System Design. Latest editions are available from: "ACCA" Air Conditioning Contractors of America, 1513 16th Street, N.W., Washington, D.C. 20036. If duct system incorporates flexible air duct, be sure pressure drop information (straight length plus all turns) shown in "ACCA" Manual "D" is accounted for in system.
- Supply plenum is attached to the duct flanges supplied with the unit.
- **IMPORTANT:** If an elbow is included in the plenum close to the unit, it must not be smaller than the

dimensions of the supply duct flange on the unit.

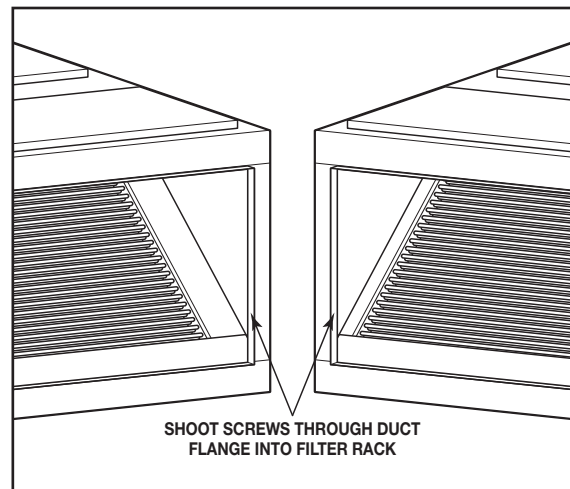
- **IMPORTANT:** If connected to the blower casing, the front flange on the return duct must not be screwed into the area where the power wiring is located.
- Secure the supply and return ductwork to the unit flanges, using proper fasteners for the type of duct used and tape or caulk the duct-to-unit joint as required to prevent air leaks.

WARNING: If appliances connected via an air duct system to one or more rooms with A2L refrigerants are installed in a room with an area less than A_{min} , or installed in a room with an effective dispersal volume less than the minimum, that room shall be without continuously operating open flames (for example an operating gas appliance) or other potential ignition sources (for example an operating electric heater or hot surfaces).

WARNING: If this unit is connected via an air duct system to one or more rooms with an area less than A_{min} , that room shall be without continuously operating flames or other potential ignition sources.

WARNING: Auxiliary devices which may be a potential ignition source shall not be installed in the ductwork.

WARNING: If this unit is connected via a duct to one or more rooms, only auxiliary devices approved by the manufacturer are declared suitable with A2L refrigerants shall be installed in the connecting ductwork.



4.6 Return Air Filters

An internal filter rack is provided that can be accessed by removing one or both of the side service access panels (**See Section 2.9**). Remove the hitch pins to remove the filter retainer angles. 1" thick throw-away fiberglass filters are provided from the factory, but the filter rack can accept up to 2" thick filters.

Reduced air-flow can reduce system performance and shorten the life of the system components such as the compressor, indoor coil, heater elements, over-temperature limits, and relays. Therefore, it is important to change the filters on a regular basis to assure optimum performance and reliability of the system.

4.0 INSTALLATION

IMPORTANT: High efficiency pleated filters typically have significantly higher pressure drop than standard efficiency fiberglass filters, especially when they become dirty. The additional pressure drop of such filters must be added into the external static pressure of the duct system when adjusting the air-flow of the air-handler.

WARNING: Do not operate the air-handler without filters. A portion of the dust entrained in the air may temporarily lodge in the duct runs and at the supply registers. Any circulating dust particles could be heated and charred by contact with the electric heating elements. This residue could soil ceilings, wall, carpets, and other articles inside the building. Operating the system without a filter will also allow lint and dirt particles to accumulate on the indoor oil fins and restrict air-flow through the coil.

4.7 Refrigerant Line Connections & Charging

4.7.1 Preparation

Pipe-work including piping material, pipe routing, and installation shall include protection from physical damage in operation and service, and be in compliance with national and local codes and standards and ASHRAE 15. All field joints shall be accessible for inspection prior to being covered or enclosed.

The coil is shipped with a low pressure (5-10 psig) charge of dry nitrogen which will be released when the rubber plugs are removed. Leave the rubber plugs in the refrigerant connection stubs on the air-handler until the refrigerant lines are ready to be brazed to the refrigerant connection stubs to prevent contaminants from entering the coil. Clean

the ends of the tubing and coil connection stubs (inside and outside) with an alcohol wipe before inserting the line set tubes into the coil connection stubs to assure a quality leak-free braze joint.

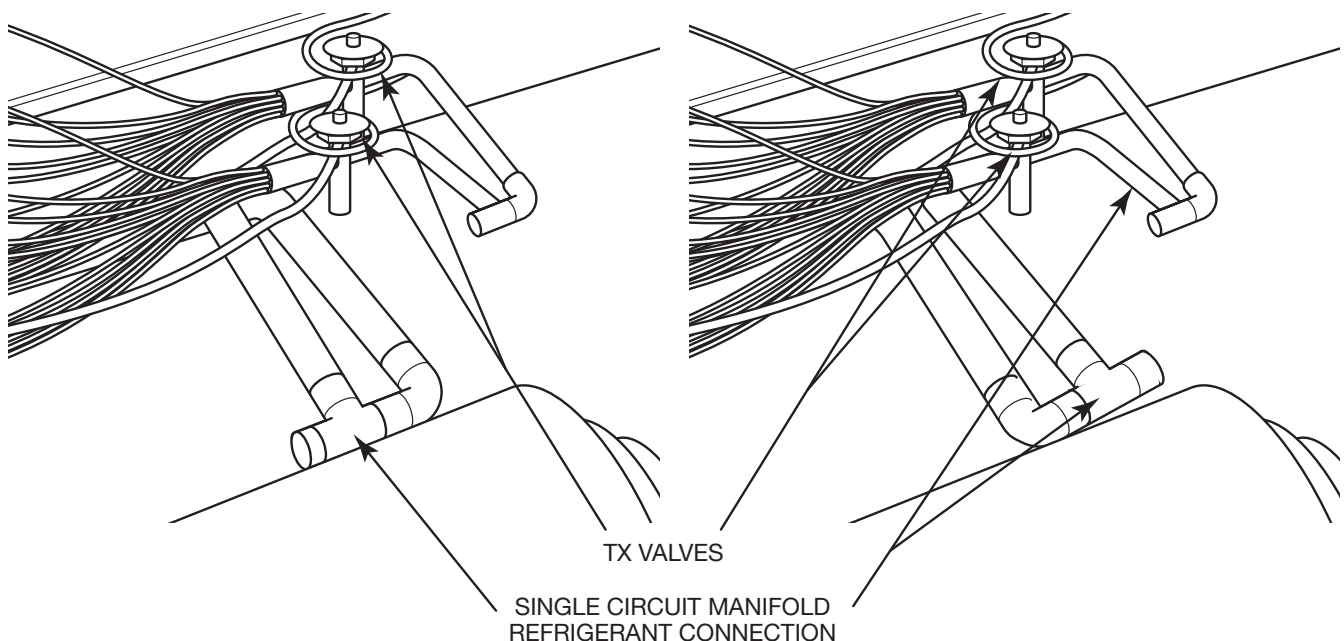
Route the refrigerant tubing in a manner than does not block service access to the front of the air-handler.

Check that internal and external unit wiring will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges, or any other adverse environmental effects, taking into account the effects of aging or continual vibration from sources such as compressors or fans.

4.7.2 Configuring Air-Handler for a Single or Dual Refrigerant Circuits

All models are provided with dual circuit coil manifolds that can be configured for dual condensing unit applications. The coil is circuited to provide full face coil operation for each system. Knock-outs are provided on both sides of the unit to allow the refrigerant tubing to enter from either side. Remove the rubber grommets from the parts bag and install them in the appropriate holes prior to running the line set tubing into the cabinet to seal around and protect the tubing. Copper fittings are provided in the parts bag to allow the two refrigerant circuits to be tied together for single condensing unit applications. The fittings may be installed to allow the tubing to enter the unit from either side as shown in **Figure 6**.

FIGURE 6



4.0 INSTALLATION

4.7.3 Refrigerant Lines

The following will be of help in accomplishing a successful installation:

1. Size liquid line for no more than 50 PSIG pressure drop.
2. Size suction lines for no more than 2°F loss which corresponds to approximately 5 PSIG pressure drop.
3. When evaporator is installed below condensing unit, do not exceed the recommended suction line O.D. This will insure adequate velocities for proper oil return.
4. Install strainer-drier and sight glass in liquid line.
5. Pitch all horizontal suction lines downward in the direction of flow.
6. When making up refrigerant piping, take every precaution to prevent dirt and moisture from entering the piping.
7. Locate the condensing unit and evaporator(s) as close together as possible to minimize piping runs.
8. See tables below for general refrigerant line sizing and equivalent length of valves and fittings.
9. Refer to the vapor and liquid line selection procedure and charts in the outdoor unit installation manual or literature for more specific refrigerant line sizing information. When dual outdoor units are matched with the air-handler using dual circuits, size the refrigerant lines for each system independently.
10. After field piping is complete, field pipework must be pressure tested first with inert gas and then vacuum tested prior to refrigerant charging.

4.7.4 Liquid Line Filter Drier

A new liquid filter drier must be installed every time any part of the system has been open to the atmosphere, even if it is for a short period of time. The filter drier should be installed close to the air-handler for a system started up in the cooling mode and near the outdoor unit for a heat pump system started up in the heating mode. This allows the filter drier to catch any contaminants in the liquid line before they can enter the indoor or outdoor TXV inlet screen. A filter drier must be installed in the liquid line of each circuit for dual circuit applications.

4.7.5 Brazing

Air inside the tubing and coil should be displaced with dry nitrogen prior to the brazing process to prevent the formation of harmful copper oxide inside the tubing. It is very important not to pressurize the system with nitrogen while brazing or pin-hole leaks will form in the braze joint. This is accomplished by removing the gauge port valve core on one of the outdoor unit service valves to allow the pressure to be relieved as the heated nitrogen expands. Fill the system with dry nitrogen through the other service valve gauge port and then turn the nitrogen flow off just before brazing is begun.

Protect the TXV's and outdoor unit service valves from overheating using a wet rag or heat sink compound. Leave the wet rag or heat sink material in place until the joint and surrounding tubing cools down to a safe temperature. Double tip torches can help minimize brazing time and heat conduction to the heat sensitive components if the flame is turned down and held on the joint just long enough to make the braze joint. With both single and double tip torches, turning the flame up too much and keeping the flame on the joint too long will damage the heat sensitive components even when a wet rag or heat sink compound is used.

REQUIRED OZ. R-454B PER FT. OF TUBING

Tube Size O.D. In. [mm]	Liquid Tube		Vapor Tube		Total		Internal volume ft ³ /ft [m ³ /m]	
	ozm /ft [g]	kg/m	ozm /ft [g]	kg/m	ozm /ft [g]	kg/m	ft ³ /ft	m ³ /m
3/8 [9.5]	0.5 [14.1]	0.05	0.0 [0.5]	0.00	0.5 [14.2]	0.05	5.55E-04	4.80E-05
1/2 [12.7]	1.0 [27.4]	0.09	0.0 [0.9]	0.00	1.0 [28.3]	0.09	1.08E-03	9.29E-05
5/8 [15.9]	1.5 [43.9]	0.14	0.1 [1.5]	0.00	1.6 [45.4]	0.15	1.73E-03	1.49E-04
3/4 [19.1]	2.2 [63.0]	0.21	0.1 [2.1]	0.01	2.3 [65.2]	0.21	2.48E-03	2.14E-04
7/8 [22.2]	3.1 [87.1]	0.29	0.1 [2.9]	0.01	3.2 [90.7]	0.30	3.43E-03	2.96E-04
1 [25.4]	4.0 [114.3]	0.37	0.1 [3.8]	0.01	4.2 [119.1]	0.39	4.50E-03	3.89E-04
1 1/8 [28.6]	5.2 [148.6]	0.49	0.2 [4.9]	0.02	5.4 [153.1]	0.50	5.85E-03	5.03E-04
1 1/4 [31.8]	6.5 [183.1]	0.60	0.2 [6.1]	0.02	6.7 [190.0]	0.62	7.21E-03	6.23E-04
1 3/8 [34.9]	7.3 [207.4]	0.68	0.2 [6.9]	0.02	7.6 [215.5]	0.70	8.17E-03	7.59E-04
1 1/2 [38.1]	9.4 [266.7]	0.87	0.3 [8.9]	0.03	9.7 [275.0]	0.90	1.05E-02	9.10E-04
1 5/8 [41.3]	11.2 [317.5]	1.04	0.4 [10.5]	0.03	11.6 [328.9]	1.08	1.25E-02	1.08E-03
2 1/8 [54.0]	19.5 [553.7]	1.82	0.6 [18.4]	0.06	20.2 [572.7]	1.88	2.18E-02	1.88E-03

Quantities based on 110°F liquid and 45°F vapor.

