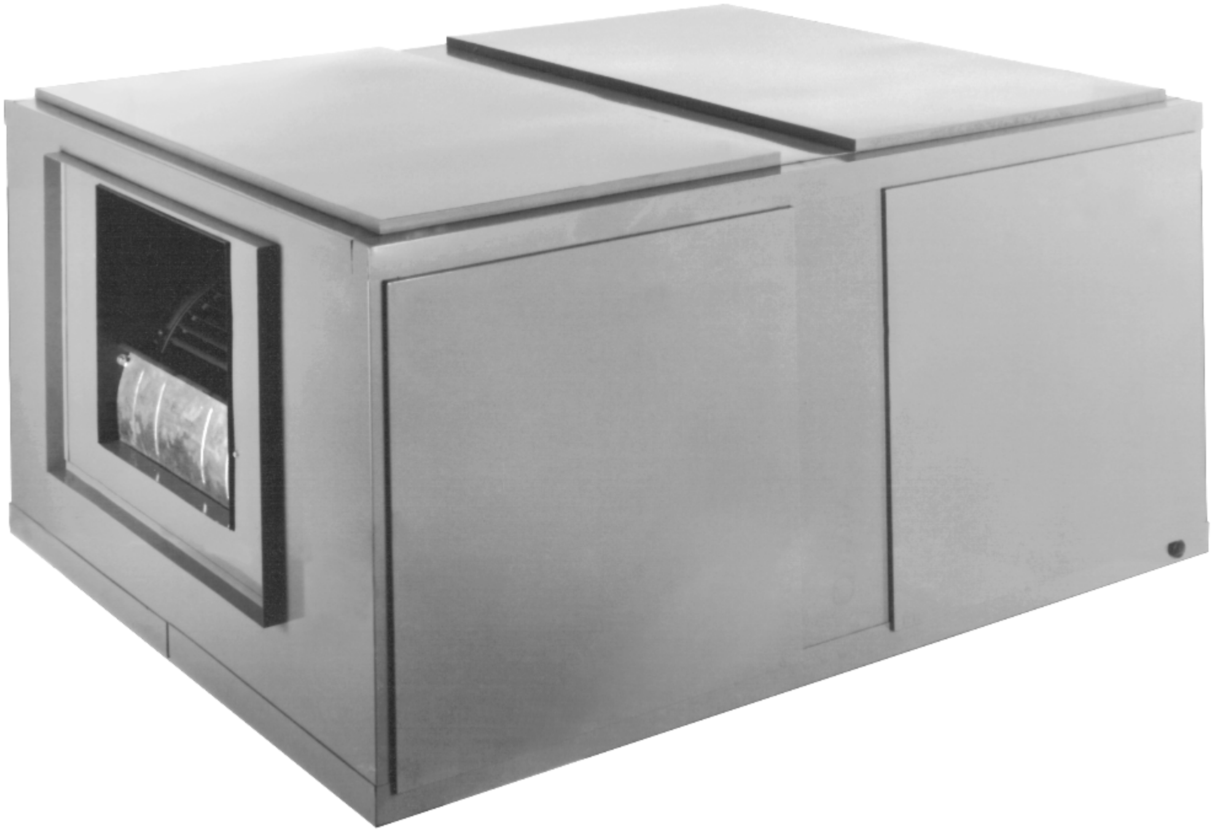
INSTALLATION INSTRUCTIONS

(-)HGL 50 & 60 Hz COMMERCIAL AIR HANDLERS
NOMINAL 7.5 - 20 TON [26 - 70 kW] AIR CONDITIONING



RECOGNIZE THIS SYMBOL AS AN INDICATION OF IMPORTANT SAFETY INFORMATION!

⚠ 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.

Accredited by the RvA

ABS Quality Evaluations, Inc. Management System Certification

ANAB ACCREDITED

ISO 9001:2008

Certificate Number: 30164

DO NOT DESTROY THIS MANUAL

PLEASE READ CAREFULLY AND KEEP IN A SAFE PLACE FOR FUTURE REFERENCE BY A SERVICEMAN

[ ] INDICATES METRIC CONVERSION

92-102775-02-03

SUPERSEDES 92-102775-02-02

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⚠ WARNING

Disconnect all power to unit before installing or servicing. More than one disconnect switch may be required to de-energize the equipment. Hazardous voltage can cause severe personal injury or death.

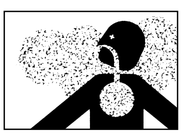
⚠ WARNING

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 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.

⚠ WARNING

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.

⚠WARNING



Carbon Monoxide (CO) Poisoning Can Cause Severe Injury or Death.

Carbon Monoxide from the exhaust of motor vehicles and other fuel burning devices can be drawn into the living space by the operation of the central heating and air conditioning system.

Exhaust from motor vehicles, generators, garden tractors, mowers, portable heaters, charcoal and gas grills, gasoline powered tools, and outdoor camping equipment contains carbon monoxide, a poisonous gas that can kill you. You cannot see it, smell it, or taste it.

- **Do NOT operate an automobile or any engine in a garage for more than the few seconds it takes to enter or exit the garage.**
- **Do NOT operate any fuel-burning device in an enclosed or partly enclosed space, or near building windows, doors or air intakes.**

The U.S. Consumer Product Safety Commission (CPSC) and Health Canada recommend the installation of UL or CSA certified Carbon Monoxide Alarm(s) in every home.

1.0 SAFETY INFORMATION

⚠ WARNING

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 (see Figure 1).

- **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 depressurization of the space and possible migration of combustion byproducts including carbon monoxide into the occupied space.**

⚠ 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.

⚠ WARNING (SEE SECTION 3.11.3: GROUNDING)

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

⚠ WARNING (SEE SECTION 3.5: DUCTWORK)

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.

⚠ WARNING (SEE SECTION 3.6: AIR FILTER)

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.

Soot damage may occur even with filters in place when certain types of candles, oil lamps or standing pilots are burned.

⚠ WARNING

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.

⚠ CAUTION (SEE SECTION 3.3: AUXILIARY OVERFLOW PAN)

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.

⚠ WARNING

PROPOSITION 65: This appliance contains fiberglass insulation. Respirable particles of fiberglass are known to the State of California to cause cancer.

All manufacturer products meet current Federal OSHA Guidelines for safety. California Proposition 65 warnings are required for certain products, which are not covered by the OSHA standards.

California's Proposition 65 requires warnings for products sold in California that contain or produce any of over 600 listed chemicals known to the State of California to cause cancer or birth defects such as fiberglass insulation, lead in brass, and combustion products from natural gas.

All "new equipment" shipped for sale in California will have labels stating that the product contains and/or produces Proposition 65 chemicals. Although we have not changed our processes, having the same label on all our products facilitates manufacturing and shipping. We cannot always know "when, or if" products will be sold in the California market.

You may receive inquiries from customers about chemicals found in, or produced by, some of our heating and air-conditioning equipment, or found in natural gas used with some of our products. Listed below are those chemicals and substances commonly associated with similar equipment in our industry and other manufacturers.

- **Glass Wool (Fiberglass) Insulation**
- **Carbon Monoxide (CO)**
- **Formaldehyde**
- **Benzene**

More details are available at the websites for OSHA (Occupational Safety and Health Administration), at www.osha.gov and the State of California's OEHHA (Office of Environmental Health Hazard Assessment), at www.oehha.org. Consumer education is important since the chemicals and substances on the list are found in our daily lives. Most consumers are aware that products present safety and health risks, when improperly used, handled and maintained.

⚠ NOTICE

When used in cooling applications, excessive sweating may occur when unit is installed in an unconditioned space. This can result in property damage.

⚠ NOTICE

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.

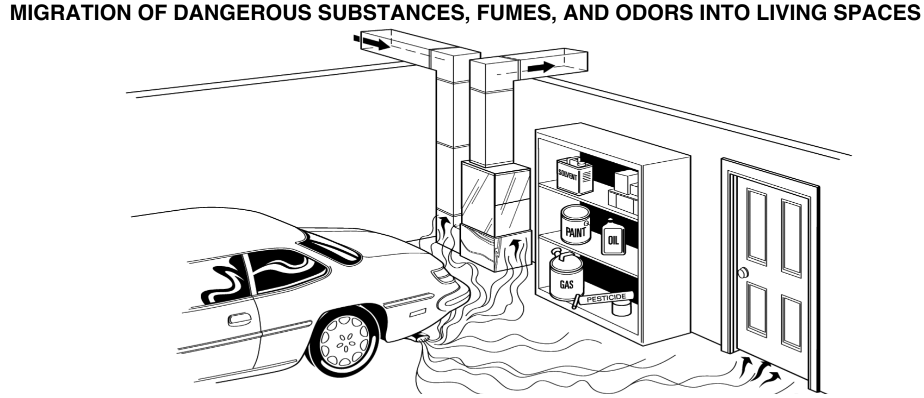
⚠ NOTICE

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.**

FIGURE 1
MIGRATION OF DANGEROUS SUBSTANCES, FUMES, AND ODORS INTO LIVING SPACES



Adapted from *Residential Duct Diagnostics and Repair*, with permission of Air Conditioning Contractors of America (ACCA).

⚠ WARNING

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2.0 GENERAL INFORMATION

2.1 IMPORTANT INFORMATION ABOUT EFFICIENCY & INDOOR AIR QUALITY

Central cooling and heating equipment is only as efficient as the duct system that carries the cooled or heated air. To maintain efficiency, comfort and good indoor air quality, it is important to have the proper balance between the air being supplied to each room and the air returning to the cooling and heating equipment.

Proper balance and sealing of the duct system improves the efficiency of the heating and air conditioning system and improves the indoor air quality of the home by reducing the amount of airborne pollutants that enter homes from spaces where the ductwork and/or equipment is located. The manufacturer and the U.S. Environmental Protection Agency's Energy Star Program recommend that central duct systems be checked by a qualified contractor for proper balance and sealing.

2.2 CHECKING PRODUCT RECEIVED

Immediately upon receipt, all cartons and contents should be inspected for transit damage. Units with damaged cartons should be opened immediately. If damage is found, it should be noted on the delivery documents and a damage claim filed with the delivering carrier.

After unit has been delivered to the job site, remove the unit from the packaging taking care not to damage the unit. Check the unit rating plate for unit model number, unit size, voltage, phase, etc. to assure the unit matches the job specifications.

Reference the unit data plate for the following information:

- Model Number
- Serial Number
- Country of Origin
- Rated Voltage and Frequency

2.3 MODEL NUMBER NOMENCLATURE

(-) H G L – 090 H K

DRIVE PACKAGE
K = STANDARD
L = OPTIONAL
M = OPTIONAL
N = OPTIONAL
O = OPTIONAL

ELECTRICAL DESIGNATION
H = 115/208-230V, 1PH, 60HZ (7½ & 10 TON ONLY)
Z = 208/230/460V, 3PH, 60HZ
V = 380V, 3PH, 60HZ
Y = 575V, 3PH, 60HZ
P = 200/220V, 3PH, 50HZ
N = 380/415V, 3PH, 50HZ

COOLING CAPACITY (NOMINAL)
090 = 90,000 BTU/HR (7½ TONS)
120 = 120,000 BTU/HR (10 TONS)
180 = 180,000 BTU/HR (15 TONS)
240 = 240,000 BTU/HR (20 TONS)

DESIGN SERIES
L = R410A

HORIZONTAL/VERTICAL, DIRECT EXPANSION

AIR HANDLER

BRAND

2.4 AVAILABLE MODELS

Available 115V/1-Phase/60 Hz Models

(-)HGL-090HK
(-)HGL-120HK

Available 230/230/460V/3-Phase/60 Hz Models

(-)HGL-090ZK	(-)HGL-120ZK	(-)HGL-180ZK	(-)HGL-240ZK
(-)HGL-090ZL	(-)HGL-120ZL	(-)HGL-180ZL	(-)HGL-240ZL
(-)HGL-090ZM	(-)HGL-120ZM	(-)HGL-180ZM	(-)HGL-240ZM

Available 380V/3-Phase/60 Hz Models

(-)HGL-090VK	(-)HGL-120VK	(-)HGL-180VK	(-)HGL-240VK
(-)HGL-090VL	(-)HGL-120VL	(-)HGL-180VL	(-)HGL-240VL
(-)HGL-090VM	(-)HGL-120VM	(-)HGL-180VM	(-)HGL-240VM

Available 575V/3-Phase/60 Hz Models

(-)HGL-090YK	(-)HGL-120YK	(-)HGL-180YK	(-)HGL-240YK
(-)HGL-090YL	(-)HGL-120YL	(-)HGL-180YL	(-)HGL-240YL
(-)HGL0090YM	(-)HGL-120YM		

Available 200/220V/3-Phase/50 Hz Models

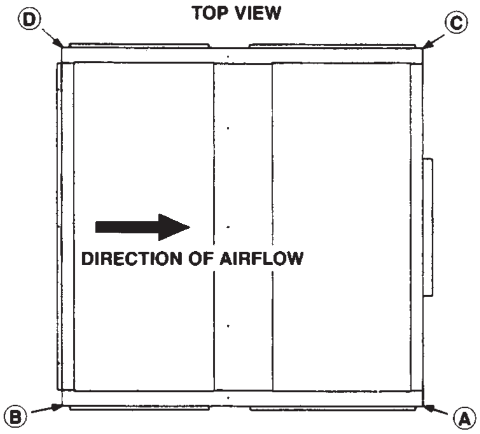
(-)HGL-090PK	(-)HGL-120PK	(-)HGL-180PK	(-)HGL-240PK
(-)HGL-090PL	(-)HGL-120PL	(-)HGL-180PL	(-)HGL-240PL
(-)HGL0090PM	(-)HGL-120PM		

Available 380/415V/3-Phase/50 Hz Models

(-)HGL-090NK	(-)HGL-120NK	(-)HGL-180NK	(-)HGL-240NK
(-)HGL-090NL	(-)HGL-120NL	(-)HGL-180NL	(-)HGL-240NL
(-)HGL0090NM	(-)HGL-120NM		

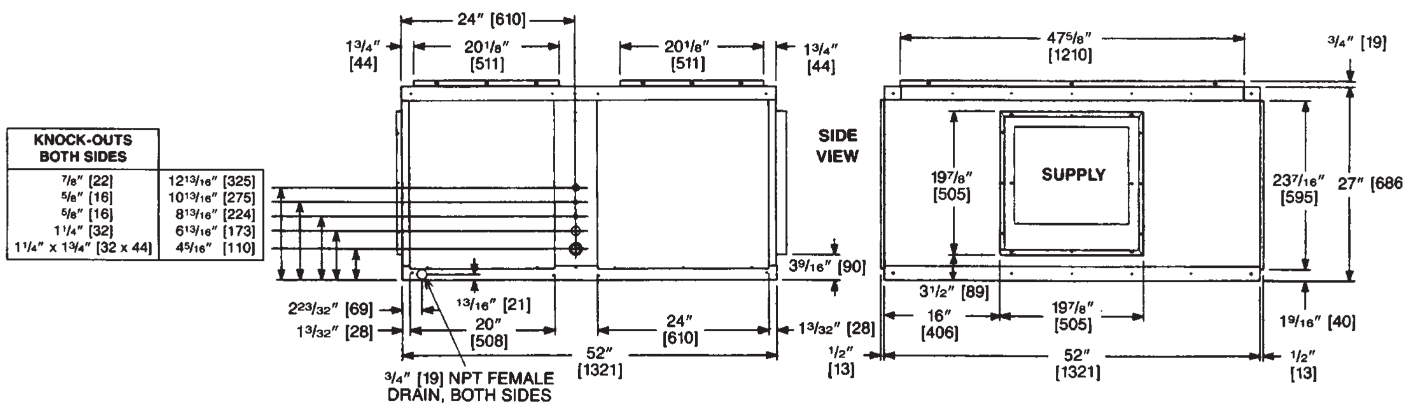
2.5 PHYSICAL DIMENSIONS – INCHES [mm]

7.5 AND 10 NOMINAL TONS [26 & 35 kW]

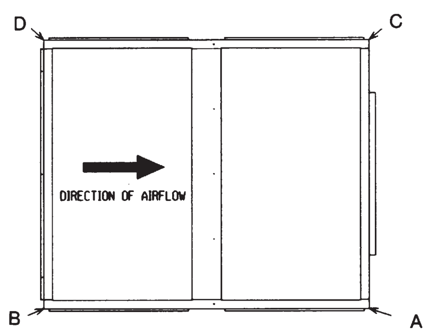


MODEL	CORNER WEIGHTS				TOTAL WEIGHT
	A	B	C	D	
7.5 TON [26 kW]	88 [40kg]	78 [35kg]	87 [39kg]	77 [35kg]	330 [150kg]
10 TON [35 kW]	93 [42kg]	82 [37kg]	92 [42kg]	80 [36kg]	347 [157kg]

