

Hi-Velocity **Systems**

Installation Manual

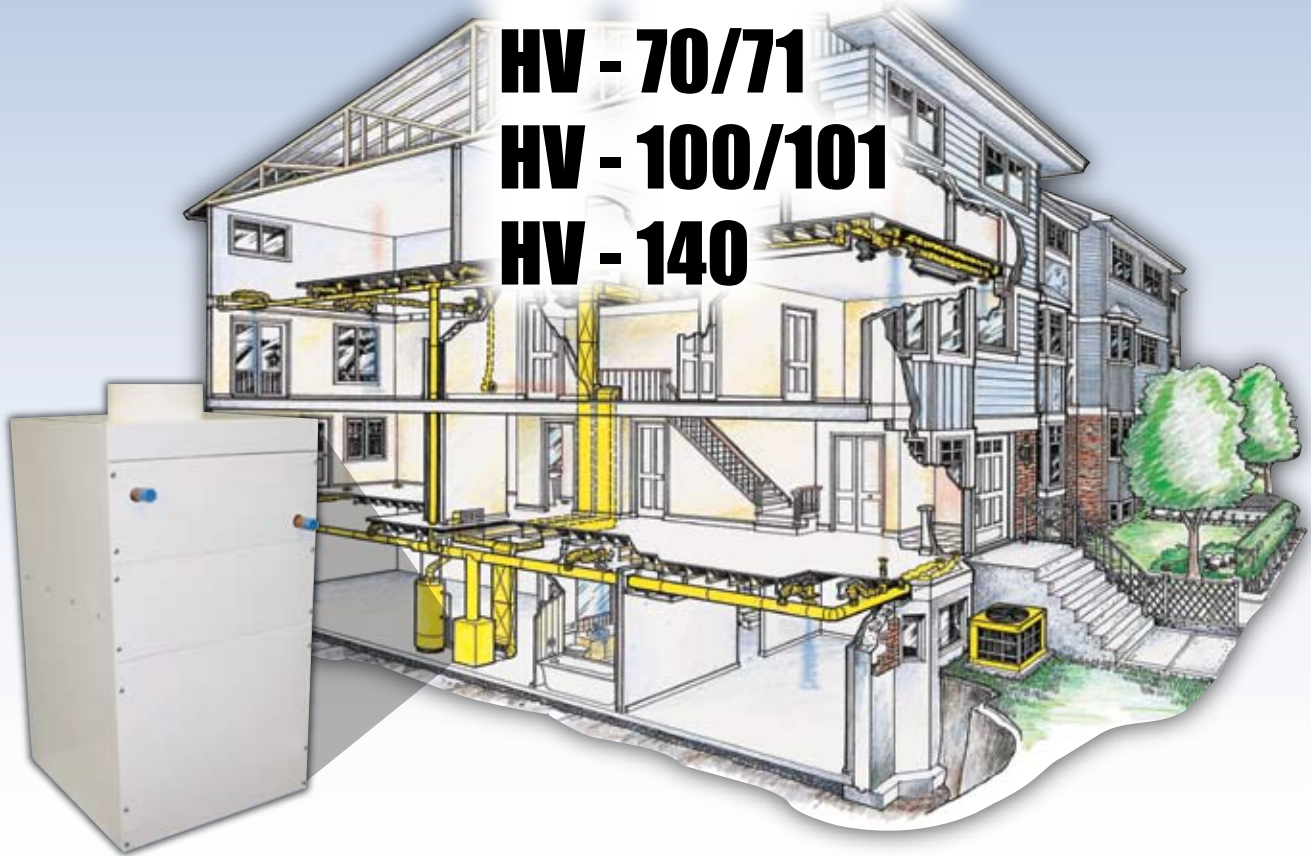
Models

HV - 50/51/52

HV - 70/71

HV - 100/101

HV - 140



**Manufactured By
Energy Saving Products Ltd.**

**Standard
ESP 103.05**

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Hi-Velocity Fan Coil Systems

Fan coil units specified in this section shall be designed as a closed loop hydronic fan coil system, with published BTUH ratings with entering water temperatures set between 110°F and 190°F. System shall allow for heating, TX or chilled water cooling, and heat pump applications with electric coil back-ups. Entering water temperature and BTUH outputs shall match performance listed in **Table 01**.

The fan coil units shall be designed, rated and approved by CSA/UL, and shall conform to applicable ASHRAE, ARI and DOE standards.

Minimum of 8 outlets per ton cooling. See **Table 02** for minimum and maximum per fan coil size.

The fan coil units shall have pre-wired controls consisting of a 24V transformer and printed circuit board. Circuit board shall be capable of providing both heating and cooling. Motors shall be 115/1/60 with published amp draws. The fan coil unit shall have speed controls for both constant fan and heating operation (HV Series only).

Sweat water connections are ½" Cu for the HV-50, ¾" for the HV-70 and HV- 100, and 1" on the HV-140. All lines should be piped so as not to restrict use of the access panels, filter section, or electrical enclosure. When the potential for gravity flow of the hot water exists, spring check valves may be needed on both the supply and return lines.

Sound data documented at 30 dba at each outlet using maximum number of outlets specified, and 40 dba if minimum number of outlets are used.

The fan coil unit can be located in a Horizontal, Hi-boy or Counter-flow position and can be suspended from the ceiling or placed directly on the floor. Location of the fan coil will vary depending on the following: length of duct runs, usable floor space, serviceability and accessibility to unit, minimizing structural changes, location of heating/cooling source, and available space in mechanical room.

The main supply duct shall be located either along the main beam(s) in the basement or in the attic space depending on location of fan coil. The supply duct shall be sealed for leaks and covered with R8 insulating sleeve if duct is located in an unconditioned area. Selection of main plenum location shall ensure that the 2" flex duct length is minimized with a maximum run length of 25 ft. Ducting layout to be matched as per the design of Energy Saving Products Ltd., or pre-approved equal.

The *Hi-Velocity Systems* are not to be used as temporary heating/cooling during the construction of the structure. If used in this capacity all warranties will be null and void.

Quality Assurance

Fan coil units shall be a total indoor air quality system complete with heating, cooling, air filtration, and possibility of humidity control and fresh air make up. The fan coil must be factory manufactured, assembled and tested.

All equipment furnished under this specification shall comply with the following standards:

ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ARI	Air-Conditioning and Refrigeration Institute
CSA	Canadian Standards Association
CE	European Conformity
DOE	Department of Energy
UL	Underwriters Laboratories

Table 01

Item	BTUH @ 190°F EWT	BTUH @160°F EWT	Kw Electrical Strip	TX Cooling MBH
HV-50/RCM-50	56,200	44,400	5 - 15 Kw	18 - 24
HV-52/RCM-50	58,636	44,877	N/A	18 - 24
HV-70/RCM 70	79,700	62,900	5 - 18 Kw	30 - 36
HV-100/RM-100	113,400	86,300	5 - 23 Kw	42 - 60
HV-140/RM-100	150,400	113,800	N/A	60

HV - 51 ratings same as the HV - 50
HV - 71 ratings same as the HV - 70
HV - 101 ratings same as the HV - 100

Table 02

Model	⁽¹⁾ Ø" Supply Air & Max Length	Return Air	Min # Outlets	Max # Outlets	CFM @ 250/ton
HV-50/51	8" Ø - 70'	12"	14	20	550
HV-70/71	8" Ø - 80'	12"	20	29	750
HV-100/101	10" Ø - 100'	14"	30	45	1100
HV-140	10" Ø - 120'	16"	40	50	1250
HV-52	Medium	8" Ø - 50'	8	14	375
	High	2 x 6" Ø - 50'	12	19	550

⁽¹⁾ Ø - Plenum diameter

Maximum length is from the unit to the supply run end cap. More than one run per unit is allowable.

Fan coils to be located indoors, however, attic, crawl space and garage conditions are fully acceptable.

Please read the ENTIRE manual before beginning installation as this will help avoid mistakes that may cost time and money.

Installing Vents

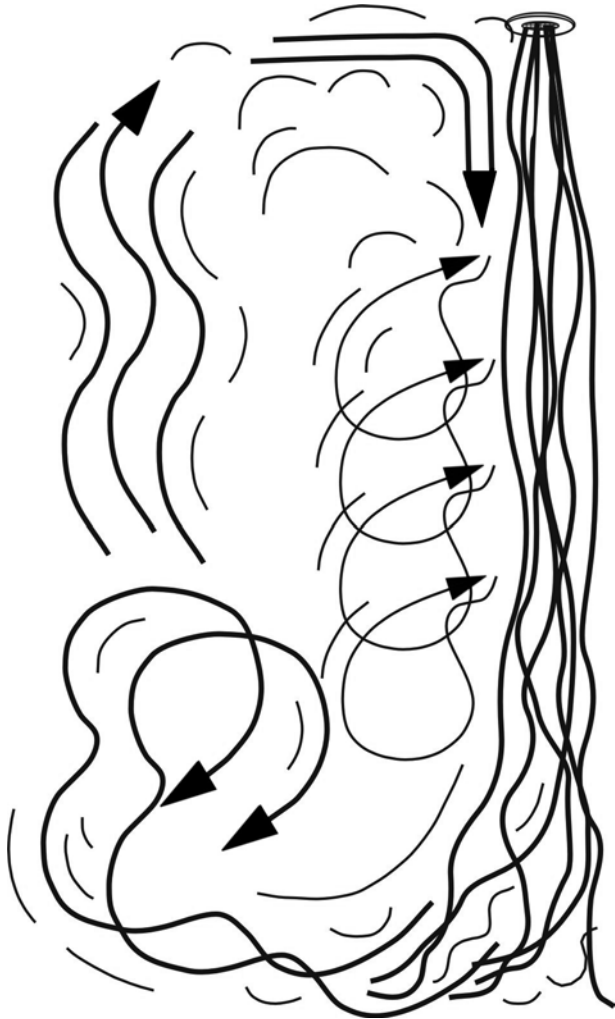
A duct layout is required before any installation can begin. The layout is designed to provide you with the maximum benefit from your Hi-Velocity System. Small deviations may be necessary due to existing construction. However, if large deviations must be made such as:

- Elimination of a vent from a room
- Moving a vent more than 10 feet from its specified location
- Re-routing the main plenum

contact your system designer before proceeding.

With the venturi effect of the Hi-Velocity system, you have more options in vent placement. Each vent has an effective throw of 18' (**Fig. 01**) and causes the air to constantly circulate. This allows for vent placement in floors, ceilings, or walls. **Fig. 01** illustrates the venturi effect of a single outlet.

Fig. 01 - Cone of Influence

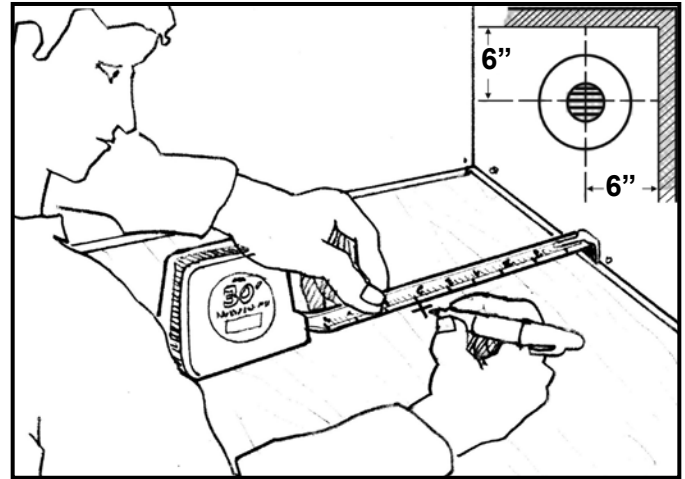


The constant circulation is very important to maintain room comfort. Do not install vents under/beside/on-top of objects that may hamper the cone of influence from circulating the room air.

Locating Vents

Outlets do not have to be located on an outside wall. Due to the venturi action of the Hi-Velocity System, the air in the entire room is gently circulated at all times. The outlets should be located six inches on center from any possible obstruction (**Fig. 02**).

Fig. 02 - Six inches on center



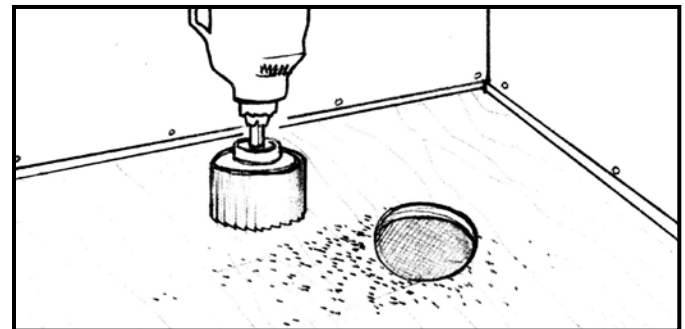
Proper location is critical to the operation of the Hi-Velocity System for optimum home comfort. The outlets should be located where it is considered to be a "low traffic area". Typical areas are in the corner of a room, or to the side of a window or door. When the vents are properly located, the home owner can expect to have a nearly draft free home.

Vent placement in outside walls of the structure should be avoided. Flexible duct that is run in outside walls may receive a substantial heat loss/gain. This can result in a higher operating cost for the structure while delivering an inferior air quality.

Installing the Rough-In Boot

Once a suitable location has been chosen for the vent placement, use a 3" hole saw to drill an opening large enough for the Rough-In Boot with a Rough-In Cap (**Fig. 03**).

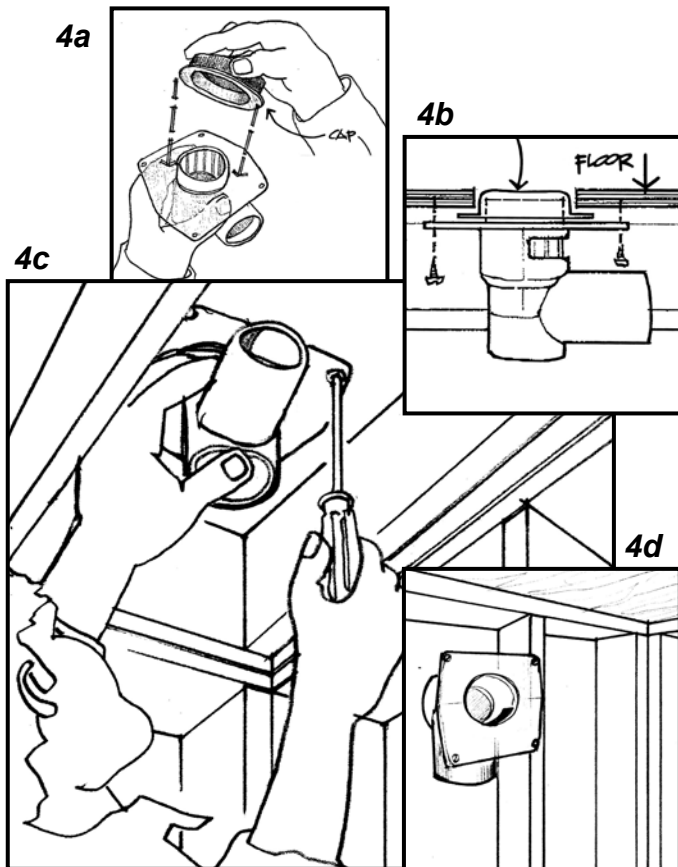
Fig. 03 - Drill a 3" hole



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Before securing the Rough-In Boot, make sure to use a Rough-In Cap (**Fig. 04**).

Fig. 04 - Always use a Rough-In Cap



- 4a - Rough-In Cap fits on Rough-In Boot
- 4b - Rough-In Boot installed with a Rough-In Cap
- 4c - Floor installed Rough-In Boot
- 4d - Wall installed Rough-In Boot

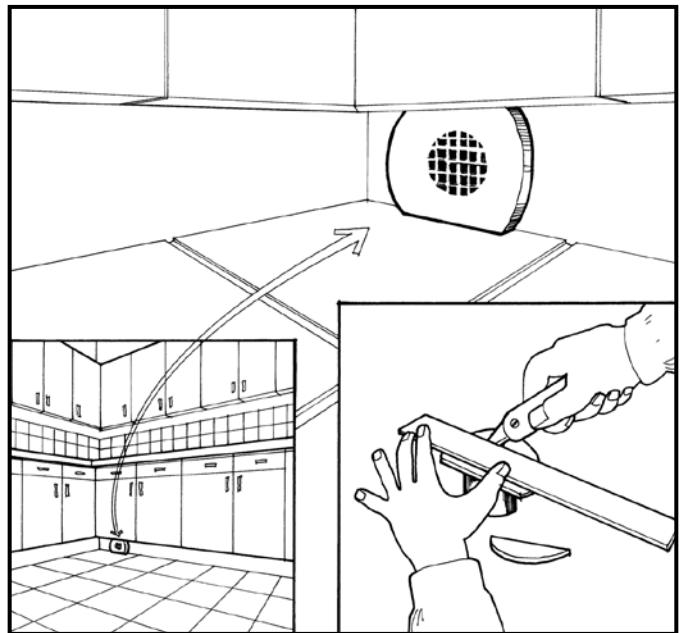
Neglecting to use a Rough-In Cap can cause serious harm to the coil in the Hi-Velocity System. During construction of the residence drywall dust, saw dust, and other small particles may clog and damage the coil. To prevent damage during construction, do not cut out the Rough-In Caps until the vent plates are ready to be installed.

Installing Vents in Kick Spaces

In kitchens and bathrooms, however, it is hard to find a "low traffic area", so it is recommended to locate the vents in the kick space under the counters. Our Vent plates have a 4" and 5" diameter, which may not fit in all Kick spaces without trimming. This can easily be done by trimming the top and bottom of our vent plate so it fits.

The easiest way to install the round vent plates in the kick space is to trim off two edges of the plate. Deeply score the top and bottom with a sharp knife, and then break off the trimmings (**Fig. 05**).

Fig. 05 - Trim the edges for kick spaces



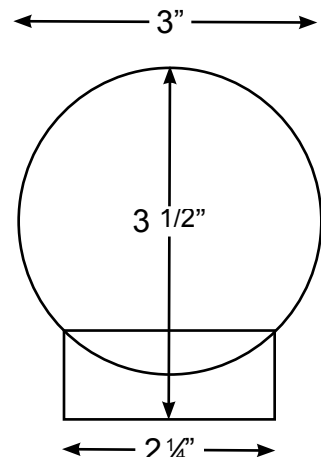
By locating the vents in this position, there will now be horizontal airflow. Caution should be exercised when locating vents in the horizontal position. Avoid placing vents directly below sinks or other locations people will be for extended periods of time.

Installing Vents in Retrofits

With the proper preparations, installing vents into finished walls and ceilings is quick and simple.