4.0 INSTALLATION

4.7.6 Leak Testing

Before beginning any work on the system or conducting any hot work, ensure that the area is in the open or that it is adequately ventilated. Ventilation must continue while the unit is being worked on. Ventilation is required to safely disperse any released refrigerant into the atmosphere.

Inspect the unit for any damage to the coils and tubing that could cause a leak.

Under no circumstances shall potential sources of ignition be used to search for or detect refrigerant leaks. A halide torch or any other detector using a naked flame must not be used.

Electronic leak detectors may be used to detect refrigerant leaks, but the sensitivity may not be accurate and may need recalibration to accurately detect R-454B.

Before use, ensure that the detector is not a potential ignition source and is suitable for R-454B.

Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and must be calibrated to R-454B.

Leak detection fluids are also suitable but do not use detergents containing chlorine. Examples of leak detection fluids are the bubble method and fluorescent method agents.

If a leak is suspected, all naked flames must be extinguished.

If a refrigerant leak is found that requires brazing, all of the refrigerants must be removed from the system.

4.7.7 Removal and Evacuation of Refrigerant

The evacuation of any system is essential before charging. Never attempt to operate a system while it is under a vacuum.

The refrigerant charge shall be recovered into R-454B recovery cylinders. The unit system must be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants, such as R-454B, again. DO NOT USE compressed air or oxygen for purging R-454B refrigerant systems.

Refrigerant 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 the atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. When the final oxygen-free nitrogen charge is used, the system shall be vented down to the atmospheric pressure to enable work to take place.

The outlet for the vacuum pump must not be close to any potential ignition sources.

Ventilation is required during removal and evacuation.

NOTE: the condensing unit is shipped with a holding charge of dry nitrogen which must be purged from the unit before evacuation.

When breaking into the refrigeration circuit for any reason, this procedure must be followed:

1. Open the suction, discharge, and liquid shut-off valves.
2. Use a refrigeration vacuum pump capable of evacuation in the 500 micron range.
3. Connect the vacuum pump to the service manifold assembly with a pressure gauge that will read 30 inches vacuum.
4. Connect the service manifold to the suction line Schrader valve port.
5. Ensure there is no power to the unit.
6. With an accurate scale, ½ oz., set the refrigerant recovery cylinder in the upright position.
7. Connect the recovery cylinder to the unit using the service valves located on the outdoor unit.
8. Connect the cylinder to the liquid shut-off valve.
9. Evacuate refrigerant from the unit until the vacuum pump reads a minimum of 500 microns.
10. Purge the refrigeration circuit with inert gas until there is no refrigerant within the system.
11. Field-made refrigerant joints indoors must be tightness tested under a pressure of at least .25 times the max allowable pressure according to the unit's nameplate. Using the inert gas in the system, pressurize the unit accordingly and check the refrigerant joints for leaks.
 - If leaks are detected, make adjustments to the joints and check for leaks again.
 - If no leaks are detected, continue to the next step.
12. Evacuate the circuit again.
13. Once all inert gas is removed, pull a vacuum on the unit to check for any leaks in the system.
14. If leaks are present, spray a soapy substance over the refrigeration circuit. Bubbles will help locate the leak.
15. Patch the leak and pull a vacuum again.
16. If leaks are still detected, repeat steps fourteen and fifteen.
17. If no leaks are present, charge the system as directed in the next section.
18. Remove the vacuum pump from suction, discharge, and liquid shut-off.

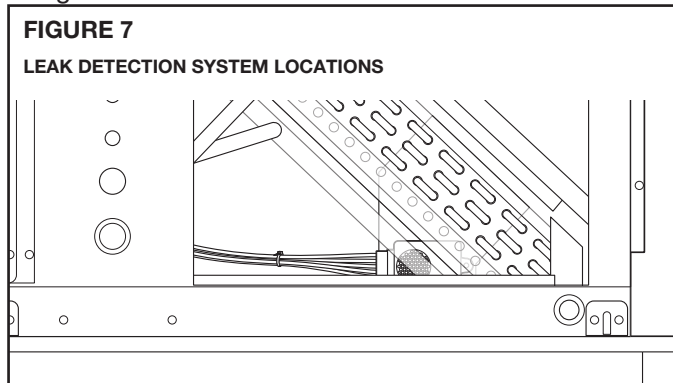
4.0 INSTALLATION

4.7.8 Refrigerant Leak Detection System

The refrigerant leak detection system will continuously monitor the air for a refrigerant leak. If the leak detection system detects a leak, the system will begin mitigation procedures: the blower will turn on and the compressors will shut down.

At the end of 15 years or if the refrigerant leak detection system becomes inoperable, the leak detection system must be replaced with components specified by the unit's manufacturer. Refer to the manufacturer's website for replacement components.

NOTE: For (-)HCYA2121 - (-)HCYA2240, the sensor must be repositioned for vertical orientation. Move the sensor to the second hole on the bracket closest to the vertical drain pan in order to effectively sense leaking refrigerant.



4.7.9 Operation When a Leak is Detected

When the unit receives a signal from the A2L sensor, circulation airflow is activated, and the compressors will be shut off. The following mitigation actions will also be activated:

1. Energize the fan(s) of the appliance to deliver indoor airflow at or above the minimum airflow. See **3.2 A2L Refrigerant Installation Safety Data**.

a. The fans shall be energized following the input signal to turn on the fan(s).

2. The system de-energizes compressor operation.

3. Activate additional mechanical ventilation, if applicable.

The above-mentioned actions shall continue for at least 5 minutes after the leak detection system begins mitigation. If the leak is no longer detected, the leak detection system will reset.

If the leak is still present, mitigation actions will continue for another 5 minutes. This cycle will repeat until no leak is detected.

4.7.10 Charging Procedure

Prior to recharging the system, complete a leak check and purge the system with inert gas as detailed in **4.7.7 Removal and Evacuation of Refrigerant**. The charging procedure steps are as follows:

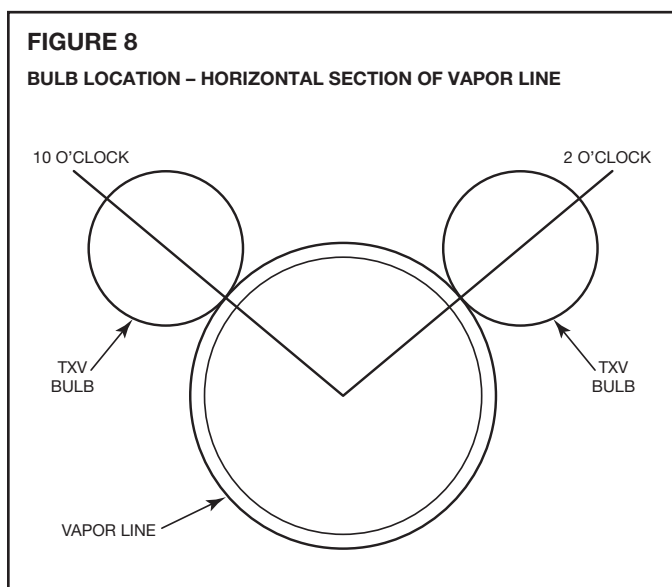
1. Ensure that the unit is properly grounded before beginning charging.
2. Install the R-454B refrigerant cylinder to the unit service valve.
3. Before tightening, purge the cylinder and service valve hose to ensure that the contamination of different refrigerants does not occur when using the charging equipment.
 - a. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
4. Position the refrigerant cylinder in the upright position. The cylinder must remain in the upright position for the entire charging procedure.
5. Use the charging charts located in this manual to properly charge the unit.
 - a. TAKE EXTREME CARE NOT TO OVERCHARGE THE UNIT.
 - b. Connect pressure gauges to suction and liquid ports on the condenser.
 - c. Measure the air temperature (Dry Bulb °F) entering the outdoor coil.
 - d. Place an "X" on the intersection of the suction and liquid pressures on the chart.
 - e. If "X" is below the outdoor ambient line, ADD charge and repeat step D.
 - f. If "X" is above the outdoor ambient line, RECOVER excess charge and repeat step D.
 - g. If the condenser fans are not running, the head pressure control may require jumping.
 - h. Conditions required at indoor and outdoor unit 80/67 (Indoor DB/WB °F) and 95 (Outdoor DB °F)
 - i. Connect pressure gauges to the liquid port on the condenser and install a thermocouple within 6" of the liquid port.
 - j. Calculate your subcooling by taking the pressure reading at the liquid port and the temperature value at the liquid port.
 - k. TARGET SUBCOOLING = Refer to the Charge Chart
 - l. Note: SUBCOOLING Tolerance = +/- 1.0 °F
 - m. If subcooling is below target, ADD charge and repeat step J.
 - n. If subcooling is above target, RECOVER excess charge and repeat step J.
6. Close the service ports on the suctions and liquid valves. Then, remove service gauges.
7. Replace service port caps and valve stem caps. These caps must be replaced to prevent leaks.
8. Label the system with the total refrigerant charge when charging is complete. This label is located on the exterior of the outdoor unit next to the rating plate.

4.0 INSTALLATION

After charging is complete, a leak test must be done. Before leaving the site, an additional leak test must also be done at the end of installation.

4.8 TXV Sensing Bulb Attachment

IMPORTANT: DO NOT perform any brazing with the TXV bulb attached to the vapor line. After brazing operations have been completed and the tubing has cooled to the touch, clamp each TXV bulb securely on a horizontal section of its corresponding vapor line at the 10 to 2 o'clock position (**See Figure 8**) with the strap provided in the parts bag.



4.9 Condensate Drain

Two drain connections are provided, one on each side of the unit. Plug the unused drain connection using the plug provided in the parts bag.

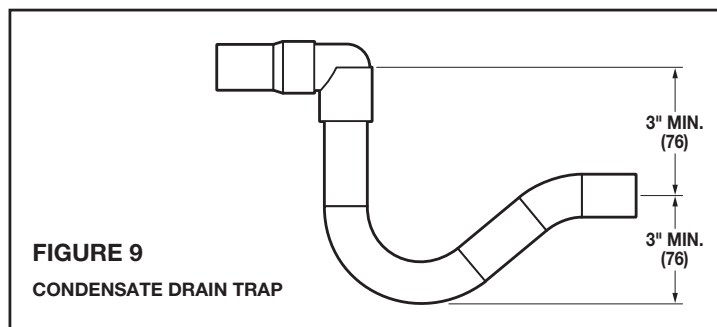
Consult local codes or ordinances for specific requirements.

IMPORTANT: When making drain fitting connections to the drain pan, use a thin layer of Teflon paste, silicone or Teflon tape and install hand tight.

IMPORTANT: When making drain fitting connections to drain pan, do not over-tighten. Over-tightening fittings can split pipe connections on the drain pan.

- Install drain lines so they do not block service access to front of the unit. Minimum clearance of 24 inches is required for filter, coil or blower removal and service access.
- It is recommended that the air-handler cabinet be pitched slightly downward toward the primary drain connection to assure the condensate drains completely from the drain pan. The downward pitch should be approximately 1/8" per foot and in both axes.

- Do not reduce drain line size less than connection size provided on condensate drain pan.
- All drain lines must be pitched downward away from the unit a minimum of 1/8" per foot of line to ensure proper drainage.
- Do not connect condensate drain line to a closed or open sewer pipe. Run condensate to an open drain or outdoors.
- The drain line should be insulated where necessary to prevent sweating and damage due to condensate forming on the outside surface of the line.
- Make provisions for disconnecting and cleaning of the primary drain line should it become necessary. Install a 3 in. trap in the primary drain line as close to the unit as possible. Make sure that the top of the trap is below connection to the drain pan to allow complete drainage of pan (**See Figure 9**).
- Plug the unused drain connection with the plug provided in the parts bag, using a thin layer of teflon paste, silicone or teflon tape to form a water tight seal.
- Test the condensate drain pan and drain line after installation is complete. Pour water into drain pan, enough to fill drain trap and line. Check to make sure drain pan is draining completely, no leaks are found in drain line fittings, and water is draining from the open end of the primary drain line.



4.0 INSTALLATION

4.10 Thermostat

See the outdoor unit's Installation and Operation Manual for recommended room thermostats.