RETURN AIR OPENINGS = $47^3/_8$" [1203] WIDTH x $19^7/_8$" [505] HEIGHT

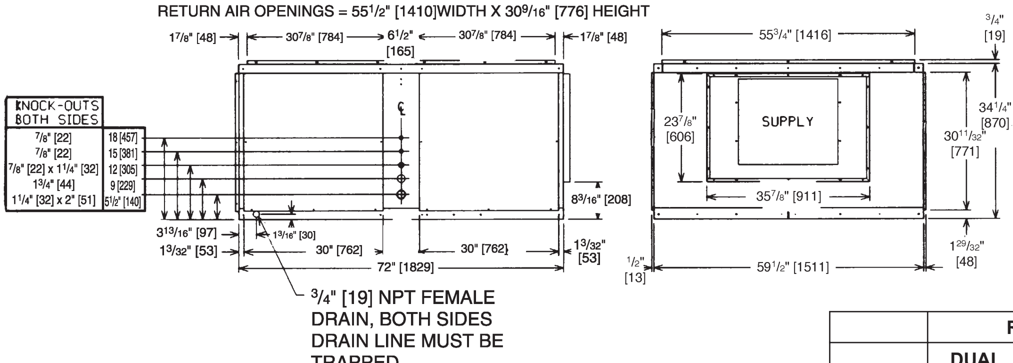


15 AND 20 NOMINAL TONS [53 & 70 kW]



MODEL	CORNER WEIGHTS				TOTAL WEIGHT
	A	B	C	D	
15 TON [53 kW]	144 [65kg]	127 [58kg]	117 [53kg]	105 [48kg]	495 [225kg]
20 TON [70 kW]	159 [72kg]	142 [64kg]	129 [59kg]	115 [52kg]	545 [247kg]

RETURN AIR OPENINGS = $55^1/_2$" [1410]WIDTH X $30^9/_{16}$" [776] HEIGHT



MODEL	REFRIGERANT STUB SIZES			
	DUAL LIQUID	DUAL SUCTION	SINGLE LIQUID	SINGLE SUCTION
090	1/8, 1/8	7/8, 7/8	1/2	1 1/8
120	1/2, 1/2	7/8, 7/8	5/8	1 3/8
180	1/2, 1/2	1 1/8, 1 1/8	5/8	1 5/8
240	5/8, 5/8	1 3/8, 1 3/8	7/8	1 5/8

2.6 PHYSICAL DATA – 50 HZ

		MODEL NO. (-)HGL-			
		090	120	180	240
Nominal Size (tons)		7.5 [26 kW]	10 [35 kW]	15 [53 kW]	20 [70 kW]
Nominal CFM @ Rated E.S.P.		2500 @ .25”	3333 @ .30”	5000 @ .35”	6670 @ .40”
MOTOR HORSEPOWER	Standard— 1750 RPM 3 Ø	1 HP	1½ HP	2 HP	5 HP
	Optional— 1750 RPM 3 Ø	1½ HP, 2 HP	2 HP, 3 HP	3 HP, 5 HP	7½ HP
Blower Size—diameter × width		12 × 12	12 × 12	18 × 15	18 × 18
Blower Shaft Diameter		¾	¾	1	1
Blower Sheave Diameter (Std.)		10	10	12	12
Motor Sheave Size Adjustment (Std.)	1750 RPM 3 Ø	3.4-4.4	4.4-5.0	3.1-4.1	4.3-5.5
Belt Type & Size Std.		A-53	A-53	B-52	B-52
Coil Face Area (sq. ft.)		10.2	10.2	16.5	16.5
Coil Tube Dia.		⅜	⅜	⅜	⅜
Coil, Rows Deep-Fins Per Inch		3/15	4/15	3/13	4/15
T.X. Valve Refrigerant Control		(2) BBIZE-3-GA	(2) CBBIZE-5-GA	(2) BBIZE-6-GA	(2) BBIZE-8-GA
Filter Size (std.)* No. Req’d		(4) 16 × 25 × 1	(4) 16 × 25 × 1	(6) 20 × 25 × 1	(6) 20 × 25 × 1
CABINET: Finish		Powder Paint	Powder Paint	Powder Paint	Powder Paint
Sheet Metal		Galvanized	Galvanized	Galvanized	Galvanized
Gauge Top		18	18	18	18
Sides		16	16	16	16
Bottom		18	18	18	18
Doors and Covers		20 min.	20 min.	20 min.	20 min.
UNIT WEIGHTS: Operating		330	347	495	545
Shipping		350	367	530	580
OPTIONAL ACCESSORIES WEIGHTS: Hot Water Coils		200	200	200	200
Steam Heating Coils		200	200	200	200
Inlet Grille		9	62	9	12
Discharge Plenum		38	38	38	62
Discharge Grille		15	15	15	23

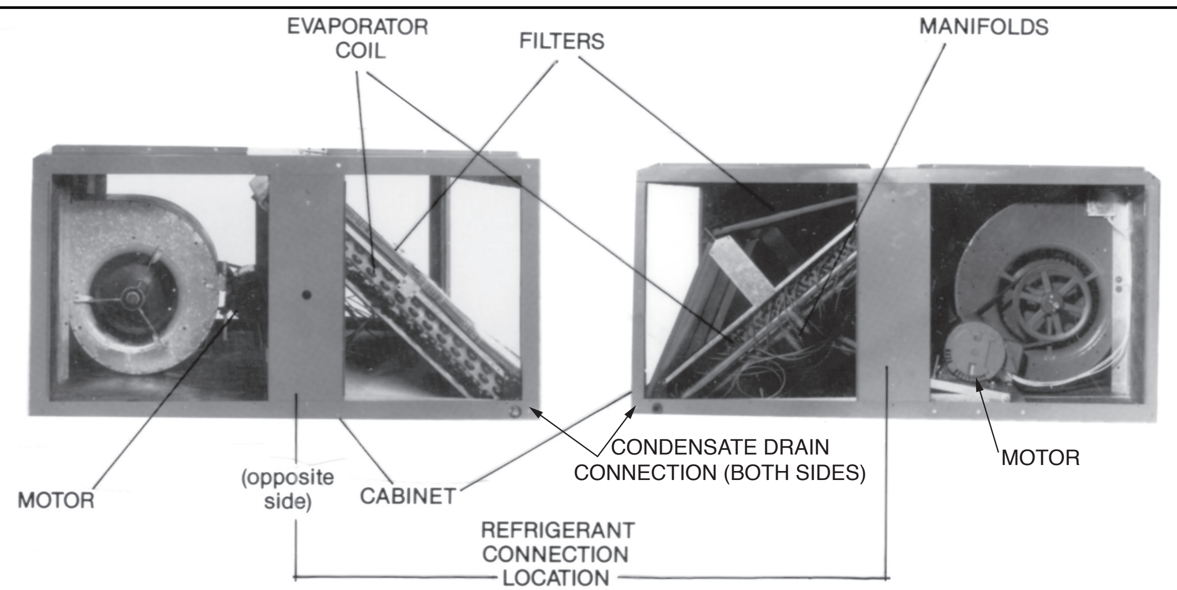
*Unit will accept 2” filters.

2.6 PHYSICAL DATA – 60 HZ

		MODEL NO. (-)HGL-			
Cooling Size		090	120	180	240
Nominal Size (tons)		7.5	10	15	20
Nominal CFM @ Rated E.S.P.		3000 @ .25”	4000 @ .30”	6000 @ .35”	8000 @ .40”
MOTOR HORSEPOWER	Standard— 3450 RPM 1 phase / 1750 RPM 3 phase	1 HP / 1 HP	2 HP / 1½ HP	2 HP	5 HP
	Optional— 1750 RPM 3 phase	1½ HP, 2 HP	2 HP, 3 HP	3 HP, 5 HP	7½ HP
Blower Size—diameter × width		12 × 12	12 × 12	18 × 15	18 × 18
Blower Shaft Diameter		¾	¾	1	1
Blower Sheave Diameter (Std.)		10	10	12	12
Motor Sheave Size Adjustment (Std.)	3450 RPM 1 phase / 1750 RPM 3 phase	1.9-2.9 / 3.4-4.4	2.4-3.2 / 4.4-5.0	3.1-4.1	4.3-5.5
Belt Type & Size Std.		A-53	A-53	B-52	B-52
Coil Face Area (sq. ft.)		10.2	10.2	16.5	16.5
Coil Tube Dia.		⅜	⅜	⅜	⅜
Coil, Rows Deep-Fins Per Inch		3/15	4/15	3/13	4/15
T.X. Valve Refrigerant Control		(2) BBIZE-3-GA	(2) CBBIZE-5-GA	(2) BBIZE-6-GA	(2) BBIZE-8-GA
Filter Size (std.)* No. Req’d		(4) 16 × 25 × 1	(4) 16 × 25 × 1	(6) 20 × 25 × 1	(6) 20 × 25 × 1
CABINET: Finish		Powder Paint	Powder Paint	Powder Paint	Powder Paint
Sheet Metal		Galvanized	Galvanized	Galvanized	Galvanized
Gauge; Top		18	18	18	18
Sides		16	16	16	16
Bottom		18	18	18	18
Doors and Covers		20 min.	20 min.	20 min.	20 min.
UNIT WEIGHTS: Operating		330	347	495	545
Shipping		350	367	530	580
OPTIONAL ACCESSORIES WEIGHTS: Hot Water Coils		200	200	200	200
Steam Heating Coils		200	200	200	200
Inlet Grille		9	62	9	12
Discharge Plenum		38	38	38	62
Discharge Grille		15	15	15	23

*Unit will accept 2” filters.

2.7 MAJOR COMPONENTS



7.5-10 nominal tons unit with side panel removed for coil connections and air filter access.

15-20 nominal tons unit with side panel removed for blower and air filter access.

2.8 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 should be selected that is properly matched to the outdoor unit. This is especially critical for heat pump systems to assure proper refrigerant charge balance between the cooling and heating modes. The recommended approach is to select an air-handler model 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.

2.9 IMPORTANCE OF A QUALITY INSTALLATION

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 the outdoor unit installation instructions 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, Chapter XX, Part 3280.

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.

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

3.0 INSTALLATION

3.1 TOOLS & REFRIGERANT

3.1.1 TOOLS REQUIRED FOR INSTALLING AND SERVICING R-410A MODELS

Manifold Sets:

• Up to 800 PSIG High-Side

• Up to 250 PSIG Low-Side

• 550 PSIG Low-Side Retard

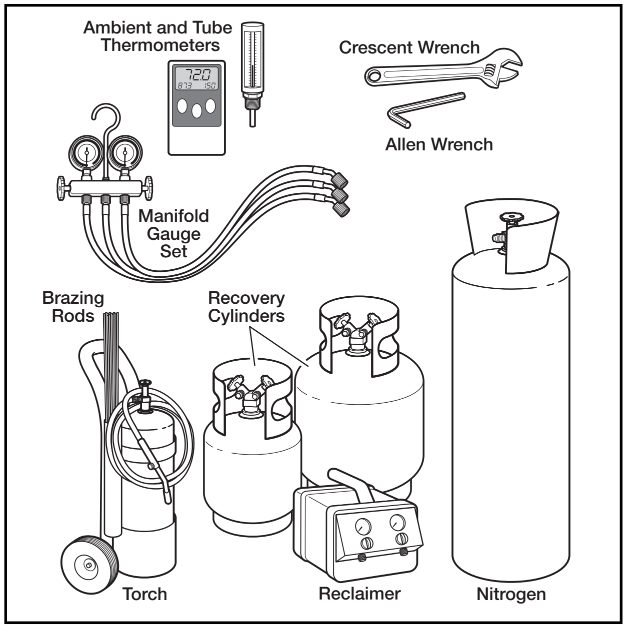
Manifold Hoses:

• Service Pressure Rating of 800 PSIG

Recovery Cylinders:

• 400 PSIG Pressure Rating

• Dept. of Transportation 4BA400 or BW400



⚠ NOTICE

R-410A systems operate at higher pressures than R-22 systems. Do not use R-22 service equipment or components on R-410A equipment.

3.1.2 SPECIFICATIONS OF R-410A

Application: R-410A is not a drop-in replacement for R-22. Equipment designs must accommodate its higher pressures. It cannot be retrofitted into R-22 heat pumps.

Physical Properties: R-410A has an atmospheric boiling point of -62.9°F [-52.7°C] and its saturation pressure at 77°F [25°C] is 224.5 psig.

Composition: R-410A is a near-azeotropic mixture of 50% by weight difluoromethane (HFC-32) and 50% by weight pentafluoroethane (HFC-125).

Pressure: The pressure of R-410A is approximately 60% (1.6 times) greater than R-22. Recovery and recycle equipment, pumps, hoses, and the like must have design pressure ratings appropriate for R-410A. Manifold sets need to range up to 800 psig high-side and 250 psig low-side with a 550 psig low-side retard. Hoses need to have a service pressure rating of 800 psig. Recovery cylinders need to have a 400 psig service pressure rating, DOT 4BA400 or DOT BW400.

Combustibility: At pressures above 1 atmosphere, a mixture of R-410A and air can become combustible. **R-410A and air should never be mixed in tanks or supply lines or be allowed to accumulate in storage tanks. Leak checking should never be done with a mixture of R-410A and air.** Leak-checking can be performed safely with nitrogen or a mixture of R-410A and nitrogen.

3.1.3 QUICK-REFERENCE GUIDE FOR R-410A

- R-410A refrigerant operates at approximately 60% higher pressure (1.6 times) than R-22. Ensure that servicing equipment is designed to operate with R-410A.
- R-410A refrigerant cylinders are light rose in color.
- R-410A, as with other HFCs, is only compatible with POE oils.
- Vacuum pumps will not remove moisture from POE oil used in R-410A systems.
- R-410A systems are to be charged with liquid refrigerants. Prior to March 1999, R-410A refrigerant cylinders had a dip tube. These cylinders should be kept upright for equipment charging. Post-March 1999 cylinders do not have a dip tube and should be inverted to ensure liquid charging of the equipment.
- Do not install a suction line filter drier in the liquid line.
- A factory-approved outdoor liquid line filter drier is shipped with every unit and must be installed in the liquid line at the time of installation. If only the air-handler is being replaced on an existing system, the existing filter drier must be replaced at the time of installation with a field supplied filter drier. **IMPORTANT:** A bi-flow filter drier must be used for heat pump applications. Filter driers must be rated for 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-410A refrigerant.

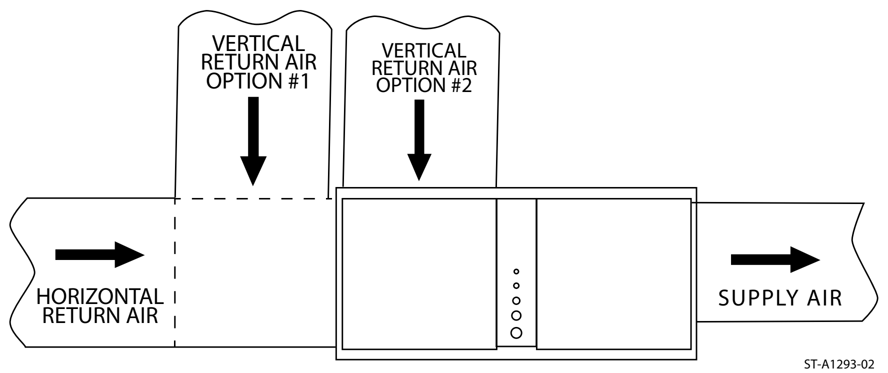
3.2 APPLICATIONS & ORIENTATION

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

3.2.1 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 2. For a vertical return duct, relocate the return air panel on top of the air-handler to cover the side return air opening.

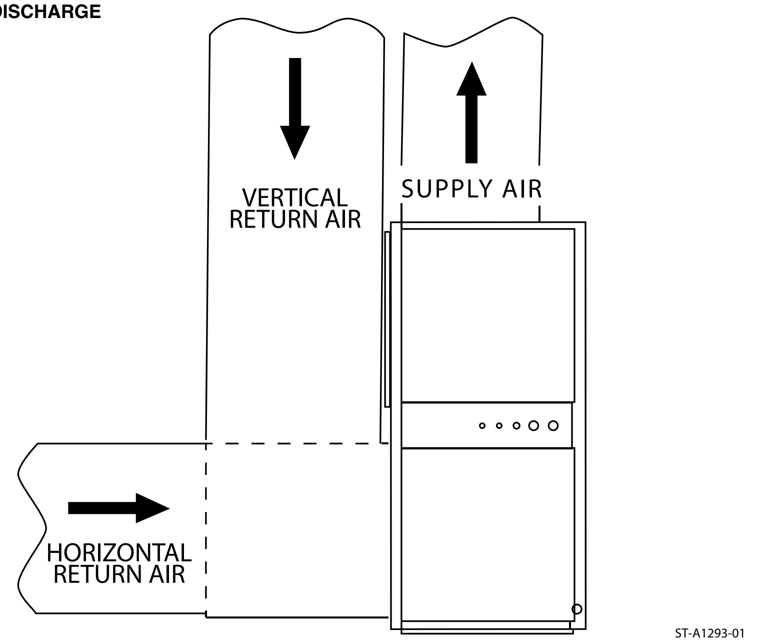
FIGURE 2
HORIZONTAL DISCHARGE



3.2.2 VERTICAL UP DISCHARGE

The air-handler may be installed in the vertical discharge configuration with a horizontal return duct as shown in Figure 3. Relocate the return air panel to cover the other return air opening to allow for the horizontal return duct.