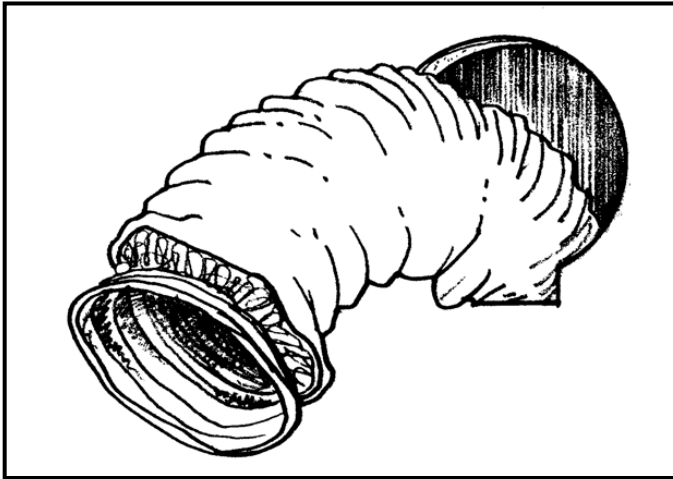
Fig. 06 - Dimensions

Using a 3" hole saw, drill a hole where the vent outlet is to be placed (**Fig. 03**). The hole needs to be enlarged in the direction of the incoming flexible duct. This is done by creating a 2 1/4" x 1/2" rectangle, which will allow the Rough-In Boot to slide easily into the wall (**Fig. 06**).



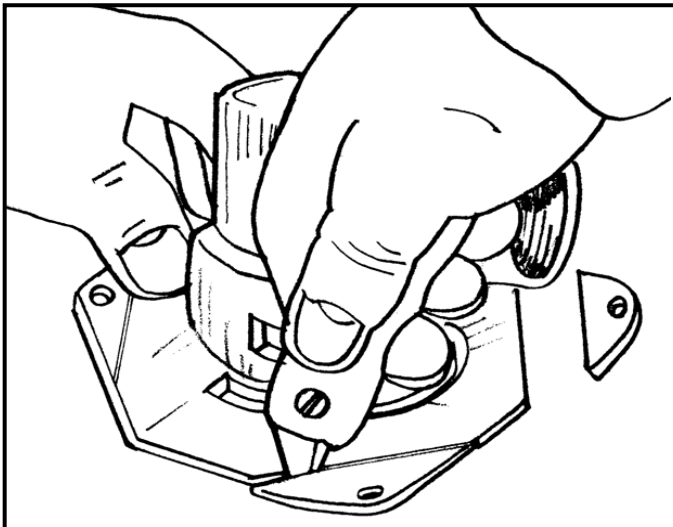
Once the hole is finished, run the flexible duct through the wall/ceiling to the vent outlet. If installed in drywall, care must be taken when pulling the flex out of the opening. Too much force can result in damage to the dry wall (**Fig. 07**).

Fig. 07 - Run flex through opening



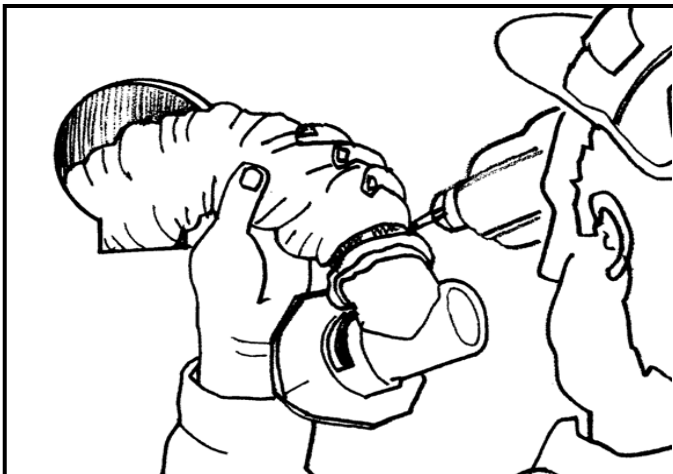
The Rough-In Boot needs a little preparation before it can be mounted to the flexible duct. The corners need to be trimmed along the score lines of each corner (**Fig. 08**). This will allow the Rough-In Boot to be completely hidden with a beauty ring (**Fig. 14**).

Fig. 08 - Trim off the 4 corners



The Rough-In Boot is then connected to flexible duct and mechanically attached with a self tapping screw (**Fig. 09**).

Fig. 09 - Secure flex to Rough-In Boot



Next the flex is fed back into the wall and Rough-In Boot slid into the hole (**Fig. 10**).

Fig. 10 - Feed the flex back into the wall

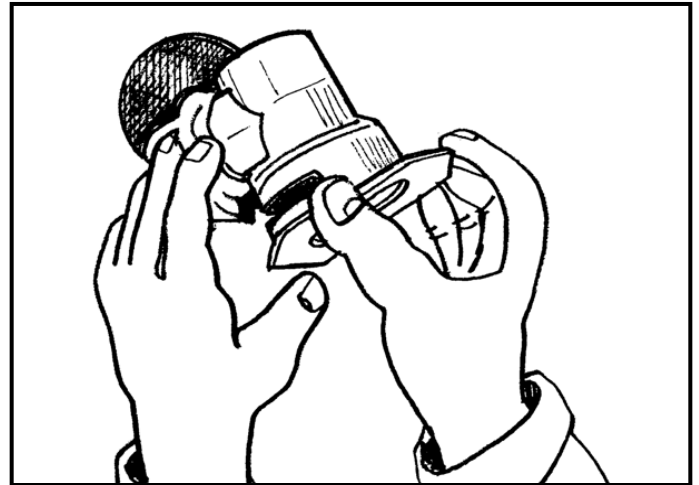
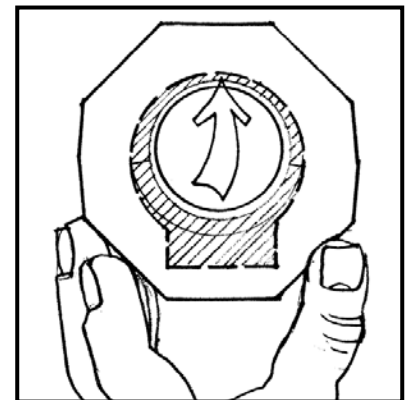


Fig. 11 - The Top



The Rough-In Boot is placed at the top of the hole; top is the opposite side of the cut out rectangle (**Fig. 11**).

If being installed in drywall, with the boot seated firmly against the top, 3 pilot holes need to be drilled for 1/4" drywall anchors (**Fig. 12**).

In drywall applications, 3 drywall anchors (1/4") should be used to secure the Rough-In Boot to the wall (**Fig. 13**).

Fig. 12 - Pre-drill for anchors

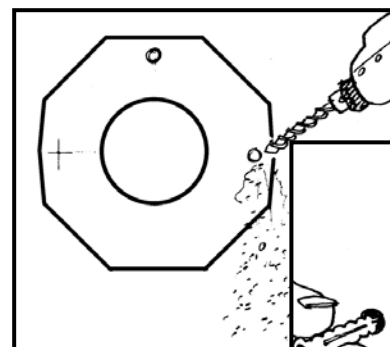
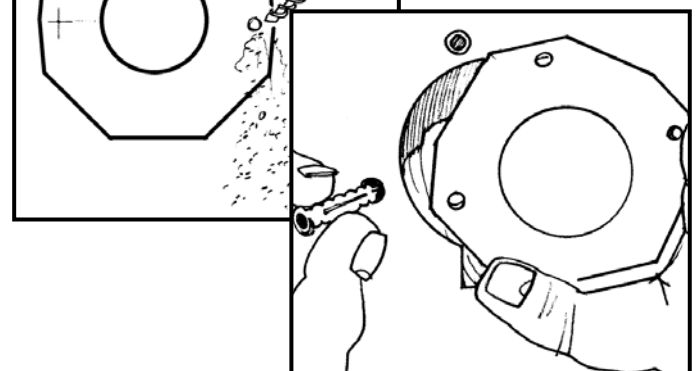


Fig. 13 - Anchors

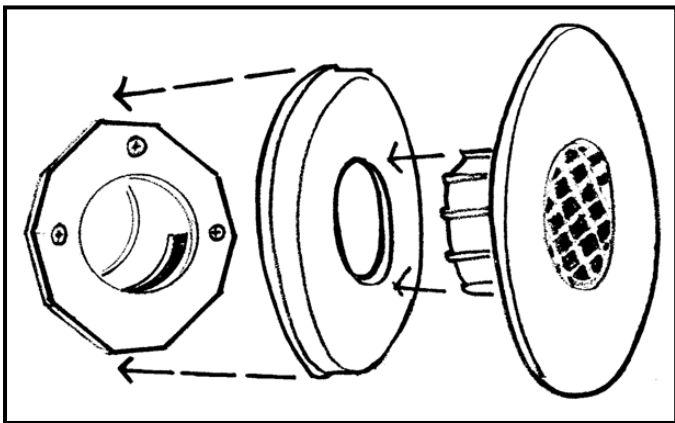


Once drywall anchors are installed, screw down the Rough-In Boot and secure it in place.

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The hole and Rough-In Boot can be completely hidden if a beauty ring is used in conjunction with a vent plate (Fig. 14).

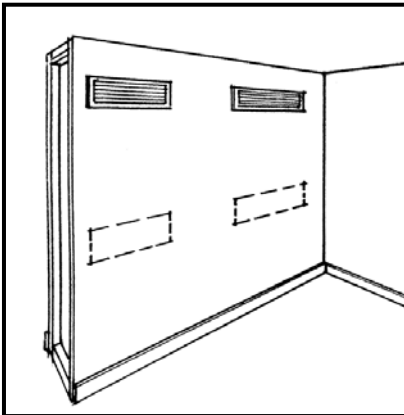
Fig. 14 - Beauty ring with Vent Plate



Linear Grills

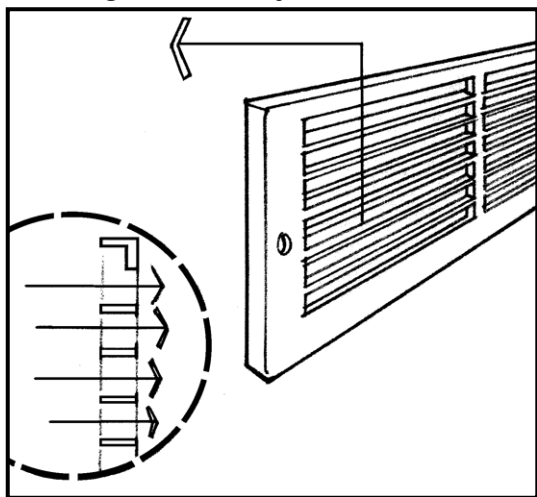
Installations in areas that have a high heat loss/gain require multiple vents. Multiple vents can be installed into linear grills for a more esthetically pleasing look. Installing in a high sidewall/ceiling or floor makes little difference (Fig. 15).

Fig. 15 - Linear Grills



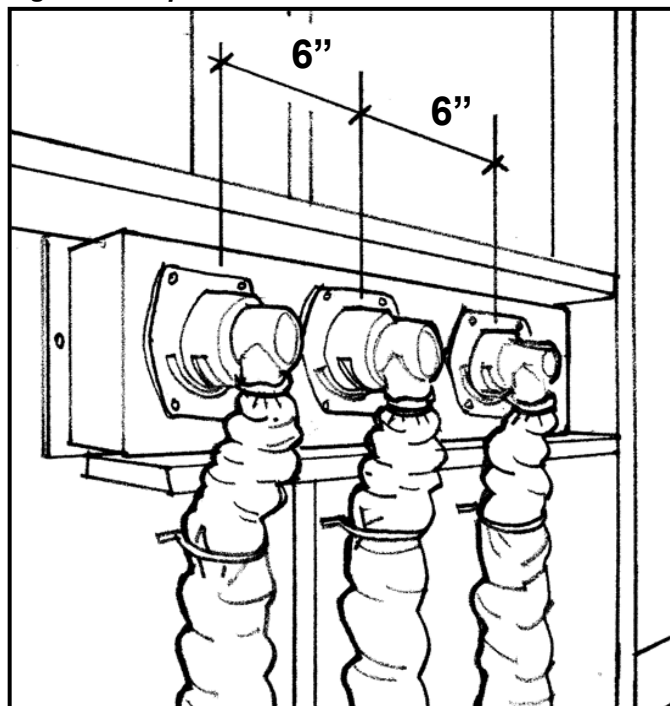
A **Straight Vane** vent grill is the **only** type of linear grill that can be used with the Hi-Velocity System (Fig. 16).

Fig. 16 - Straight vanes only



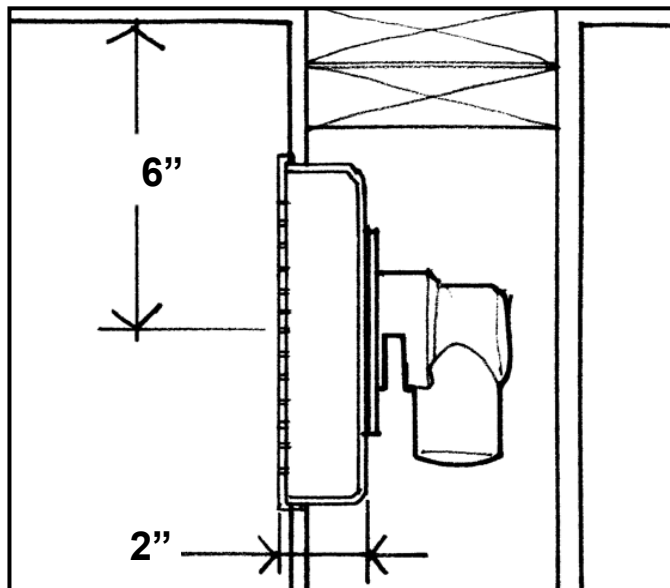
When installing multiple vents into linear grills, the vents must be a minimum of 6" on center from each other (Fig. 17). Same rules apply for vents in linear grills as a single outlet installation; see locating vents for more information on vent placement.

Fig. 17 - 6" Apart on center



The outlet of the Rough-In Boot must be no more than 2" away from the grill (Fig. 18).

Fig. 18 - Outlet no more than 2" from grill



Installing the vents around the room will allow for the room air to mix. This will give the room a more even air temperature and better distribution.

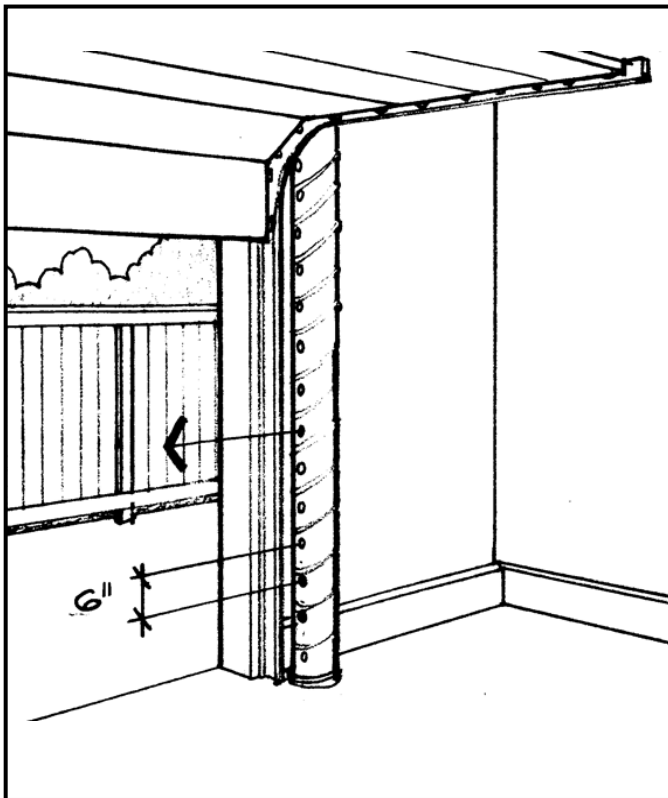
Drilled Outlets

Caution must be used when not using the 2" flexible duct, the air velocity from the drilled outlet may create noise. Drilled Outlets **CAN NOT** be installed in a residential structure; too much noise is generated from the outlets. In commercial areas with large ceilings the sound can be absorbed by the room or is not a concern because of the ambient noises.

Drilled outlets are commonly used to supply a large area with heating and cooling. Drilled outlets can also be used to create a pressurized air curtain for bay doors, or large openings to the outside environment. When drilled outlets are used with the Hi-Velocity System a few points to remember:

- When multiple 1" or 2" holes are used, they need to be a minimum of 6" apart on center (**Fig. 19**).
- One 1¼" drilled hole is equivalent to a single 2"x10' AFD kit (2" Rough-In Boot attached to a 10' piece of flex duct). With the 1¼" drilled outlet the throw from the outlet is up to 18'.
- One 2" drilled outlet is equivalent to two - 2"x10' AFD kits (2" Rough-In Boot attached to a 10' piece of flex duct). With the 2" drilled outlet the throw from the outlet is up to 30' in distance.
- Using drilled outlets larger than 2" is not recommended; with too large of an opening in the main plenum the static pressure may drop to an unacceptable level.

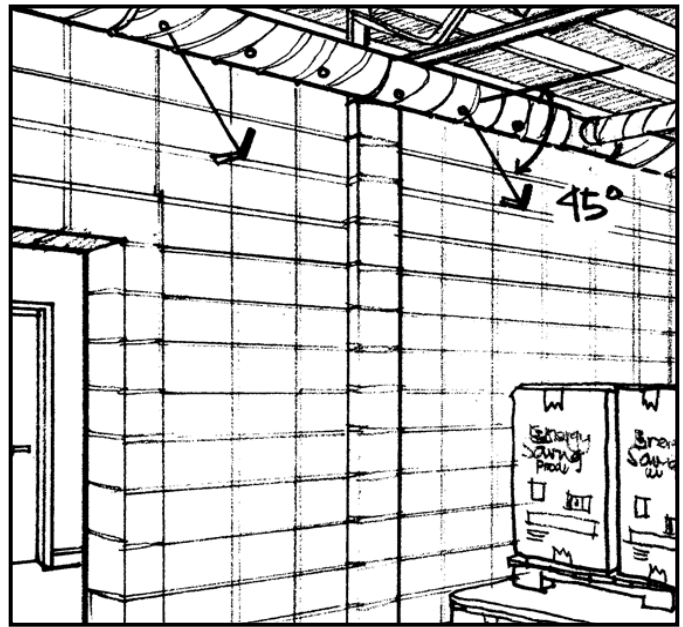
Fig. 19 - 6" Apart on center



Plenum Runs on Ceiling

When drilled outlets are used in a ceiling install, drill the outlets at a 45° angle to properly circulate the room air (**Fig. 20**).

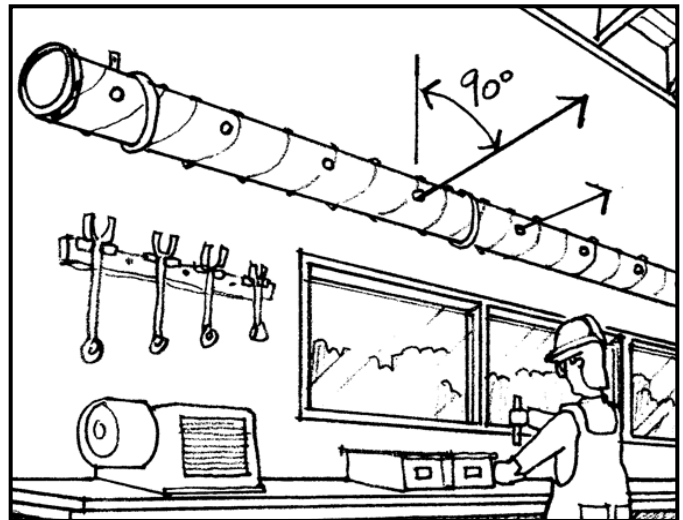
Fig. 20 - Airflow 45° angle to floor



Plenum Runs On Sidewall

For sidewall installations the outlets are drilled parallel to the floor (Horizontal airflow). When the vents are in this configuration, they can be used to create a pressurized air curtain.