- Choose an appropriate thermostat for the application.
- The thermostat should be mounted 4 to 5 feet above the floor on an inside wall of the conditioned space or a hallway that has good air circulation from the other rooms being controlled by the thermostat. It is essential that there be free air circulation at the location of the same average temperature as other rooms being controlled. Movement of air should not be obstructed by furniture, doors, draperies, etc. The thermostat should not be mounted where it will be affected by drafts, hot or cold water pipes or air ducts in walls, radiant heat from fireplace, lamps, the sun, T.V. or an outside wall. See instruction sheet packaged with thermostat for mounting and installation instructions.

WARNING: If the thermostat turns off without any obvious explanation, this could be and is the only indication that there has been a trigger to the A2L R-454B Leak Detection System. Service is required for the unit to become operable again. Refer to **Section 7.0**.

4.11 Electrical Wiring

Field wiring must comply with the National Electric Code (C.E.C. in Canada) and any applicable local ordinance.

4.11.1 Power Wiring

It is important that proper electrical power is available for connection to the unit model being installed. See the unit nameplate, wiring diagram, and electrical data in the installation instructions.

- Install a circuit disconnect of adequate size, located within sight of, and readily accessible to the unit.
- **IMPORTANT:** Units with electric heater kits installed may be equipped with one or more branch circuit fuses. These fuses protect the internal wiring in the event of a short circuit.
- Supply circuit power wiring must be 75°C minimum copper conductors only. See Electrical Data in **Section 3.1** for ampacity, wire size and circuit protector requirement. Supply circuit protective devices may be either fuses or circuit breakers.

4.11.1.1 No-Heat Applications

If electric heat is not installed, connect the incoming line voltage wires to the line voltage terminal block (TB1) inside the air-handler control box.

4.11.1.2 Electric Heat Applications

If an electric heater kit is installed, the blower motor contactor is provided in the heater kit with leads that must be routed to the air-handler control box and connected to the line voltage terminal block (TB1) inside the air-handler control box.

IMPORTANT: The variable speed Drive (VFD) must be continuously powered and controlled by the thermostat signals to prevent premature failure of the VFD.

Therefore, the blower motor power supply leads from the blower contactor located in the electric heat kit must be moved from the load side of the blower contactor (T1,T2,T3) to the line side of the blower connector (L1,L2,L3).

All Electric heater kits are field installed. For information regarding the specific heater kit, refer to the Installation and Operation manual included with the accessory. To identify the heater kit, a model number should be printed on the inside of the heater kit control box.

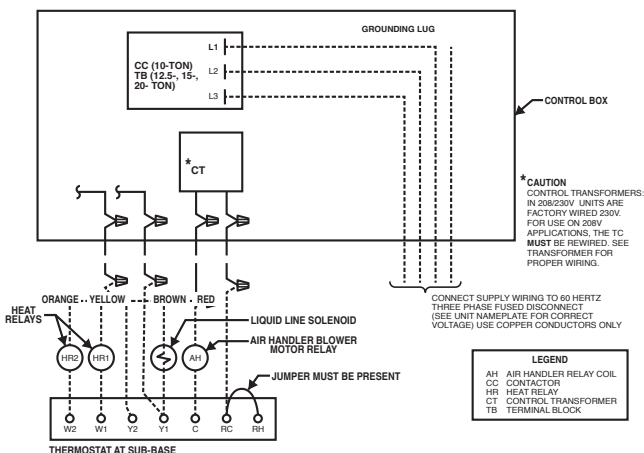
4.11.2 Grounding

WARNING: The unit must be permanently grounded. Failure to do so can result in electrical shock causing personal injury or death.

- This product must be sufficiently grounded in accordance with National Electrical Code (C.E.C. in Canada) and any applicable local ordinance.
- Grounding may be accomplished by grounding metal conduit when installed in accordance with electrical codes to the unit cabinet.
- Grounding may also be accomplished by attaching ground wire to ground lug provided in the air-handler control box.

FIGURE 10
TYPICAL FIELD WIRING

TYPICAL FIELD WIRING



4.0 INSTALLATION

4.12 Potential Ignition Sources

The UL safety standard defines potential ignition sources as hot surfaces, flames, and current carrying devices which can be the source of arcing or sparking.

In case any internal electrical components need to be replaced, those replacement parts must be ordered from the unit manufacturer's website to ensure that the internal electrical components are not potential ignition sources.

Examples of internal electrical components include contactors, relays, and control boards. This is not an exhaustive list. For the safety of customers and technicians, refer to the unit manufacturer's website for proper unit component replacement.

4.13 Control Wiring

IMPORTANT: Class 2 low voltage control wire should not be run in conduit with power wiring and must be separated from power wiring unless class 1 wire of proper voltage rating is used. After installation, confirm separation of control and power wiring has been maintained. Low voltage control wiring must be 18 awg and color coded. For lengths longer than 100 ft., refer to **Table 1** below for the correct control wire sizing.

After completing refrigerant removal, evacuation, and charging, check that the internal and field wiring will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges, or any other adverse environmental effects, taking into account the effects of aging or continual vibration from sources such as compressors or fans.

TABLE 1

FIELD WIRE SIZE FOR 24 VOLT THERMOSTAT CIRCUITS

Thermostat Load - Amps	SOLID COPPER WIRE - AWG.					
	16	14	12	10	10	10
3.0	16	14	12	12	10	10
2.5	16	14	12	12	10	10
2.0	18	16	14	12	12	10
	50	100	150	200	250	300
Length of Run - Feet (1)						

(1) Wire length equals twice the run distance.

NOTE: Do not use control wiring smaller than No. 18 AWG between thermostat and outdoor unit.

4.13.1 No-Heat Applications

The appropriate thermostat control wires (C, G, Y2) must also be connected to the low voltage terminal block (TB2) located on the outside of the air-handler control box. Knockouts are provided on each side of the air-handler for connecting low voltage conduit or plastic bushing. Refer to the wiring diagrams in **Section 9.0** for typical wiring connections for non-electric heat applications.

4.13.2 Electric Heat Applications

The appropriate thermostat control wires must be connected to the thermostat pigtails on the heater kit and to the C, G, Y2, and W1 terminals on the low voltage terminal block located on the outside of the air handler control box. Refer to the wiring diagrams in **Section 9.0** for typical wiring connections for electric heat applications.

4.13.3 Configuring Outdoor Unit Transformer for 208V Applications

For 208V applications, the control transformer in the outdoor unit will need to be re-configured to assure adequate secondary control voltage (24V). Refer to the outdoor unit installation manual, wiring diagram, and/or the transformer label for reconfiguring the transformer for 208V applications.

This air-handler is equipped with a Variable Frequency Drive (VFD) that provides a reduction in air-flow in the continuous fan mode, first stage cooling mode, and first stage heat pump heating mode.

Full air-flow is delivered for the second stage of cooling mode, second stage of heat pump heating mode, and all stages of electric heat. The VFD output frequency and air-flow level is based on the 24VAC thermostat inputs. Energizing the G low voltage terminal located on the air-handler low voltage terminal block causes the VFD to operate at a lower input frequency. Energizing the Y2 or W1 terminals on the low voltage terminal block causes the VFD to operate at a max airflow. The VFD is programmed at the factory for optimum performance and therefore requires no adjustment when air-handler is installed.

The blower performance charts in **Section 4.14.1** is based on a dry coil with the factory 1" fiberglass filters in place and the VFD operating at 100%. A component resistance chart is provided in **Section 4.14.1** to provide the pressure drop for the various accessories that will need to be added to the external static pressure of the duct system before selecting a drive package and motor sheave setting. Keep in mind that high efficiency pleated filters will likely have more pressure drop than the factory filters, so that additional pressure drop will also need to be taken into account. Refer to the filter manufacturer's pressure drop data for more information.

4.0 INSTALLATION

4.14 Air-Flow Performance Data (Dry Coil) (-)HYCA2090

Model (-)HYCA2090		Voltage 208/230, 460, 575 — 3 phase 60 Hz — Sideslow																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
Air Flow		External Static Pressure - Inches of Water [kPa]																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
CFM [L/s]	RPM	0.1 [0.02]		0.2 [0.05]		0.3 [0.07]		0.4 [0.10]		0.5 [0.12]		0.6 [0.15]		0.7 [0.17]		0.8 [0.20]		0.9 [0.22]		1.0 [0.25]		1.1 [0.27]		1.2 [0.30]		1.3 [0.32]		1.4 [0.35]		1.5 [0.37]		1.6 [0.40]		1.7 [0.42]		1.8 [0.45]		1.9 [0.47]		2.0 [0.50]																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
		W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
2400 [1133]	506	487	581	537	631	591	695	619	720	650	763	688	804	724	844	764	884	802	922	842	962	882	1002	922	1042	962	1082	1002	1122	1042	1162	1082	1202	1122	1242	1162	1282	1202	1302	1222	1342	1262	1462	1382	1502	1422	1602	1522	1702	1622	1802	1722	1902	1822	2002	1922	2102	2022	2202	2122	2302	2222	2402	2322	2502	2422	2602	2522	2702	2622	2802	2722	2902	2822	3002	2922	3102	3022	3202	3122	3302	3222	3402	3322	3502	3422	3602	3522	3702	3622	3802	3722	3902	3822	4002	3922	4102	4022	4202	4122	4302	4222	4402	4322	4502	4422	4602	4522	4702	4622	4802	4722	4902	4822	5002	4922	5102	5022	5202	5122	5302	5222	5402	5322	5502	5422	5602	5522	5702	5622	5802	5722	5902	5822	6002	5922	6102	6022	6202	6122	6302	6222	6402	6322	6502	6422	6602	6522	6702	6622	6802	6722	6902	6822	7002	6922	7102	7022	7202	7122	7302	7222	7402	7322	7502	7422	7602	7522	7702	7622	7802	7722	7902	7822	8002	7922	8102	8022	8202	8122	8302	8222	8402	8322	8502	8422	8602	8522	8702	8622	8802	8722	8902	8822	9002	8922	9102	9022	9202	9122	9302	9222	9402	9322	9502	9422	9602	9522	9702	9622	9802	9722	9902	9822	10002	9922	10102	10022	10202	10122	10302	10222	10402	10322	10502	10422	10602	10522	10702	10622	10802	10722	10902	10822	11002	10922	11102	11022	11202	11122	11302	11222	11402	11322	11502	11422	11602	11522	11702	11622	11802	11722	11902	11822	12002	11922	12102	12022	12202	12122	12302	12222	12402	12322	12502	12422	12602	12522	12702	12622	12802	12722	12902	12822	13002	12922	13102	13022	13202	13122	13302	13222	13402	13322	13502	13422	13602	13522	13702	13622	13802	13722	13902	13822	14002	13922	14102	14022	14202	14122	14302	14222	14402	14322	14502	14422	14602	14522	14702	14622	14802	14722	14902	14822	15002	14922	15102	15022	15202	15122	15302	15222	15402	15322	15502	15422	15602	15522	15702	15622	15802	15722	15902	15822	16002	15922	16102	16022	16202	16122	16302	16222	16402	16322	16502	16422	16602	16522	16702	16622	16802	16722	16902	16822	17002	16922	17102	17022	17202	17122	17302	17222	17402	17322	17502	17422	17602	17522	17702	17622	17802	17722	17902	17822	18002	17922	18102	18022	18202	18122	18302	18222	18402	18322	18502	18422	18602	18522	18702	18622	18802	18722	18902	18822	19002	18922	19102	19022	19202	19122	19302	19222	19402	19322	19502	19422	19602	19522	19702	19622	19802	19722	19902	19822	20002	19922	20102	20022	20202	20122	20302	20222	20402	20322	20502	20422	20602	20522	20702	20622	20802	20722	20902	20822	21002	20922	21102	21022	21202	21122	21302	21222	21402	21322	21502	21422	21602	21522	21702	21622	21802	21722	21902	21822	22002	21922	22102	22022	22202	22122	22302	22222	22402	22322	22502	22422	22602	22522	22702	22622	22802	22722	22902	22822	23002	22922	23102	23022	23202	23122	23302	23222	23402	23322	23502	23422	23602	23522	23702	23622	23802	23722	23902	23822	24002	23922	24102	24022	24202	24122	24302	24222	24402	24322	24502	24422	24602	24522	24702	24622	24802	24722	24902	24822	25002	24922	25102	25022	25202	25122	25302	25222	25402	25322	25502	25422	25602	25522	25702	25622	25802	25722	25902	25822	26002	25922	26102	26022	26202	26122	26302	26222	26402	26322	26502	26422	26602	26522	26702	26622	26802	26722	26902	26822	27002	26922	27102	27022	27202	27122	27302	27222	27402	27322	27502	27422	27602	27522	27702	27622	27802	27722	27902	27822	28002	27922	28102	28022	28202	28122	28302	28222	28402	28322	28502	28422	28602	28522	28702	28622	28802	28722	28902	28822	29002	28922	29102	29022	29202	29122	29302	29222	29402	29322	29502	29422	29602	29522	29702	29622	29802	29722	29902	29822	30002	29922	30102	30022	30202	30122	30302	30222	30402	30322	30502	30422	30602	30522	30702	30622	30802	30722	30902	30822	31002	30922	31102	31022	31202	31122	31302	31222	31402	31322	31502	31422	31602	31522	31702	31622	31802	31722	31902	31822	32002	31922	32102	32022	32202	32122	32302	32222	32402	32322	32502	32422	32602	32522	32702	32622	32802	32722	32902	32822	33002	32922	33102	33022	33202	33122	33302	33222	33402	33322	33502	33422	33602	33522	33702	33622	33802	33722	33902	33822	34002	33922	34102	34022	34202	34122	34302	34222	34402	34322	34502	34422	34602	34522	34702	34622	34802	34722	34902	34822	35002	34922	35102	35022	35202	35122	35302	35222	35402	35322	35502	35422	35602	35522	35702	35622	35802	35722	35902	35822	36002	35922	36102	36022	36202	36122	36302	36222	36402	36322	36502	36422	36602	36522	36702	36622	36802	36722	36902	36822	37002	36922	37102	37022	37202	37122	37302	37222	37402	37322	37502	37422	37602	37522	37702	37622	37802	37722	37902	37822	38002	37922	38102	38022	38202	38122	38302	38222	38402	38322	38502	38422	38602	38522	38702	38622	38802	38722	38902	38822	39002	38922	39102	39022	39202	39122	39302	39222	39402	39322	39502	39422	39602	39522	39702	39622	39802	39722	39902	39822	40002	39922	40102	40022	40202	40122	40302	40222	40402	40322	40502	40422	40602	40522	40702	40622	40802	40722	40902	40822	41002	40922	41102	41022	41202	41122	41302	41222	41402	41322	41502	41422	41602	41522	41702	41622	41802	41722	41902	41822	42002	41922	42102	42022	42202	42122	42302	42222	42402	42322	42502	42422	42602	42522	42702	42622	42802	42722	42902	42822	43002	42922	43102	43022	43202	43122	43302	43222	43402	43322	43502	43422	43602	43522	43702	43622	43802	43722	43902	43822	44002	43922	44102	44022	44202	44122	44302	44222	44402	44322	44502	44422	44602	44522	44702	44622	44802	44722	44902	44822	45002	44922	45102	45022	45202	45122	45302	45222	45402	45322	45502	45422	45602	45522	45702	45622	45802	45722	45902	45822	46002	45922	46102	46022	46202	46122	46302	46222	46402	46322	46502	46422	46602	46522	46702	46622	46802	46722	46902	46822	47002	46922	47102	47022	47202	47122	47302	47222	47402	47322	47502	47422	47602	47522	47702	47622	47802	47722	47902	47822	48002	47922	48102	48022	48202	48122	48302	48222	48402	48322	48502	48422	48602	48522	48702	48622	48802	48722	48902	48822	49002	48922	49102	49022	49202	49122	49302	49222	49402	49322	49502	49422	49602	49522	49702	49622	49802	49722	49902	49822	50002	49922	50102	50022	50202	50122	50302	50222	50402	50322	50502	50422	50602	50522	50702	50622	50802	50722	50902	50822	51002	50922	51102	51022	51202	51122	51302	51222	51402	51322	51502	51422	51602	51522	51702	51622	51802	51722	51902	51822	52002	51922	52102	52022	52202	52122	52302	52222	52402	52322	52502	52422	52602	52522	52702	52622	52802	52722	52902	52822	53002	52922	53102	53022	53202	53122	53302	53222	53402	53322	53502	53422	53602	53522	53702	53622	53802	53722	53902	53822	54002	53922	54102	54022	54202	54122	54302	54222	54402	54322	54502	54422	54602	54522	54702	54622	54802	54722	54902	54822	55002	54922	55102	55022	55202	55122	55302	55222	55402	55322	55502	55422	55602	55522	55702	55622	55802	55722	55902	55822	56002	55922	56102	56022	56202	56122	56302	56222	56402	56322	56502	56422	56602	56522	56702	56622	56802	56722	56902	56822	57002	56922	57102	570</