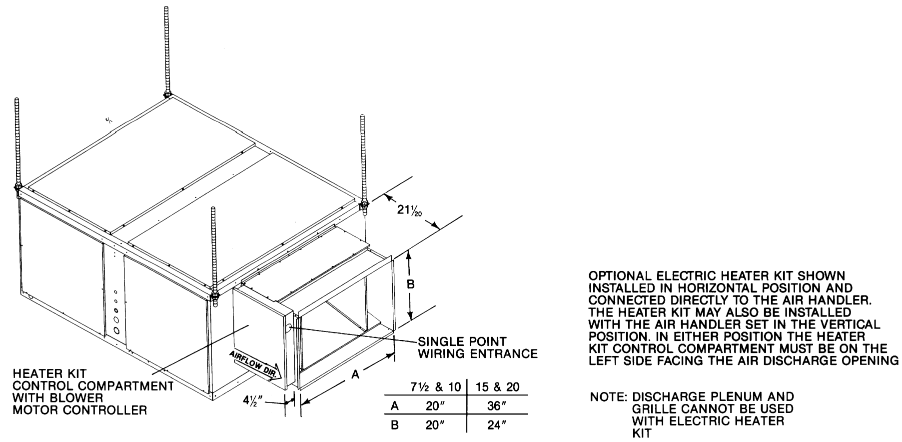
FIGURE 3
VERTICAL UP DISCHARGE



3.2.3 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 4. 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 Section 6.1 for information concerning the available heater kits.

FIGURE 4
APPLICATIONS REQUIRING ELECTRIC HEAT



3.2.4 SUSPENDING UNIT

Four heavy gauge angles are furnished in the parts bag shipped with the air-handler for suspending the unit from all four corners as shown in Figure 4 above. ½" minimum support rods are recommended. If "All-Thread" rods are used, it is recommended that two nuts and two lock washers be tightened securely against the suspension angles.

When the air-handler is suspended as illustrated, hot water or steam coils, mixing boxes, and discharge air plenums cannot be mounted due to weight limitations. In these applications, an alternate suspension method such as field supplied angles or channels must be located underneath the air-handler.

3.2.5 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 3.3)

3.2.6 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.

3.3 AUXILIARY OVERFLOW PAN

In compliance with recognized codes, an auxiliary overflow pan must 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.

3.4 CLEARANCES

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

3.5 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:** The front flange on the return duct if connected to the blower casing must not be screwed into the area where the power wiring is located. Drills or sharp screw points can damage insulation on wires located inside unit.
- 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.

3.6 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 2.7). 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.

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 airflow through the coil.

3.7 REFRIGERANT LINE CONNECTIONS & CHARGING

3.7.1 PREPARATION

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.

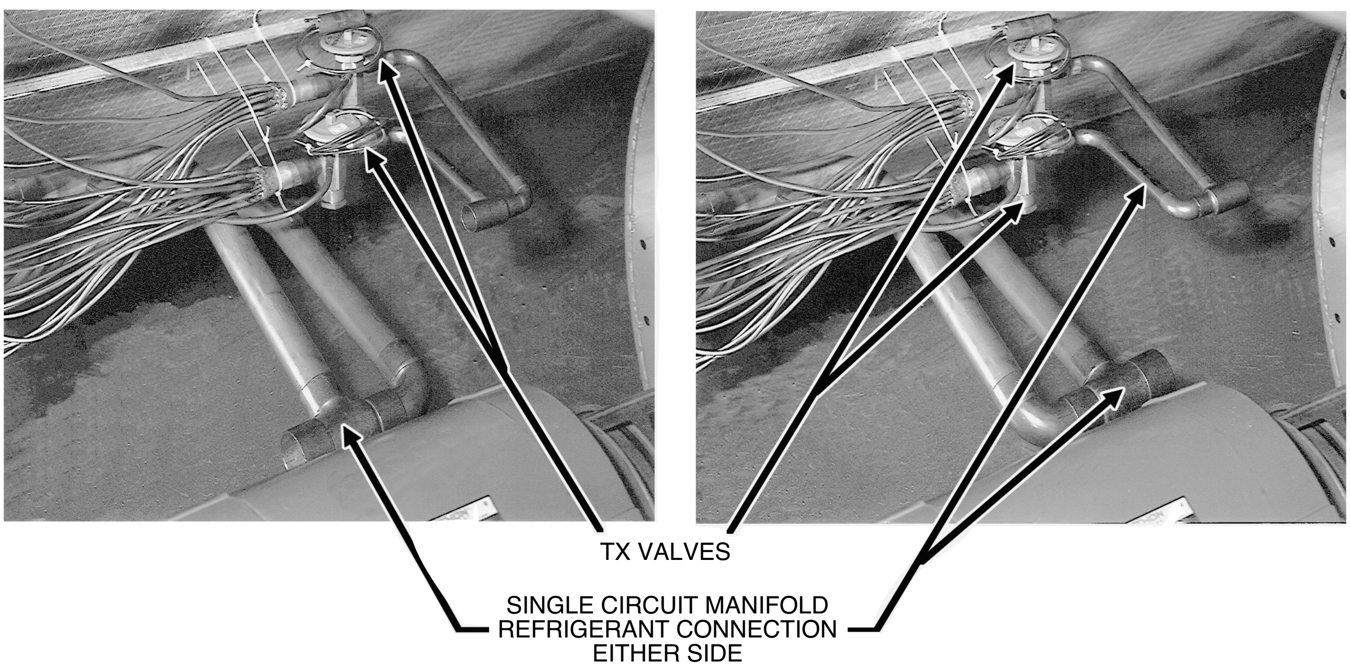
Refer to the outdoor unit installation instructions for details on refrigerant line sizing and installation.

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

3.7.2 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 5.

FIGURE 5



3.7.3 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. A liquid line solenoid installed just ahead of the expansion valve is recommended.
9. See tables below for general refrigerant line sizing and equivalent length of valves and fittings.
10. 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.

PIPING SIZES 7.5-10 TONS [26 - 35 kW] (INCHES)			
EQUIV. LENGTH TO EVAP. (FT.)	LIQUID LINE O.D.	SUCTION LINE O.D.	
	7.5-10 [26 - 35 kW]	7.5 [26 kW]	10 [35 kW]
0-50 [0-15m]	⅝ [26mm]	1⅛ [29mm]	1⅜ [35mm]
51-100 [16-30m]	⅝ [26mm]	1⅜ [35mm]	1⅝ [41mm]
101-150 [31-46m]	⅝ [26mm]	1⅝ [41mm]	1⅝ [41mm]

PIPING SIZES 15-20 TONS [53 - 70 kW] (INCHES)				
EQUIV. LENGTH TO EVAP. (FT.)	LIQUID LINE O.D.		SUCTION LINE O.D.	
	15 [53 kW]	20 [70 kW]	15 [53 kW]	20 [70 kW]
0-50 [0-15m]	¾ [19mm]	⅞ [22mm]	1⅜ [35mm]	1⅝ [41mm]
51-100 [16-30m]	¾ [19mm]	⅞ [22mm]	1⅝ [41mm]	2⅛ [54mm]
101-150 [31-46m]	¾ [19mm]	⅞ [22mm]	2⅛ [54mm]	2⅛ [54mm]

EQUIVALENT LENGTH, FT. [m] OF STRAIGHT TYPE "L" TUBING FOR NON-FERROUS VALVES AND FITTINGS (BRAZED)						
TUBE SIZE INCHES [mm] O.D.	SOLE-NOID VALVE	ANGLE VALVE	SHORT RADIUS ELL	LONG RADIUS ELL	TEE LINE FLOW	TEE BRANCH FLOW
1/2 [13]	12 [3.7]	8.3 [2.5]	1.6 [0.5]	1.0 [0.3]	1.0 [0.3]	3.1 [0.9]
5/8 [16]	15 [4.6]	10.4 [3.2]	1.9 [0.8]	1.2 [0.4]	1.2 [0.4]	3.6 [1.1]
3/4 [19]	18 [5.5]	12.5 [3.8]	2.1 [0.7]	1.4 [0.4]	1.4 [0.4]	4.2 [1.3]
7/8 [22]	21 [6.4]	14.8 [4.4]	2.4 [0.7]	1.6 [0.5]	1.6 [0.5]	4.8 [1.5]
1 1/8 [29]	12 [3.7]	18.8 [5.7]	3.0 [0.9]	2.0 [0.6]	2.0 [0.6]	6.0 [1.8]
1 3/8 [35]	15 [4.6]	22.9 [7.0]	3.6 [1.1]	2.4 [0.7]	2.4 [0.7]	7.2 [2.2]
1 5/8 [41]	18 [5.5]	27.1 [8.3]	4.2 [1.3]	2.8 [0.8]	2.8 [0.8]	8.4 [2.6]
2 1/8 [54]	21 [6.4]	35.4 [10.8]	5.3 [1.6]	3.5 [1.1]	3.5 [1.1]	10.7 [3.3]

3.7.4 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's 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.

3.7.5 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.

3.7.6 LEAK TESTING

After all braze joints are completed, replace the valve core removed when purging with nitrogen and then leak test the system by pressurizing to 150 psig with dry nitrogen and allow the system to sit for at least 15 minutes (longer if possible) to assure the pressure does not drop.

3.7.7 EVACUATION

If no leaks are detected, open the outdoor unit service valves for outdoor units shipped with a nitrogen holding charge and evacuate the system down to 500 microns or below before charging the system. Failure to reach 500 microns of vacuum is a sign of a leak or excessive moisture inside the system. For outdoor units shipped charged with R-410A, do not open the service valves until the evacuation process is complete.

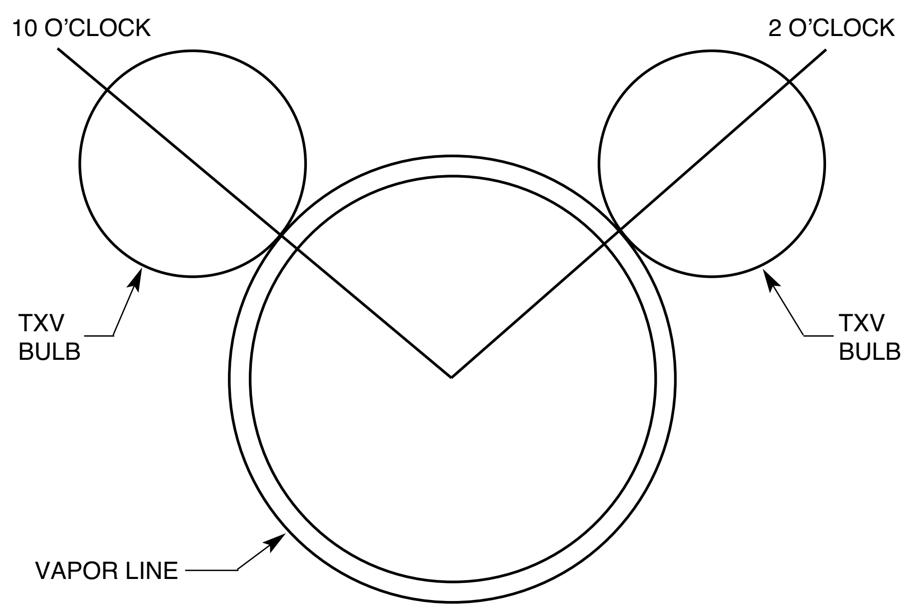
3.7.8 REFRIGERANT CHARGING

Once the evacuation process is completed, break the vacuum with the refrigerant from a refrigerant cylinder (or with refrigerant stored in the outdoor unit by opening the outdoor unit service valves if the outdoor unit is charged with R-410A). The charging process cannot be completed until the remaining steps in the installation process are completed and the indoor air-flow is adjusted to the proper level. See Section 4.4 for further details.

3.8 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 6) with the strap provided in the parts bag.

FIGURE 6
BULB LOCATION – HORIZONTAL SECTION OF VAPOR LINE



3.9 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.

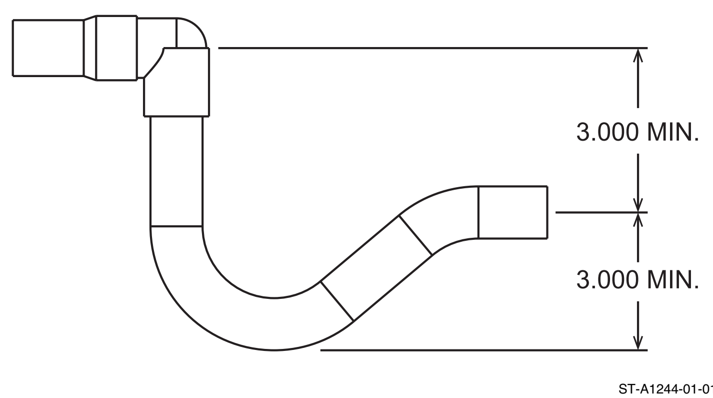
Consult local codes or ordinances for specific requirements.

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 overtighten. Overtightening 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 7).
- 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.

FIGURE 7
CONDENSATE DRAIN TRAP



3.10 THERMOSTAT

See instructions for the condensing unit or heat pump 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.

3.11 ELECTRICAL WIRING

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

3.11.1 CONFIGURING MOTOR FOR 460V ELECTRICAL POWER

208/230/460V 60Hz models (Z voltage designation) are shipped with the blower motor configured for 208/230V. For 460V applications, the motor must be re-configured for 460V power. Some models with 1 – 3 horsepower motors have a voltage change plug in the motor junction box that can be pulled out, turned over, and reinserted to re-configure the motor for 460V operation. For motors without the voltage change plug, the wires in the motor junction box must be re-wired for 460V operation per the label on the outside of the motor and reconnected with wire nuts to the motor power leads from the air-handler junction box.

3.11.2 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 Sections 3.11.4 and 3.11.5 for ampacity, wire size and circuit protector requirement. Supply circuit protective devices may be either fuses or circuit breakers.

3.11.2.1 NO-HEAT APPLICATIONS

If electric heat is not installed, a field supplied blower motor contactor must be installed in the air-handler junction box. The leads from the motor must be connected to the load side of the contactor and the incoming power must be connected to the line side of the contactor. Refer to the wiring connection diagrams in Section 3.11.10 for typical wiring connections for non-electric heat applications.

IMPORTANT: Certain models intended for the international market are equipped with a factory installed blower contactor located in the air-handler junction box and therefore do not require a contactor to be field installed.

3.11.2.2 ELECTRIC HEAT APPLICATIONS

If an RXHE 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 junction box and connected to the motor leads with wire nuts or compression connectors inside the junction box. Refer to the wiring connection diagrams in Section 3.11.10 for typical wiring connections for electric heat applications.

IMPORTANT: If an RXHE electric heater kit is installed on a model with a factory installed contactor, the motor power leads from the heater kit must connect directly to the leads from the motor inside the junction box, thus bypassing the contactor located in the air-handler junction box. This must be done to allow the blower contactor in the heater kit to control the operation of the blower in coordination with the heater operation.

3.11.3 GROUNDING

- This product must be sufficiently grounded in accordance with National Electrical Code (C.E.C. in Canada) and any applicable local ordinance.

⚠ WARNING

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

- 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 unit wiring compartment.