Fig. 21 - 6" Airflow parallel to floor



If there is an air velocity noise coming from the drilled outlets, a static pressure reading from the plenum duct should be taken. This reading is to be taken no closer than 18" from supply air outlet of fan coil (**Fig. 35**). Static pressure readings are taken from the inside edge of the plenum; do not insert pitot tube deeper than ¼" from the inside surface of the plenum.

If the static pressure is high, drilling more holes into the main plenum will lower the static pressure and the noise level of the system. The standard supply pressures for the Hi-Velocity System runs between 0.7 H₂O and 1.2 H₂O. Do not allow the static pressure to drop below 0.7 H₂O as this can cause a low airflow and over AMP the motor.

Fan Coils

Hi-Velocity Systems fan coils are manufactured with a direct drive permanently lubricated motor that is mounted within the blower. All HV fan coils are single side access. The blower assembly can easily be slid out by removing the three mounted bolts that attach it to the center plate. In some instances, the electrical box may need to be removed.

Placement

The fan coil unit is to be placed according to the layout provided by the designer. As with vent placement, small deviations can be made in fan coil placement. If the fan coil has to be moved more than a few feet from it's pre-designed location, contact the designer before proceeding.

When installing the fan coil keep these points in mind.

- Serviceability and access to the unit.
- Maximizing usable floor space.
- Location of heat/cool source to fan coil.

The fan coil can be installed in many different configurations. The fan coil can be located in a Hi-Boy, Counter flow, or Horizontal position. In the Hi-Boy position, the supply air is delivered from the top of the unit (**Fig. 22**).

Fig. 22 - Hi-Boy

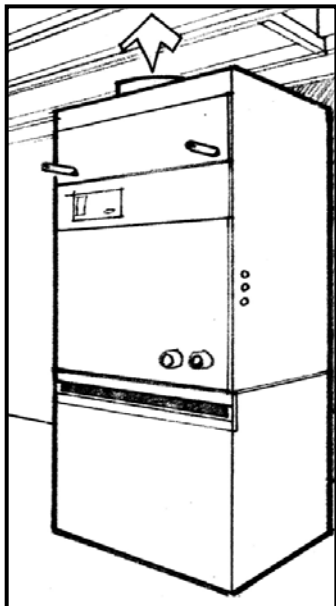
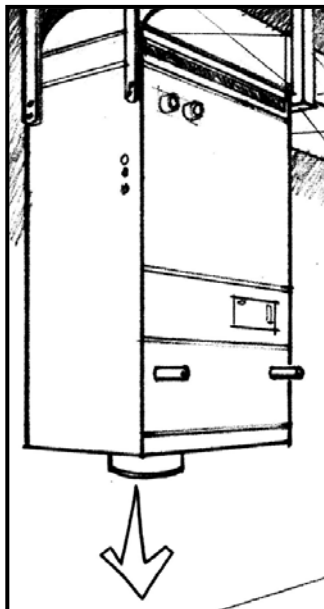
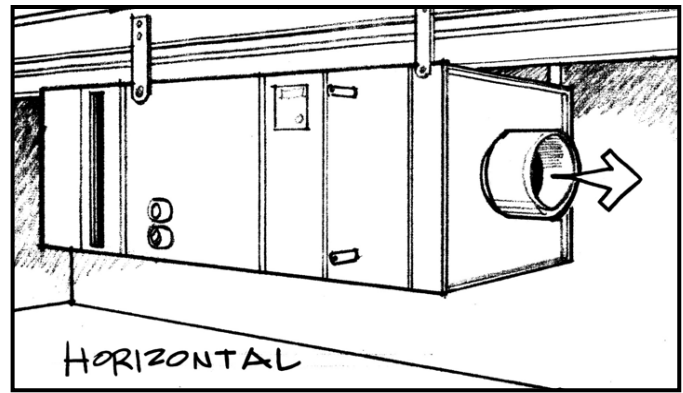


Fig. 23 - Counter flow



When placed in the Counter flow position, the supply air delivery is from the bottom of the unit (**Fig. 23**).

Fig. 24 - Horizontal installation



Quite often, the best location for the fan coil unit is suspended from the ceiling of the mechanical room, in the horizontal position (**Fig. 24**). This will allow for more floor space in the room, and will minimize the duct work needed to connect to the fan coil unit.

Clearances

Clearance is only needed on the access side of the units. However, ensure that there is a small space between the unit and any other surface to prevent vibration transfer. In order to maintain and service the fan coil unit, the minimum clearances required on the access side are (**Table 03**).

Table 03 – Fan coil clearances

Unit	Inches
HV – 50/51/52	18"
HV – 70/71	22"
HV – 100/101	29"
HV – 140	29"

Add an additional 4" for Electric Strip Coils

Hanging Strap Kit

The Hanging Strap Kits are designed to suspend a horizontal or vertical fan coil. The nylon straps will absorb most of the vibration generated by the fan coil system eliminating any sound transfer.

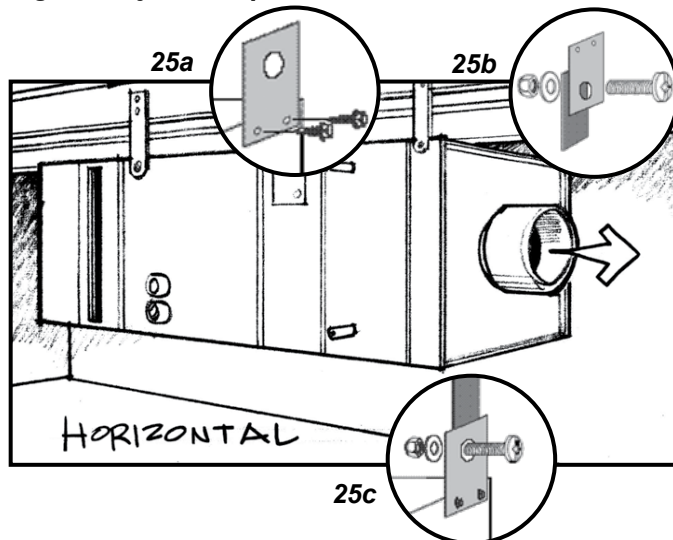
Clearance is only needed on the access side of the units. However, ensure that there is a small space between the unit and any other surface to prevent vibration transfer.

Fan Coil Unit Only

Attach the metal flanges to the four facing corners of the fan coil unit (**Fig. 25a**).

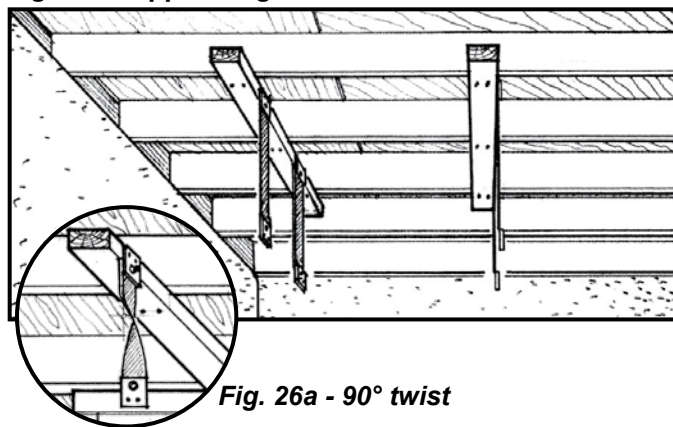
The Nylon Straps need to be cut to the desired length (4" or more). Make a 1/4" hole 1" from the end of the nylon strap. Slide the 1/4" bolt into the hole of the metal flange then into the nylon strap, secure with washer and nut. Repeat this at each end of the nylon straps (**Fig. 25b – 25c**).

Fig. 25 - Nylon Straps



Secure the nylon straps to the joist or support, it may be necessary to install a support across the joists to properly fasten the Nylon Straps (**Fig. 26**). The Nylon Straps are always installed in a vertical position; they should never be installed at an angle. It is acceptable to put a 90° twist in the Nylon Straps (**Fig. 26a**), do not exceed 90°.

Fig. 26 - Support might be needed



Fan Coil Unit with Cooling Coil

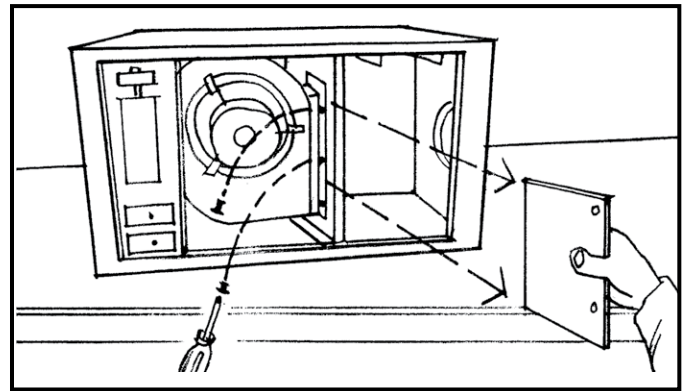
Attach the cooling coil to fan coil unit. Attach the metal flanges to the four facing corners of the **fan coil and cooling coil** assembly.

After attaching the metal flanges, follow the same steps for fan coil unit only.

Static Plate (Model HV-50/51/52 Only)

Within the HV-50/51/52 fan coils, there is a metal Static Plate installed between the blower and the center plate of the fan coil. This is used to balance the air pressure for short or extended plenum runs. If there is a reduced air flow in the system, this plate can be removed to provide additional CFM.

Fig. 27 - Static Plate removal



Removing the Static Plate:

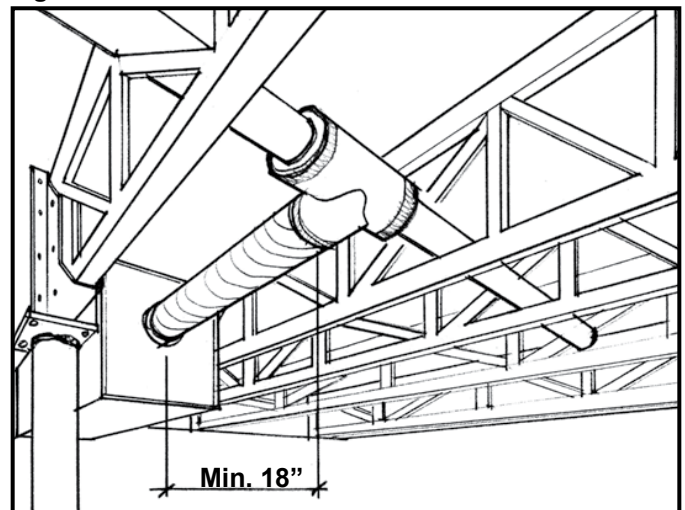
The front access doors are first removed from the fan coil unit. Then the two mounting bolts attaching the blower to the center plate of the fan coil unit are removed. Once the bolts have been removed, the Static Plate is removed by sliding it out from between the blower and center plate (**Fig. 27**). Finish by replacing the 2 blower mounting bolts, washers and nuts. Replace and secure the access doors to the unit.

Plenum Duct

Location

When locating the plenum duct, one of the main factors to consider is the integration of the duct work into the structure. The main supply duct can be located along the main beam(s) in the basement (**Fig. 28**).

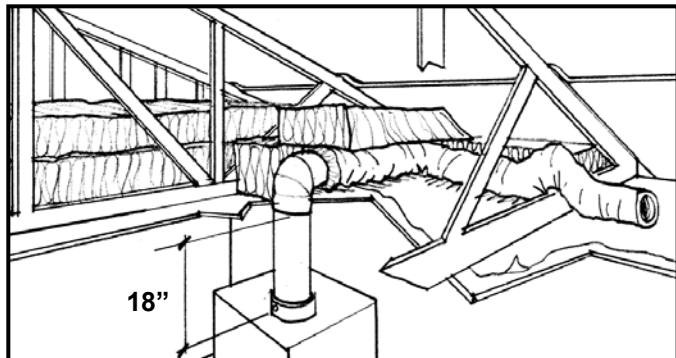
Fig. 28 - Basement installation



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The main plenum can also be easily installed in the attic space. (*Fig. 29*)

Fig. 29 - Attic Installation



If the unit is installed in the attic, make sure that all ducts in the attic are insulated with a vapour barrier (All A/C systems main plenums need to be insulated and vapour barriered). This includes the Branch Take Off and the vent Rough-In Boot. If the duct work is run above the attic insulation, an extra insulation sleeve may be needed. Check your local building code for the ruling in your area.

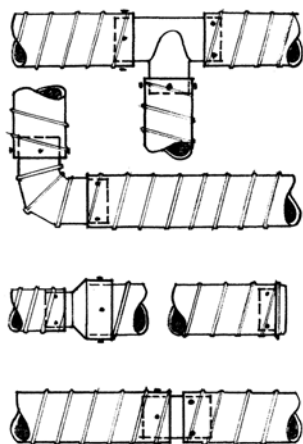
For any duct runs over 75% of the maximum allowable plenum length (*Table 02*), it is recommended to insulate the main plenum. Insulating the main plenum will cut down on your duct loss, and form a vapour barrier. The attic insulation should be placed over all Hi-Velocity System ducts to further reduce any duct losses.

Main Plenum Connectors

There are five types of connections that are possible with the Hi-Velocity System.

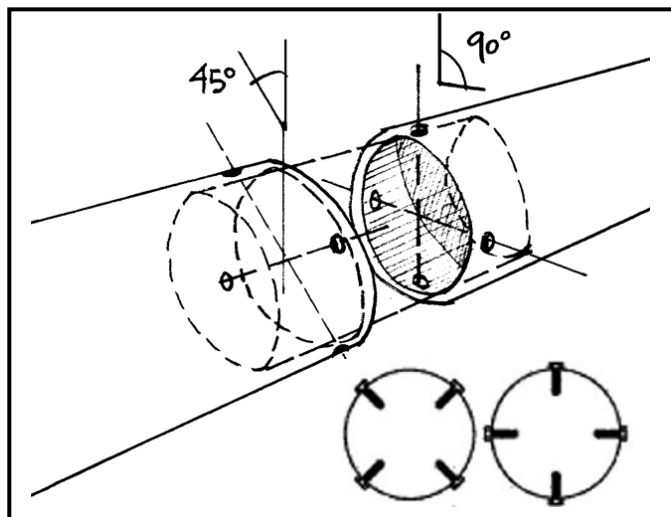
Fig. 30 - Connectors

1. Tee Connection
2. Elbow Connection
3. Reducers
4. End Cap
5. Straight Connection



All the connections are done as follows. Place the joint connector, cap, tee, or elbow inside the plenum you intend to connect. Push the plenum over the fitting as tight as possible. Use four screws on each side of the connector, alternating the screw locations as indicated in *Fig. 31*.

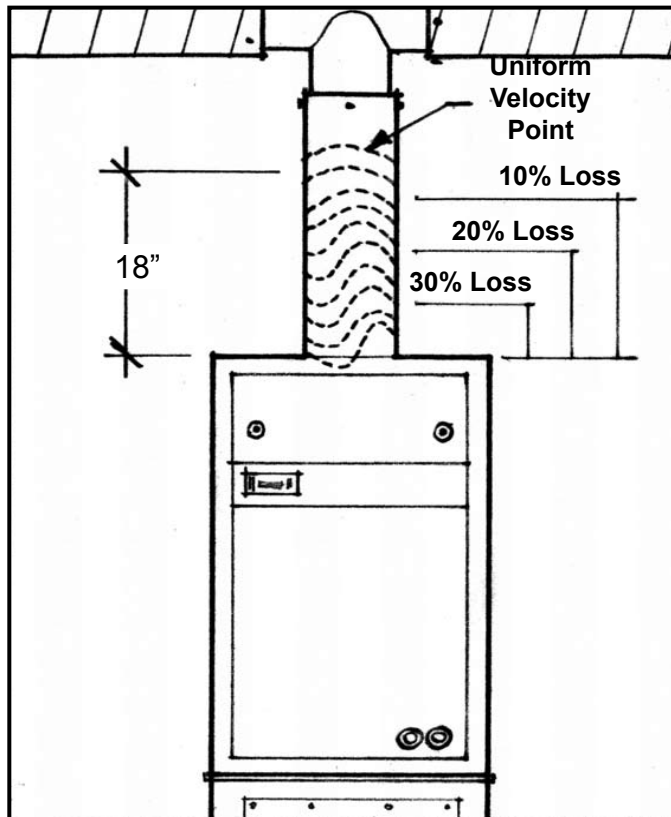
Fig. 31 - Alternating screw locations



Elbow and Tee Placement

Elbows and tees must not be placed any closer than 18" from supply outlet on the air handling unit. A significant loss of airflow can result if elbows or tees are installed closer than 18". *Fig. 28* and *Fig. 29* illustrate a proper install with at least 18" of straight plenum after the unit supply outlet. *Fig. 32* shows the sigma velocity profile of the first 18" of the main plenum and why it's important to allow the system to equalize air flow.

Fig. 32 - Sigma velocity profile



If elbows, tees, or Branch-Take Off's are placed closer than 18" you may lose up to 30% of your airflow as illustrated in *Fig. 32*.

Branch Tees

When branch tees are used, the plenum split is to be a 70/30 main/branch split (**Fig. 33**).

Fig. 33 - Branch Tee, 70/30 split

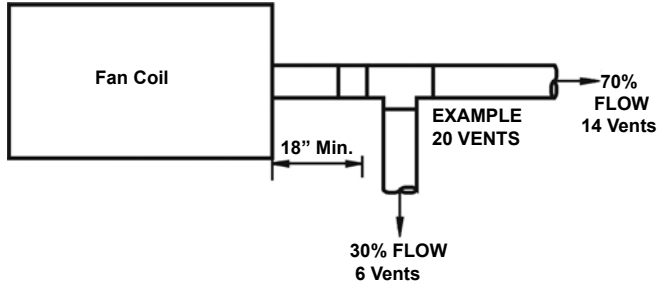
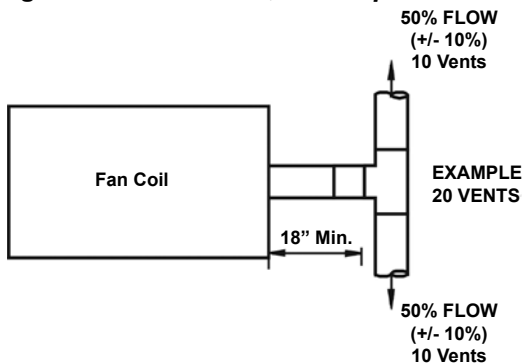


Fig. 34 - Bullhead Tee, 50/50 split

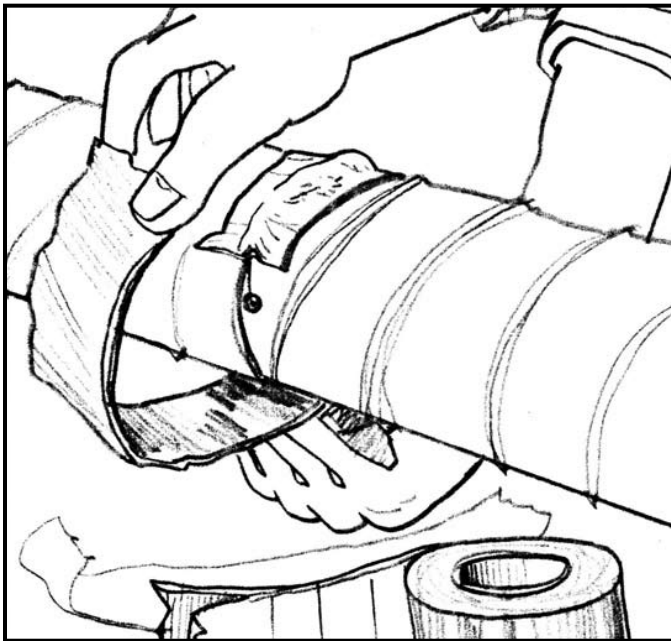


Bullhead Tees

Bullhead tees are to be maintained as close to a 50/50 split as possible, with a maximum 60/40 split (**Fig. 34**). For the best system performance, keep the number of elbows and tees to a minimum.