4.0 INSTALLATION

4.14 Air-Flow Performance Data (Dry Coil) (-)HYCA2120

Model (-)HYCA2120		Voltage 208/230, 460, 575 — 3 phase 60 Hz — Sideslow																																											
Air Flow		External Static Pressure - Inches of Water [kPa]																																											
CFM [L/s]	RPM	0.1 [0.02]		0.2 [0.05]		0.3 [0.07]		0.4 [0.10]		0.5 [0.12]		0.6 [0.15]		0.7 [0.17]		0.8 [0.20]		0.9 [0.22]		1.0 [0.25]		1.1 [0.27]		1.2 [0.30]		1.3 [0.32]		1.4 [0.35]		1.5 [0.37]		1.6 [0.40]		1.7 [0.42]		1.8 [0.45]		1.9 [0.47]		2.0 [0.50]					
		W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM				
3100 [1463]	—	—	—	—	—	—	—	756	915	793	984	830	1055	866	1129	901	1207	945	1317	980	1376	1012	1436	1042	1488	1070	1561	1096	1625	1119	1680	1140	1756	1183	1828	1213	1895	1238	1959	1259	2021				
3200 [1510]	—	—	—	—	—	—	—	731	911	768	979	805	1050	841	1124	876	1202	911	1263	969	1382	993	1445	1024	1509	1053	1574	1080	1640	1104	1708	1126	1777	1146	1847	1193	1921	1220	1989	1243	2055	1262	2118		
3300 [1557]	—	—	—	—	—	—	—	744	975	781	1046	817	1121	852	1198	887	1279	921	1362	973	1452	1005	1519	1035	1586	1063	1655	1089	1725	1112	1797	1133	1869	1172	1944	1202	2018	1227	2088	1248	2155	1265	2220		
3400 [1604]	—	—	—	—	—	—	—	757	1044	794	1118	829	1195	864	1276	899	1360	963	1459	986	1528	1017	1598	1046	1669	1073	1742	1097	1816	1119	1891	1139	1967	1182	2044	1210	2119	1233	2191	1253	2260	1269	2326		
3500 [1652]	—	—	—	—	—	—	—	734	1042	771	1116	807	1194	842	1274	876	1368	909	1444	987	1536	999	1609	1039	1693	1057	1758	1082	1834	1105	1911	1126	1990	1145	2068	1192	2146	1218	2224	1239	2298	1256	2368	1269	2436
3600 [1699]	—	—	—	—	—	—	—	749	1116	785	1193	820	1274	854	1357	888	1444	921	1533	980	1619	1011	1665	1040	1773	1067	1851	1091	1931	1113	2012	1133	2094	1163	2176	1201	2256	1221	2344	1244	2409	1259	2481	1269	2636
3700 [1746]	—	—	—	—	—	—	—	764	1198	799	1274	834	1357	867	1444	900	1534	961	1628	993	1707	1023	1787	1051	1868	1076	1950	1099	2034	1120	2118	1139	2204	1163	2286	1209	2348	1231	2448	1248	2525	1261	2598	1269	2636
3800 [1793]	743	1195	779	1275	813	1359	847	1445	880	1535	913	1628	975	1718	1006	1800	1034	1884	1061	1968	1085	2054	1107	2141	1127	2229	1145	2319	1168	2402	1216	2496	1236	2567	1251	2645	1263	2720	1270	2792					
3900 [1840]	759	1278	794	1381	828	1448	861	1537	894	1630	956	1728	988	1813	1018	1898	1045	1966	1071	2074	1094	2164	1115	2254	1134	2346	1155	2438	1175	2533	1201	2621	1223	2697	1241	2699	1254	2789	1263	2846	1269	3019			
4000 [1888]	775	1365	800	1451	843	1541	876	1634	908	1729	970	1824	1001	1813	1029	2002	1056	2093	1080	2185	1102	2278	1122	2372	1140	2468	1166	2555	1210	2645	1229	2732	1245	2816	1256	3030	1263	3110	1264	3186					
4100 [1935]	791	1456	825	1545	888	1638	900	1734	921	1833	983	1926	1013	2018	1041	2111	1068	2206	1089	2301	1110	2396	1128	2496	1145	2595	1195	2681	1217	2773	1235	2862	1249	2947	1258	3030	1263	3110	1264	3186					
4200 [1982]	808	1551	841	1643	873	1739	905	1838	966	1938	996	2033	1025	2128	1051	2228	1076	2323	1098	2423	1117	2523	1135	2625	1180	2716	1204	2812	1224	2905	1240	2996	1251	3083	1259	3167	1262	3248	1261	3326					
4300 [2029]	825	1650	857	1746	889	1844	920	1946	979	2047	1099	2145	1027	2244	1062	2345	1085	2447	1106	2549	1124	2653	1141	2759	1190	2850	1212	2947	1230	3042	1244	3134	1253	3222	1259	3308	1260	3391	1257	3471					
4400 [2076]	842	1753	873	1852	905	1954	962	2060	993	2161	1021	2262	1048	2365	1072	2470	1094	2575	1113	2681	1131	2789	1146	2898	1199	2987	1220	3087	1236	3183	1247	3276	1255	3366	1259	3454	1257	3538	1252	3619					
4500 [2123]	859	1860	890	1962	921	2067	976	2176	1005	2280	1033	2385	1059	2492	1081	2600	1102	2709	1120	2819	1137	2930	1186	3026	1208	3129	1226	3230	1240	3328	1250	3423	1256	3515	1257	3603	1254	3689	1247	3772					
4600 [2171]	876	1972	907	2077	959	2190	989	2296	1018	2404	1044	2513	1068	2623	1090	2735	1110	2847	1127	2961	1142	3076	1196	3170	1216	3276	1232	3378	1244	3477	1252	3574	1256	3667	1255	3757	1250	3845	1241	3929					
4700 [2218]	894	2087	924	2195	973	2312	1003	2422	1030	2534	1055	2646	1079	2760	1099	2875	1117	2992	1134	3109	1148	3228	1205	3319	1224	3426	1238	3530	1248	3637	1254	3729	1255	3824	1252	3916	1245	4004	1234	4090					
4800 [2265]	912	2207	956	2327	987	2440	1015	2554	1041	2669	1066	2785	1087	2903	1107	3021	1124	3141	1139	3262	1153	3381	1214	3473	1230	3581	1243	3686	1251	3789	1254	3888	1254	3985	1249	4078	1240	4168	1227	4256					
4900 [2312]	939	2341	971	2456	1000	2572	1027	2690	1053	2809	1075	2929	1096	3050	1115	3172	1131	3296	1145	3420	1203	3517	1222	3630	1236	3740	1247	3847	1253	3951	1254	4052	1252	4150	1245	4245	1234	4337	1219	4426					
5000 [2359]	964	2472	985	2591	1013	2711	1039	2832	1063	2954	1085	3078	1105	3203	1122	3329	1137	3456	1150	3584	1213	3678	1229	3792	1242	3903	1250	4012	1254	4117	1254	4220	1249	4319	1240	4416	1228	4509	1210	4600					
5100 [2407]	989	2608	998	2730	1026	2854	1051	2979	1074	3105	1094	3232	1113	3361	1139	3490	1143	3621	1203	3723	1222	3848	1247	3958	1247	4071	1253	4181	1255	4288	1252	4392	1246	4493	1235	4591	1220	4686	1149	5137					

Motor Package		R										S										T																
Drive H.P. [W]	—	2 [1491.4]										2.0 [1491.4]										3 [2237.1]																
Blower Sheave	—	AK10x3/4										AK8x3/4										AK9x3/4																
Motor Sheave	—	1VP65x7/8										1VP65x7/8										1VP75x7/8																
Belt	—	A52										A49										A52																
Turns Open	0	1	2	3	4	5	732	765	797	829	862	894	926	958	990	1022	1054	1086	1118	1150	1182	1214	1246	1278	1310	1342	1374	1406	1438	1470	1502	1534	1566	1598	1630	1662	1694	1726
RPM	894	862	829	797	765	732	700	668	636	604	572	540	508	476	444	412	380	348	316	284	252	220	188	156	124	92	60	28	—	—	—	—	—	—	—	—	—	—

- Notes:
1. Factory sheave settings are shown in bold type.
 2. Do not set sheave below minimum or maximum turns open shown.
 3. Re-adjustment of sheave required to achieve rated airflow at AHRI minimum External Static Pressure.
 4. Add component resistance (below) to duct resistance to determine total External Static Pressure.