3.11.4.1 ELECTRICAL DATA – WITHOUT ELECTRIC HEAT – 50 Hz

AIR HANDLER MOTOR			RATING PLATE AMPS	MOTOR LRA	MINIMUM CIRCUIT AMPACITY	RECOMMENDED MINIMUM Cu WIRE SIZE (3% VOLTAGE 75°C DROP) MAX. RUN IN FEET	MAX. FUSES BREAKERS
HP [W]	VOLTS	PHASE					
1 [746]	200/220	3Ø	4.0/3.6	23.9/21.6	15	#14/240	15
1 [746]	380/415	3Ø	1.8	10.8	15	#14/400	15
1 1/2 [1119]	200/220	3Ø	5.7/5.2	34.5/31.2	15	#14/230	15
1 1/2 [1119]	380/415	3Ø	2.6	15.6	15	#14/300	15
2 [1491]	200/220	3Ø	7.5/6.8	45.1/40.8	15	#14/165	15
2 [1491]	380/415	3Ø	3.4	20.4	15	#14/275	15
3 [2237]	200/220	3Ø	10.6/9.6	64.1/58	15	#14/135	15
3 [2237]	380/415	3Ø	4.8	26.8	15	#14/230	15
5 [3729]	200/220	3Ø	16.7/15.2	100.6/91	21/19	#10/240 #12/150	25/20
5 [3729]	380/415	3Ø	7.6	45.6	15	#14/185	15
7 1/2 [5593]	200/220	3Ø	24.2/22.0	146/132	30/28	#10/150	30/30
7 1/2 [5593]	380/415	3Ø	11.0	66	15	#14/135	15

NOTE: N.E.C., C.E.C. and local codes take precedence over suggested wire and fuse sizes.
[ ] Designates Metric Conversions

3.11.4.2 ELECTRICAL DATA – WITHOUT ELECTRIC HEAT – 60 Hz

AIR HANDLER MOTOR			RATING PLATE AMPS	MOTOR LRA	MINIMUM CIRCUIT AMPACITY	RECOMMENDED MINIMUM Cu WIRE SIZE (3% VOLTAGE 75°C DROP) MAX. RUN IN FEET	MAX. FUSES BREAKERS
HP [W]	VOLTS	PHASE					
1 [746]	208-230	3Ø	4.0/3.6	23.9/21.6	15	#14/240	15
1 [746]	460	3Ø	1.8	10.8	15	#14/400	15
1 [746]	575	3Ø	1.4	8.4	15	#14/425	15
1 [746]	115-230	1Ø	16/8	96/48	20/15	#12/120 #14/180	20/15
1 1/2 [1119]	208-230	3Ø	5.7/5.2	34.5/31.2	15	#14/230	15
1 1/2 [1119]	460	3Ø	2.6	15.6	15	#14/300	15
1 1/2 [1119]	575	3Ø	2.1	12.6	15	#14/325	15
2 [1491]	208-230	3Ø	7.5/6.8	45.1/40.8	15	#14/165	15
2 [1491]	460	3Ø	3.4	20.4	15	#14/275	15
2 [1491]	575	3Ø	2.7	16.2	15	#14/300	15
2 [1491]	115-230	1Ø	24/12	144/72	30/15	#10/140 #14/120	30/15
3 [2237]	208-230	3Ø	10.6/9.6	64.1/58	15	#14/135	15
3 [2237]	460	3Ø	4.8	26.8	15	#14/230	15
3 [2237]	575	3Ø	3.9	23.4	15	#14/240	15
5 [3729]	208-230	3Ø	16.7/15.2	100.6/91	21/19	#10/240 #12/150	25/20
5 [3729]	460	3Ø	7.6	45.6	15	#14/185	15
5 [3729]	575	3Ø	6.1	36.6	15	#14/220	15
7 1/2 [5593]	208-230	3Ø	24.2/22.0	146/132	30/28	#10/150	30/30
7 1/2 [5593]	460	3Ø	11.0	66	15	#14/135	15
7 1/2 [5593]	575	3Ø	9.0	54	15	#14/150	15

NOTE: N.E.C., C.E.C. and local codes take precedence over suggested wire and fuse sizes.
[ ] Designates Metric Conversions

3.11.5.1 ELECTRICAL DATA – WITH ELECTRIC HEAT – 50 Hz

AIR HANDLER NOM. TONNAGE [kW]/HEATER NOM. 240V K.W. 1ST STAGE/TOTAL	AMPS HEATER ONLY	HEATER KIT CAPACITY KW INPUT	HEATING CAPACITY— MBH [kW]	MINIMUM CIRCUIT AMPACITY	MAXIMUM FUSE OR HACR BREAKER SIZE
200/220 VOLT MODELS					
7.5 [26], 10/20	42/48	15/20	51,200/68,300 [15/20]	66/72	70/80
7.5 [26], 15/30	60/70	21.6/28.8	73,700/98,300 [22/29]	88/100	90/100
7.5 [26], 20/40	83/96	30/40	102,400/136,500 [30/40]	117/132	125/150
15 [53], 10/20	42/48	15/20	51,200/68,300 [15/20]	83/88	90/90
15 [53], 15/30	60/70	21.6/28.8	73,700/98,300 [22/29]	105/115	110/125
15 [53], 20/40	83/96	30/40	102,400/136,500 [30/40]	134/148	150/150
15 [53], 30/60	120/139	43.2/57.6	147,500/196,600 [43/58]	180/201	200/225
380/415 VOLT MODELS					
7.5 [26], 10/20	19/21	12.5/15	42,800/51,000 [13/15]	30/32	30/35
7.5 [26], 10/30	28/30	18.1/21.5	61,600/73,500 [18/22]	41/44	45/45
7.5 [26], 10/40	38/42	25.1/29.9	85,600/102,000 [25/30]	54/58	60/60
15 [53], 20/20	19/21	12.5/15	42,800/51,000 [13/15]	38/40	40/40
15 [53], 20/30	28/30	18.1/21.5	61,600/73,500 [18/22]	49/52	50/60
15 [53], 20/40	38/42	25.1/29.9	85,600/102,000 [25/30]	62/66	70/70
15 [53], 20/60	55/60	36.1/43.1	123,200/147,000 [36/43]	83/89	90/90

3.11.5.2 ELECTRICAL DATA – WITH ELECTRIC HEAT – 60 Hz

AIR HANDLER MODEL	HEATER KIT MODEL	HEATER KIT VOLTAGE	HEATER KIT [kW]	HEATER KIT AMPS	HEATING CAPACITY [kW]	HEATING CAPACITY MBH	MINIMUM CIRCUIT AMPACITY	MAX. FUSE OR HACR BREAKER SIZE
RHGL-090 / RHGL-120	RXHE-DE020CA	208/240	20	43.1/48.9	15.6/20.2	53.2/68.9	67/73	70/80
RHGL-090 / RHGL-120	RXHE-DE030CA	208/240	30	60.8/70.2	22.0/29.6	75.1/101	89/100	90/100
RHGL-090 / RHGL-120	RXHE-DE020DA	480	20	24.7	20.2	68.9	37	40
RHGL-090 / RHGL-120	RXHE-DE030DA	480	30	35	29.7	101.3	50	50
RHGL-180 / RHGL-240	RXHE-CE030CC	208/240	30	60/70	21.6/28.8	73.7/98.3	105/115	110/125
RHGL-180 / RHGL-240	RXHE-CE040CC	208/240	40	83/96	30/40	102.4/136.5	134/148	150/150
RHGL-180 / RHGL-240	RXHE-CE030DC	480	30	35	28.8	98.3	58	60
RHGL-180 / RHGL-240	RXHE-CE040DC	480	40	48	40	136.5	74	80

3.11.6 COPPER WIRE SIZE - AWG. (3% VOLTAGE DROP)

SUPPLY WIRE LENGTH FEET																	
200 [61]	12	10	8	8	8	6	6	6	4	4	3	3	2	2	1	0	00
150 [46]	12	10	10	10	8	8	6	6	6	4	4	3	3	2	1	0	00
100 [30]	14	12	10	10	8	8	8	6	6	4	4	3	3	2	1	0	00
50 [15]	14	12	10	10	8	8	8	6	6	4	4	3	3	2	1	0	00
	15	20	25	30	35	40	45	50	60	70	80	90	100	110	125	150	175

SUPPLY CIRCUIT AMPACITY

NOTE: WIRE BASED ON COPPER CONDUCTORS 75°C MINIMUM RATING. FOR MORE THAN 3 CONDUCTORS IN A RACEWAY OR CABLE, SEE N.E.C. FOR DERATING THE AMPACITY OF EACH CONDUCTOR.

3.11.7 ELECTRIC HEATER KIT IDENTIFICATION LABEL

Mark the appropriate box on the Electric Heater Kit Identification Label (See Figure 8 below) located on the air-handler cabinet for the benefit and safety of future service technicians.

FIGURE 8

SUITABLE FOR USE WITH HEATER KITS

INSTALLER TO INDICATE WHICH HEATER IF ANY HAS BEEN INSTALLED. REFERENCE HEATER KIT RATING PLATE FOR BRANCH CIRCUIT DATA IF OPTIONAL HEATER KIT IS INSTALLED.

NO SUPPLEMENTARY ELECTRIC HEAT INSTALLED ☐
RXHE-DE020CA ☐
RXHE-DE030CA ☐
RXHE-DE020DA ☐
RXHE-DE030DA ☐

3.11.8 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.

TABLE 1

FIELD WIRE SIZE FOR 24 VOLT THERMOSTAT CIRCUITS

Thermostat Load - Amps	SOLID COPPER WIRE - AWG.					
3.0	16	14	12	10	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.

3.11.8.1 NO-HEAT APPLICATIONS

The appropriate thermostat control wires must also be connected to the coil of the field or factory installed blower contactor to energize the blower motor when there is a call for blower operation (G signal and common). Knockouts are provided on each side of the air-handler for connecting low voltage conduit or plastic bushing. Refer to the wiring connection diagrams in Section 3.11.9 for typical wiring connections for non-electric heat applications.

3.11.8.2 ELECTRIC HEAT APPLICATIONS

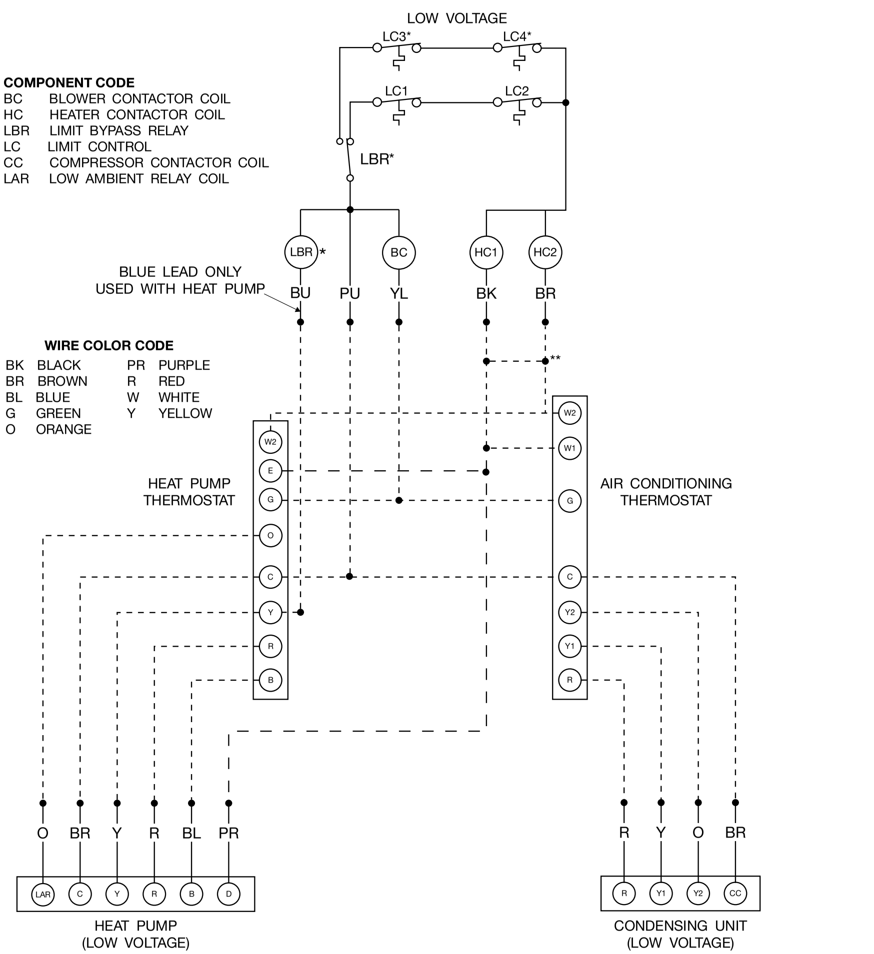
The appropriate thermostat control wires must also be connected to the thermostat pig-tails on the heater kit which will allow the blower operation to be based on the heater operation and thermostat inputs. Refer to the wiring connection diagrams in Section 3.11.9 for typical wiring connections for electric heat applications.

3.11.8.3 CONFIGURING OUTDOOR UNIT TRANSFORMER FOR 200V, 208V, & 380V APPLICATIONS

For 200V, 208V, and some 380V 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 operating at the low end of the unit voltage range.

3.11.9 WIRING CONNECTION DIAGRAMS

TYPICAL LOW VOLTAGE WIRING CONNECTIONS FOR SINGLE CONDENSING UNIT OR HEAT PUMP AND OPTIONAL ELECTRIC HEAT



COMPONENT CODE

BC BLOWER CONTACTOR COIL
HC HEATER CONTACTOR COIL
LBR LIMIT BYPASS RELAY
LC LIMIT CONTROL
CC COMPRESSOR CONTACTOR COIL
LAR LOW AMBIENT RELAY COIL

WIRE COLOR CODE

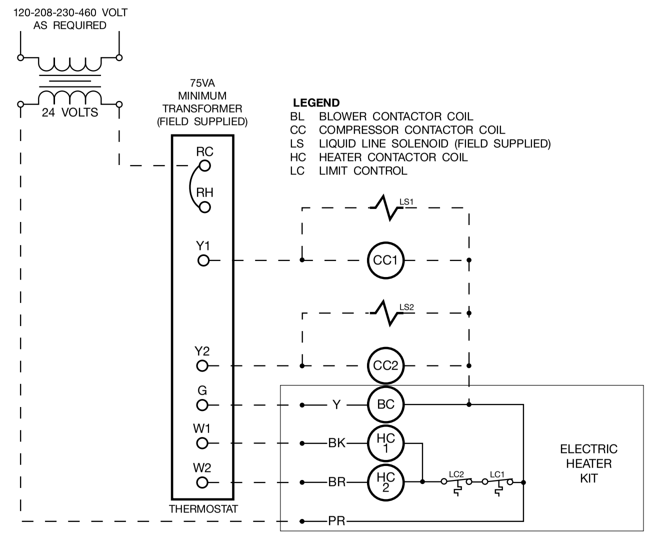
BK	BLACK	PR	PURPLE
BR	BROWN	R	RED
BL	BLUE	W	WHITE
G	GREEN	Y	YELLOW
O	ORANGE		

*LBR, LC3 AND LC4 NOT REQUIRED ON 208/240 V KITS RATED 20KW & 30KW OR KITS INSTALLED ON 15 TON OR 20 TON AIR HANDLERS

**W1 AND W2 CAN BE CONNECTED TOGETHER FOR MAXIMUM TEMPERATURE RISE IN THE HEATING MODE.

ST-A1292-01

TYPICAL WIRING CONNECTIONS FOR DUAL CIRCUIT AIR HANDLER, DUAL CONDENSING UNITS AND OPTIONAL ELECTRIC HEAT

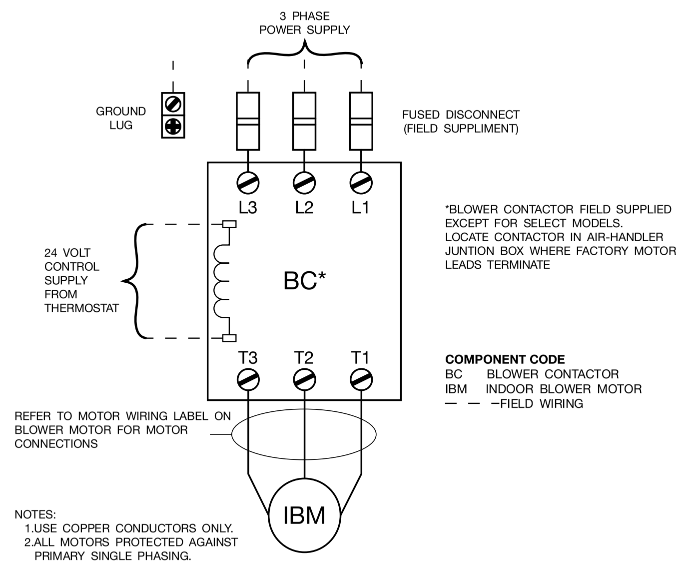


LEGEND

BL BLOWER CONTACTOR COIL
CC COMPRESSOR CONTACTOR COIL
LS LIQUID LINE SOLENOID (FIELD SUPPLIED)
HC HEATER CONTACTOR COIL
LC LIMIT CONTROL

ST-A1292-01

TYPICAL POWER WIRING - WITHOUT ELECTRIC HEAT (See Note 3)



*BLOWER CONTACTOR FIELD SUPPLIED EXCEPT FOR SELECT MODELS. LOCATE CONTACTOR IN AIR-HANDLER JUNTION BOX WHERE FACTORY MOTOR LEADS TERMINATE

COMPONENT CODE

BC BLOWER CONTACTOR
IBM INDOOR BLOWER MOTOR
— — —FIELD WIRING

NOTES:
1.USE COPPER CONDUCTORS ONLY.
2.ALL MOTORS PROTECTED AGAINST PRIMARY SINGLE PHASING.
3.REFER TO ELECTRIC HEATER KIT INSTRUCTIONS FOR POWER WIRING ON APPLICATIONS WITH ELECTRIC HEAT. FIELD POWER WIRING IS CONNECTED TO HEATER KIT TERMINAL BLOCK AND PIGTAILS FROM HEATER KIT CONNECT TO BLOWER MOTOR LEADS IN AIR-HANDLER JUNCTION BOX.