After any connection is made, tape (foil duct tape) or a sealant should be used to eliminate any air leaks.

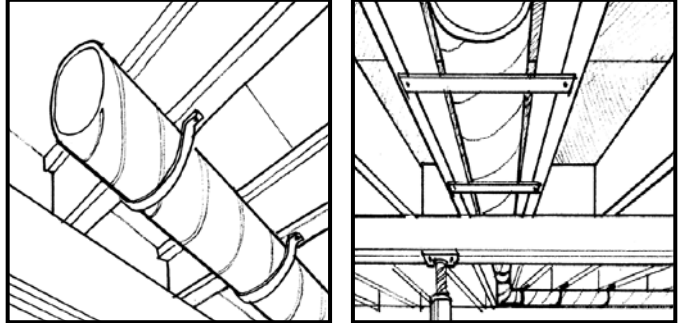
Fig. 35 - Seal all connections



Joist and Trusses

When running the plenum duct between joists in the basement, sheet metal strapping should be used (supplied by the installer, not the factory) to secure the plenum in place (**Fig. 36**).

Fig. 36 - Use metal strapping



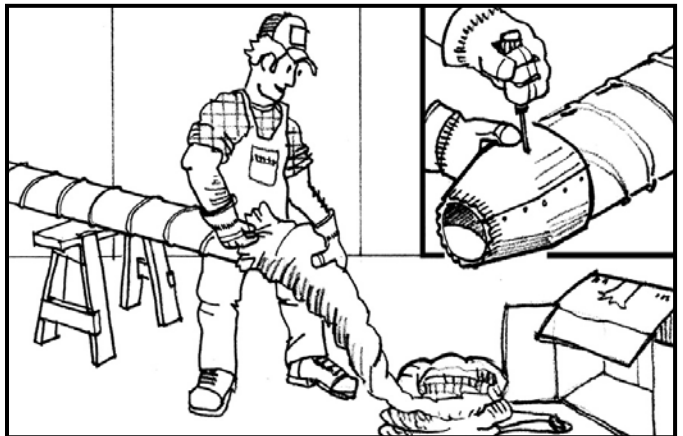
When located in ceiling spaces, the duct may be laid upon ceiling trusses. Run the duct work low so that it can be covered with the house insulation (**Fig. 29**).

Insulation Sleeve

Any time the duct will be run in an unconditioned space (attic or crawl space) it must be insulated with a vapour barrier. It's also recommended to vapour barrier runs that exceed 75% of the total allowable distance (**Table 02**).

To install the insulation sleeve over the main plenum, either tape the end of the duct or use an end cap. This will allow the sleeve to slide on easier, and prevent the insulation from catching on the sharp metal ends of the duct (**Fig. 37**).

Fig. 37 - Use an End Cap or Reducer



Branch Take-Off with Insulation Sleeve

After the insulation sleeve is installed, cut an X through the vapour barrier and insulation. Peel it back enough to allow you to drill your hole without ripping all of the insulation. Install the branch take-off as described in the Branch Take-Off section.

Fig. 38 - BTO with insulation sleeve



Space Saver Supply Take-Offs

The Space Saver model is the same as other Hi-Velocity Systems with the exception of the supply air take-offs. The Space Saver was designed for closer main plenum take-offs with more take off points. The Space Saver comes with 5 available supply outlet locations. The unit consists of four 6" supply outlets, along with a single 8" outlet at the end/top of the unit (**Fig. 40**).

When the 8" supply outlet is used, no elbows or tees shall be placed any closer than 18" from the top side of the air handling supply outlet (**8" collar, #1 Fig. 40**). A significant loss of airflow can result if installed closer than 18" (**Fig. 32**). When using the top 8" supply outlet only that outlet may be used (**Fig. 39**).

Fig. 39 - Space Saver take-offs

Any Two 6" take-offs, no 8"

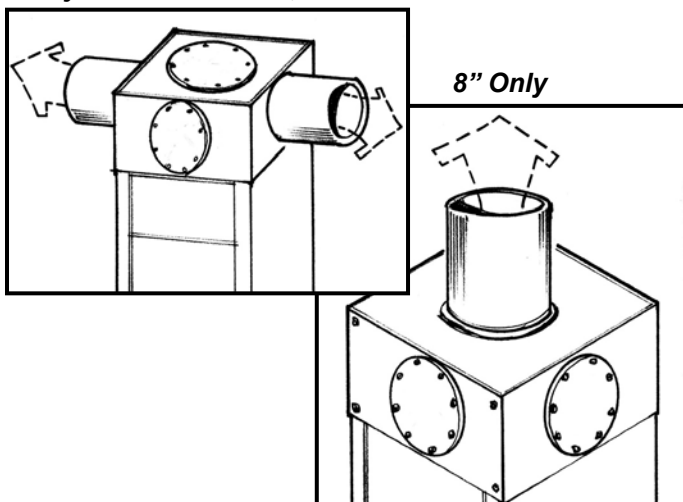
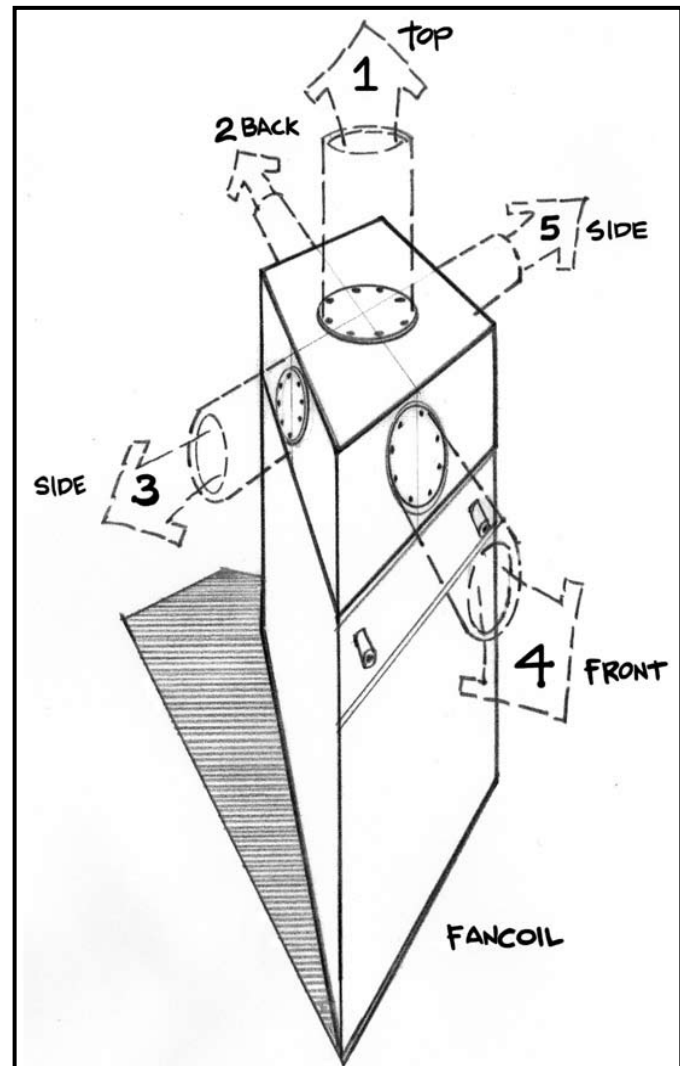


Fig. 40 - Space Saver take-offs



When using the 6" outlets, a combination of two 6" outlets may be used at a time, with no more than two 6" take-offs used (**Fig. 39**). When the 6" outlets are used, elbows and tees may be closer than 18" from the outlet.

Two 6" tap in collars and a single 8" tap in collar are supplied with the Space Saver fan coil. The collars are installed by removing the cover plate off of the desired outlet. Attach the tap in collar ensuring a tight seal is made. Foil duct tape or sealant should be used to create an air tight seal at the connection (**Fig. 35**).

Connecting Plenum to Fan Coil

After the main plenum duct and the fan coil unit are in place, they can be fitted together. Do not permanently fasten the two together yet, as the plenum may need to be rotated in order to make the branch take-off connections.

Duct Reductions

In some installations, it is necessary to reduce the size of the main plenum. Caution must be used when reducing plenum size, since smaller ducts can handle less number of outlets. The Branch Take Off's easily form to ducts in the 6" to 8" range; extra care must be taken with smaller sized ducts to ensure a proper air seal. For tee reductions, keep the tee to the full duct size, reducing only after the tee. Keep the length of the smaller duct sizes to a minimum, since the friction loss is much higher. If a hole saw will be used to drill the Branch Take-Off holes, metal ducts are recommended to be 28 gauge steel.

Table 04 – Duct Reduction

Duct Size	# of Vents	Max. Length
4"	4	30'
5"	6	40'
6"	12	50'
7"	19	60'
8"	29	70'
10"	50	100'

Branch Duct

With both the Main Plenum and Rough-In Boot installed, there is now only the connection of the two. This is done with the two inch flexible branch duct. Keep in mind that the minimum duct length is 10 feet, with a maximum length of 25 feet. Branch duct runs should be kept as short as possible to maximize the airflow through these runs. Energy Saving Products supplies the 2" flexible duct in three different configurations:

- 2" x 10' AFD (Assembled Flex Duct)
- 2" x 15' AFD (Assembled Flex Duct)
- 2" x 25' UFD (Unassembled Flex Duct)

(Builders and Space Saver Systems may use a 5' AFD)

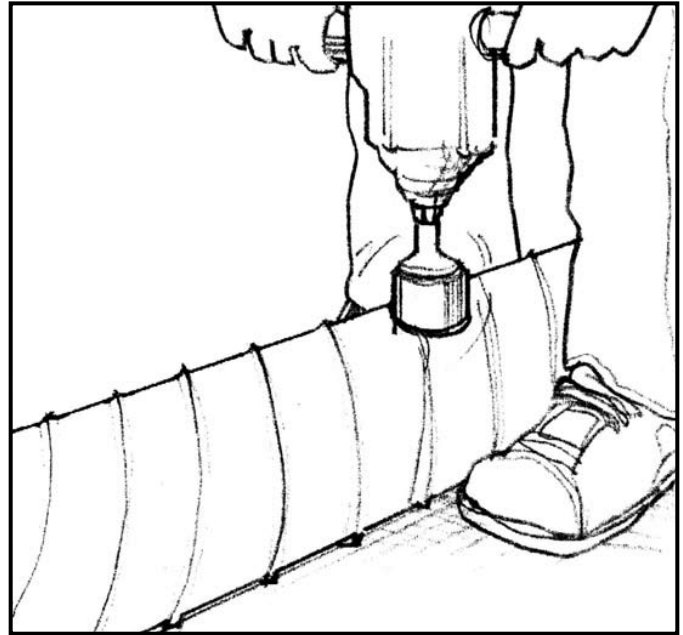
The 2" AFD comes complete with the necessary components for one complete ten foot or fifteen foot branch run. The 2" UFD is to be used only to extend these runs if needed.

If extending branch runs longer than the design layout, contact the system designer. Or reference the design manual for branch duct losses on extended runs.

Branch Take-Offs (BTO)

The locations for the 2" Branch Take-Offs should be determined before any drilling is done. Once all spots are marked for the Branch Take-Offs, a 2 1/4" hole saw is used to drill the outlets (**Fig. 41**).

Fig. 41 - 2 1/4" hole



It's **NOT** recommended to connect any Branch Take-Offs until all holes have been drilled, as it may be necessary to rotate the plenum to drill the outlets.

After all the holes have been drilled in the main plenum, the Branch Take-Offs are then installed. The Branch Take Off is placed over the 2 1/4" hole with the gasket in between (**Fig. 42a**). The curvature of Branch Take-Off is aligned so it matches the shape of the plenum. With the opening fully over the hole push the BTO tight against the main plenum and secure with four 1/4" self tapping screws (**Fig. 42b**).

Fig. 42a - Branch Take-Off

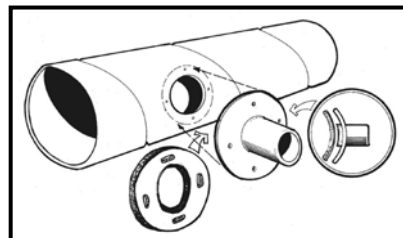
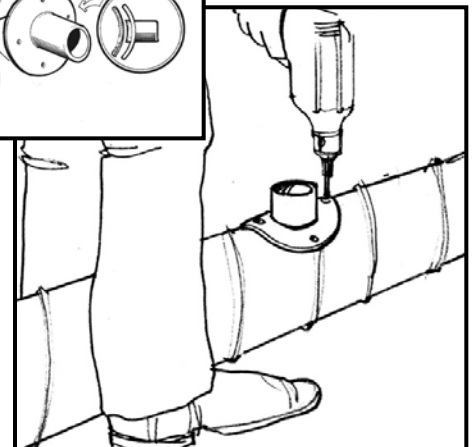


Fig. 42b - Securing



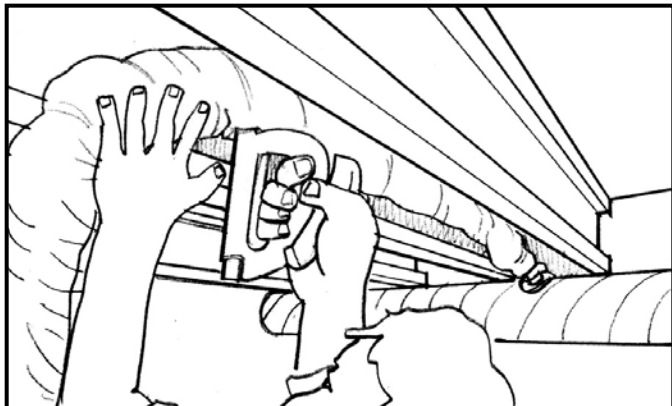
Flexible Duct Placement

After the all the Branch Take-Offs have been installed, the 2" flexible duct can then be fastened to the joist with strapping material. Staples may be used, as long as the insulation sleeve isn't damaged or torn.

Hi-Velocity Systems®

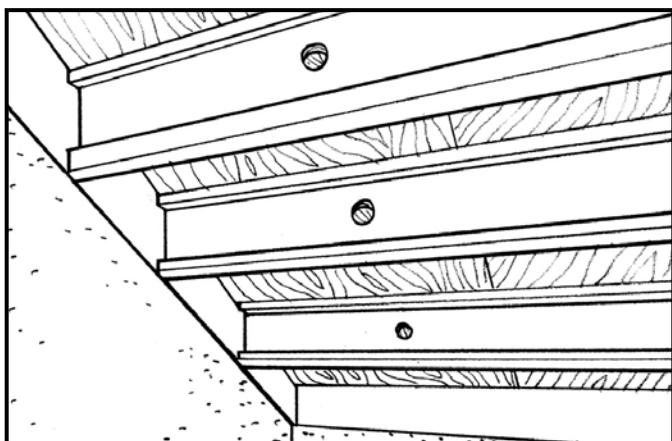
Only use staples if local code allows, if the insulation sleeve is damaged use foil duct tape to seal the sleeve, do not use cloth style tapes as they will not create a proper seal. Try to run the 2" Flexible Duct parallel to the joists whenever possible as this takes less space (**Fig. 43**).

Fig. 43 - Use strapping to hold the Flexible duct



When installing the two inch flexible duct in areas in which you must run opposite to the direction of solid joists, some drilling may be required. It is recommended to drill the smallest hole possible (**Fig. 44**) in order to maintain structural integrity. Check with local code laws and ensure that it is allowable to drill holes through the joists before proceeding. If possible, run the flex duct under the joists and avoid drilling any holes.

Fig. 44 - Through or under joists



When larger holes (4") can be drilled, then the insulated flex duct may be pulled through whole. If code or the designer only allow for a 2 1/4" hole, the insulation must first be removed from the flexible duct (**Fig. 45a**). The insulation is then cut into lengths that correspond to the joist spacing. As the 2" inner soft core of the flexible duct is fed into each hole the insulation is slid over the core (**Fig. 45b**).

Fig. 45a - 2 1/4" holes

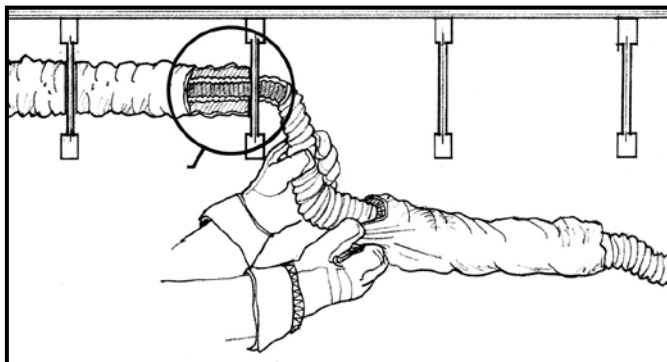
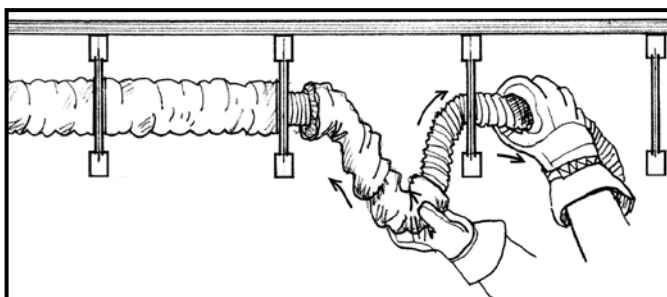


Fig. 45b - Add insulation at each joist



If a T-Bar ceiling is going to be installed, it is far easier to run the 2" FD in that space, rather than drilling through several joists.

The flexible duct should never be cut shorter than 10' in length. If the run to the outlet is less than 10' the flexible duct can be coiled up. The bends in the flexible duct shall have a minimum radius of 6" (**Fig. 46**). Sharp bends in the Flexible Duct will reduce airflow to that vent.