Airflow	AIRFLOW CORRECTION FACTORS *				COMPONENT AIRFLOW RESISTANCE		
					Wet Coil	MERV 8 Filter	MERV 13 Filter
	CFM [L/s]	Total MBH	Sensible MBH	Power kW			
					Resistance — Inches of Water [kPa]		
	3500 [1652]	0.98	0.92	0.99	0.07 [02]	0.091	0.098
	3600 [1699]	0.98	0.93	0.99	0.08 [02]	0.097	0.103
	3700 [1746]	0.99	0.95	1.00	0.08 [02]	0.103	0.109
	3800 [1793]	0.99	0.97	1.00	0.08 [02]	0.109	0.115
	3900 [1840]	1.00	0.99	1.00	0.08 [02]	0.115	0.121
	4000 [1888]	1.00	1.00	1.01	0.09 [02]	0.121	0.127
	4100 [1935]	1.00	1.02	1.01	0.09 [02]	0.127	0.132
	4200 [1982]	1.01	1.04	1.01	0.09 [02]	0.133	0.138
	4300 [2029]	1.01	1.06	1.01	0.10 [02]	0.139	0.144
	4400 [2076]	1.02	1.07	1.02	0.10 [02]	0.145	0.150
	4500 [2123]	1.02	1.09	1.02	0.10 [02]	0.151	0.156
	4600 [2171]	1.03	1.11	1.02	0.10 [02]	0.157	0.161
	4700 [2218]	1.03	1.12	1.03	0.11 [03]	0.163	0.167
	4800 [2265]	1.04	1.14	1.03	0.11 [03]	0.169	0.173
	4900 [2312]	1.04	1.16	1.03	0.11 [03]	0.175	0.179
	5000 [2359]	1.05	1.18	1.03	0.12 [03]	0.181	0.185
	5100 [2407]	1.05	1.19	1.04	0.12 [03]	0.188	0.190

4.0 INSTALLATION

4.14 Air-Flow Performance Data (Dry Coil) (-)HYCA2121

Model (-)HCYA2121		Voltage 208/230, 480, 575 — 3 phase 60 Hz - Sideslow																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
Air Flow		External Static Pressure - Inches of Water [kPa]																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
CFM [L/s]		0.1 [0.2]	0.2 [0.5]	0.3 [0.7]	0.4 [1.0]	0.5 [1.2]	0.6 [1.5]	0.7 [1.7]	0.8 [2.0]	0.9 [2.2]	1.0 [2.5]	1.1 [2.7]	1.2 [3.0]	1.3 [3.2]	1.4 [3.5]	1.5 [3.7]	1.6 [4.0]	1.7 [4.2]	1.8 [4.5]	1.9 [4.7]	2.0 [5.0]																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP

- Notes:
1. Factory sheave settings are shown in bold type.
 2. Do not set sheave below minimum or maximum turns open shown.
 3. Re-adjustment of sheave required to achieve rated airflow at AHR minimum External Static Pressure.
 4. Add component resistance (below) to duct resistance to determine total External Static Pressure.

Airflow	AIRFLOW CORRECTION FACTORS *			COMPONENT AIRFLOW RESISTANCE		
	Wet Coil			MERV 8 Filter		
CFM [L/s]	Total MBH	Sensible MBH	Power kW	Resistance — Inches of Water [kPa]		
				MERV 13 Filter		
3500 [1652]	0.98	0.92	0.99	0.07 [0.2]	0.091	0.098
3600 [1699]	0.98	0.93	0.99	0.08 [0.2]	0.097	0.103
3700 [1746]	0.99	0.95	1.00	0.08 [0.2]	0.103	0.109
3800 [1793]	0.99	0.97	1.00	0.08 [0.2]	0.109	0.115
3900 [1840]	1.00	0.99	1.00	0.08 [0.2]	0.115	0.121
4000 [1888]	1.00	1.00	1.01	0.09 [0.2]	0.121	0.127
4100 [1935]	1.00	1.02	1.01	0.09 [0.2]	0.127	0.132
4200 [1982]	1.01	1.04	1.01	0.09 [0.2]	0.133	0.138
4300 [2029]	1.01	1.06	1.01	0.10 [0.2]	0.139	0.144
4400 [2076]	1.02	1.07	1.02	0.10 [0.2]	0.145	0.150
4500 [2123]	1.02	1.09	1.02	0.10 [0.2]	0.151	0.156
4600 [2171]	1.03	1.11	1.02	0.10 [0.2]	0.157	0.161
4700 [2218]	1.03	1.12	1.03	0.11 [0.3]	0.163	0.167
4800 [2265]	1.04	1.14	1.03	0.11 [0.3]	0.169	0.173
4900 [2312]	1.04	1.16	1.03	0.11 [0.3]	0.175	0.179
5000 [2359]	1.05	1.18	1.03	0.12 [0.3]	0.181	0.185
5100 [2407]	1.05	1.19	1.04	0.12 [0.3]	0.188	0.190

*Multiply correction factor times gross performance data resulting sensible capacity cannot exceed total capacity.

4.0 INSTALLATION

4.14 Air-Flow Performance Data (Dry Coil) (-)HYCA2150

Model (-)HYCA2150		Voltage 208/230, 460, 575 — 3 phase 60 Hz — Sidelow																																								
Air Flow		External Static Pressure - Inches of Water [kPa]																																								
CFM [L/s]	RPM	0.1 [0.2]	0.2 [0.6]	0.3 [0.7]	0.4 [-1.0]	0.5 [-1.2]	0.6 [-1.5]	0.7 [-1.7]	0.8 [-2.0]	0.9 [-2.2]	1.0 [-2.5]	1.1 [-2.7]	1.2 [-3.0]	1.3 [-3.2]	1.4 [-3.5]	1.5 [-3.7]	1.6 [-4.0]	1.7 [-4.2]	1.8 [-4.5]	1.9 [-4.7]	2.0 [-5.0]																					
		BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM																					
4200 [1982]	—	—	—	—	502	1033	529	1093	555	1162	582	1239	610	1325	639	1418	661	1538	686	1633	712	1732	738	1836	755	1770	778	1874	801	1966	826	2106	852	2236	878	2374	—	—				
4300 [2029]	—	—	—	—	482	1015	507	1070	533	1133	560	1205	586	1284	614	1372	642	1468	664	1562	689	1678	714	1778	741	1882	757	1814	779	1919	803	2033	828	2156	853	2287	880	2427	—	—		
4400 [2076]	—	—	—	—	487	1053	512	1110	538	1176	564	1250	591	1332	618	1422	645	1521	667	1629	691	1725	717	1826	743	1931	759	1861	781	1968	805	2063	829	2208	855	2341	881	2482	—	—		
4500 [2123]	—	—	—	—	493	1093	518	1153	543	1221	568	1297	595	1382	621	1475	649	1576	670	1678	694	1775	719	1876	745	1982	761	1910	783	2019	807	2136	831	2262	857	2397	883	2541	—	—		
4600 [2171]	—	—	—	—	499	1135	523	1197	549	1265	573	1347	599	1434	625	1530	652	1633	673	1729	697	1827	722	1929	747	2035	763	1962	786	2073	809	2192	833	2320	859	2456	885	2602	—	—		
4700 [2218]	—	—	—	—	481	1123	504	1180	528	1245	553	1318	578	1399	603	1469	629	1567	656	1693	676	1783	700	1881	725	1984	750	2091	765	2017	788	2129	811	2250	835	2380	861	2518	887	2665	—	—
4800 [2265]	—	—	—	—	487	1168	510	1227	534	1295	558	1370	583	1454	608	1546	634	1647	656	1744	679	1839	703	1938	727	2041	753	2149	768	2074	790	2198	813	2311	838	2443	863	2583	889	2732	—	—
4900 [2312]	—	—	—	—	493	1215	516	1277	539	1347	563	1423	588	1511	612	1606	638	1709	660	1820	683	1959	710	2059	734	2164	752	2287	771	2134	793	2262	816	2375	840	2576	868	2720	884	2872	—	—
5000 [2359]	—	—	—	—	500	1265	522	1339	545	1407	569	1482	593	1571	617	1668	642	1773	664	1893	687	1959	717	2199	740	2295	758	2317	779	2330	801	2451	824	2581	848	2720	873	2868	899	3024	—	—
5100 [2407]	484	1298	506	1317	528	1384	551	1458	574	1542	598	1633	622	1733	646	1841	668	1925	690	2022	713	2123	737	2228	755	2151	776	2262	788	2381	821	2510	845	2647	870	2792	896	2947	—	—		
5200 [2454]	491	1311	513	1372	534	1441	557	1518	579	1604	603	1697	627	1800	651	1910	672	1990	694	2088	717	2189	744	2285	761	2286	782	2400	804	2524	827	2656	851	2796	876	2946	—	—				
5300 [2501]	498	1365	519	1428	541	1500	563	1580	585	1668	608	1764	632	1869	656	1982	678	2058	698	2156	721	2258	744	2365	761	2366	782	2486	804	2599	830	2733	854	2875	879	3026	—	—				
5400 [2548]	505	1422	526	1488	547	1562	569	1644	591	1735	614	1834	637	1941	660	2033	681	2128	702	2226	724	2329	747	2437	765	2357	785	2474	807	2599	830	2733	854	2875	879	3026	—	—				
5500 [2595]	513	1481	533	1550	554	1626	575	1711	597	1804	619	1906	642	2015	665	2105	685	2200	706	2298	728	2403	751	2511	769	2431	789	2556	811	2677	833	2812	857	2957	882	3110	—	—				
5600 [2643]	520	1543	540	1614	560	1693	581	1780	603	1876	625	1980	647	2092	670	2179	690	2275	711	2375	732	2479	752	2587	772	2508	792	2628	814	2757	837	2895	860	3041	885	3196	—	—				
5700 [2690]	527	1607	547	1681	567	1762	588	1852	609	1950	630	2057	652	2171	674	2255	694	2362	715	2452	737	2557	756	2674	775	2588	798	2710	818	2840	840	2980	864	3128	888	3284	—	—				
5800 [2737]	535	1674	554	1750	574	1834	594	1926	615	2027	636	2136	658	2253	679	2334	699	2431	720	2532	741	2638	759	2655	779	2670	800	2794	821	2926	844	3067	867	3217	892	3375	—	—				

Drive Package		R												S												T											
Motor H.P. [W]		2 [1491.4]												3 [2237.1]												5 [2237.1]											
Blower Sheave		BK120SP 1.0"												BK120SP 1.0"												BK100SP											
Motor Sheave		1VP44x7/8												IVL50 7/8												1VP50 1 1/8											
Belt		B52												B52												B46											
Turns Open		0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
RPM		650	630	606	579	551	522	746	723	699	644	617	597	877	840	803	766	730	694	877	840	803	766	730	694	877	840	803	766	730	694	877	840	803	766	730	694

Notes:
1. Factory sheave settings are shown in bold type.
2. Do not set sheave below minimum or maximum turns open shown.
3. Re-adjustment of sheave required to achieve rated airflow at AHR minimum External Static Pressure.
4. Add component resistance below to duct resistance to determine total External Static Pressure.