ST-A1292-01

3.12 AIR-FLOW

The blower performance charts in Section 3.12.2 is based on a dry coil with the factory 1" fiberglass filters in place. A component resistance chart is provided in Section 3.12.3 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.

3.12.1 DRIVE PACKAGE DATA – 50 Hz

NOMINAL TONS [kW]	DRIVE PACKAGE	— BELT	SHEAVE SELECTIONS*, IN. [mm]			MOTOR	APPROX. BLOWER RPM @ MOTOR SHEAVE TURNS OPEN						
			MOTOR/BORE		BLOWER	HP [W]/PHASE	0	1	2	3	4	5	6
7.5 [26]	K	4L530	3.4-4.4-5/8	[86-112-16]	9.75 [248]	1 [746]/3Ø	658	633	608	583	554	525	—
	K	4L480	1.9-2.9	[48-74]	9.75 [248]	1 [746]/1Ø	854	804	750	692	633	579	—
	L	4L530	4.2-5.2-5/8	[107-132-16]	9.75 [248]	1.5 [1119]/3Ø	771	746	717	688	658	625	—
	M	4L550	5.2-6.2-5/8	[132-157-16]	9.75 [248]	1.5 [1119]/3Ø	938	908	879	850	821	788	—
	◇N	4L550	5.7-6.7-7/8	[145-170-22]	8.75 [222]	2 [1491]/3Ø	1100	1082	1050	1022	989	956	—
10 [35]	K	4L530	4.0-5.0-5/8	[102-127-16]	9.75 [248]	1.5 [1119]/3Ø	738	713	688	663	633	608	—
	L	4L540	4.6-5.6-7/8	[117-142-22]	9.75 [248]	2 [1491]/3Ø	829	800	775	746	717	688	—
	M	4L550	5.2-6.2-7/8	[132-157-22]	9.75 [248]	3 [2237]/3Ø	938	908	879	850	821	788	—
	ΔN	4L530	4.7-5.7-7/8	[119-145-22]	7.75 [197]	3 [2237]/3Ø	1021	992	958	925	892	858	—
	□O	4L540	5.2-6.2-7/8	[132-157-22]	7.75 [197]	3 [2237]/3Ø	1180	1142	1106	1069	1032	991	—
15 [53]	K	BP-52	3.1-4.1-7/8	[79-104-22]	11.4 [290]	2 [1491]/3Ø	538	517	492	471	446	425	400
	L	BP-52	3.7-4.7-7/8	[94-119-22]	11.4 [290]	3 [2237]/3Ø	608	588	567	546	525	500	475
	@M	BP-45	3.7-4.7-1 1/8	[94-119-29]	9.4 [239]	5 [3729]/3Ø	725	700	675	650	625	596	567
	#N	BP-50	4.8-6.0-1 1/8	[122-152-29]	10.4 [264]	5 [3729]/3Ø	821	800	779	758	738	717	696
20 [70]	K	BP-50	4.3-5.5-1 1/8	[109-140-29]	11.4 [290]	5 [3729]/3Ø	708	688	667	646	621	596	571
	L	BP-48 (2)	4.3-5.5-1 3/8	[109-140-35]	10.4 [264]	7.5 [5593]/3Ø	796	771	746	721	696	671	650
	^M	BP-47 (2)	4.3-5.5-1 3/8	[109-140-35]	9.4 [239]	7.5 [5593]/3Ø	858	829	800	771	742	713	679
	+N	BP-48 (2)	5.4-6.6-1 3/8	[137-168-35]	9.4 [239]	7.5 [5593]/3Ø	1030	995	976	945	913	891	853

*Actual pitch diameter in inches. Minimum and maximum pitch diameter shown for adjustable motor sheave.
◇ Field Supplied (Motor Sheave: Browning IVP75, Blower Sheave: Browning AZ90, Motor: 2 HP, 4 Pole, 3 Ø).
Δ Field Supplied (Motor Sheave: Browning IVP65, Blower Sheave: Browning AZ80).
□ Field Supplied (Motor Sheave: Browning IVP71, Blower Sheave: Browning A80).
Field Supplied (Motor Sheave: Browning IVP65, Blower Sheave: Browning BK110, Motor 5 HP, 4 Pole, 3Ø).
+ Field Supplied (Motor Sheave: Browning 2VP71, Blower Sheave: Browning 2BK100).
@ Field Supplied (Motor Sheave: Browning IVP50, Blower Sheave: Browning BK100, Motor 5 HP, 4 Pole, 3Ø).
^ Field Supplied (Motor Sheave: Browning 2VP60, Blower Sheave: Browning 2BK100).
Shaded Area Represents Factory Sheave Setting. **[ ] Designates Metric Conversions**

3.12.1 DRIVE PACKAGE DATA – 60 Hz

NOMINAL TONS	3 PH DRIVE	SHEAVE SELECTIONS*		MOTOR	APPROX. BLOWER RPM @ MOTOR SHEAVE TURNS OPEN						
		MOTOR	BLOWER	HP / PH	0	1	2	3	4	5	6
7.5	K	3.4-4.4	9.75	1 / 3	790	760	730	700	665	630	—
	L	4.2-5.2	9.75	1 ½ / 3	925	895	860	825	790	750	—
	M	5.2-6.2	9.75	1 ½ / 3	1125	1090	1055	1020	985	945	—
	N◇	5.7-6.7	9.75	2 / 3	1195	1165	1130	1100	1065	1030	—
10	K	4.0-5.0	9.75	1 ½ / 3	885	855	825	795	760	730	—
	L	4.6-5.6	9.75	2 / 3	995	960	930	895	860	825	—
	M	5.2-6.2	9.75	3 / 3	1100	1060	1020	985	945	905	—
	NΔ	4.7-5.7	8.75	3 / 3	1225	1190	1150	1110	1070	1030	—
	O□	5.7-6.7	8.75	3 / 3	1280	1250	1220	1185	1150	1115	—
15	K	3.1-4.1	11.4	2 / 3	645	620	590	565	535	510	480
	L	3.7-4.7	11.4	3 / 3	730	705	680	655	630	600	570
	M	3.7-4.7	9.4	5 / 3	870	840	810	780	750	715	680
	N#	4.8-6.0	10.4	5 / 3	985	960	935	910	885	860	835
20	K	4.3-5.5	11.4	5 / 3	850	825	800	775	745	715	685
	L	4.3-5.5	10.4	7.5 / 3	995	925	895	865	835	805	780
	M	4.3-5.5	9.4	7.5 / 3	1030	995	960	9225	890	855	815
NOMINAL TONS	**1 PH DRIVE**	**SHEAVE SELECTIONS***		**MOTOR**	**APPROX. BLOWER RPM @ MOTOR SHEAVE TURNS OPEN**						
		MOTOR	**BLOWER**	**HP / PH**	**0**	**1**	**2**	**3**	**4**	**5**	**6**
7½	K	1.9-2.9	9.75	1 / 1	1025	965	900	830	760	695	—
10	K	1.9-2.9	8.75	2 / 1	1140	1070	995	920	845	770	—

*Actual pitch diameter in inches. Minimum and maximum pitch diameter shown for adjustable motor sheave.
◇ Field supplied (Motor Sheave: Browning IVP75, Blower Sheave: Browning AZ100, Belt: A-50, Motor: 2 HP, 4 Pole, 3 Ø)
Δ Field Supplied (Motor Sheave: Browning IVP65, Blower Sheave: Browning AZ90, Belt: A-50)
□ Field Supplied (Motor Sheave: Browning IVP75, Blower Sheave: Browning AZ90, Belt: A-54)
Field Supplied (Motor Sheave: Browning IVP65, Blower Sheave: Browning BK110, Belt B-50)

3.12.2 AIR-FLOW PERFORMANCE DATA (DRY COIL) (-)HGL-090 (50 Hz)

E.S.P. - INCHES OF WATER [kPa]

DRIVE PKG	STD CFM [L/S]	0.1 RPM	0.1 W	0.2 RPM	0.2 W	0.3 RPM	0.3 W	0.4 RPM	0.4 W	0.5 RPM	0.5 W	0.6 RPM	0.6 W	0.7 RPM	0.7 W	0.8 RPM	0.8 W	0.9 RPM	0.9 W	1.0 RPM	1.0 W
	1600 [755]	--	--	--	--	500	265	530	300	565	350	615	380	630	405	675	450	725	490	820	565
	1800 [850]	--	--	510	225	530	290	565	335	600	380	645	420	670	460	710	500	760	560	825	630
K	2000 [944]	490	245	530	275	560	325	600	375	635	425	675	470	710	515	745	555	785	645	835	695
L	2200 [1038]	515	300	550	340	590	390	630	440	665	490	700	540	735	580	770	640	810	715	845	765
M	2400 [1133]	530	355	570	405	610	460	650	510	690	570	720	610	770	670	800	755	830	805	860	870
N	2600 [1227]	555	430	595	490	635	545	675	620	715	665	750	720	780	795	810	865	850	930	885	990
	2800 [1321]	595	525	630	595	665	665	705	720	740	775	775	850	800	920	830	985	865	1060	905	1130
	3000 [1416]	630	660	660	730	695	775	730	840	770	920	800	995	830	1060	860	1145	890	1220	935	1230

DRIVE PKG	STD CFM [L/S]	1.1 RPM	1.1 W	1.2 RPM	1.2 W	1.3 RPM	1.3 W	1.4 RPM	1.4 W	1.5 RPM	1.5 W	1.6 RPM	1.6 W	1.7 RPM	1.7 W	1.8 RPM	1.8 W	1.9 RPM	1.9 W	2.0 RPM	2.0 W
	1600 [755]	855	610	880	630	915	670	955	680	980	740	1010	765	1040	810	1070	840	1095	900	1110	965
	1800 [850]	860	670	890	700	925	740	965	760	990	805	1020	840	1050	895	1080	925	1100	985	--	--
K	2000 [944]	865	730	900	770	935	810	975	840	1000	870	1030	915	1060	980	1090	1015	1105	1070	--	--
L	2200 [1038]	875	820	915	870	950	880	980	920	1010	975	1040	1025	1070	1080	1100	1125	--	--	--	--
M	2400 [1133]	895	925	930	970	970	985	995	1030	1025	1080	1055	1160	1080	1200	1110	1245	--	--	--	--
N	2600 [1227]	915	1045	950	1060	985	1105	1010	1155	1040	1230	1070	1290	1090	1345	--	--	--	--	--	--
	2800 [1321]	940	1140	975	1190	1000	1250	1030	1320	1060	1400	1090	1450	1105	1455	--	--	--	--	--	--
	3000 [1416]	965	1285	995	1345	1020	1405	1050	1505	1080	1560	1110	1640	--	--	--	--	--	--	--	--

K = IVP50, AZ100, 1 HP [766 W]
L = IVP60, AZ100, 1½ HP [1119 W]
M = IVP68, AZ100, 1½ HP [1119 W] [Field Supplied]
N = IVP75, AZ90, 2 HP [1491 W] [Field Supplied]

(-)HGL-120 (50 Hz)

E.S.P. - INCHES OF WATER [kPa]

DRIVE PKG	STD CFM [L/S]	0.1 RPM	0.1 W	0.2 RPM	0.2 W	0.3 RPM	0.3 W	0.4 RPM	0.4 W	0.5 RPM	0.5 W	0.6 RPM	0.6 W	0.7 RPM	0.7 W	0.8 RPM	0.8 W	0.9 RPM	0.9 W	1.0 RPM	1.0 W
	2400 [1133]	--	--	--	--	600	460	635	505	670	560	705	610	740	670	770	735	805	800	835	865
	2600 [1227]	--	--	595	500	630	550	665	600	700	665	735	720	770	790	800	850	830	915	860	990
	2800 [1321]	600	570	630	620	660	675	690	720	725	785	760	845	795	910	825	980	855	1050	885	1130
K	3000 [1416]	630	675	660	730	690	795	720	860	755	930	790	1000	820	1065	855	1130	885	1205	915	1280
L	3200 [1510]	660	810	690	870	720	940	750	1005	785	1075	815	1150	850	1225	880	1300	910	1390	940	1470
M	3400 [1605]	690	930	720	1005	750	1090	780	1160	815	1240	845	1320	880	1410	910	1500	935	1590	960	1665
N	3600 [1669]	720	1100	755	1175	780	1255	810	1340	845	1430	875	1515	910	1615	935	1705	960	1790	990	1870
O	3800 [1793]	755	1265	785	1360	810	1455	845	1550	875	1640	905	1740	940	1840	960	1925	990	2030	1020	2125
	4000 [1888]	790	1475	820	1575	845	1680	880	1780	910	1880	940	2000	970	2100	990	2185	1020	2280	1050	2380
	4200 [1982]	830	1745	855	1840	880	1945	915	2055	945	2160	975	2260	1000	2365	1025	2470	1050	2560	1075	2650

DRIVE PKG	STD CFM [L/S]	1.1 RPM	1.1 W	1.2 RPM	1.2 W	1.3 RPM	1.3 W	1.4 RPM	1.4 W	1.5 RPM	1.5 W	1.6 RPM	1.6 W	1.7 RPM	1.7 W	1.8 RPM	1.8 W	1.9 RPM	1.9 W	2.0 RPM	2.0 W
	2400 [1133]	870	940	905	1030	940	1110	970	1200	1000	1295	1030	1380	1065	1470	1100	1570	1130	1665	1160	1760
	2600 [1227]	895	1070	930	1150	960	1230	990	1310	1020	1400	1050	1480	1080	1565	1110	1650	1140	1730	1170	1805
	2800 [1321]	920	1210	950	1285	980	1370	1005	1445	1035	1520	1065	1590	1095	1665	1120	1735	1150	1810	1175	1880
K	3000 [1416]	950	1360	975	1440	1000	1520	1025	1600	1050	1680	1080	1750	1110	1820	1130	1890	1160	1950	1180	2010
L	3200 [1510]	965	1550	995	1625	1020	1700	1040	1780	1070	1850	1095	1920	1125	1985	1145	2045	1170	2100	1190	2160
M	3400 [1605]	990	1750	1020	1840	1040	1920	1060	1995	1085	2060	1110	2120	1140	2185	1160	2245	1185	2300	--	--
N	3600 [1669]	1020	1965	1040	2050	1060	2125	1080	2200	1105	2265	1130	2330	1155	2400	1175	2460	--	--	--	--
O	3800 [1793]	1045	2210	1065	2300	1085	2370	1100	2450	1125	2515	1150	2585	1170	2655	--	--	--	--	--	--
	4000 [1888]	1070	2460	1090	2535	1110	2610	1125	2690	--	--	--	--	--	--	--	--	--	--	--	--
	4200 [1982]	1100	2685	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

K = IVP56, AZ100, 1.5 HP [1119 W]
L = IVP62, AZ100, 2 HP [1491 W]
M = IVP68, AZ100, 3 HP [2237 W]
N = IVP65, AZ80, 3 HP [2237 W] [Field Supplied]
N = IVP71, AZ80, 3 HP [2237 W] [Field Supplied]