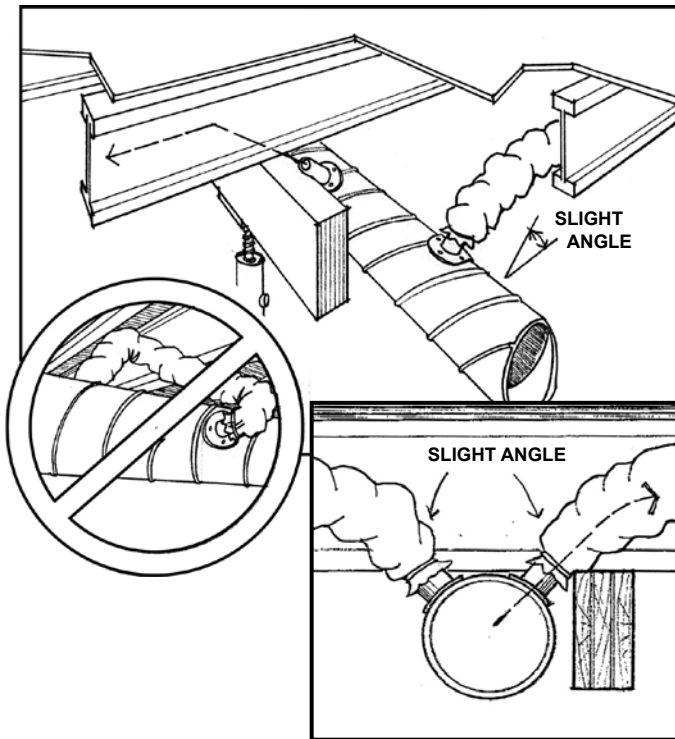
Fig. 46 - 6" minimum radius on bends



Connecting to the Main Plenum

The Flexible Duct coupling is connected to the branch Take-Off, then mechanically fastened with at least one 1/4" self tapping screw. The connection then should be sealed with foil duct tape or an approved sealant.

Fig. 47 - Secure to plenum with gentle bends

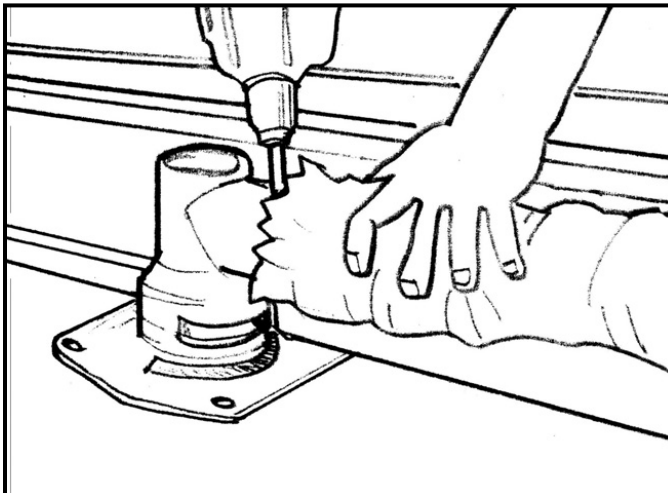


Hard angles should never be used when connecting to the main plenum or Rough-In Boot, keep the bends as gentle as possible (**Fig. 47**). A hard bend should never be created in the flexible duct as this will restrict airflow to the outlet.

Connecting to Rough-In Boot

The Flexible Duct coupling is connected to the Rough-In Boot, then mechanically fastened with at least one 1/4" self tapping screw (**Fig. 48**). The connection then should be sealed with foil duct tape or an approved sealant.

Fig. 48 - Mechanically Fasten

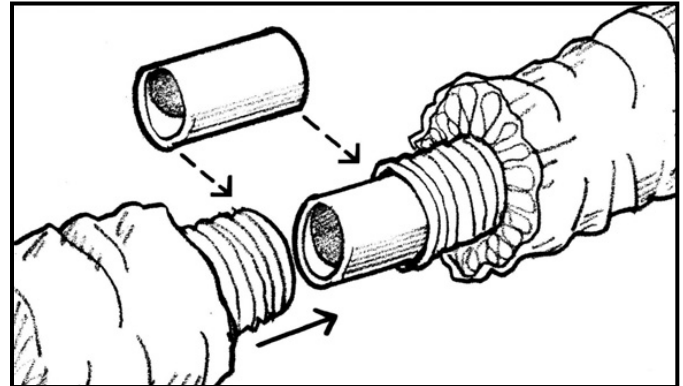


Extending the AFD with a UFD kit

When connecting the 2" UFD to the 2" AFD, attach the branch coupling into the inner core of the 2" UFD with foil duct tape, connect the two branch couplings with the

branch connector tube (**Fig. 49**). Now pull the insulation and vapour barrier over the inner core and secure around the outside of the vapour barrier with a cable tie. Tighten the cable tie securely around the branch connector, inner core, insulation, and vapour barrier.

Fig. 49 - Fasten with tie straps



Unconditioned Spaces

If the 2" Flexible Duct is in an unconditioned space, then all connections must be taped to ensure a continuous vapour seal. This includes the Branch Take-Off and the vent Rough-In Boot. Try not to damage the vapour barrier on the 2" Flexible Duct. If it is damaged, holes must be taped. If possible, try to run the 2" Flexible Duct between the insulation and the vapour barrier.

Two Inch Metal Duct

For certain applications in which 2" metal ducts are needed, certain guidelines must be followed. All metal ducts run in a concrete slab must be sealed with an approved duct sealer. For vertical runs out of the floor, it may be necessary to extend the damper tube or vent plate collar (**Fig. 52**).

Flexible Duct Termination

To complete the installation, cut out the Rough-In Cap (**Fig. 50**) and install the vent plate by sliding the vent plate into the end of the damper tube (**Fig. 51**).

Fig. 50

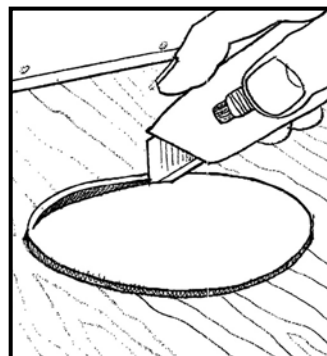
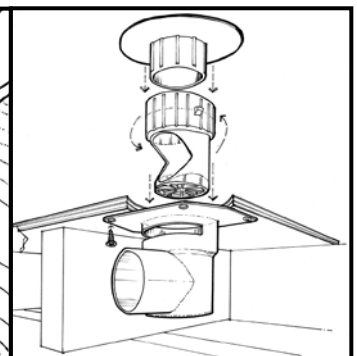


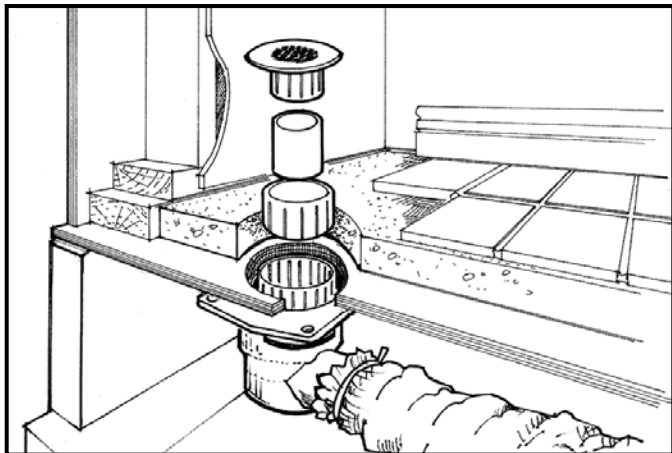
Fig. 51



Vent Plate Extensions

When the sub floor and floor finishing is too thick for the connection of the vent plate, it may be necessary to use an extension kit. Connect the vent plate extension to the branch connector tube and vent plate. The branch connector tube can be cut at different lengths so the vent plate sits flush with the floor finishing.

Fig. 52 - Extension kit

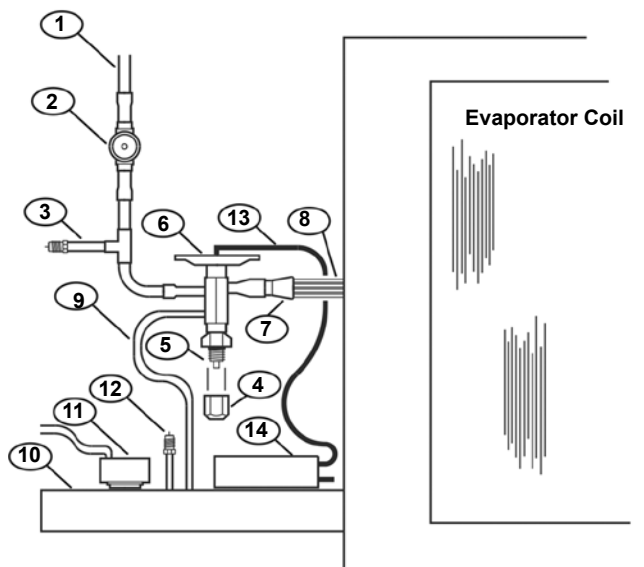


Refrigerant Modules (RCM/RM)

The cooling coil comes as a module and must be installed in the vertical position on the return air side of the fan coil. For return air cut out sizes, refer to **Table 10 – Return air cutouts**.

Refrigerant modules come with two L mounting brackets, thermal expansion valve, site glass, two access ports, and an external freeze stat. **Fig. 53** shows an installed coil assembly and how each piece is connected.

Fig. 53 - Coil Assembly



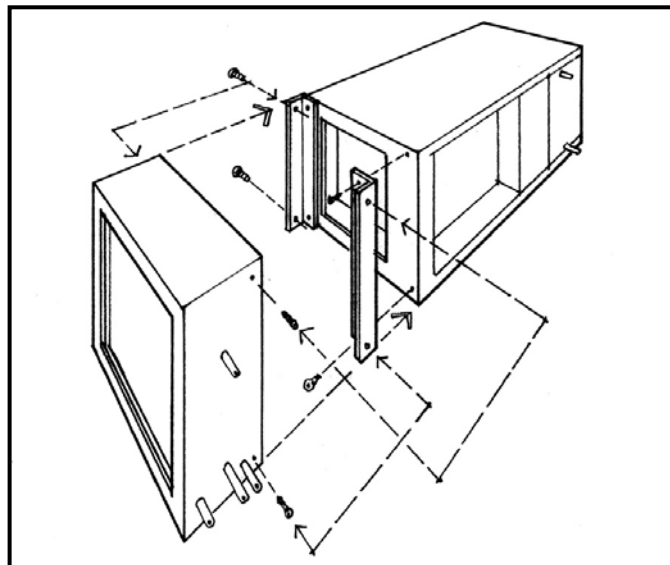
1) Liquid line	8) Distributor tubes
2) Site glass	9) External equalizer line
3) High side access port	10) Suction line
4) Adjustment stem cap	11) Anti-ice control
5) Superheat adjustment stem	12) Low side access port
6) Thermal expansion valve (TX)	13) TX capillary tube
7) Refrigerant distributor	14) TX sensing bulb

R series modules can be used on R-410A condensers; if R-410A refrigerant components are used. All Energy Saving Products R series modules are shipped with R-22 refrigerant components. R-410A is a specialty order and must be stated at time of purchase.

Mounting Brackets

Mounting the cooling coil to the fan coil can be done with the L brackets supplied (**Fig. 54**), ensure that no screws puncture the drain pan or coil. Appendix B has the dimensions of the fan coil units and cooling modules.

Fig. 54 - Extension kit



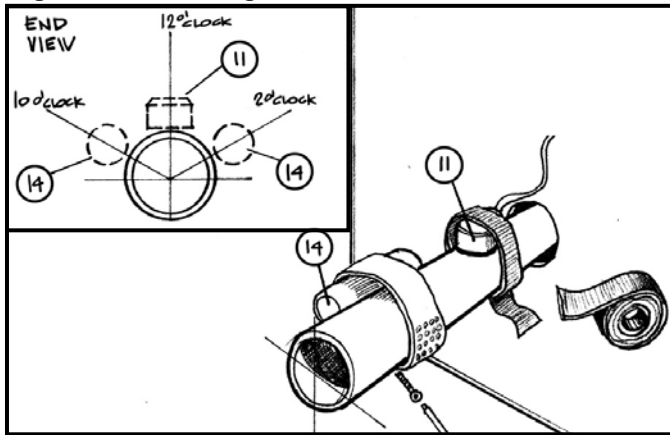
Thermal expansion valve (TX)

When brazing the TX valve to the copper liquid line, a brazing rod that can bond dissimilar metals should be used. Always wet rag or use heat dissipating paste on the TX body to reduce the chance of overheating the valve.

Thermal expansion sensing bulb

The remote sensing bulb for the thermal expansion valve should be located on a clean, horizontal section of the suction line. It should be mounted on the top half of the pipe in the 2 o'clock or 10 o'clock position (**Fig. 53 and Fig. 55 – reference 14**).

Fig. 55 - TX sensing bulb



Site Glass and Access Ports

When refrigerant lines are connected to the fan coil, a site glass needs to be installed (**Fig. 53 – reference 2**), as well as both high and low side access ports (**Fig. 53 – reference 3 & 12**). The site glass should be installed close enough to the coil to be seen while charging the system. The site glass and access ports are required for system startup and for future trouble shooting or service.

External Equalizer Line

The external equalizer line should be installed on the suction line, immediately after the remote sensing bulb (**Fig. 53 – reference 9**).

Freeze Stat

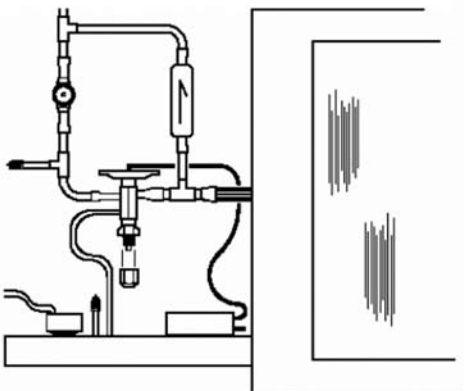
Install the anti-ice control (Freeze-Stat) above the center line of the suction line and connect the wires to the Freeze Stat terminals on the fan coil circuit board (**Fig. 53 and Fig. 55 – reference 11**).

Ensure that the TX bulb and the anti-ice control are fastened securely and are well insulated. Do not use a self-tightening clamp on the anti-ice control, as the control may be damaged by excessive tightening.

Refrigerant Bypass

RCM coils are TX heat pump ready, however an additional refrigerant bypass check valve must be installed (**Fig. 56**). A Bypass check valve is **NOT** supplied with the RCM coil.

Fig. 56 - Bypass Check Valve



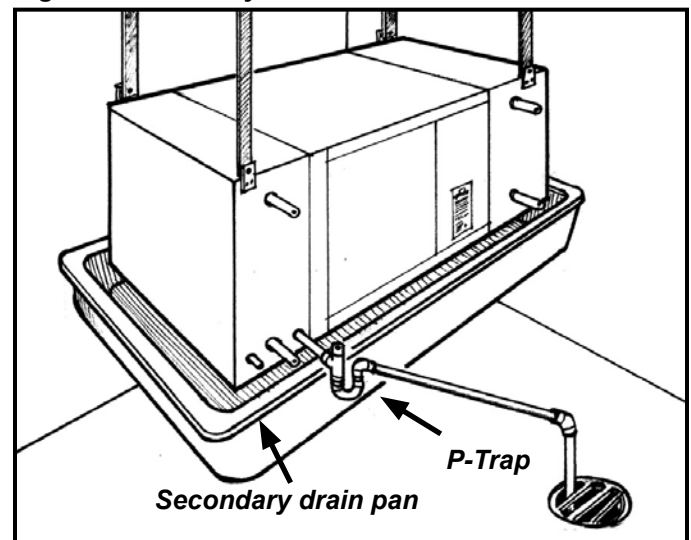
P - Trap

The condensate drain must have a Vented P-trap installed (**Fig. 56**), and run at a slope of $\frac{1}{4}$ " per foot in the direction of the drain. All RCM/WCM modules come with a $\frac{3}{4}$ " primary outlet and a $\frac{3}{4}$ " secondary outlet. When installing the P-trap it must be installed on the primary outlet. A vent must be installed between the coil and the P-trap, keeping the vent as close to the coil as possible.

Secondary Drain Pan

Some building codes call for a secondary drain pan under the entire unit (**Fig. 57**). Any installation that has the potential of property damage due to condensate must have a secondary drain pan installed. If the unit is installed in a high heat and/or high humidity location, extra insulation around the unit casing may be required. This will prevent excessive condensate from forming on the outer surface of the casing.

Fig. 57 - Secondary Drain Pan



Piping the RCM/RM

Refrigerant grade pipe and fittings are only to be used with Hi-Velocity Systems. Plumbing fittings may contain wax or other contaminants which are detrimental to the proper operation of the system. Insulate the suction line with $\frac{3}{8}$ " insulation such as Armaflex. In high heat areas $\frac{1}{2}$ " insulation may be needed. If the lines are run in an area where temperatures could exceed 120°F or runs longer than 50', then the liquid line may need to be insulated as well. Support the pipe every 5 feet, or whatever local code states.

Run the pipes in the most direct route possible, taking into account structural integrity and building details. If the evaporator is located above the condenser, slope any horizontal runs toward the condenser. If the condenser is located above the evaporator, a P-trap must be installed at the bottom of the vertical riser. For long vertical risers, additional P-traps must be installed for every twenty feet. For lines running over 50', a suction line accumulator must be installed. Lines running over 100' are not recommended.

Pipe Sizing

Tables 05 and 06 contain line sizing information for the liquid and suction lines.

Table 05 – Liquid Line sizes								
	Tons							
Distance	1	1½	2	2½	3	3½	4	5
1'–25'	¼	¼	⅝	¾	¾	¾	¾	½
26'–50'	⅝	⅝	¾	¾	½	½	½	½
51'–75'	¾	¾	¾	½	½	½	½	½
76'–100'	¾	¾	½	½	½	½	½	½

Table 06 – Suction Line sizes								
	Tons							
Distance	1	1½	2	2½	3	3½	4	5
1'–25'	⅝	⅝	¾	¾	¾	⅞	⅞	1
26'–50'	⅝	¾	¾	¾	⅞	⅞	1⅛	1⅛
51'–75'	¾	¾	⅞	⅞	1⅛	1⅛	1⅛	1⅛
76'–100'	¾	⅞	⅞	1⅛	1⅛	1⅛	1⅛	1⅛

The sizes given in the above tables are only for general reference, if the condenser manufacture requires a different size than specified in **Table 06** and **Table 07**, their sizing shall be used whenever a discrepancy occurs.

Outdoor Unit Installation

Locate the outdoor unit in a suitable location, as close as possible to the fan coil. Maintain the clearances recommended by the manufacturers of the outdoor unit, to ensure proper airflow. The outdoor unit must be installed level, in a properly supported location. A liquid line filter/drier is recommended to be installed.

Wiring – Outdoor Unit

Make all connections to the outdoor unit with rain tight conduit and fittings. Most building codes require a rain tight disconnect switch at the outdoor unit as well (always check local codes). Run the proper size copper wires to the unit, and connect as per the manufacturer's recommendations.