Airflow	AIRFLOW CORRECTION FACTORS *					COMPONENT AIRFLOW RESISTANCE				
						Wet Coil	MERV 8 Filter	MERV 13 Filter		
CFM [L/s]	Total MBH	Sensible MBH	Power kW	Resistance — Inches of Water [kPa]						
				0.07 [0.2]	0.09	0.07 [0.2]	0.091	0.098	0.103	
3500 [1652]	0.98	0.92	0.99	0.08 [0.2]	0.99	0.08 [0.2]	0.097	0.103	0.109	
3600 [1699]	0.98	0.93	0.99	0.08 [0.2]	1.00	0.08 [0.2]	0.103	0.109	0.115	
3700 [1746]	0.99	0.95	1.00	0.08 [0.2]	1.00	0.08 [0.2]	0.109	0.115	0.121	
3800 [1793]	0.99	0.97	1.00	0.08 [0.2]	1.00	0.08 [0.2]	0.115	0.121	0.127	
3900 [1840]	1.00	0.99	1.00	0.08 [0.2]	1.01	0.09 [0.2]	0.121	0.127	0.132	
4000 [1888]	1.00	1.00	1.01	0.09 [0.2]	1.01	0.09 [0.2]	0.127	0.132	0.138	
4100 [1935]	1.00	1.02	1.01	0.09 [0.2]	1.01	0.09 [0.2]	0.132	0.138	0.144	
4200 [1982]	1.01	1.04	1.01	0.09 [0.2]	1.01	0.09 [0.2]	0.138	0.144	0.150	
4300 [2029]	1.01	1.06	1.01	0.10 [0.2]	1.01	0.10 [0.2]	0.144	0.150	0.156	
4400 [2076]	1.02	1.07	1.02	0.10 [0.2]	1.02	0.10 [0.2]	0.150	0.156	0.161	
4500 [2123]	1.02	1.09	1.02	0.10 [0.2]	1.02	0.10 [0.2]	0.156	0.161	0.167	
4600 [2171]	1.03	1.11	1.02	0.11 [0.3]	1.02	0.11 [0.3]	0.161	0.167	0.173	
4700 [2218]	1.03	1.12	1.03	0.11 [0.3]	1.03	0.11 [0.3]	0.167	0.173	0.179	
4800 [2265]	1.04	1.14	1.03	0.11 [0.3]	1.03	0.11 [0.3]	0.173	0.179	0.185	
4900 [2312]	1.04	1.16	1.03	0.11 [0.3]	1.03	0.11 [0.3]	0.179	0.185	0.190	
5000 [2359]	1.05	1.18	1.03	0.12 [0.3]	1.04	0.12 [0.3]	0.185	0.190		
5100 [2407]	1.05	1.19	1.04	0.12 [0.3]	1.04	0.12 [0.3]	0.190			

*Multiply correction factor times gross performance data resulting sensible capacity cannot exceed total capacity.

4.0 INSTALLATION

4.14 Air-Flow Performance Data (Dry Coil) (-)HYCA2180

Model (-)HYCA2180		Voltage 208/230, 460, 575 — 3 phase 60 Hz — Sidelow																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
Air Flow		External Static Pressure - Inches of Water [kPa]																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
CFM [L/s]	RPM	0.1 [0.2]	0.2 [0.5]	0.3 [0.7]	0.4 [1.0]	0.5 [1.2]	0.6 [1.5]	0.7 [1.7]	0.8 [2.0]	0.9 [2.2]	1.0 [2.5]	1.1 [2.7]	1.2 [3.0]	1.3 [3.2]	1.4 [3.5]	1.5 [3.7]	1.6 [4.0]	1.7 [4.2]	1.8 [4.5]	1.9 [4.7]	2.0 [5.0]																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
		BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM

- Notes:
1. Factory sheave settings are shown in bold type.
 2. Do not set sheave below minimum or maximum turns open shown.
 3. Re-adjustment of sheave required to achieve rated airflow at AHRF, minimum External Static Pressure.
 4. Add component resistance (below) to duct resistance to determine total External Static Pressure.

Airflow	AIRFLOW CORRECTION FACTORS *				COMPONENT AIRFLOW RESISTANCE			
					Wet Coil	MERV 8 Filter		MERV 13 Filter
	CFM [L/s]	Total MBH	Sensible MBH	Power kW		Resistance — Inches of Water [kPa]		
4750 [2241]	1.03	1.13	1.03	1.03	0.11 [0.3]	0.166	0.170	
4850 [2289]	1.04	1.15	1.03	1.03	0.11 [0.3]	0.172	0.176	
4950 [2336]	1.04	1.17	1.03	1.03	0.11 [0.3]	0.178	0.182	
5050 [2383]	1.05	1.19	1.03	1.03	0.12 [0.3]	0.185	0.188	
5150 [2430]	1.05	1.20	1.04	1.04	0.12 [0.3]	0.191	0.193	
5250 [2477]	1.06	1.22	1.04	1.04	0.12 [0.3]	0.197	0.199	
5350 [2525]	1.06	1.24	1.04	1.04	0.13 [0.3]	0.203	0.205	
5450 [2572]	1.07	1.25	1.05	1.05	0.13 [0.3]	0.209	0.211	
5550 [2619]	1.07	1.27	1.05	1.05	0.13 [0.3]	0.215	0.217	
5650 [2666]	1.08	1.29	1.05	1.05	0.13 [0.3]	0.221	0.222	
5750 [2713]	1.08	1.31	1.05	1.05	0.14 [0.3]	0.227	0.228	
5850 [2760]	1.08	1.32	1.06	1.06	0.14 [0.3]	0.233	0.234	
5950 [2808]	1.09	1.34	1.06	1.06	0.14 [0.3]	0.239	0.240	
6050 [2855]	1.09	1.36	1.06	1.06	0.15 [0.4]	0.245	0.246	
6150 [2902]	1.10	1.38	1.07	1.07	0.15 [0.4]	0.251	0.251	
6250 [2949]	1.10	1.39	1.07	1.07	0.15 [0.4]	0.257	0.257	
6350 [2996]	1.11	1.41	1.07	1.07	0.15 [0.4]	0.263	0.263	

*Multiply correction factor times gross performance data resulting sensible capacity cannot exceed total capacity.

4.0 INSTALLATION

4.14 Air-Flow Performance Data (Dry Coil) (-)HYCA2240

Model (-)HCYA2240		Voltage 208/230, 460, 575 — 3 phase 60 Hz — Sideslow																																											
Air Flow		External Static Pressure - Inches of Water [kPa]																																											
CFM [L/s]																																													
0.1 [0.02]	0.2 [0.05]	0.3 [0.07]	0.4 [0.10]	0.5 [0.12]	0.6 [0.15]	0.7 [0.17]	0.8 [0.20]	0.9 [0.22]	1.0 [0.25]	1.1 [0.27]	1.2 [0.30]	1.3 [0.32]	1.4 [0.35]	1.5 [0.37]	1.6 [0.40]	1.7 [0.42]	1.8 [0.45]	1.9 [0.47]	2.0 [0.50]																										
RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP								
6400 [3000]	575	1734	802	1845	828	1960	853	2078	877	2189	900	2325	922	2453	944	2585	964	2721	983	2860	1000	3000	1016	3144	1031	3291	1046	3440	1060	3591	1074	3744	1087	3898	1100	4054	1112	4212	1124	4371	1135	4531	1146		
6500 [3091]	585	1834	811	1940	837	2068	862	2190	886	2316	908	2445	929	2578	949	2714	969	2854	988	2997	1006	3144	1024	3294	1043	3446	1061	3600	1079	3756	1096	3914	1113	4074	1130	4236	1146	4400	1162	4566	1178	4734	1193	4899	1208
6700 [3202]	595	1941	821	2060	846	2182	871	2309	894	2438	916	2571	937	2708	958	2848	977	2992	995	3139	1016	3290	1035	3444	1053	3600	1071	3758	1088	3918	1105	4079	1121	4242	1137	4407	1153	4574	1168	4742	1183	4911	1197	5079	1212
6850 [3322]	605	2052	831	2175	856	2302	879	2432	902	2566	924	2703	944	2844	964	2988	983	3136	1004	3286	1022	3438	1040	3592	1057	3748	1074	3906	1090	4066	1106	4228	1121	4391	1136	4556	1151	4722	1165	4890	1180	5058	1194	5226	1208
7000 [3303]	615	2169	840	2298	865	2427	888	2561	911	2698	932	2840	952	2986	972	3133	990	3283	1007	3435	1023	3589	1040	3744	1056	3900	1072	4058	1088	4218	1103	4379	1118	4541	1132	4704	1146	4868	1160	5034	1174	5200	1188	5368	1202
7150 [3374]	625	2291	850	2422	874	2557	897	2695	919	2837	939	2982	958	3130	977	3283	994	3438	1010	3594	1026	3751	1041	3910	1056	4070	1071	4231	1086	4393	1100	4556	1114	4720	1128	4886	1141	5052	1155	5219	1168	5387	1181	5554	1195
7300 [3445]	635	2419	860	2554	883	2692	906	2835	927	2981	948	3130	967	3283	985	3438	1001	3594	1016	3751	1031	3910	1046	4070	1061	4231	1076	4393	1090	4556	1104	4720	1118	4886	1132	5052	1146	5219	1159	5387	1172	5556	1185	5724	1196
7450 [3515]	645	2552	869	2691	892	2834	915	2980	936	3130	948	3284	967	3438	985	3594	1001	3751	1016	3910	1031	4070	1046	4231	1061	4393	1076	4556	1090	4720	1104	4886	1118	5052	1132	5219	1146	5387	1159	5556	1172	5725	1185	5894	1196
7600 [3586]	655	2691	879	2824	902	2967	924	3113	944	3265	964	3418	982	3572	1000	3728	1016	3886	1033	4046	1050	4209	1067	4373	1083	4538	1099	4704	1114	4870	1129	5036	1144	5203	1152	5370	1161	5538	1174	5706	1186	5875	1197	6044	1208
7750 [3657]	665	2831	888	2962	911	3153	932	3307	952	3465	972	3624	990	3776	996	3941	1009	4108	1024	4276	1040	4444	1056	4612	1069	4781	1086	4950	1101	5120	1115	5290	1129	5460	1143	5631	1156	5802	1169	5974	1181	6146	1200	6318	1212
7900 [3728]	675	2984	898	3133	920	3300	941	3449	961	3610	979	3776	996	3941	1009	4108	1024	4276	1040	4444	1056	4612	1069	4781	1086	4950	1101	5120	1115	5290	1129	5460	1143	5631	1156	5802	1169	5974	1181	6146	1200	6318	1212	6490	1224
8050 [3799]	685	3139	908	3294	935	3453	954	3603	974	3768	991	3931	1008	4096	1023	4262	1038	4429	1054	4609	1069	4779	1086	4949	1103	5119	1126	5290	1133	5460	1146	5631	1159	5802	1169	5974	1181	6146	1200	6318	1212	6490	1224	6662	1236
8200 [3869]	695	3299	917	3448	939	3621	959	3788	978	3958	996	4131	1018	4298	1035	4466	1051	4635	1068	4804	1081	4974	1097	5145	1112	5316	1128	5488	1140	5660	1152	5832	1164	6004	1175	6177	1186	6350	1197	6523	1208	6696	1220	6869	1232
8350 [3940]	705	3465	927	3628	948	3795	967	3965	986	4139	1004	4311	1031	4484	1049	4658	1072	4832	1095	5006	1117	5181	1129	5356	1146	5532	1158	5708	1169	5885	1180	6062	1191	6240	1202	6418	1213	6596	1224	6775	1235	6954	1246	7133	1257
8500 [4011]	715	3636	937	3803	957	3974	976	4149	994	4325	1023	4498	1041	4674	1054	4850	1067	5027	1080	5204	1093	5382	1105	5560	1117	5739	1129	5918	1140	6098	1153	6278	1164	6458	1175	6638	1186	6818	1197	6999	1208	7179	1219	7359	1230
8650 [4082]	725	3812	947	3984	967	4159	985	4337	1004	4516	1032	4693	1044	4871	1056	5049	1069	5228	1081	5408	1093	5588	1105	5768	1117	5948	1128	6129	1140	6310	1151	6491	1162	6672	1173	6853	1184	7034	1195	7215	1206	7396	1217	7576	1228
8800 [4153]	735	3994	956	4161	976	4348	994	4531	1009	4716	1036	4901	1046	5086	1059	5272	1071	5458	1083	5645	1095	5832	1106	6020	1117	6208	1128	6396	1139	6585	1150	6774	1161	6963	1172	7152	1183	7342	1194	7531	1205	7721	1216	7911	1227
8950 [4223]	745	4181	966	4361	985	4544	1004	4729	1019	4916	1039	5104	1052	5292	1064	5481	1075	5670	1086	5860	1097	6050	1108	6240	1119	6430	1130	6620	1140	6810	1151	7000	1161	7190	1172	7380	1183	7570	1194	7760	1205	7950	1216	8140	1227
9100 [4294]	755	4374	976	4558	994	4745	1013	4931	1029	5119	1047	5308	1065	5498	1076	5688	1087	5878	1098	6069	1109	6260	1119	6451	1130	6642	1140	6833	1151	7024	1161	7215	1172	7406	1183	7597	1194	7788	1205	7979	1216	8170	1227	8360	1238
9250 [4365]	765	4572	986	4746	1004	4935	1022	5121	1039	5310	1057	5500	1074	5690	1086	5881	1097	6072	1108	6263	1119	6454	1130	6645	1140	6836	1151	7027	1161	7218	1172	7409	1183	7600	1194	7791	1205	7982	1216	8173	1227	8364	1238	8555	1249
9400 [4436]	775	4776	997	4947	1014	5136	1043	5327	1061	5519	1078	5712	1095	5905	1102	6098	1119	6291	1129	6484	1140	6677	1151	6870	1161	7063	1172	7256	1183	7449	1194	7642	1205	7835	1216	8028	1227	8221	1238	8414	1249	8607	1260	8800	1271

Notes:

1. Factory sheave settings are shown in bold type.
2. Do not set sheave below minimum or maximum turns open shown.
3. Re-adjustment of sheave required to achieve rated airflow at AHR minimum External Static Pressure.
4. Add component resistance (below) to duct resistance to determine total External Static Pressure.