[ ] Designates Metric Conversions

3.12.2 AIR-FLOW PERFORMANCE DATA (DRY COIL) (-)HGL-180 (50 Hz)

DRIVE	STD CFM	E.S.P. - INCHES OF WATER [kPa]																																							
		0.1		0.2		0.3		0.4		0.5		0.6		0.7		0.8		0.9		1.0		1.1		1.2		1.3		1.4		1.5		1.6		1.7		1.8		1.9		2.0	
PKG	[L/S]	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	W
	3200 [1510]	--	--	--	--	395	600	430	620	465	665	500	710	535	760	565	840	590	940	615	1050	640	1160	665	1280	685	1390	710	1510	730	1615	750	1730	770	1850	785	1970	805	2080	810	2200
	3600 [1699]	--	--	395	700	425	725	455	750	490	790	520	850	550	930	580	1020	605	1135	630	1250	655	1360	680	1470	700	1590	725	1700	745	1815	765	1930	785	2050	800	2170	815	2275	825	2385
K	4000 [1888]	400	760	415	820	450	870	475	910	510	990	540	1055	565	1140	595	1230	620	1345	645	1450	665	1560	690	1680	710	1790	735	1900	755	2015	775	2130	795	2245	810	2350	825	2450	--	--
L	4400 [2077]	420	870	440	940	475	1015	500	1090	530	1175	555	1250	580	1345	610	1430	635	1540	660	1650	680	1760	705	1870	725	1990	745	2100	765	2215	785	2330	805	2450	825	2540	--	--	--	--
M	4800 [2265]	445	1020	465	1090	495	1185	520	1275	545	1355	570	1460	595	1550	625	1660	650	1770	670	1880	695	2005	715	2120	735	2240	755	2350	775	2460	795	2575	815	2690	835	2800	--	--	--	--
N	5200 [2454]	465	1220	490	1300	515	1385	540	1475	565	1575	590	1680	615	1790	640	1920	665	2030	685	2160	710	2290	730	2420	750	2540	770	2655	785	2770	805	2890	825	3000	--	--	--	--	--	--
	5600 [2643]	490	1420	515	1505	540	1605	560	1700	585	1820	610	1935	635	2080	660	2225	680	2365	700	2510	725	2635	745	2740	765	2860	785	2985	800	3105	820	3225	--	--	--	--	--	--	--	--
	6000 [2832]	510	1640	535	1750	560	1865	585	1990	605	2130	630	2270	655	2425	675	2570	695	2720	720	2850	740	2980	760	3100	780	3225	800	3355	815	3480	835	3620	--	--	--	--	--	--	--	--

K = IVP44, BK120, 2 HP [1491 W]
L = IVP50, BK120, 3 HP [2237 W]
M = IVP50, BK100, 5 HP [3729 W] [Field Supplied]
N = IVP65, BK110, 5 HP [3729 W] [Field Supplied]

(-)HGL-240 (50 Hz)

DRIVE	STD CFM	E.S.P. - INCHES OF WATER [kPa]																																					
		0.1		0.2	0.3		0.4		0.5		0.6		0.7		0.8		0.9		1.0		1.1		1.2		1.3		1.4		1.5		1.6		1.7		1.8		1.9		2.0	
PKG	[L/S]	RPM	W	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
	5000 [2360]	--	--	--	--	--	--	--	--	1120	565	1240	590	1360	615	1480	640	1600	665	1720	690	1850	715	1970	740	2095	760	2215	780	2330	800	2450	820	2560	840	2670	855	2780	870	2890
	5500 [2596]	--	--	--	--	--	--	--	560	1420	585	1550	610	1680	635	1810	660	1935	685	2070	710	2200	735	2330	760	2455	780	2580	800	2710	820	2835	840	2950	855	3070	870	3190	885	3310
K	6000 [2832]	--	--	--	--	--	560	1620	585	1760	610	1900	635	2030	660	2160	685	2295	710	2440	735	2580	760	2720	780	2850	800	2980	820	3120	840	3240	860	3370	875	3485	890	3610	905	3730
L	6500 [3068]	--	--	--	560	1860	585	2000	610	2140	635	2280	660	2420	685	2550	710	2700	735	2850	760	2990	780	3130	805	3270	825	3400	840	3530	860	3660	880	3800	895	3930	910	4055	930	4200
M	7000 [3304]	--	--	2150	590	2290	615	2440	640	2580	665	2720	690	2865	715	2990	735	3150	760	3285	780	3430	800	3565	825	3720	845	3865	860	4020	880	4145	900	4285	915	4420	930	4560	950	4750
N	7500 [3540]	585	2470	2610	625	2750	650	2890	670	3035	695	3180	715	3350	740	3490	760	3655	780	3800	805	3950	825	4080	845	4245	865	4370	880	4520	900	4640	920	4785	935	4920	950	5100	970	5340
	8000 [3776]	620	3000	3140	660	3280	680	3430	700	3570	725	3720	745	3875	765	4040	785	4200	805	4355	830	4500	850	4635	865	4775	885	4915	900	5055	920	5200	940	5360	955	5550	970	5780	990	5985
	8500 [4012]	650	3560	3700	690	3850	710	4000	730	4155	750	4325	770	4470	790	4630	810	4780	830	4925	850	5065	870	5215	890	5365	905	5520	920	5680	940	5870	960	6050	975	6270	990	6480	1010	6680

K = IVP60, BK120, 5 HP [3729 W]
L = 2VP60, 2BK110, 7½ HP [5593 W]
M = 2VP60, 2BK100, 7½ HP [5593 W] [Field Supplied]
N = 2VP71, 2BK100, 7½ HP [5593 W] [Field Supplied]

NOTES: 1. Standard air @ .075 lbs/ft³ [m³]
2. Operation below heavy lines require optional drives.
3. Motor efficiency = .85
4. BHP = $\frac{\text{Watts} \times \text{Motor Efficiency}}{746}$
5. BHP = Brake Horsepower
RPM = Blower Speed

[ ] Designates Metric Conversions

3.12.2 AIR-FLOW PERFORMANCE DATA (DRY COIL) (-)HGL-090 (60 Hz)

E.S.P.—INCHES OF WATER [kPa]

DRIVE PKG	STD CFM [L/S]	.1 [0.02]		.2 [0.05]		.3 [0.07]		.4 [0.10]		.5 [0.12]		.6 [0.15]		.7 [0.17]		.8 [0.20]		.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	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
K / L / M / N	1800 [850]	—	—	—	—	—	—	—	—	—	—	645	420	670	460	690	500	725	560	825	630	860	670	890	700	925	740	965	760	990	805	1020	840	1050	895	1080	925	1110	985	1115	1010
	2000 [944]	—	—	—	—	—	—	—	—	645	405	675	470	690	515	730	555	800	645	835	695	865	730	900	770	930	810	975	840	1000	870	1030	915	1060	980	1090	1015	1125	1070	1120	1080
	2200 [1038]	—	—	—	—	—	—	—	—	670	490	680	540	720	580	785	640	810	715	840	765	870	820	910	870	950	880	980	920	1010	975	1040	1025	1070	1080	1105	1125	1100	1140	1130	1210
	2400 [1133]	—	—	—	—	—	—	650	510	690	570	720	610	770	670	800	755	830	805	860	870	895	925	930	970	970	985	995	1030	1030	1080	1055	1160	1080	1200	1120	1270	1125	1265	1140	1350
	2600 [1227]	—	—	—	—	635	545	675	620	715	665	750	720	780	795	810	865	850	930	885	990	915	1045	960	1060	985	1105	1010	1155	1040	1230	1065	1290	1110	1345	1115	1350	1135	1445	1160	1510
	2800 [1321]	—	—	630	595	665	665	705	720	740	775	775	850	800	920	830	985	865	1060	905	1130	975	1140	975	1190	1000	1250	1030	1320	1060	1400	1090	1450	1095	1455	1120	1530	1150	1615	1180	1700
	3000 [1416]	630	660	660	730	695	775	730	840	770	920	800	995	830	1060	860	1145	890	1220	935	1230	965	1285	995	1345	1020	1405	1050	1505	1080	1560	1110	1640	1115	1650	1140	1740	1170	1815	1195	1885
	3200 [1510]	660	810	695	860	725	920	765	1000	975	1070	825	1140	855	1225	890	1315	920	1370	960	1385	985	1445	1015	1530	1040	1620	1070	1685	1085	1695	1115	1780	1135	1875	—	—	—	—	—	—
	3400 [1605]	690	940	725	1000	760	1090	790	1155	820	1225	850	1325	885	1410	915	1460	950	1485	980	1570	1010	1660	1030	1680	1045	1745	1075	1830	—	—	—	—	—	—	—	—	—	—	—	—
	3600 [1699]	720	1120	750	1185	790	1250	820	1315	850	1430	885	1520	915	1590	945	1605	975	1695	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

K = IVP50, AZ100, 1 HP [766 W]
M = IVP68, AZ100, 1½ HP [1119 W]
L = IVP60, AZ100, 1½ HP [1119 W]
N = IVP75, AZ100, Belt A050, 2 HP [1491 W] Field Supplied

(-)HGL-120 (60 Hz)

E.S.P.—INCHES OF WATER [kPa]

DRIVE PKG	STD CFM [L/s]	.1 [0.02]		.2 [0.05]		.3 [0.07]		.4 [0.10]		.5 [0.12]		.6 [0.15]		.7 [0.17]		.8 [0.20]		.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	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
K / L / M / N / O	3000 [1416]	—	—	—	—	—	—	730	880	755	940	790	1005	825	1065	855	1130	885	1190	920	1290	955	1380	980	1425	1010	1500	1035	1620	1065	1690	1100	1750	1110	1800	1140	1880	1160	1920	1185	1980
	3200 [1510]	—	—	—	—	730	950	750	1005	785	1080	815	1150	850	1225	880	1285	910	1390	950	1470	975	1540	1010	1620	1030	1740	1065	1820	1095	1880	1095	1890	1125	1985	1155	2045	1175	2090	1190	2160
	3400 [1605]	—	—	—	—	745	1090	780	1160	810	1240	845	1320	875	1390	910	1500	945	1590	970	1650	995	1725	1025	1860	1055	1940	1055	1900	1080	1975	1110	2095	1140	2185	1165	2245	1180	2270	1200	2315
	3600 [1699]	—	—	745	1175	780	1250	810	1340	845	1435	875	1510	905	1620	945	1715	960	1780	990	1855	1020	1995	1050	2080	1080	2160	1080	2165	1105	2225	1135	2325	1155	2400	1175	2460	1195	2510	1220	2575
	3800 [1793]	745	1265	780	1350	810	1455	840	1550	875	1630	905	1740	940	1840	955	1905	990	2050	1025	2145	1045	2225	1075	2315	1075	2270	1100	2390	1130	2495	1150	2590	1170	2650	1190	2710	1220	2770	1265	2895
	4000 [1888]	780	1465	810	1575	850	1690	880	1780	910	1880	940	2010	970	2110	990	2180	1020	2300	1050	2400	1075	2490	1075	2445	1100	2570	1130	2690	1145	2785	1170	2855	1185	2920	1215	2985	1260	3090	1275	3165
	4200 [1982]	825	1750	855	1840	885	1925	920	2060	940	2160	965	2260	995	2365	1025	2470	1050	2560	1080	2680	1080	2685	1100	2795	1130	2890	1150	3000	1165	3080	1190	3145	—	—	—	—	—	—	—	—
	4400 [2077]	845	1925	905	2100	925	2195	950	2320	970	2430	995	2550	1030	2650	1050	2755	1055	2760	1085	2855	1100	2985	1130	3115	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	4600 [2171]	915	2225	930	2375	955	2495	980	2620	1010	2750	1030	2840	1035	2950	1055	2960	1080	3070	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	4800 [2265]	930	2555	960	2680	985	2810	1015	2940	1035	3040	1035	3045	1055	3180	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	5000 [2360]	960	2870	990	3010	1020	3135	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

K = IVP56, AZ100, 1½ HP [1119 W]
L = IVP62, AZ100, 2 HP [1491 W]
M = IVP68, AZ100, 3 HP [2237 W]
N = IVP65, AZ80, 3 HP [2237 W] Field Supplied
O = IVP75, AZ90, 3 HP [2237 W] Field Supplied

[ ] Designates Metric Conversions

3.12.2 AIR-FLOW PERFORMANCE DATA (DRY COIL) (-)HGL-180 (60 Hz)

DRIVE PKG	STD CFM [L/S]	E.S.P.—INCHES OF WATER [kPa]																																							
		.1 [0.02]		.2 [0.05]		.3 [0.07]		.4 [0.10]		.5 [0.12]		.6 [0.15]		.7 [0.17]		.8 [0.20]		.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	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
K / L / M / N	4000 [850]	—	—	—	—	—	—	480	950	510	1020	540	1090	565	1165	595	1250	620	1320	645	1400	665	1575	690	1740	710	1860	730	1960	735	2220	765	2155	800	2255	820	2340	835	2435	850	2600
	4400 [944]	—	—	—	—	—	—	505	1090	530	1175	560	1250	585	1325	610	1385	635	1485	655	1650	680	1770	700	1945	725	2035	735	2100	755	2225	785	2340	810	2430	825	2525	840	2645	855	2750
	4800 [1038]	—	—	—	—	495	1185	520	1275	550	1355	575	1440	595	1520	620	1600	645	1700	665	1880	690	2015	710	2170	730	2290	745	2350	775	2470	795	2575	815	2690	830	2790	845	2895	860	3100
	5200 [1133]	—	—	490	1300	515	1385	545	1485	565	1550	590	1660	615	1760	635	1850	660	2050	685	2170	705	2320	725	2460	740	2540	770	2655	790	2770	810	2890	825	3000	840	3120	855	3265	870	3365
	5600 [1227]	490	1420	515	1505	540	1620	560	1700	590	1820	610	1905	635	2080	660	2240	680	2365	700	2510	720	2665	740	2740	765	2860	785	2985	805	3105	820	3225	835	3350	850	3490	870	3690	900	3750
	6000 [1321]	510	1640	530	1750	560	1860	590	1950	610	2165	630	2270	660	2450	675	2570	695	2725	720	2905	740	2975	765	3100	780	3220	800	3355	815	3480	835	3620	850	3755	865	3850	895	3885	910	4035
	6400 [1416]	530	1900	555	1980	590	2255	610	2370	630	2470	655	2660	675	2800	695	2965	720	3180	735	3255	760	3360	775	3485	800	3630	820	3750	830	3890	850	4035	865	4130	890	4150	905	4270	920	4440
	6800 [1510]	570	2370	590	2455	610	2575	625	2670	655	2870	675	3030	700	3055	720	3175	740	3350	760	3485	780	3620	800	3750	815	3880	830	4020	845	4160	865	4320	890	4430	905	4595	920	4755	935	4935
	7200 [1605]	590	2685	610	2800	630	2945	650	3100	680	3195	700	3310	720	3450	745	3610	765	3745	780	3910	800	4040	820	4230	830	4345	845	4470	865	4630	890	4790	905	4985	920	5150	—	—	—	—

K = IVP44, BK120, 2 HP [1491 W]
L = IVP50, BK120, 3 HP [2237 W]
M = IVP50, BK100, 5 HP [3729 W]
N = IVP65, BK110, 5 HP [3729 W] Field Supplied

(-)HGL-240 (60 Hz)

DRIVE PKG	STD CFM [L/S]	E.S.P.—INCHES OF WATER [kPa]																																							
		.1 [0.02]		.2 [0.05]		.3 [0.07]		.4 [0.10]		.5 [0.12]		.6 [0.15]		.7 [0.17]		.8 [0.20]		.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	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
K / L / M	6000 [2832]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	695	2295	715	2525	740	2675	755	2820	780	2975	800	2950	820	3100	840	3180	865	3380	875	3475	890	3590	910	3690
	6500 [3068]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	695	2560	710	2745	730	2850	755	3000	775	3165	805	3270	825	3365	845	3495	865	3700	880	3800	895	3930	910	4030	930	4125
	7000 [3304]	—	—	—	—	—	—	—	—	—	—	—	—	695	2865	710	2990	730	3130	755	3285	775	3450	790	3530	825	3710	845	3865	865	4020	875	4145	895	4270	910	4360	930	4530	950	4625
	7500 [3540]	—	—	—	—	—	—	—	—	—	—	695	3190	720	3350	735	3490	760	3675	780	3800	805	4000	830	4080	850	4245	865	4370	880	4520	895	4620	910	4785	930	4920	950	5090	965	5340
	8000 [3776]	—	—	—	—	—	—	685	3430	700	3560	725	3720	740	3875	760	4060	785	4240	815	4355	835	4545	850	4635	870	4775	880	4915	900	5055	915	5200	935	5360	955	5550	965	5810	980	5985
	8500 [4012]		—	—	—	690	3805	715	4000	730	4155	750	4325	770	4500	790	4700	820	4795	840	4925	850	5065	870	5215	890	5365	905	5495	920	5645	935	5775	950	6120	970	6310	980	6480	1000	6645
	9000 [4248]	685	4070	700	4240	720	4440	735	4615	760	4790	780	4995	815	5165	830	5300	850	5435	865	5570	880	5720	895	5860	910	6060	925	6170	940	6370	955	6660	975	6860	990	7040	1010	7240	1025	7500
	9500 [4484]	700	4730	720	4940	785	5325	800	5500	820	5670	835	5790	850	5920	865	6060	880	6210	895	6370	905	6530	925	6700	940	6850	950	7140	965	7335	985	7520	—	—	—	—	—	—	—	—
	10000 [4720]	805	6080	815	6145	830	6470	840	6615	860	6720	870	6890	885	7040	900	7220	915	7430	925	7600	990	7600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

K = IVP60, BK120, 5 HP [3729 W]
L = 2VP60, 2BK110, 7½ HP [5593 W]
M = 2VP60, 2BK100, 7½ HP [5593 W]

NOTES:

1. Standard Air @ .075 lbs./Ft.^{3} [m^2]
2. Operation below heavy lines require optional L drive.
3. Motor efficiency = .85
4. BHP = $\dfrac{\text{Watts} \times \text{Motor Efficiency}}{746}$
5. Code:
   BHP = Brake Horsepower
   RPM = Blower Speed

[ ] Designates Metric Conversions

3.12.3 COMPONENT AIR-RESISTANCE DATA

RHGL 7.5 TON [26 kW] & 10 TON [35 kW]

CFM [L/s]	1800 [850]	2200 [1038]	2600 [1227]	3000 [1416]	3400 [1605]	3800 [1793]	4200 [1982]	4600 [2171]	5000 [2360]
Electric Heater 20KW, 30KW	.060 [.015]	.100 [.025]	.140 [.034]	.160 [.040]	.230 [.057]	.320 [.080]	.410 [.102]	.500 [.124]	.600 [.150]
Mixing Box (R/A Damper Open)	.006 [.001]	.008 [.002]	.012 [.003]	.024 [.006]	.038 [.009]	.053 [.013]	.068 [.017]	.080 [.020]	.095 [.024]
Discharge Grille (Set Max. Open)	.008 [.002]	.011 [.003]	.015 [.004]	.020 [.005]	.025 [.006]	.031 [.008]	.039 [.010]	.046 [.012]	.055 [.014]
Inlet Grille	.008 [.002]	.010 [.002]	.014 [.003]	.020 [.005]	.026 [.006]	.032 [.008]	.039 [.010]	.049 [.012]	.058 [.014]
Discharge Plenum	.02 [.005]	.04 [.010]	.05 [.012]	.065 [.016]	.085 [.021]	.100 [.025]	.120 [.030]	.150 [.037]	.180 [.045]

RHGL 15 TON [53 kW]

CFM [L/s]	4000 [1888]	4400 [2077]	4800 [2265]	5200 [2454]	5600 [2643]	6000 [2832]	6400 [3020]	6800 [3209]	7200 [3398]
Electric Heater 30KW	.175 [.040]	.187 [.050]	.200 [.049]	.215 [.053]	.230 [.057]	.250 [.062]	.275 [.068]	.305 [.076]	.350 [.087]
Electric Heater 40KW	.290 [.070]	.320 [.080]	.350 [.087]	.380 [.095]	.410 [.102]	.450 [.112]	.495 [.123]	.550 [.137]	.600 [.149]
Mixing Box (R/A Damper Open)	.030 [.007]	.037 [.009]	.044 [.011]	.052 [.013]	.061 [.015]	.071 [.018]	.091 [.023]	.102 [.025]	.110 [.027]
Discharge Grille (Set Max. Open)	.010 [.003]	.012 [.003]	.014 [.004]	.017 [.004]	.019 [.005]	.022 [.006]	.025 [.006]	.029 [.007]	.032 [.008]
Inlet Grille	.010 [.002]	.014 [.003]	.020 [.005]	.027 [.007]	.035 [.009]	.044 [.011]	.054 [.013]	.065 [.016]	.077 [.019]
Discharge Plenum	.02 [.005]	.04 [.010]	.05 [.012]	.065 [.012]	.085 [.021]	.100 [.025]	.120 [.030]	.150 [.037]	.180 [.045]

RHGL 20 TON [70 kW]

CFM [L/s]	6400 [3020]	6800 [3209]	7200 [3398]	7600 [3586]	8000 [3776]	8400 [3964]	8800 [4153]	9200 [4342]	9600 [4531]
Electric Heater 30KW	.220 [.055]	.230 [.057]	.240 [.060]	.260 [.065]	.280 [.070]	.300 [.075]	.320 [.080]	.340 [.085]	.370 [.092]
Electric Heater 40KW	.360 [.090]	.390 [.097]	.420 [.104]	.450 [.112]	.490 [.122]	.530 [.132]	.570 [.142]	.610 [.152]	.650 [.162]
Mixing Box (R/A Damper Open)	.095 [.023]	.102 [.025]	.110 [.027]	.115 [.030]	.121 [.030]	.126 [.031]	.128 [.032]	.135 [.034]	.142 [.035]
Discharge Grille (Set Max. Open)	.025 [.006]	.029 [.007]	.032 [.008]	.036 [.009]	.040 [.010]	.044 [.011]	.048 [.012]	.053 [.013]	.057 [.014]
Inlet Grille	.054 [.013]	.065 [.016]	.077 [.019]	.090 [.022]	.104 [.026]	.120 [.030]	.150 [.037]	.190 [.047]	.240 [.060]
Discharge Plenum	.120 [.030]	.150 [.037]	.180 [.045]	.210 [.052]	.250 [.062]	.290 [.072]	.340 [.085]	.400 [.010]	.470 [.117]

3.12.4 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 3.12.3)

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 "K" drive being everything left of the first heavy line, "L" drive being for everything between the 1st and 2nd heavy lines, "M" 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. See Section 3.12.5 for more details on field supplied blower drives.

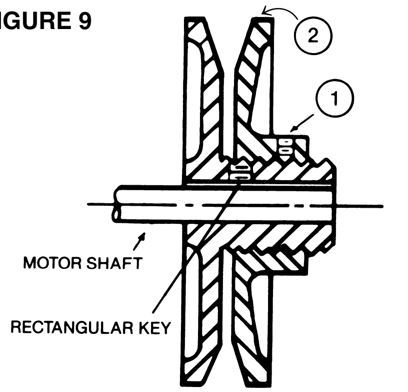
Determine the correct blower RPM from the air-flow performance chart at the intersection of the target air-flow and E.S.P. Then refer to the Blower Package Data table to determine the correct setting in turns open for the variable pitch motor sheave. The variable pitch motor sheave can be adjusted in 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 3.12.6.

3.12.5 FIELD SUPPLIED BLOWER DRIVES

For applications where the blower drive packages available from the factory cannot provide enough External Static Pressure (E.S.P.), the motor sheave and/or blower sheave and the belt(s) can be changed to a factory authorized optional field supplied blower drive that will extend the E.S.P. range of the air-handler. Please note that In some cases, a higher horsepower motor may have to be substituted for the factory motor per the specifications in the Blower Package Data table. Factory authorized field supplied blower drive specifications are provided in the Blower Package Data table and the air-flow performance tables include data for the factory authorized field supplied blower drives.

IMPORTANT: Do not deviate from the specifications for the factory authorized field supplied blower drive packages to assure the motor is not overloaded and to assure that a known air-flow level can be achieved.

FIGURE 9



3.12.6 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 at right, 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.

3.12.7 DRIVE BELT ALIGNMENT & ADJUSTMENT

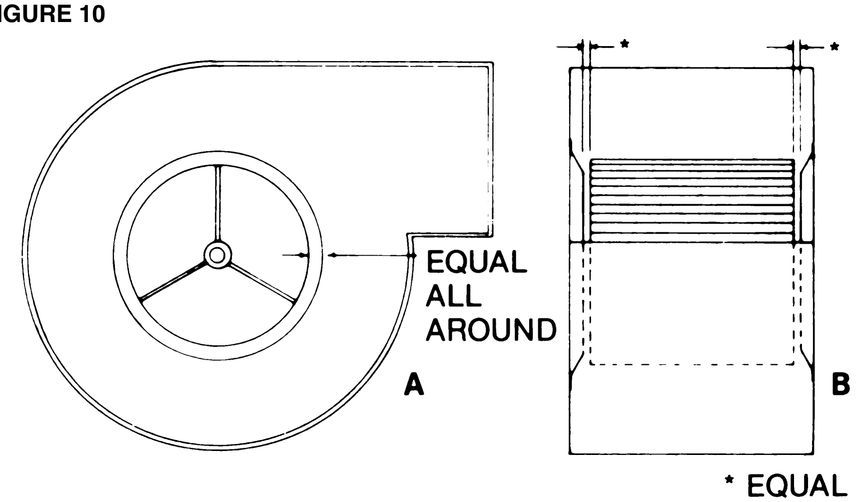
Place belt on the groove of the blower sheave and motor sheave to obtain the approximate alignment and belt tension. Remove the belt and align the blower sheave and motor sheave using a straight edge. When both sheaves are properly aligned, re-install belt. Do not force or pry the belt onto the sheaves. 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.

4.0 START-UP

4.1 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. Check motor and blower rotation.
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 Figures 10A and 10B.

FIGURE 10



4.2 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.
- If the blower is running backwards, disconnect power to the unit and switch two of the motor leads in the junction box to reverse the motor rotation. Restore electrical power to the unit and confirm proper blower rotation.
- 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.

4.3 CHECKING INDOOR AIR-FLOW RATE

4.3.1 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 3.12. 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.

4.3.2 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.

CFM = Heating BTUH / (Elevation Factor × Temp Rise °F)

L/s = (895 × Heating kW) / (Elevation Factor × Temp Rise °C)

Note: Refer to Sections 4.3.3 and 4.3.4 to determine Heating Capacity and the following chart for Elevation Factor.

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

4.3.3 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.

Actual kW = Rated kW × (Actual Voltage^2 / Rated Voltage^2).

4.3.4 CALCULATING ELECTRIC HEAT CAPACITY IN BTUH

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

BTUH Capacity = kW × 3412
(Where 3412 = BTUH per kW)

4.4 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, refer to the manufacturer's outdoor unit charging chart and installation manual for the proper charging procedure for the system.

4.5 SEQUENCE OF OPERATION

4.5.1 COOLING & HEAT PUMP HEATING MODES

When the thermostat calls for cooling or heat pump heating and the thermostat fan setting is set to the AUTO position, the G signal from the thermostat energizes the blower contactor coil in the air-handler junction box or in the electric heater kit which closes the contacts and energizes the blower motor. If the thermostat fan setting is set to the ON (continuous fan) position, then the blower will already be energized upon a call for cooling or heat pump heating. When the call for cooling at the thermostat is satisfied or the thermostat is turned to the OFF position, the blower contactor opens and de-energizes the blower motor if the thermostat fan setting is set to the AUTO position.

4.5.2 ELECTRIC HEAT MODE

When the thermostat calls for the 1st stage of heat, the 1st stage heater contactor (HC1) in the electric heater kit closes which energizes the 1st stage heater elements. If the thermostat fan setting is set to the AUTO position, the G signal from the thermostat energizes the blower contactor coil which closes the contacts and energizes the blower motor. If the thermostat fan setting is set to the ON (continuous fan) position, then the blower motor will already be energized upon a call for the 1st stage of heat.

If the thermostat calls for the 2nd stage of heat, the 2nd stage heater contactor (HC2) in the electric heater kit closes which energizes the 2nd stage heater elements. The heater kit will then cycle between the 1st and 2nd 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 blower contactor will open and the blower motor will be de-energized. If the thermostat fan setting is set to the ON (continuous fan) position, the blower will continue to circulate air through the system after the call for heat has ended.

4.5.3 SUPPLEMENTAL HEATING DURING THE HEAT PUMP HEATING & DEFROST MODES

Should the room temperature continue to fall when the system is operating in the heat pump heating mode, the thermostat will energize supplemental electric heat as required if an electric heater kit has been installed.

If the purple pigtail connected to the "D" terminal on the outdoor unit defrost control is connected to the W1 input (black pigtail) on the electric heater kit, the 1st stage of electric heat will be energized during the defrost cycle. This prevents cold air from being discharged from the supply registers during the defrost cycle. For the most economical operation when discharge air temperature during defrost is not an issue, do not make this connection.

4.5.4 EMERGENCY HEAT (HEAT PUMP)

If heat pump thermostat is set to the "Emergency Heat" mode, the outdoor unit will be prevented from operating and heat will be provided solely by the electric heater. The electric heater elements and indoor blower motor will be energized any time there is a call for heat with no compressor and outdoor fan operation. A jumper should be installed between the W1 and E terminals on the thermostat sub-base so a call for emergency heat will be transferred to the 1st stage of heat of the thermostat. The indoor blower will cycle on and off with the electric heater elements when the thermostat fan setting is set to the "auto" mode.

4.5.5 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.

5.0 FIELD INSTALLED ACCESSORIES & KITS

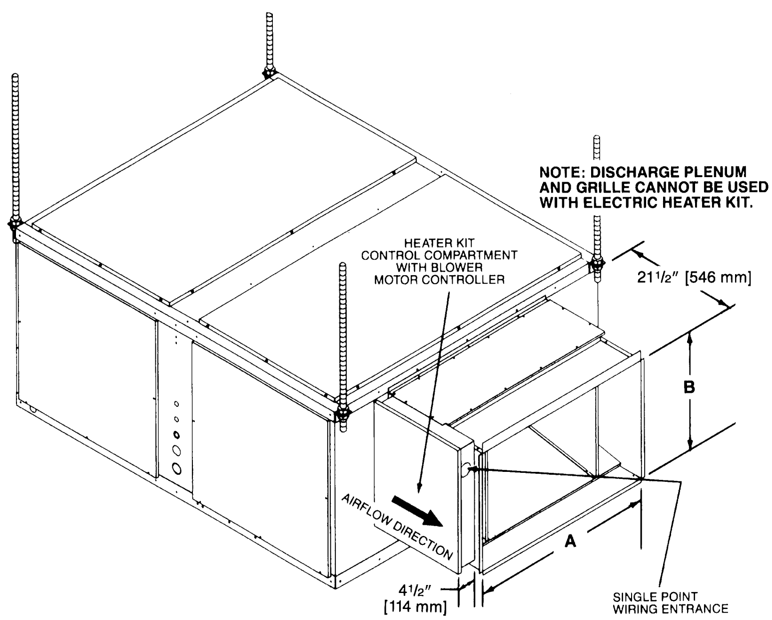
ACCESSORY DESCRIPTION	MODEL NUMBER	SIZES USED ON	NET WEIGHT (LBS) [kg]
Hot Water Coil	RXHC-C74W	090, 120	200 [91]
	RXHC-C76W	180, 240	200 [91]
Steam Coil	RXHC-C74S	090, 120	200 [91]
	RXHC-C76S	180, 240	200 [91]
Filter Frame Kit	RXHF-B74A	090, 120	90 [41]
	RXHF-B76A	180, 240	117 [53]
Inlet Grille Kit	RXHG-C74A	090, 120	9 [4]
	RXHG-C76A	180, 240	12 [5]
Discharge Grille Kit	RXHG-C74B	090, 120	15 [7]
	RXHG-C76B	180, 240	23 [10]
Discharge Plenum Kit	RXHL-C74B	090, 120	38 [17]
	RXHL-C76B	180, 240	62 [28]
Mixing Box	RXHM-BC74H	090, 120	120 [54]
	RXHM-BC76H	180, 240	195 [88]
Auxiliary Heater Kit	RXHE-DE020*A	090, 120	75 [34]
	RXHE-DE030*A	090, 120	75 [34]
	RXHE-CE030*C	180, 240	90 [41]
	RXHE-CE040*C	180, 240	98 [44]

NOTE: *Designates “C”, “D” or “Y” Voltage
[ ] Designates Metric Conversions

5.1 ELECTRIC RESISTANCE HEATER KITS

OPTIONAL ELECTRICAL HEATER KIT SHOWN INSTALLED IN HORIZONTAL POSITION AND CONNECTED DIRECTLY TO THE AIR HANDLER. THE HEATER KIT MAY ALSO BE INSTALLED WITH THE AIR HANDLER SET IN THE VERTICAL POSITION. IN EITHER POSITION THE HEATER KIT CONTROL COMPARTMENT MUST BE ON THE LEFT SIDE FACING THE AIR DISCHARGE OPENING.

MODEL NO.	AIR HANDLERS SIZES USED ON	IN. [mm] A	IN. [mm] B
RXHE-DE****A	090, 120	20 [508]	20 [508]
RXHE-CE****C	180, 240	36 [914]	24 [610]



[ ] Designates Metric Conversions

5.2 MIXING BOX KITS

7½ & 10 ACCESSORY MODEL RXHM-A74F
15 & 20 ACCESSORY MODEL RXHM-A76F

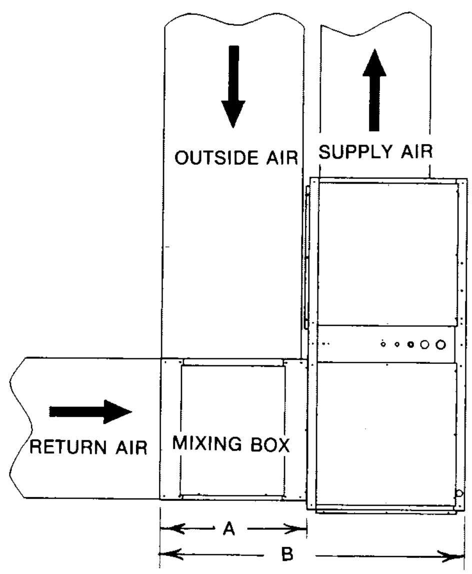
COOLING SEASON—Thermostat set at "Cool" and "Fan Auto," outside air damper goes to "minimum fresh air" position when cooling thermostat closes, energizing mechanical cooling. When cooling thermostat is satisfied, mechanical cooling is de-energized, and outside air damper closes.