Ensure that the unit is setup for a TX system. If not, a hard start kit may be required.

Evacuating

After the piping is installed and all components have been brazed together, A vacuum pump must be used to evacuate the system from both the low and high side to 1500 microns. Add pressure to the system to bring the pressure above zero psig.

After allowing the refrigerant to absorb moisture, repeat the above procedure. Evacuate the system to 500 microns on the second evacuation, and ensure that the system holds at the vacuum pressure. If not, check for leaks and evacuate again. If the vacuum holds, add refrigerant to raise the pressure to 2 psig. At this point open service valves on pre-charged condensing units, or add refrigerant to the system.

The use of an electronic leak detector is recommended, as it is more sensitive to small leaks under the low pressures.

Charging

Once the system has been determined clean and ready for charging, refrigerant can be added to the system. The access ports on the condenser must be open at this point. Never leave the system unattended when charging. With the system running, slowly add refrigerant to the system until the site glass is clear of all bubbles. If the site glass is clear of bubbles and the super heat is off, the TX valve will need to be adjusted (See Super Heat for temperature settings). When adjusting the TX valve, never turn it more than a quarter turn at a time. Always allow 5 minutes for the system to settle down before making another TX adjustment. When adjusting the TX valve, a clockwise turn will close the valve allowing less refrigerant through. With less refrigerant flowing through the coil, less cooling will be done, which will bring up the suction line temperature.

Super Heat

Super heat on Hi-Velocity Systems with the RCM/RPM series should normally be around 8°F -12°F. The suction line should be set at approximately 42°F. With the RM series of coils the suction line temperature should be around 38°F.

Carry Over Screen

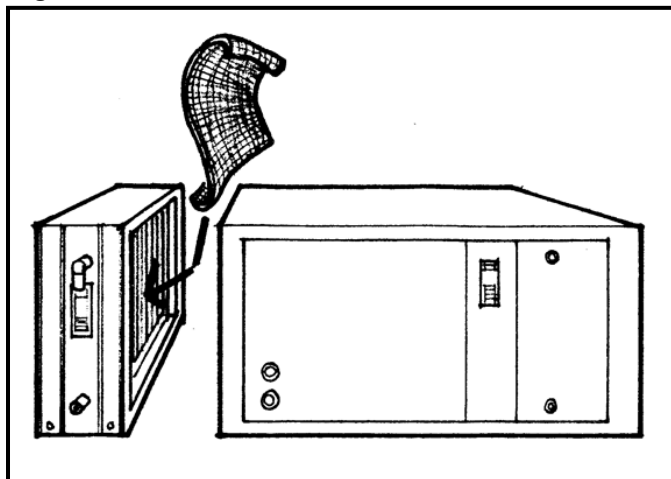
All Energy Saving Products refrigerant cooling modules (RM/RCM/RPM) come supplied with a nylon mesh Carry-Over Screen and six stand-off screws. The Hi-Velocity units have a very high humidity removal rate, it is possible for the airflow across the coil to grab moisture off the fins and carry it into the unit. With the carry-over screen in place it reduces the chance of moisture being carried into the unit.

Ensure that the nylon mesh is placed on the exiting air side of the cooling module (**Fig. 58**).

Installation Instructions

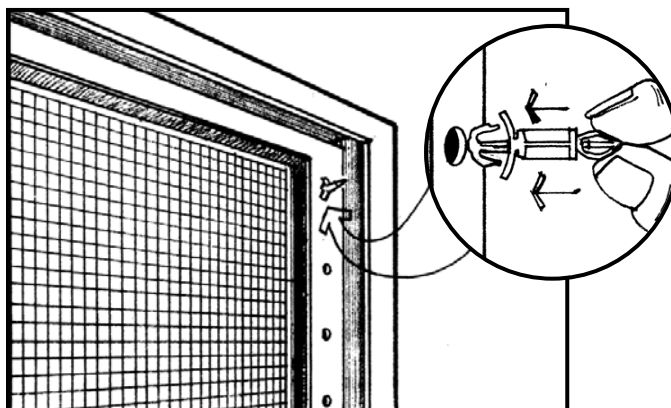
The Carry Over Screen is placed on fan coil side of the cooling module (**Fig. 28**).

Fig. 58 - Screen on the fan coil side



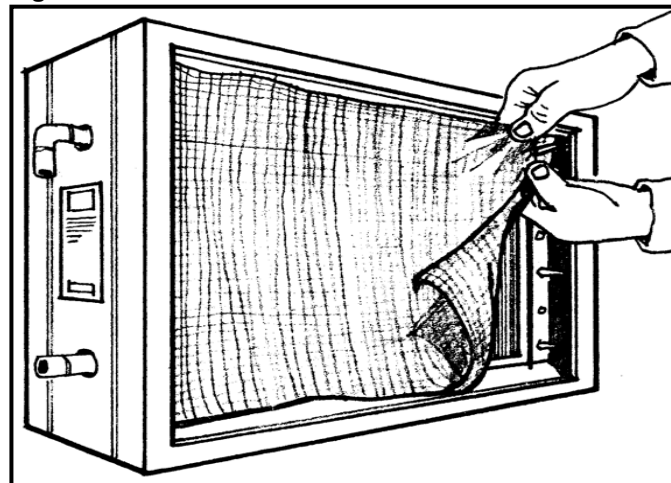
On the fan coil side of the cooling module, attach three plastic stand-offs down each side of the cooling coil (**Fig. 59**).

Fig. 59 - Attach stand-off plugs



Place the nylon wire mesh over the stand-offs, ensuring the screen touches the drain pan. Then snap the screen over the plastic stand-offs (**Fig. 60**).

Fig. 60 - Attach screen to coil

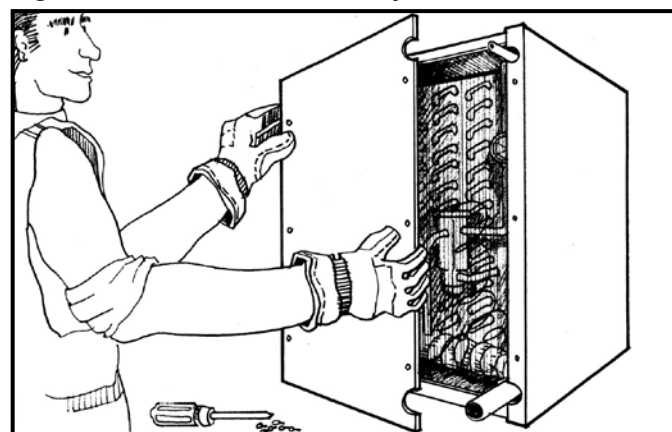


Refrigerant Pre-Piped Module (RPM)

The RPM comes pre-piped with the coil assembly; the coil assembly is shown in figure 53. With the RPM the Liquid and Suction line are the only brazing that need to be done at the fan coil. For charging and brazing, remove the front access panel of the RPM (**Fig. 61**). With the access panel removed the coil assembly will be accessible. Wet rag the liquid and suction line (or use a heat dissipating paste) to ensure no overheating occurs to the pre-piped coil assembly.

Install the RPM with the same procedures used per RCM, omitting the coil assembly as it has already been pre-piped.

Fig. 61 - Remove front access panel



Water Coil Module (WCM/WM)

The water coil comes as a module and must be installed in the vertical position on the return air side of the fan coil. The WCM/WM come supplied with two L mounting brackets for connection to the fan coil (**Fig. 54**). For WCM/WM dimensional information and sweat water connection sizes refer to **Appendix B**.

Piping the WCM/WM

When the potential for gravity flow of the hot water exists, check valves may be needed on both the supply and return lines. **Fig. 63** and **64** give an example of this. All lines should be piped so as not to restrict access to the front panels, filter section, or electrical enclosure. Size your supply and return lines according to **Table 07**.

Table 07 – WCM/WM pipe sizing

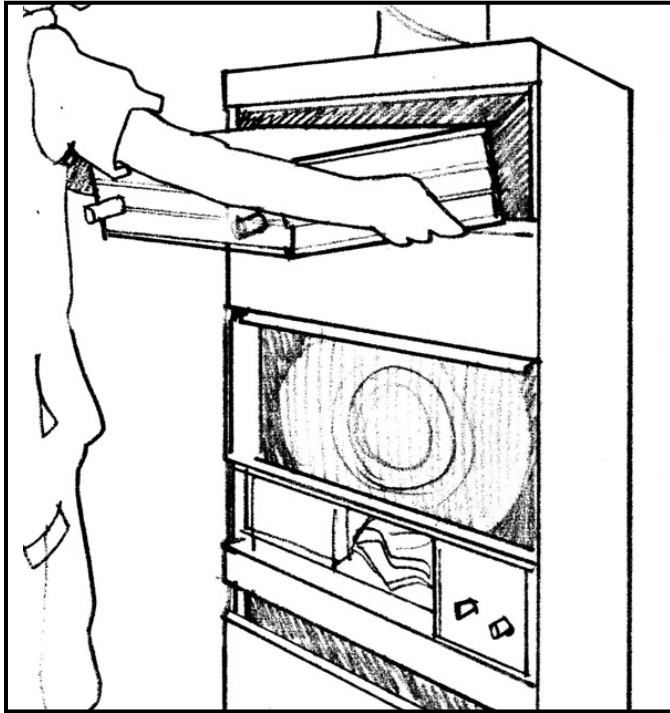
Zone BTUH Heat loss	Pipe Size up to 40 feet	Pipe Size 40 – 100 feet
0 - 35,000	5/8"	3/4"
35,001 - 70,000	3/4"	1"
70,001 - 140,000	1"	1 1/4"

Hot Water Coil Add-on (HCA)

The Hot Water Coil Add-on is easily installed in the Hi-Velocity System. With heating, condensate is not a consideration and the coil can be mounted on the supply side of the blower (**Fig. 62**).

With the removal of the front panels, the HCA can be slid in place on the supply side of the blower. For HCA dimensional information and sweat water connection sizes refer to **Appendix B**.

Fig. 62 - HCA easily slides into the fan coil



Piping the HCA

Fig. 63 and 64 illustrate typical pipe runs from a dual purpose hot tank to a fan coil. These drawings are only for reference as all piping has to be run according to local code.

Fig. 63 - Hot water tank: Side take-offs

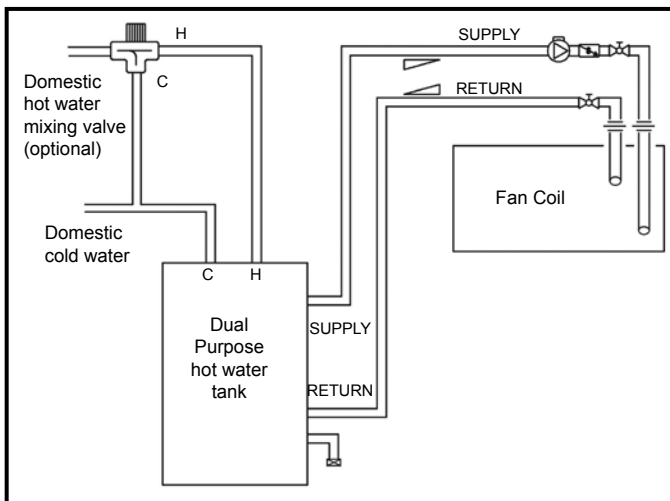
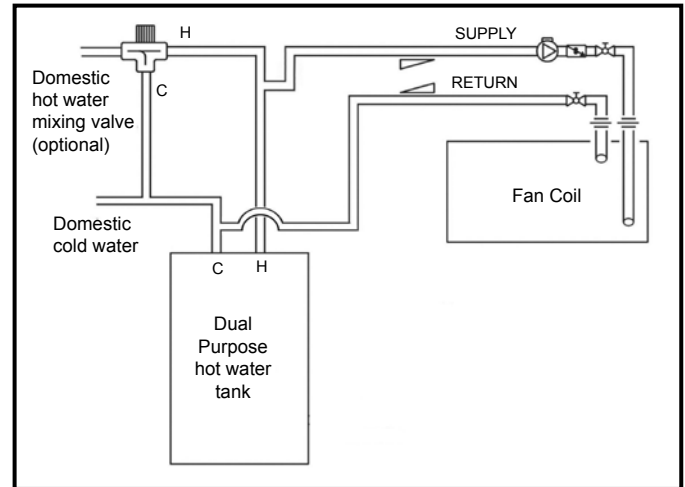


Fig. 64 - Hot water tank: Without side take-offs



Electrical Strip Heater (ESH)

The Electrical Strip Heater slides into the fan coil, on the supply side of the blower (**Fig. 62**). The fan coil unit needs some preparation before the ESH can be installed. The front access doors must be removed along with the static plate and heating rheostat. Refer to the fan coil Static Plate section for removal instructions (**Fig. 27**). Once the static plate and heating rheostat have been removed the ESH can be slid into place.

The ESH is labeled with a directional airflow sticker; when placing the ESH the sticker shall be in the direction of the air flow.

Wiring the Electrical Strip Heater (ESH)

Before wiring in the ESH, make sure all power sources are disconnected. The wiring diagram is on the inside of the ESH front panel, or refer to Appendix C. Use only wires suitable for 75°C; wires shall be sized according to local electrical code.

Use only class 2 wiring for the Control Circuit connections between the heater terminal 1, terminal 2 and the zone valve terminals.

Table 08 – Electrical Strip Heater specifications

Kw	Volts/Phase	# of Feeders and heater	Circuit Breakers
5	240/1	1 x 20.8	1 x 30A
10	240/1	1 x 41.6	1 x 60A
15	240/1	1 x 20.8 1 x 41.6	1 x 30A 1 x 60A
18	240/1	1 x 41.6 1 x 41.6	1 x 60A 1 x 60A
20	240/1	2 x 41.6	2 x 60A
23	240/1	2 x 47.0	2 x 60A

Return Air

The return air duct is not supplied with the Hi-Velocity System. It is to be supplied and installed by the contractor. The return air and fresh air make-up ducts are to be installed according to local building code.

The first five feet of the return air duct from the air handling units is to be acoustically lined for sound absorption. This only applies on short return air duct work of less than 10 feet. For traditional house return air using a combination of return air metal duct and joist liners this does not apply.

Duct Sizing

The return air is to be sized on a 0.15 static pressure as compared to 0.10 static pressure for conventional forced air systems. The maximum length for an individual return air duct is fifty feet.

Table 09 – Return Air duct sizes

Unit	Round Duct	Square Inches
HV-50/51/52 H/BU HV-70/71 H/BU	12"	113
HV-100/101 H/BU	14"	154
HV-140 H/BU	16"	201

When sizing the return air ducts, keep in mind that if they are too small they can create noise, but if they are too large, the fan coil cannot build up proper pressure. **Table 09** has recommended return air sizes for round and rectangular ducts. A variance of plus/minus 20% is allowable for sizing return ducts that connect to the Hi-Velocity Systems unit.

It is recommended to install a grill that is 10 - 20% larger than specifications require, this will ensure that there is no air velocity noise at the grill. Where allowed by local codes, a single return air grill may be used. When using flexible duct for return air, use one duct size larger due to the higher friction loss.

Return Cutout

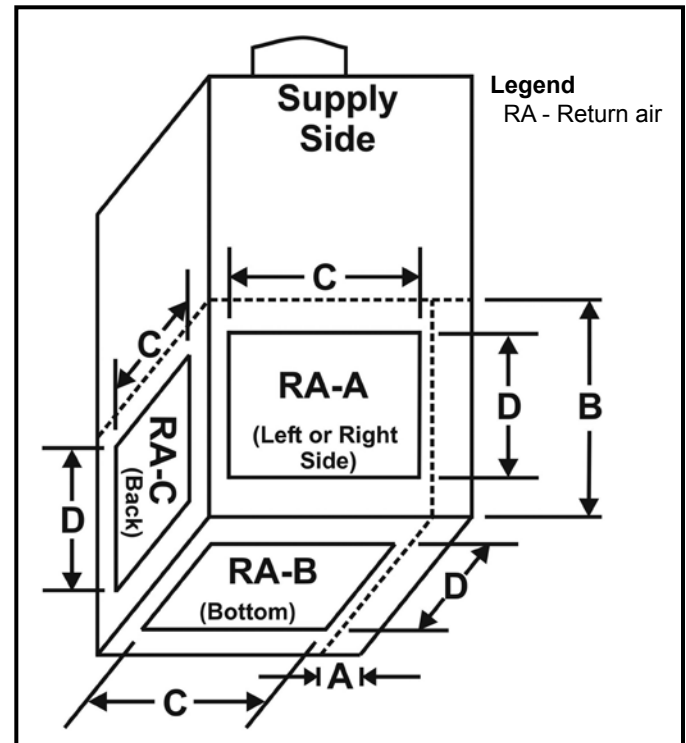
Fig. 65 shows the different locations the return air can be installed on Hi-Velocity Systems. **Table 10** contains the dimensions needed for the return. All fan coils are shipped with a Return Air Cutout template; the template will guarantee maximum airflow across the coil.

Table 10 – Return air cutouts

Model	A	B	C	D
HV-50/51/52 H/BU	3"	17"	10"	14"
HV-70/71 H/BU	3"	17"	15"	15"
HV-100/101 H/BU	3"	17"	22"	15"
HV-140 H/BU	3"	17"	22"	15"

HV-140 sizing based upon RCM Cooling Module

Fig. 65 - Return air cutout sizing

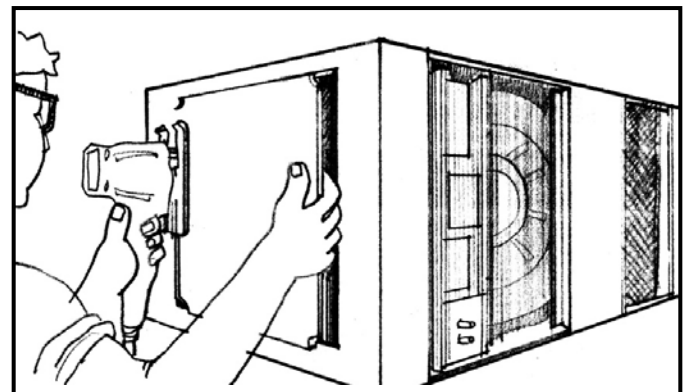


Note:

- **DO NOT** cut past the center plate or electrical box (Dim A & B).
- Model HV-100 and HV-140 **CANNOT** use return air "C" (RA-C).
- This drawing is **NOT** to scale.

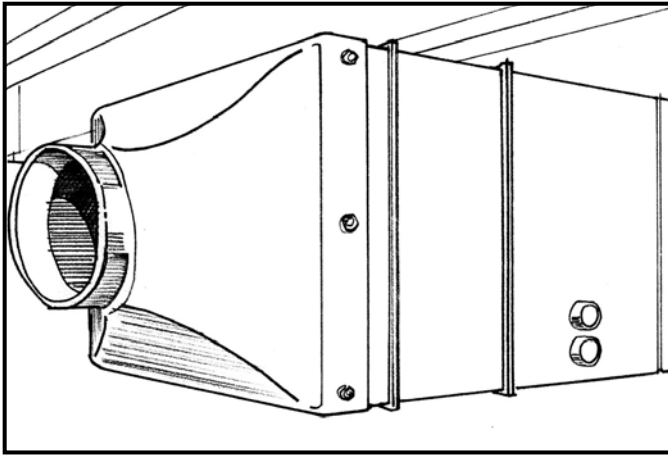
Once the placement of the return has been decided, the return air can be marked and cut (**Fig. 66**). The template supplied with the fan coil should always be used; this will guarantee maximum airflow across the coil.