4.0 INSTALLATION

4.14.1 Selecting the Proper Blower Drive & Motor Sheave Setting

To select the proper blower drive, the following information is required.

- Target air-flow in CFM or L/s
- Total static pressure of the duct system in inches of water or kPa
- Component Resistance (**See Section 4.14.2**).

Add the total static pressure of the duct system to the component resistance to determine the External Static Pressure (E.S.P.) that the air-handler must work against. Locate the target CFM [L/s] row on the air-flow performance table and move to the right along that row to the correct E.S.P. column. If the target CFM and E.S.P. are between the values shown on the table, it will be necessary to interpolate between rows and lines.

There are heavy lines dividing blower drives from left to right with the “R” drive being everything left of the first heavy line, “S” drive being for everything between the 1st and 2nd heavy lines, “T” drive being for everything between the 2nd and 3rd heavy lines, and so forth.

Once the correct blower drive is determined, confirm the air-handler being installed has the correct drive package or can be converted to the correct drive with field supplied sheaves and belt(s). In some cases, a motor change is also required for field supplied blower drives.

Determine the correct blower RPM from the air-flow performance chart at the intersection of the target air-flow and E.S.P. Then refer to the Blower Package Data table to determine the correct setting in turns open for the variable pitch motor sheave. The variable pitch motor sheave can be adjusted in half turns to provide finer adjustments of the blower RPM if needed. Adjust the variable pitch motor sheave to the correct setting using the instructions found in **Section 4.14.4**.

4.14.2 Adjusting the Variable Pitch Motor Sheave

The adjustable pitch sheave which is mounted on the motor shaft controls the fan speed. To adjust the fan speed refer to **Figure 11**, proceed as follows:

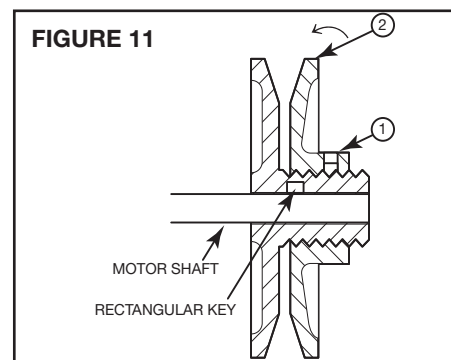
- a. Loosen the set screw, item 1.
- b. Rotate the adjustable sheave, item 2, to the desired position.
- c. Lock the adjustable sheave in place by tightening the set screw, item 1.

NOTE: The adjustable sheave is not to be used to adjust belt tension.

WARNING: BEFORE MAKING FAN ADJUSTMENTS, BE SURE THE MAIN ELECTRICAL DISCONNECT SWITCH IS IN THE “OFF” POSITION TO PREVENT POSSIBLE INJURY DUE TO ACCIDENTAL OPERATION OF THE MOTOR.

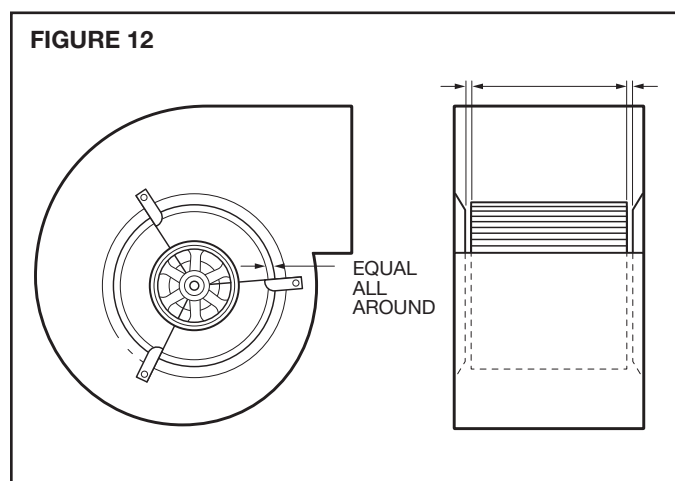
4.14.3 Drive Belt Alignment & Adjustment

Place belt on the groove of the blower sheave and motor sheave to obtain the approximate alignment and belt tension. Remove the belt and align the blower sheave and motor sheave using a straight edge. When both sheaves are properly aligned, re-install belt. Do not force or pry the belt onto the sheaves. With the belt in place, adjust so that all the slack is on one side of the drive. The belt should have from 3/4” to 1” [19 to 25 mm] of slack at 3 lbs. [21 kPa] pressure. Adjust the belt to this tension, by raising or lowering the swing base via the adjusting rods and nuts.



5.1 Pre-Start Checklist

1. Leak test entire system.
2. Check motor mounting to make sure all nuts are tight.
3. Check motor and blower sheaves to make sure they are in proper alignment and set screws are tight.
4. Check belt tension—belts should be fairly tight for the initial “start-up”.
5. Check bearing—collar set screws on blower shaft to make sure they are tight.
6. Ball type bearings are factory lubricated and do not require additional grease before starting.
7. Rotate blower shaft by hand to be sure it is free.
8. Ensure VFD voltage matches supply voltage.
9. Check all screws, bolts, set screws and piping connections for tightness.
10. Check drain.
11. Insure that filters are in place.
12. Insure all outdoor unit service valves are open.
13. Be sure that electrical controls and motors are properly wired and fused in accordance with applicable codes.
14. Check wheel position in blower housing. **See Figure 12.**
15. Check that internal and external unit wiring will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges, or any other adverse environmental effects, taking into account the effects of aging or continual vibration from sources such as compressors or fans.



5.0 SYSTEM START-UP

5.2 System Start-Up & Operational Check-Out

- Once everything on the Pre-Start Check-List has been confirmed, turn the electrical power disconnect on and adjust the thermostat to call for continuous fan operation. Confirm the blower has the correct rotation and is circulating air in the duct system.
- On any models with a Variable Frequency Drive, VFD, the motor will always rotate in the correct direction.
- Confirm the blower is turning the correct RPM using a strobe light or other device capable of measuring RPM.
- Confirm the full load motor amps listed on the unit data plate are not being exceeded by more than the 15% service factor rating of the motor.
- If the blower is unusually noisy, disconnect power to the unit and check for improper alignment of the blower wheel or belt or for something loose.
- If field installed accessories have been installed, confirm proper functioning of those accessories.
- When all items running properly, tape all access panel to ensure unit is sealed off completely.

5.3 Checking Indoor Air-Flow Rate

5.3.1 Estimating Air-Flow Rate Using External Static Pressure

A common method of checking indoor is to measure the external static pressure that the air-handler is working against and then referring to the air-flow data in **Section 4.14.1**. Measuring external static pressure to a high degree of precision in the field is challenging, so keep in mind that the air-flow rate determined by this method is an estimate, but is accurate enough for all practical purposes.

To determine external static pressure, the static pressure should be measured in inches of water column across the air-handler using an incline manometer, digital static pressure meter, or a Magnahelic. The static pressure inside the return plenum should be measured as close to the air-handler as possible and must be measured between any external filter rack and the unit so the pressure drop across the filter is accounted for. The static pressure inside the supply plenum should be measured at a point about halfway between the air-handler and the first elbow or the end of the plenum. Total external static pressure is the sum of the return and supply plenum static pressures. Even though the return plenum static pressure is a negative pressure, it must be added to the supply plenum static pressure, ignoring the negative sign. The supply and return plenum static pressure tubing can also be connected to both pressure ports of the pressure measuring device which will automatically add the two pressures together.

5.0 SYSTEM START-UP

5.3.2 Estimating Air-Flow Rate Using Electric Heat Temperature Rise

If the air-handler is equipped with an electric heater, the air-flow can be estimated using the air temperature rise across the air-handler with the heater and blower both energized once the unit has run long enough for the temperatures to stabilize. As with determining air-flow rate using external static pressure, the air-flow rate determined by this method is an estimate, but is accurate enough for all practical purposes. Measure the return air temperature as close to the unit as possible and the supply air temperature about half way from the air-handler to the first elbow or end of the supply plenum. Use the following formula to calculate air-flow rate once the temperature rise is determined.

$$\text{CFM} = \text{Heating BTUH} / (\text{Elevation Factor} \times \text{Temp Rise } ^\circ\text{F})$$
$$\text{L/s} = (895 \times \text{Heating kW}) / (\text{Elevation Factor} \times \text{Temp Rise } ^\circ\text{C})$$

Note: Refer to **Sections 5.3.4** to determine Heating Capacity and the following chart for Elevation Factor.

5.3.3 Correcting Electric Heat kW for Voltage

The actual electric heat kW varies with the supply voltage. Use the following formula to correct the heater rated kW at voltages other than rated voltage.

$$\text{Actual kW} = \text{Rated kW} \times (\text{Actual Voltage}^2 / \text{Rated Voltage}^2)$$

Elevation -ft [m]	Elevation Factor
Sea Level	1.08
500 [152]	0.98
1000 [305]	0.96
1500 [451]	0.95
2000 [610]	0.93
2500 [762]	0.91
3000 [914]	0.90
3500 [1067]	0.88
4000 [1219]	0.86
5000 [1524]	0.83
6000 [1829]	0.83
7000 [2134]	0.77
8000 [2438]	0.74
9000 [2743]	0.72
10000 [3048]	0.69

5.3.4 Calculating Electric Heat Capacity in BTUH

Use the following formula to convert heater kW to heating capacity in BTUH.

$$\text{BTUH Capacity} = \text{kW} \times 3412$$

(Where 3412 = BTUH per kW)

5.4 Checking Refrigerant Charge

System refrigerant charging should only be performed after the indoor air-flow is confirmed to be correct for the application. Once the air-flow is confirmed, check the refrigerant charge according to **Section 4.7.10**.

5.5 Sequence of Operation

5.5.1 Cooling Mode

When the 2-stage thermostat calls for first stage of cooling or heat pump heating and the thermostat fan setting is set to the AUTO position, the G signal from the thermostat causes the Variable Frequency Drive (VFD) to ramp the motor to the low speed air-flow level. If the thermostat fan setting is set on the ON position (continuous fan), the motor will already be operating at the low speed air-flow level when there is a call for 1st stage cooling or heat pump heating.

If the 2-stage thermostat calls for second stage of cooling or heat pump heating, the Y signal from the thermostat will cause the VFD to ramp the motor to the high speed air-flow level. As the thermostat cycles between stages, the VFD and motor will cycle between the low and high speed air-flow levels.

When the call cooling or heat pump heating at the thermostat is satisfied or the thermostat is turned to the OFF position, the VFD will ramp down to 0 Hz and the motor will stop if the thermostat fan settings is set to AUTO position. If the thermostat fan setting is set to the ON position (continuous fan), the VFD will continue to drive the motor at the low speed level.

5.0 SYSTEM START-UP

5.5.2 Electric Heat Mode

When the thermostat calls for the first stage of heat, the first stage heater contactor (HC1) in the electric heater kit closes which energizes the first stage heater elements. If the thermostat fan setting is set to the AUTO position, the G signal from the thermostat causes the VFD to ramp the motor up to the high speed air-flow level. If the thermostat fan setting is set to the ON (continuous fan) position, then the VFD will ramp the motor from low speed air-flow to high speed air-flow.

If the thermostat calls for the second stage of heat, the second stage heater contactor (HC2) in the electric heater kit closes which energizes the second stage heater elements. The heater will then cycle between the first and second stages of heat at the direction of the thermostat.

When the call for heat at the thermostat is satisfied or the thermostat is turned to the OFF position, the heater contactor(s) open and de-energize the electric heater elements. If the thermostat fan setting is set to the AUTO position, the VFD will ramp down to 0 Hz and the motor will stop. If the thermostat fan setting is set to the ON (continuous fan) position, the VFD will ramp down to the low speed air-flow level until the next call for electric heat.

5.5.3 Approved Auxiliary Devices

WARNING: Only auxiliary devices approved by the appliance manufacturer or declared suitable with the refrigerant shall be installed in connecting ductwork.