INTERMEDIATE SEASON—Same as for cooling season, except that cooling thermostat closes, starting indoor blower motor, the enthalpy control, mounted on outside air, determines if "free" cooling or mechanical cooling should be utilized. If outside air conditions are suitable for cooling, the mechanical cooling remains off and the mixed air controller modulates the damper motor to assume the proper damper position to maintain mixed air setting. If outside conditions are not suitable for cooling, then the dampers go to "minimum fresh air" position and mechanical cooling is energized.

HEATING SEASON—Damper always stays at "minimum fresh air" position while fan motor is operating. Outside air damper closes when blower motor is off. "Minimum fresh air" position must not allow mixed air temperatures to air handler below 50°F. during heating seasons.

CAUTION: Because of the possibility of freeze damage, it is not recommended that hot water or steam coils be used with the mixing box accessory, unless provision is made to shut-off the outside air duct 100% during freezing conditions.

Another possible system enhancement would be to install an air proving switch in the air handler supply duct wired in series with the compressor contactor coil (24V) which would lock out the compressor in the event of air flow failure.



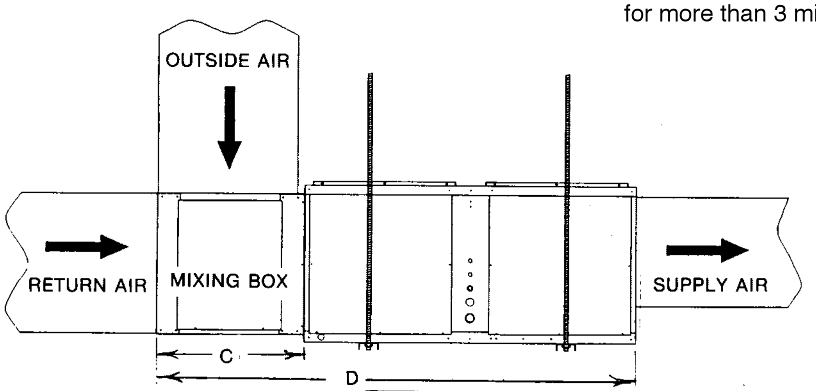
VERTICAL APPLICATION

	A	B
7½ and 10	27	54
15 and 20	32	67

HORIZONTAL APPLICATION

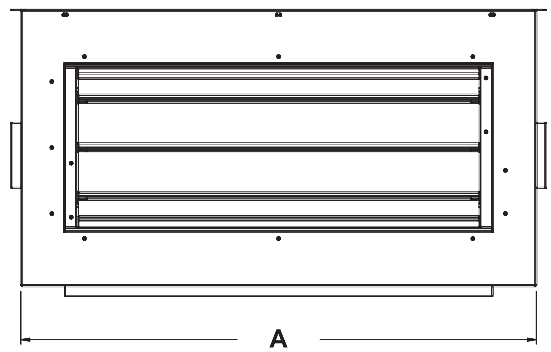
	C	D
7½ and 10	27	79
15 and 20	32	104

NOTE:
The bottom of the air handler should be sloped in two planes that pitch the condensate to the drain connection. The drain pan shall not leave puddles larger than 2 inches in diameter and 1/8 inch deep for more than 3 minutes.

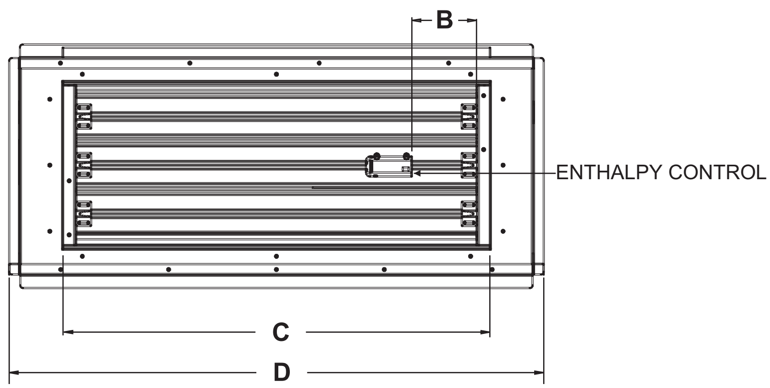


5.2 MIXING BOX KITS (continued)

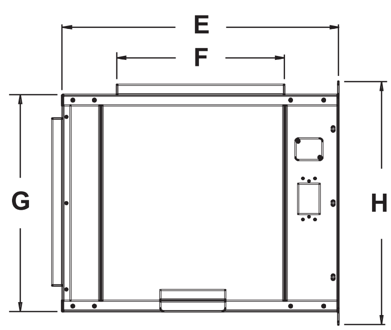
Field - Installed Mixing Box Dimensions



TOP VIEW



FRONT VIEW

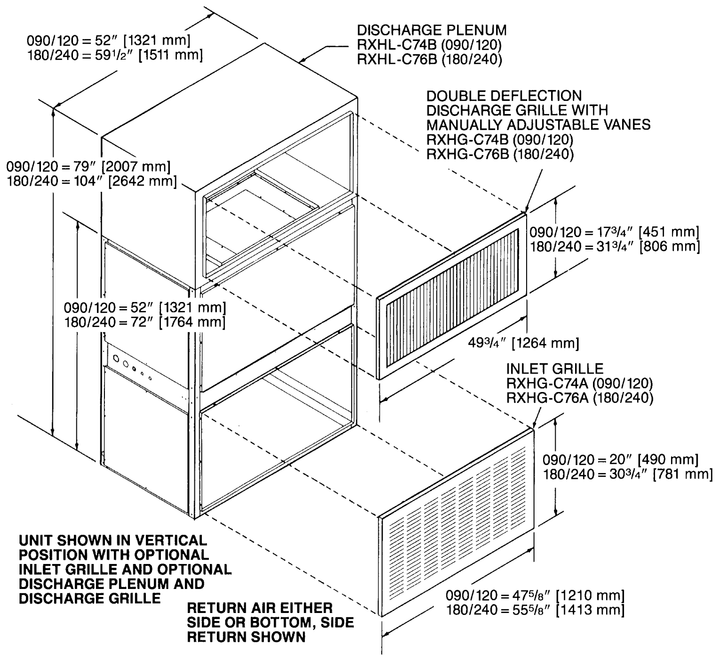


SIDE VIEW

									Flanged Duct Opening	
MODEL#	A	B	C	D	E	F	G	H	Length	Width
(-)XHM-BC74H	47 ¾	6	39 9/16	49 9/16	25 5/8	15 ½	20 1/8	22 9/16	42 1/8"	16 7/8"
(-)XHM-BC76H	55 ¾	6	47 7/8	57 9/16	32	21 7/8	30 ½	32 15/16	48 3/8"	22 1/8"

ST-A1201-01-X0

5.3 DISCHARGE PLENUM, DISCHARGE GRILLE, & INLET GRILLE KITS



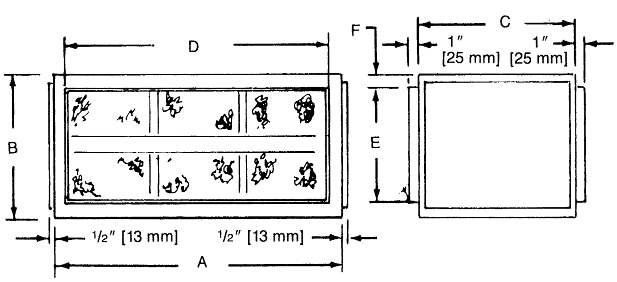
DOUBLE DEFLECTION DISCHARGE GRILLE

MODEL NO.	AIR HANDLER SIZES USED ON	NOMINAL CFM [L/s]	FT. [m] OF THROW
RXHG-C74B	090	3000 [1416]	0° DEFLECTION - 43' [13.1] 22° DEFLECTION - 37' [11.3] 45° DEFLECTION - 22' [6.7]
	120	4000 [1888]	0° DEFLECTION - 53' [16.2] 22° DEFLECTION - 46' [14] 45° DEFLECTION - 27' [8.2]
RXHG-C76B	180	6000 [2831]	0° DEFLECTION - 52' [15.8] 22° DEFLECTION - 36' [11] 45° DEFLECTION - 18' [5.5]
	240	8000 [3775]	0° DEFLECTION - 65' [19.8] 22° DEFLECTION - 45' [13.7] 45° DEFLECTION - 22' [6.7]

5.4 FILTER FRAME KITS

The filter rack accessory can be connected directly to the hot water/steam coil accessory. The filter rack accessory is ONLY needed when hot water steam coils are used.

MODEL NO.	AIR HANDLER SIZES USE ON	IN. [mm]					
		A	B	C	D	E	F
RXHF-B74A	090, 120	51 1/2 [1308]	24 [610]	25 1/8 [638]	47 3/8 [1203]	19 7/8 [505]	2 1/16 [52]
RXHF-B76A	180, 240	59 1/2 [1511]	34 1/2 [876]	27 [686]	55 1/2 [1410]	30 1/2 [775]	2 [51]

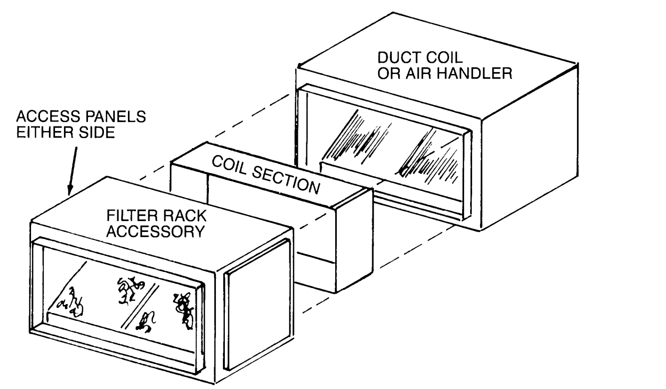


MODEL NO.	FILTER SIZE (QTY.) TYPE
RXHF-B74A	16×20×1 (4) Disposable 20×20×1 (2) Disposable
RXHF-B76A	20×25×1 (6) Disposable

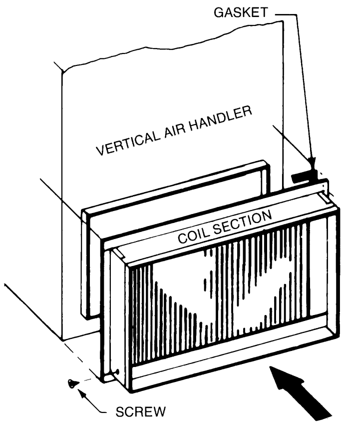
[ ] Designates Metric Conversions

FILTER PRESSURE DROP:

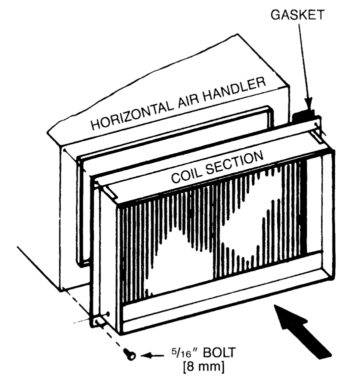
MODEL NO.	CFM [L/s] × 1000 [472]								
	2	3	4	5	6	7	8	9	10
RXHF-B74A	.01 [2]	.02 [4]	.03 [7]	.07 [16]	.10 [22]	.15 [33]	—	—	—
RXHF-B76A	—	—	—	—	.05 [11]	.06 [13]	.10 [22]	.12 [27]	.15 [33]



5.5 HOT WATER & STEAM COILS



(090, 120) **RXHC-C74W**
RXHC-C74S
or
(180, 240) **RXHC-C76W**
RXHC-C76S

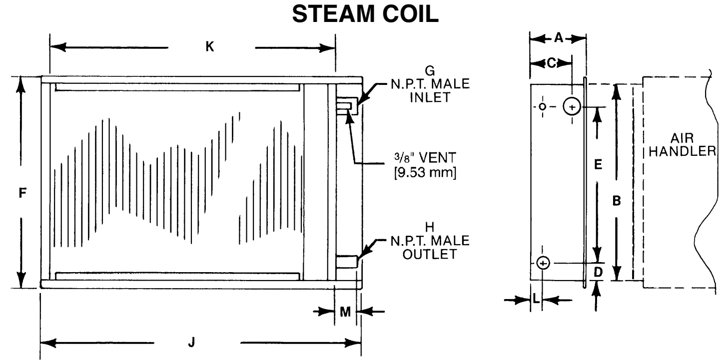


(090, 120) **RXHC-C74W**
RXHC-C74S
or
(180, 240) **RXHC-C76W**
RXHC-C76S

PHYSICAL SPECIFICATIONS

NOMINAL TONS [kW]	FINNED HEIGHT– IN. [mm]	FINNED LENGTH– IN. [mm]	FACE AREA FT² [m²]	CIRCUITS & TUBES HIGH
7 1/2 [26.38]-10 [35.17]	18 [457]	40 [1016]	5.0 [.46]	12
15 [52.75]-20 [70.34]	27 [686]	48 [1219]	9.0 [.84]	18

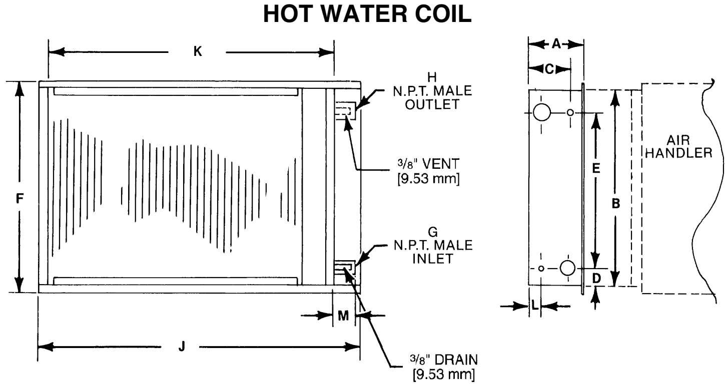
STEAM COIL



STEAM COIL COIL DIMENSIONS—INCHES [mm]

MODEL	NOMINAL TONS [kW]	A	B	C	D	E	F	G	H	J	K	L	M
RXHC-C74	7 1/2 [26.38]-10 [35.17]	9 1/16 [230]	21 3/8 [543]	5 3/8 [137]	3 3/16 [81]	15 [381]	24 [610]	1 1/2 [38]	1 1/4 [32]	51 1/2 [1308]	47 5/8 [1210]	2 13/16 [71]	3 1/4 [83]
RXHC-C76S	15 [52.75]-20 [70.34]	9 1/16 [230]	30 7/8 [784]	5 3/8 [137]	3 3/16 [81]	24 [610]	35 [889]	2 [51]	1 1/2 [38]	59 1/2 [1511]	55 5/8 [1413]	2 13/16 [71]	3 1/2 [89]

HOT WATER COIL



HOT WATER COIL DIMENSIONS—INCHES [mm]

MODEL	NOMINAL TONS [kW]	A	B	C	D	E	F	G	H	J	K	L	M
RXHC-C74W	7 1/2 [26.38]-10 [35.17]	9 1/16 [230]	21 3/8 [543]	5 3/8 [137]	3 3/16 [81]	15 [381]	24 [610]	1 1/4 [32]	1 1/4 [32]	51 1/2 [1308]	47 5/8 [1210]	2 13/16 [71]	3 [76]
RXHC-C76W	15 [52.75]-20 [70.34]	9 1/16 [230]	30 7/8 [784]	5 3/8 [137]	3 3/16 [81]	24 [610]	35 [889]	1 1/2 [38]	1 1/2 [38]	59 1/2 [1511]	55 5/8 [1413]	2 13/16 [71]	3 1/4 [83]

[ ] Designates Metric Conversions

6.0 MAINTENANCE

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

6.1 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 should 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.

6.2 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.

6.3 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.

6.4 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.

6.5 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.

6.6 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).

7.0 DIAGNOSTICS

Problem	Possible Cause (Suggested Fix)
Blower motor will not operate or no air-flow	• Failed run capacitor (H voltage only) • Failed motor (replace) • Loose wiring connection or broken wire (check connections & 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)
Excessive vibration	• Blower wheel out of balance (replace or clean blower wheel)
Water overflowing drainpan	• Plugged drain (clear 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 (replace filter) • Inadequate air-flow due to incorrect blower sheave adjustment (adjust sheave to achieve proper air-flow) or excessively restrictive duct system (correct duct system) • Belt loose, broken, or off (adjust or replace belt)
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) • Contaminants 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 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)