Fig. 66 - Return air cutout



Once the return air has been cut out, a transition will be needed to attach the return air duct to the fan coil (**Fig. 67**).

Fig. 67 – Return Air using a transition



A round or square return air duct can be used; they must be sized for the Hi-Velocity Systems according to **Table 09**. Before the return air can be attached to the transition, the first five feet (from the fan coil) is to be acoustically lined for sound absorption.

Return Air Base (Optional)

Energy Saving Products manufactures a return air base with a built in filter rack that matches up to the fan coil units. The return air base comes complete with a one-inch filter and one-inch filter rack. The filter is a 3 medium filter approximately 14% efficient, and can be replaced with any aftermarket filter. All the Return Air bases come acoustically lined with half-inch sound absorbing insulation.

Fig. 68 – Return Air Design

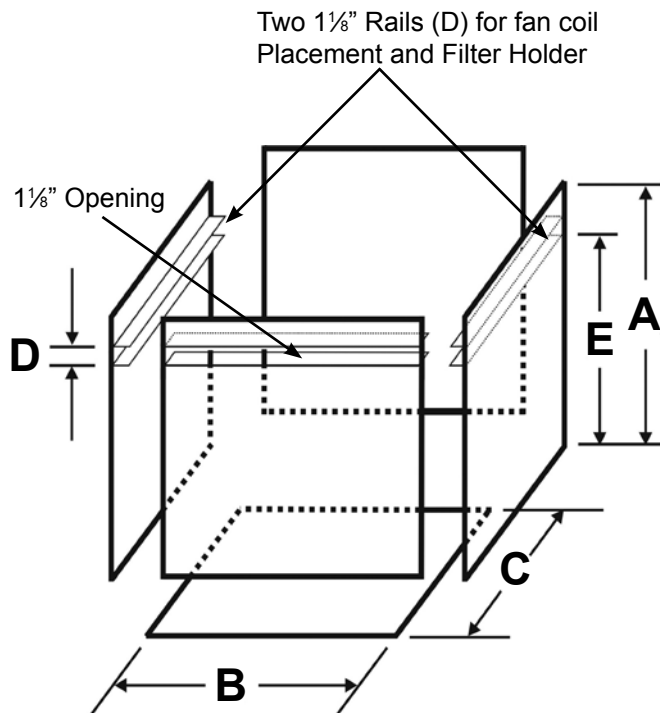


Table 11 – Return Air Base dimensions

	A	B	C	D	E
HV-50/51/52	24"	18½"	14½"	1⅝"	21¾"
HV-70/71	24"	18½"	19½"	1⅝"	21¾"
HV-100/101	24"	18½"	25½"	1⅝"	21¾"
HV-140	24"	24½"	26½"	1⅝"	21¾"

Filter Rack (Optional)

Also available from Energy Saving Products is a 3" Filter Rack. Supplied with a one-inch 3 medium filter approximately 14% efficient, and can be replaced with any aftermarket filter.

Fig. 69 – Filter Rack Design

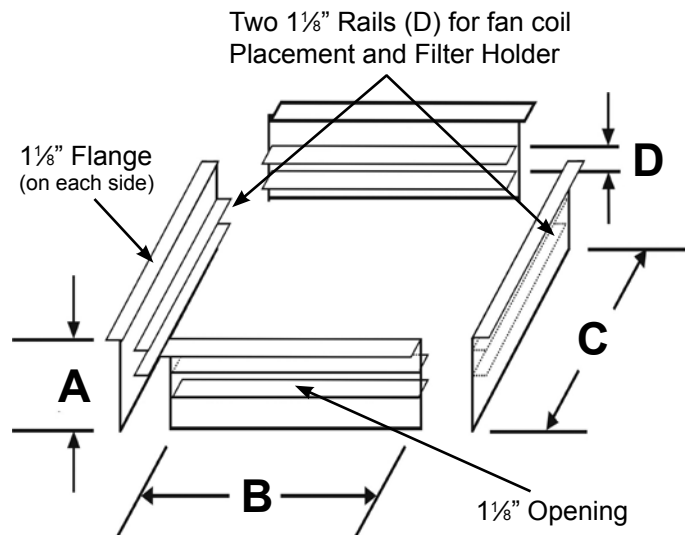


Table 12 – Filter Rack dimensions

	A	B	C	D
HV-50/51/52	3"	18½"	14½"	1⅝"
HV-70/71	3"	18½"	19½"	1⅝"
HV-100/101	3"	18½"	25½"	1⅝"
HV-140	3"	24½"	26½"	1⅝"

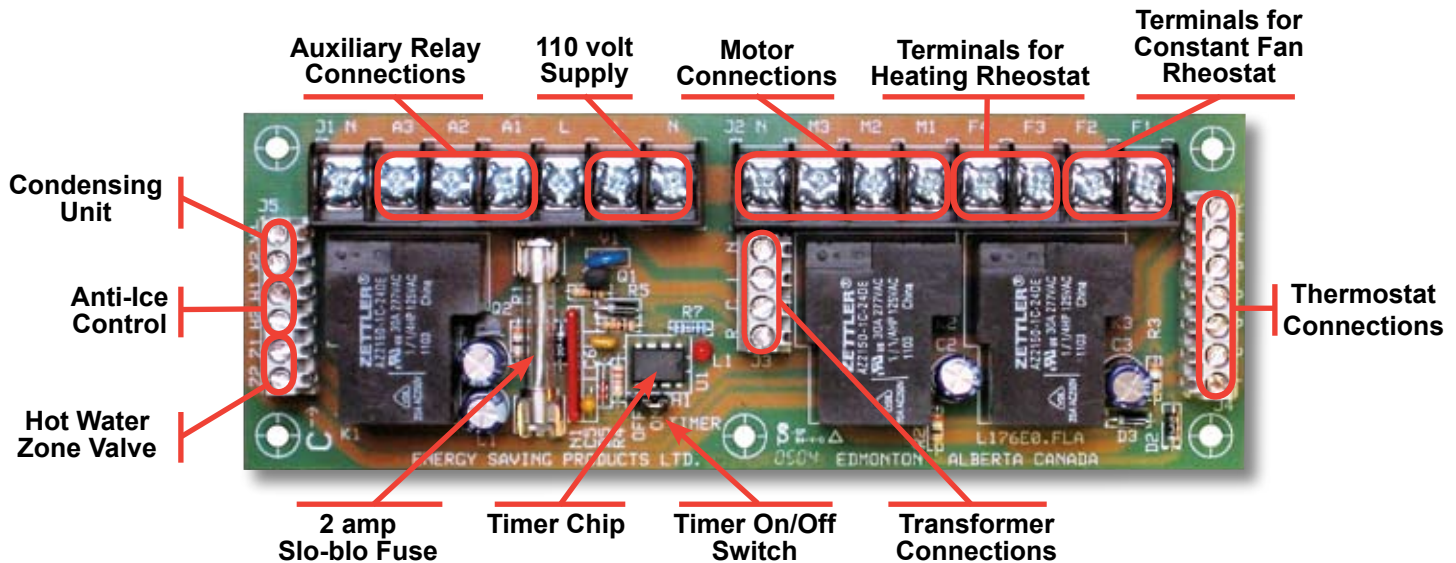
Filters

Energy Saving Products filters are 1 inch thick, 3 medium filters approximately 14% efficient. Any aftermarket filter may be used with both the HI-Velocity Return Air Base and Filter Rack.

Table 13 – Filter Part Numbers

FR/RA-50/51	10050900050
FR/RA-70/71	10050900070
FR/RA-100/101	10050900100
FR/RA-140	10050900100

Wiring/Printed Circuit Board



Considerations:

- Fan coil unit is ready for both heating and cooling with no additional relays required.
- 24v transformer is factory installed and wired.
- Auxiliary relay is included for 110v, 24v, or dry contact applications.
- Factory installed speed controls for both constant fan and heating operation.
- R W G Y terminals for thermostat hookup follow industry standards for ease of installation.
- Terminals for your heating zone valve, cooling condensing unit, and anti-ice control are supplied to simplify the field control wiring.
- Dynamic pump duty cycle chip provided to prevent water stagnation in potable water systems and to provide pump rotor protection.
- Slow-blow fuse provided for circuit board protection.

When power is applied to the Printed Circuit Board without any call for heating or cooling, the low speed motor windings are energized. This will provide constant fan operation and can be controlled through the use of the Constant Fan Control Rheostat. On a call for heat, the motor will switch to high speed and can be controlled with the Heating Fan Control Rheostat. Do not turn the heating fan control rheostat to the off position or you will not have any heat.

Note: The Builder's Series Hi-Velocity units are manufactured with no control rheostats, and the Space Savers Series are manufactured with a single speed controller. Additional rheostats are optional.

When the unit is in heating mode, the auxiliary relay is also engaged. The most common use for this relay is to start a circulator pump for heating; however, the auxiliary relay can be used for 110v, 24v, or dry contact operation depending upon your needs. Also in heating mode, 24v power is supplied to the two ZONE VALVE terminals in case you have a normally closed zone valve with your fan coil. The Circulator Timer Chip on our circuit board will energize the pump for 5 minutes every 24 hours. This timing cycle starts when power is turned on to the fan coil unit, and will be engaged at the same time every day. If you wish to have the timer cycle operate at a specific time of day, simply turn off power to the fan coil unit for three seconds at that time, and then turn the power back on. If you do not need to use the timer circuit, move the jumper header from the ON pins to the OFF pins and it will be disabled.

When the fan coil goes into cooling mode, the motor will switch to high speed, but will bypass the heating fan control rheostat. This is done because airflow is much more critical to proper operation with cooling than with heating. In cooling mode, 24v power is supplied to the COND UNIT terminals in order to start your outdoor condenser. This power first passes through the FREEZE STAT terminals, so this control must be installed and wired into the fan coil unit.

Hi-Velocity Systems Installation Check List

Ensure that all electrical connections are tight, and that any packing or shipping restraints are removed from both the fan coil, and the outdoor unit. With the power to the condensing unit off, check the thermostat for normal operation, and again check that there is proper airflow from all the vents. Ensure that no branch ducts were damaged or bent sharply. Do not run the fan coil without a filter in place.

Observe the system pressures during the initial start-up and charging of the system. Check the voltage and amp draw of both the fan coil, and the outdoor unit. The voltages must be within 10% of the rating plate data. If more than 10% is noted, contact your local electrical company. Check that the amp draws of both units are within the information printed on the unit rating plates. Set the system charge and adjust the TEV setting according to the flow chart Cooling Start-Up.

Flexible Duct

___	Ensure no Flex runs are shorter than 10' or longer than 25'. (Branch Duct Section) (5' allowable for the Builders and Space Saver Units)
___	Ensure no Flex duct is crushed or torn.
___	Ensure proper bend radius in flex duct. (Fig. 46)
___	Ensure all Flex connections are secured and sealed at the plenum and Rough In Boot.
___	Ensure vent plate is connected to the rough in boot.
___	Ensure flex connections are not kinked at plenum. (Fig. 47)
___	Ensure all outlet dampers are fully open.

Supply Plenum

___	Ensure 18" minimum of straight plenum off fan coil (no elbows, tees, outlets, etc.). (Fig. 32, 33, 34)
___	Ensure plenum and all connections are sealed (elbows, tee's, end caps, etc.).
___	Ensure proper system balancing is maintained if Tee's have been used. (Fig. 36 and 37)
___	Ensure all duct and components in unconditioned space are insulated with a vapour barrier.

Fan coil

___	Ensure motor, blower, and coil(s) are free of dirt, drywall dust, etc.
___	Ensure return air opening has been cut in fan coil (Return Air Section).
___	If used for heating ensure heating rheostat is in on position.
___	If Electric Coil is installed, ensure static plate and heating rheostat are removed (Electric Strip Heater Section).
___	Ensure minimum clearances are met for access side (Table 03).

Cooling Coil (if applicable)

___	Ensure all components are installed and located correctly (TX Valve, site glass, access ports (2), freeze stat. (RCM Section)
___	Ensure condensate line is vented with a P-trap. (Fig. 55)
___	Ensure proper slope has been maintained in condensate line for drainage. (Fig. 55)

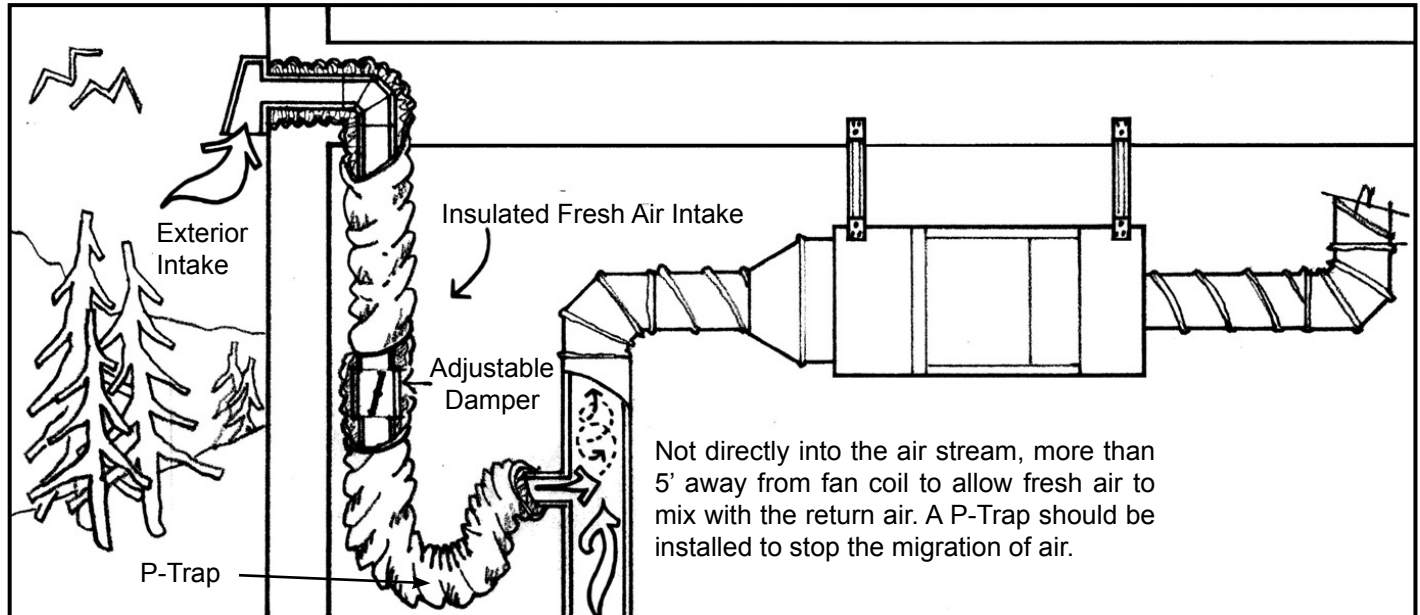
Return Air

___	Ensure correct size return is used and securely connected. (Table 09)
___	Ensure filter is installed before fan coil or cooling module if applicable.

In the event of difficulty during the start-up procedure, please refer to the trouble shooting flow charts to assist you in determining the problem.

Third Party Options

Fig. 70 – Fresh Air Make up



Fresh Air Make-Up

For areas that require fresh air make-up, a small intake may have to be installed. It is recommended to install an insulated flex duct, with a damper, into the return air plenum. The damper can then be adjusted to supply the exact amount of fresh air needed to meet local building codes (**Fig. 70**). This should be balanced to the exhaust air levels of the structure.

Install the fresh air duct to the side of the return air and if possible not directly into the air stream. As shown in **Fig. 70**, the fresh air duct has been installed more than 5' away from the fan coil and before a 90° bend.

If too large of a duct is installed, the excess fresh air will increase system operating costs and decrease system performance.

Fire Stopping

Some areas require a Fire Stopping device to stop the spread of a fire and/or prevent the duct system from supplying oxygen to the fire. The Hi-Velocity System can be used in conjunction with several types of Fire Stopping devices.

With our Rough-In Boots, Metacaulk pipe collars work very well; **Fig. 72** gives an illustration of a pipe collar used with the Rough-In Boot. Many options are available to the designer. If assistance is needed in product choice, call our representatives at Energy Saving Products for free technical advice.

Humidity Control

Fig. 71 – Humidifier

When a bypass type humidifier is used, the humidifier can be mounted on the return air duct, and then a two inch take-off from the hot air side is run back (**Fig. 71**). **DO NOT** use any size larger than two inch, and be sure to install a summer shut-off, or it will create problems with the airflow. When installing a steam humidifier install on the return side of the unit.

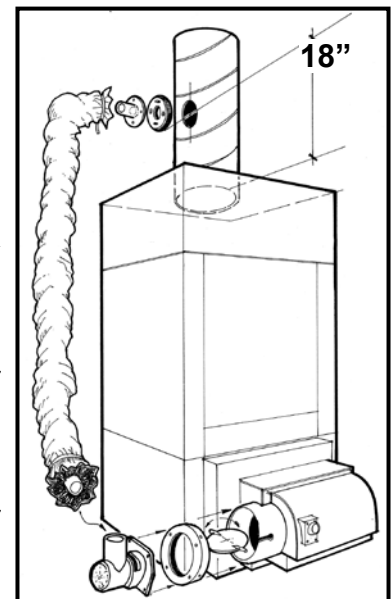
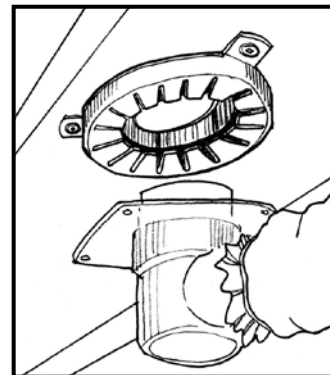


Fig. 72 – Fire Stopping Devices



Lots of Choices

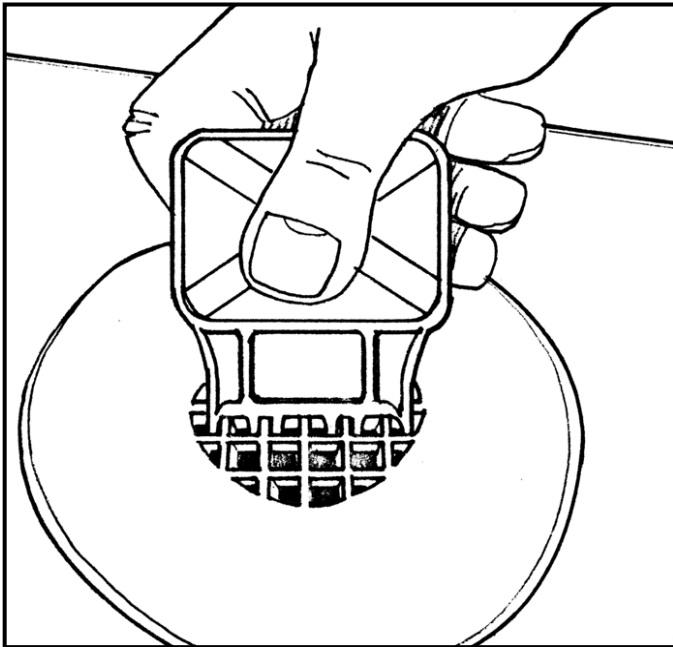
- Pipe Collars
- Wrap Strips
- Mechanical Shut offs
- Call ESP for Advice

User Guide

Difference in Number of Vents Needed for Heating and Cooling

There may be cases when the number of outlets needed for heating is significantly different than the amount needed for cooling. This is usually caused by a large appliance load or an excessive amount of windows. In cooling mode the outlets must be in the fully open position or there will be a loss in system performance. The vents may need to be partially closed in heating mode, or it may be necessary to close off some of the outlets. The Rough-In Boots have built in dampers and can be adjusted for room comfort. Use the damper key supplied from Energy Saving Products for easy vent adjustments (*Fig. 73*).