5.5.4 Thermostat Fan Setting

If the thermostat “FAN” setting is adjusted to the “AUTO” position, the indoor blower motor will only operate when there is a call for cooling or heating. If the setting is adjusted to the “ON” position, the indoor blower motor will operate continuously at the low speed air-flow level.

5.6 Safety Checks

At all times the manufacturer’s maintenance and service guidelines must be followed. If in doubt, contact the manufacturer’s technical support for assistance.

Before leaving the installation site the following safety checks must be completed:

- Ensure all electrical components in this system are approved by the manufacturer.
- Confirm the actual refrigerant charge complies with the minimum room size requirements outlined in **3.2 A2L Refrigerant Installation Safety Data**.
- Ensure that the ventilation machinery and outlets are operating correctly and are not obstructed.
- If an indirect refrigerant circuit is being used, the secondary circuit must be checked for the presence of refrigerant.
- Ensure that all the equipment labels and markings are visible and legible. Markings, labels, and signs that are illegible must be corrected.
- Confirm that any refrigerating pipe or components are installed in a position where they are unlikely to be exposed to corrosion, unless the refrigerant-containing components are constructed of corrosion-resistant materials or are protected from corrosion.

6.0 DIAGNOSTICS

Problem	Possible Cause (Suggested Fix)
Blower motor will not operate or no air-flow	Failed motor (replace) Loose wiring connection or broken wire (check connection & wiring) Failed transformer on outdoor unit (replace) Circuit breaker or fuse is turned off or has tripped due to overcurrent or shorted circuit (check for shorts, reset breaker) Belt loose, broken, or off (adjust or replace belt) Corrupted VFD program (see VFD Installation and Operation Instructions) Failed VFD (replace)
Excessive vibration	Blower out of balance (replace or clean blower wheel)
Water overflowing drainpan	Plugged drain (clean drain) Unit not level (level unit)
Electric Heater not heating properly or not heating at all, but blower motor is operating	Over temperature limit has tripped (check for low air-flow) Over temperature limit has failed (replace) Contactor has failed (replace) One or more heating elements have burned out (replace)
Coil is frozen up	System low on refrigerant charge (check for leaks and adjust charge) Dirty return air filter due to incorrect blower sheave adjustment (adjust sheave to achieve proper air-flow) or excessively restrictive duct system (correct duct system) Belt is loose, broken, or off
Excessive air-flow	Incorrect blower sheave adjustment (adjust sheave to achieve proper air-flow)
Water blow-off from coil	Excessive air-flow (adjust sheave to achieve proper air-flow) Containment on coil fans (clean coil) Damaged coil fins (comb out fins or replace coil)
TXV not controlling properly	TXV bulb not positioned correctly or clamp is not tight (check position of TXV sensing bulb and tightness of clamp) Failed TXV (replace) Plugged TXV inlet screen (clean or replace screen or replace TXV)
The refrigerant leak detection system detects an event and mitigation procedure occurs.	Check for refrigerant leaks.
The mitigation procedure is triggered when no event occurs.	Organic compounds could be falsely triggering mitigation procedure. Check the installation location for potential contaminants. The sensor is faulty; replace the sensor.

7.0 DECOMMISSIONING

7.1 Before Beginning Decommissioning

Before carrying out decommissioning, the technician performing decommissioning must be familiar with the equipment and its safety procedures, and ensure electrical power is available to the unit. See Section **4.1.2 Working Personnel** for more information.

Before recovering the refrigerant, an oil and refrigerant sample must be taken if the technician intends to reuse the recovered refrigerant to have a record.

Before beginning any work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimized. See **4.1.6 No Ignition Sources**.

Before beginning any work on the system or conducting any hot work, ensure that the area is in the open or that it is adequately ventilated. Ventilation must continue while the unit is being worked on. Ventilation is required to safely disperse any released refrigerant into the atmosphere.

Work shall be undertaken under a controlled procedure so as to minimize the risk of flammable gas or vapor being present while work is being performed. See **2.2 Importance of a Quality Installation**.

All maintenance staff and others working in the local area shall be instructed on the nature of the work being performed. Work in confined spaces shall be avoided.

The area shall be checked with an appropriate refrigerant detector before and during work to ensure the technician is aware of potentially toxic or flammable atmospheres.

7.2 Decommissioning Procedure

Follow the decommissioning procedure outlined below:

READ ALL STEPS BEFORE BEGINNING.

1. Become familiar with the equipment, its operation, and its safety procedures.
2. Isolate the system electrically.
3. Ensure that mechanical handling equipment for the refrigerant cylinders is at hand, if required.
4. Ensure personal, protective equipment is being used correctly.
5. A competent supervisor must be present during the refrigerant recovery process. Ensure

such a person is available on site.

6. Confirm that the recovery equipment and cylinders are correct for the equipment and its refrigerant.
7. Follow the steps outlines in Section **4.7.6 Leak Testing** and Section **4.7.7 Removal and Evacuation of Refrigerant**.
8. If possible, pump down the refrigerant system.
9. If a vacuum is not possible, make a manifold so that the refrigerant can be removed from various parts of the system.
10. Make sure that the recovery cylinder is situated on the scale before recovery begins.
11. Start the recovery machine and operate it in accordance with its instructions.
12. Do not overflow the cylinders. No more than 80% volume liquid charge is allowed.
13. Do not exceed the maximum working pressure of the cylinder, even temporarily.
14. When the cylinders have been filled correctly and the process is complete, make sure that the cylinders and the recovery equipment are removed from the site promptly.
15. Verify all isolation valves on the unit are closed (off).
16. Recovered refrigerant shall not be charged into another unit unless a sample was taken prior to recovering the refrigerant and its been cleaned and checked.

When performing any maintenance or troubleshooting on the refrigerating equipment or associated parts, a dry powder or CO2 fire extinguisher shall be nearby for emergency use. Equipment must be labeled stating that is has been decommissioned and emptied of refrigerant. The label must be dated and signed. Ensure that there are label(s) on the unit stating that this equipment contains **flammable refrigerant**.

8.0 INFORMATION FOR THE OWNER

8.1 General

At least once a year, scheduled service checks must be made to verify the safety systems in this unit are working as intended.

For continuing high performance, and to minimize possible equipment failures, it is essential that periodic maintenance be performed on this equipment. This section provides general guidelines on what items require periodic maintenance and the recommended frequency for maintenance.

8.2 Cabinet Cleaning and Care

Annual cleaning of the exterior cabinet is recommended using a mild detergent, water, and cloth/sponge to remove dust, mold, and potentially corrosive contaminants that have collected on the cabinet. Do not apply wax to the cabinet since the painted surface is textured which will result in a white wax build-up.

8.3 Air Filters

Check the system filter every 30-90 days or as often as found to be necessary depending on the application. Clean or replace filters if found to be obstructed. New filters are available from a local distributor or industrial supply store.

A qualified installer, service agency, or HVAC professional should change the filters or instruct the building owner's maintenance personnel on how to access and change/clean the filters and how often this maintenance must be performed.

IMPORTANT: Do not operate the system without a filter in place as this will result in lint and contaminants accumulating on the coil resulting in reduced performance and possible icing of the coil.

8.4 Coil, Drain Pan, Drain Line

Inspect the indoor coil, drain pan, and drain line once each year for cleanliness and clean as necessary. Remove the filters and check the return side of the coil for lint and contaminants and flashlight.

IMPORTANT: Do not use caustic household drain cleaners with bleach in the condensate pan or near the indoor coil. Drain cleaners will quickly damage the indoor coil and condensate pan.

8.5 Outdoor Coil Cleaning

The outdoor fan draws air across the coil during operation which results in contaminants collecting on and between the aluminum fins. These contaminants restrict the air-

flow through the coil resulting in reduced capacity and efficiency and increases the temperature of the components that can reduce their life. Therefore, it is recommended that the outdoor coil be cleaned at least annually by a qualified service technician using a non-corrosive coil cleaner and low pressure water hose sprayer. Care must be taken not to damage or flatten out the fins by spraying the fins from an angle. Washing from the top of the coil down from the inside out is the most effective method of cleaning the coil. The exterior louver panels and unit top are easily removable to facilitate the coil cleaning task.

WARNING: Disconnect electrical power to the unit before removing the top panel or any electrical panel as the fan motor could start at any time and live electrical connections will be exposed.

8.6 Blower Lubrication & Cleaning

The ball bearing motor is pre-lubricated and does not require the addition of grease at time of installation. However, periodic cleaning out and renewing the grease in ball bearings may be necessary. Please note that extreme care must be exercised to prevent foreign matter from entering the bearing.

Over time, dust and contaminants may collect on the motor, especially if the air-filters have not been replaced or cleaned on a regular basis. The motor should be inspected annually and the exterior surface should be cleaned as needed and the air vents vacuumed out to remove any obstruction.

8.7 Blower Shaft Bearings, Bearing Collar Set Screws, Blower Wheel, Sheaves & Blower Drive Belt(s)

Inspection of the blower shaft bearings, bearing collar set screws, blower wheel, and the blower drive belt(s) is recommended every 6 months. Check bearing-collar set screws on the blower shaft to make sure they are still tight. Check the blower shaft bearings for smooth operation and lubricate or replace bearings if necessary. Inspect the blower wheel for accumulation of lint and contaminants or damage. Remove blower wheel and clean or replace if necessary. Inspect the motor and blower sheaves for excessive wear or damage and check set-screws or D bushing bolts for tightness. Replace sheaves and tighten screws and bolts as necessary. Check alignment of sheaves and adjust if necessary. Inspect the blower drive belt(s) for wear and proper tension. Replace the belt(s) and re-adjust the tension if necessary.

8.0 INFORMATION FOR THE OWNER

8.8 Motor Replacement

Only replace the blower motor with one with the equivalent voltage, horsepower rating, amp rating, and NEMA frame size to maintain factory performance and reliability.

8.9 Replacement Parts

Any replacement part used to replace parts originally supplied on equipment must be the same as or an approved alternate to the original part supplied. The manufacturer will not be responsible for replacement parts not designed to physically fit or operate within the design parameters the original parts were selected for.

These parts include but are not limited to: Heater controls, heater limit controls, heater elements, motor, motor capacitor, blower contactor, blower wheel, indoor coil, sheaves, blower shaft, bearings, and sheet metal parts.

When ordering replacement parts, it is necessary to order by part number and include with the order the complete model number and serial number from the unit data plate. (See Parts List for unit component part numbers).

All replacement parts must be compatible with R-454B refrigerant and approved by the unit manufacturer.

8.10 Refrigerant Recovery

When removing refrigerant from a unit, either for service or decommissioning, the following practices are required to safely remove the refrigerant.

When transferring the refrigerant into cylinders, ensure that only the appropriate recovery cylinders are employed.

- Ensure that the correct number of recovery cylinders are available to hold the total system charge.
- All cylinders used must be designed for recovering R-454B refrigerant.
- Cylinders shall be complete with a pressure relief valve and shut-off valves, all in working order.
- Empty recovery cylinders must be evacuated and cooled before refrigerant recovery occurs.
- The following equipment is required to be on site and in good working condition prior to and during refrigerant recovery:
 - The technician's recovery equipment
 - The recovery equipment's instructions that details the proper recovery of flammable refrigerant.
 - A set of calibrated weighing scales
 - Hoses, which must be complete with leak-free disconnect couplings.

If in doubt, contact the manufacturer about recovering flammable refrigerant.

The recovered refrigerant must be processed according to local legislation in the correct recovery cylinder, and the

relevant waste transfer note arranged. DO NOT MIX REFRIGERANTS IN RECOVERY UNITS OR RECOVERY CYLINDERS.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to make certain that the flammable refrigerant, R-454B, does not remain within the lubricant. The compressor body must not be heated by an open flame or other ignition sourced to accelerate this process. When oil is drained from a system, it shall be carried out safely.

8.11 Checking Electrical Components

Repair and maintenance of electrical components must include safety checks and component inspections.

If a fault exists that could compromise safety, then no electrical supply can be connected to the unit until the error causing the fault is repaired. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution must be used. The temporary solution must be communicated to the owner.

Initial safety checks include:

- Confirming that the capacitors are discharged. This must be done safely to avoid the possibility of sparking.
- Ensure that no live electrical components or wiring are exposed while charging, recovering, or purging the system.
- Confirm that the unit grounding is constant

8.12 Warranty Information

For more information on this unit's factory warranty, see the warranty card shipped with the unit. The warranty card is also provided on the manufacturer's website.

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