Fig. 73 – Easy Adjusting Vents



Indoor Air Quality (IAQ)

Ensure that there is always a filter in place, and check every month to ensure that the filter is clean. The amount of time between filter changes/cleaning will be dependant upon the living habits of the homeowner. With a clean air filter, you not only have cleaner air to breathe, but you will also help maintain unit efficiency, and increase operating life.

Filter Maintenance

The filters supplied by Energy Saving Products Ltd. can be cleaned and re-used. If the filter needs cleaning it should first be removed from the system and cleaned. To clean the filters, wash the white side and vacuum the pink side. Once the filter has been washed, vacuumed and completely dried, A filter can generally be cleaned a few times, if re-used too often it will restrict airflow.

Fan Controls

The “Constant Fan Control” is enabled when there is no demand for heating or cooling from the thermostat. This control will enable you to adjust the fan speed to your own comfort level. It is optional and can be turned off if not desired. The “Heating Fan Control” enables the fan speed to be adjusted on a demand for heat from the thermostat (not applicable to heat pumps). In most cases it is recommended to keep this control set on the high setting, and only needs to be adjusted if longer heat cycles are desired, or if you wish to tone down the airflow from the system.

Note:

- It is not recommended to turn down control dials more than half of their full setting, as this can be hard on the motor over a long period of time.
- In cooling mode, the fan coil will automatically switch to full high speed and bypass both speed controls

Timer Chip (flashing red light)

The printed circuit board within the fan coil contains a timer circuit. On some systems (when applicable) this timer will cycle the pump on potable water systems to flush the water through the system and prevent any water stagnation. The timer circuit is equipped with a red flashing light in the center of the circuit board. It is normal for the red light to be flashing as it shows power is being supplied to the unit.

System Efficiency/Performance

The following steps should be taken to increase the overall system performance, and decrease system costs.

1. There is great benefit with using the constant fan control. This will reduce the amount of stratified air (hot and cold spots) within the home, giving you more even temperatures between floors, as well as providing constant air filtration. The amount of power actually used with this constant fan operation is about the same as a 100w light bulb.
2. Try to maintain your house temperature within a 5 degree temperature range. Residential heating/cooling systems are designed to maintain a set temperature within the home.
3. Clean the filter (or replace) on a regular basis.

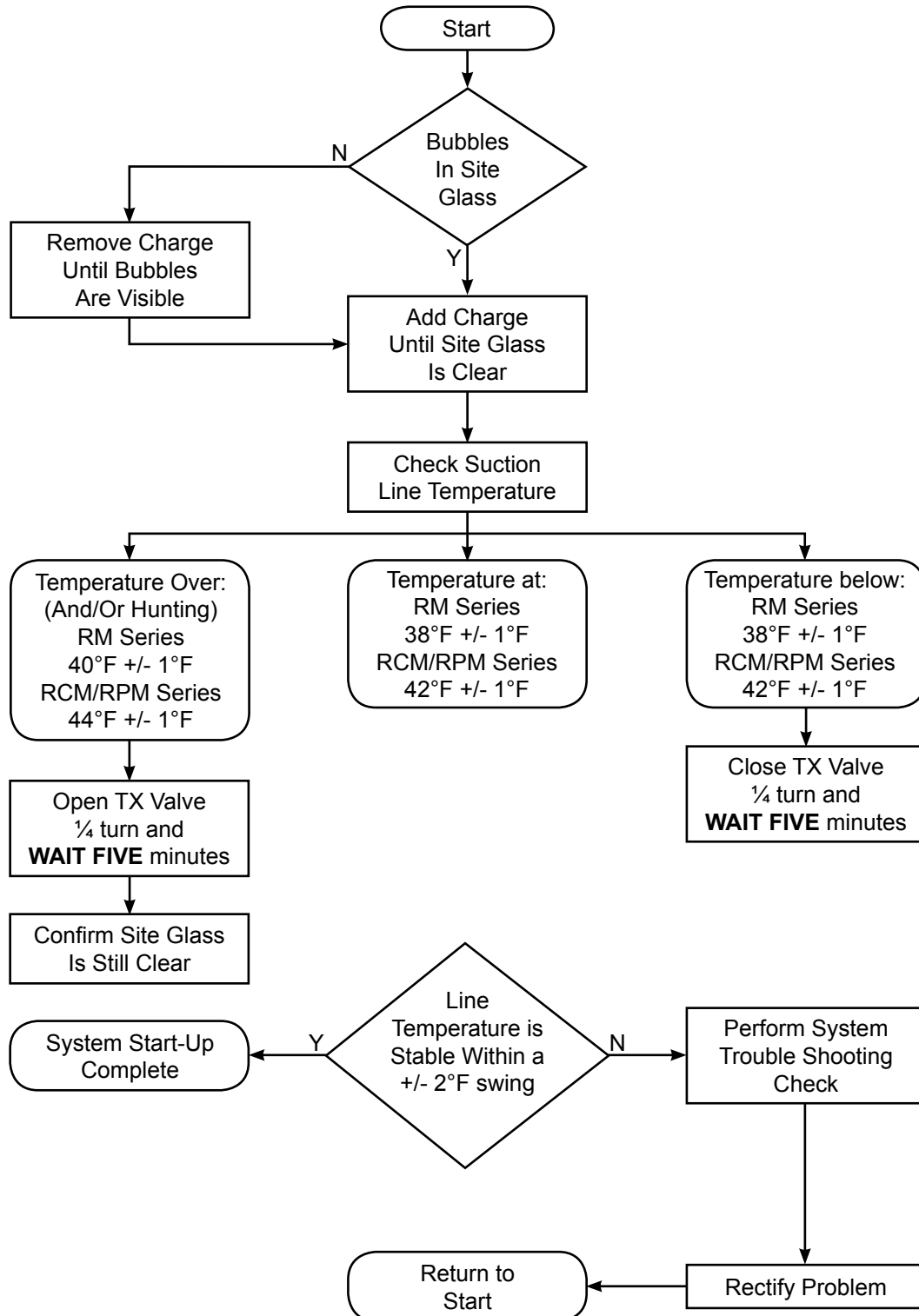
A big misconception that people have is to turn off their air conditioning/heating when they leave the home, and “crank” it up/down when they get home thinking that this is efficient. For a residential heating/cooling system to bring up/down the temperature drastically like this (as an example lets say more than 5 degrees), the system will have to run much longer than it would have throughout the day, therefore consuming more power and making it much more inefficient.

For Cooling Systems only

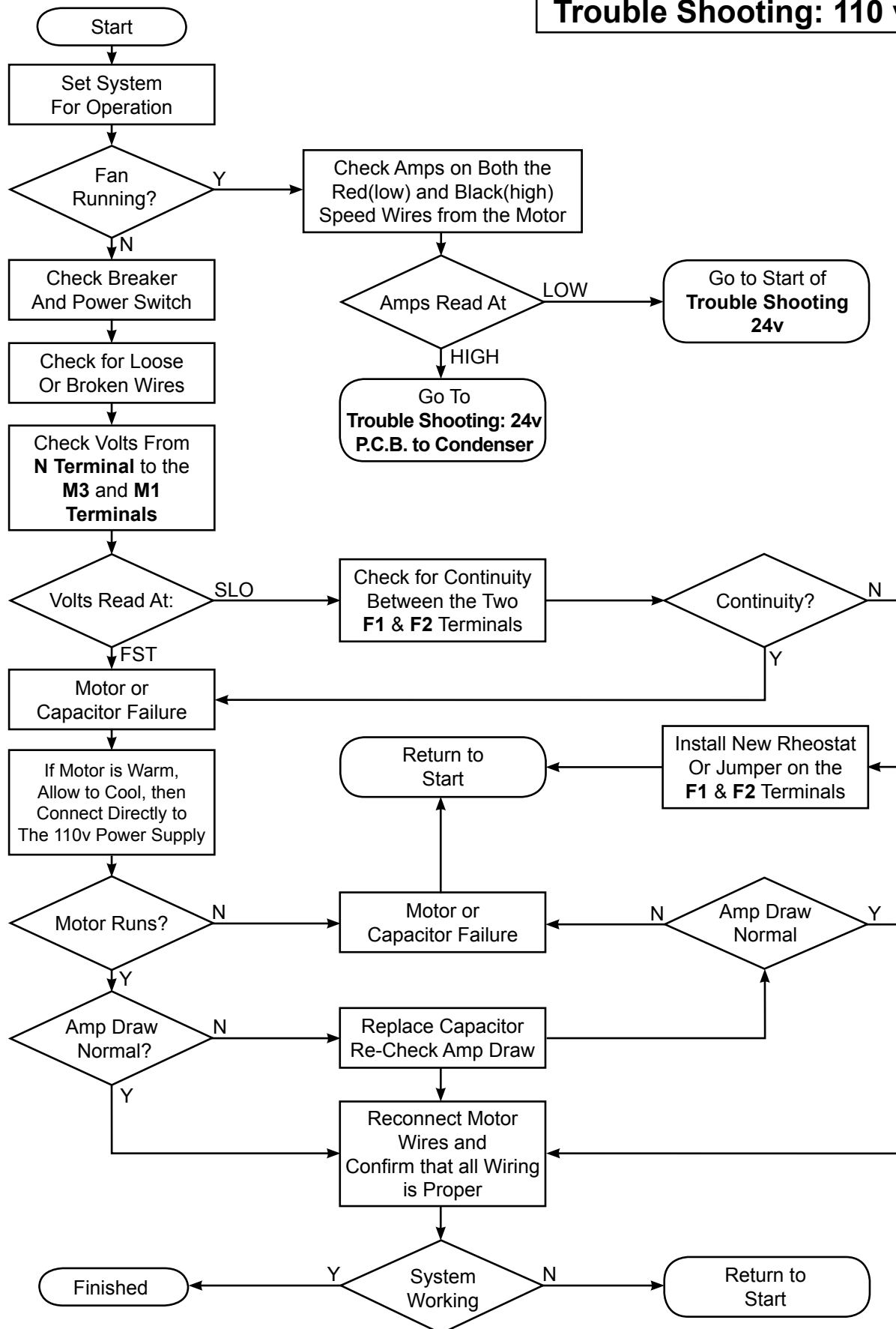
When located in an unconditioned space (crawl space or attic), all the vent outlets must be closed and the return air blocked during winter shutoff times unless the constant fan is being used.

Cooling Start-Up

1. Pipe system with Site Glass and Access Ports at the evaporator.
2. Leak check and evacuate system.
3. Check system operation with power to the outdoor unit off or use the service disconnect.
4. Connect gauges and open outdoor unit service valves.
5. Turn on power to the outdoor unit and start system.



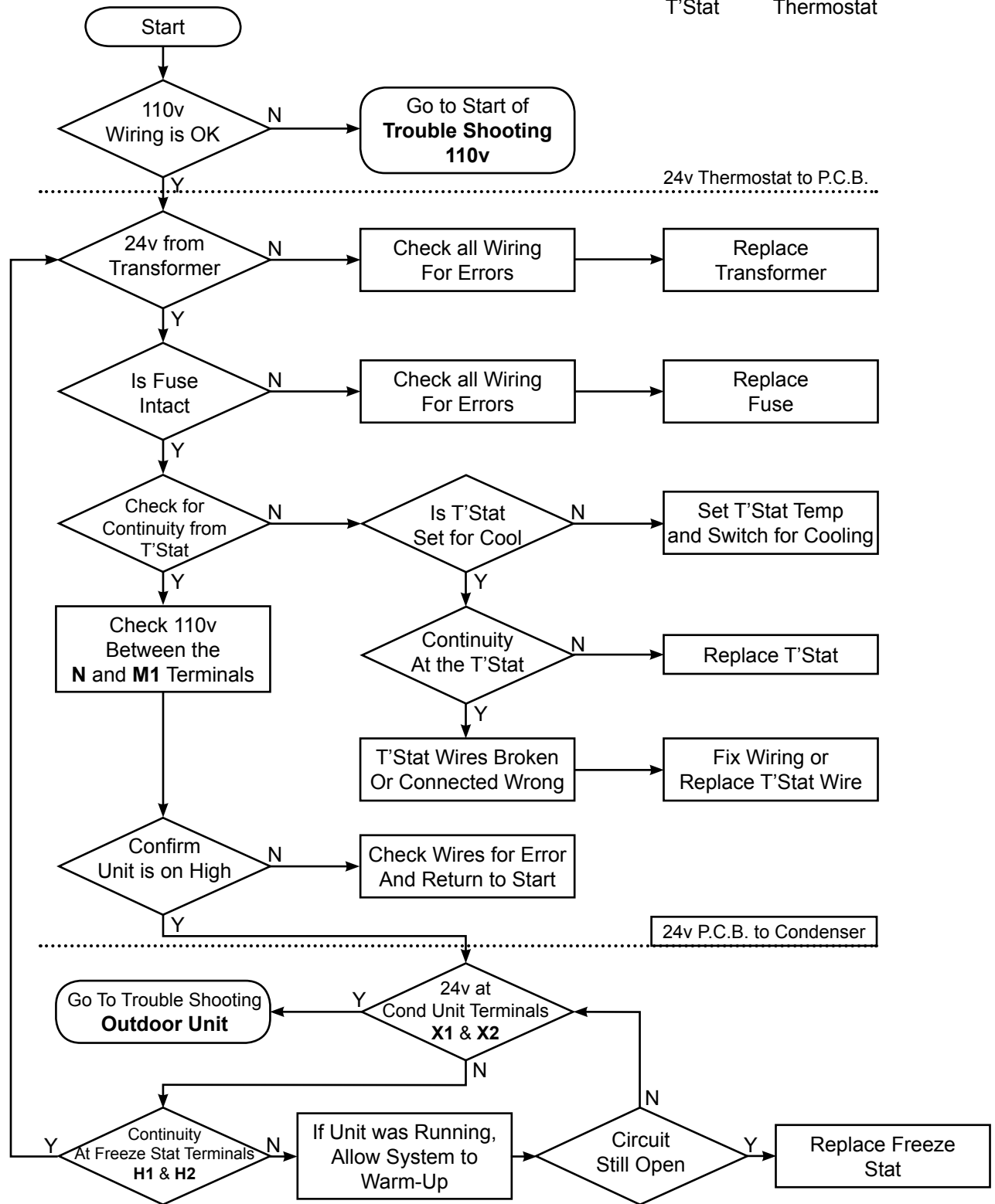
Trouble Shooting: 110 volt



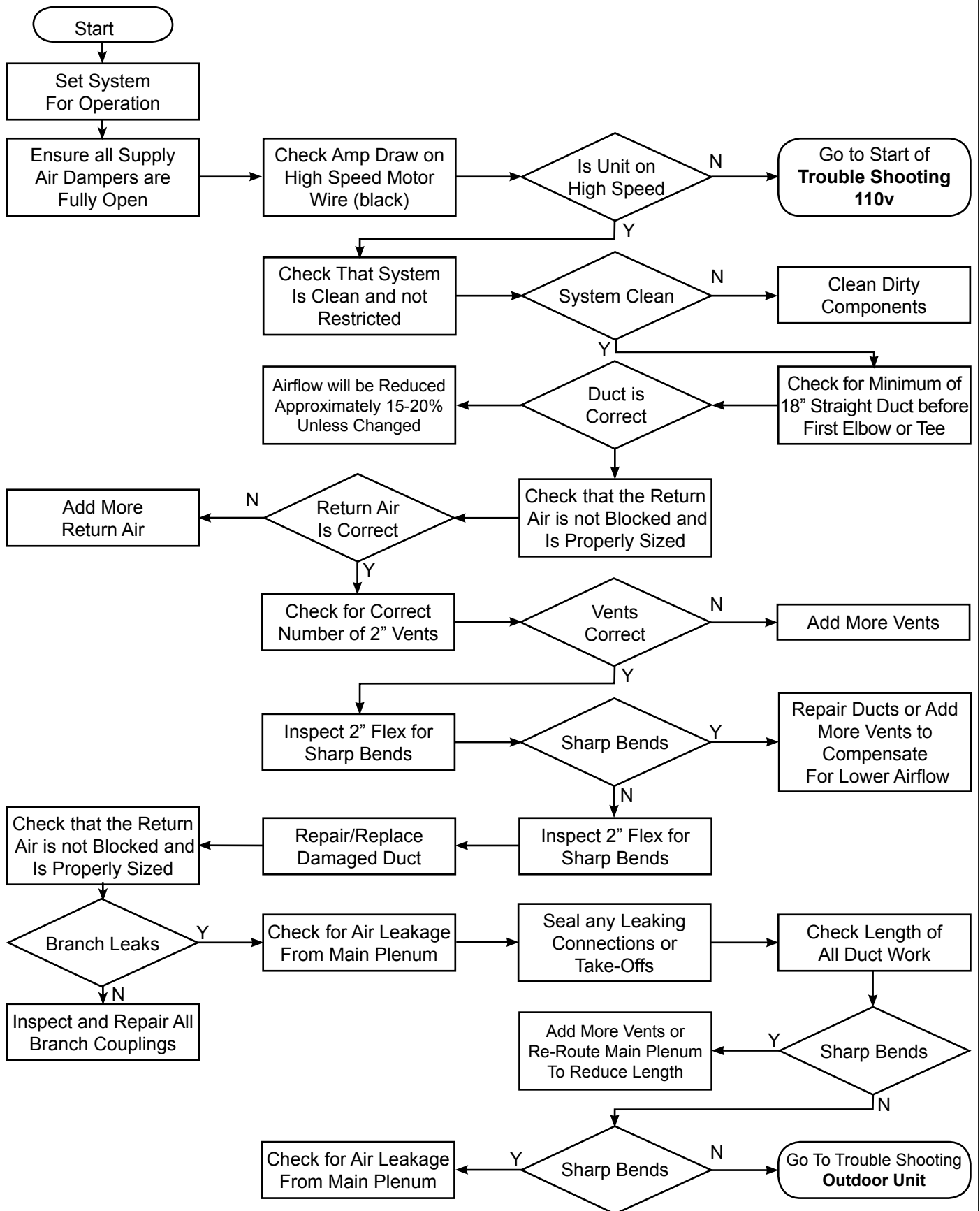
Trouble Shooting: 24 volt

Legend:

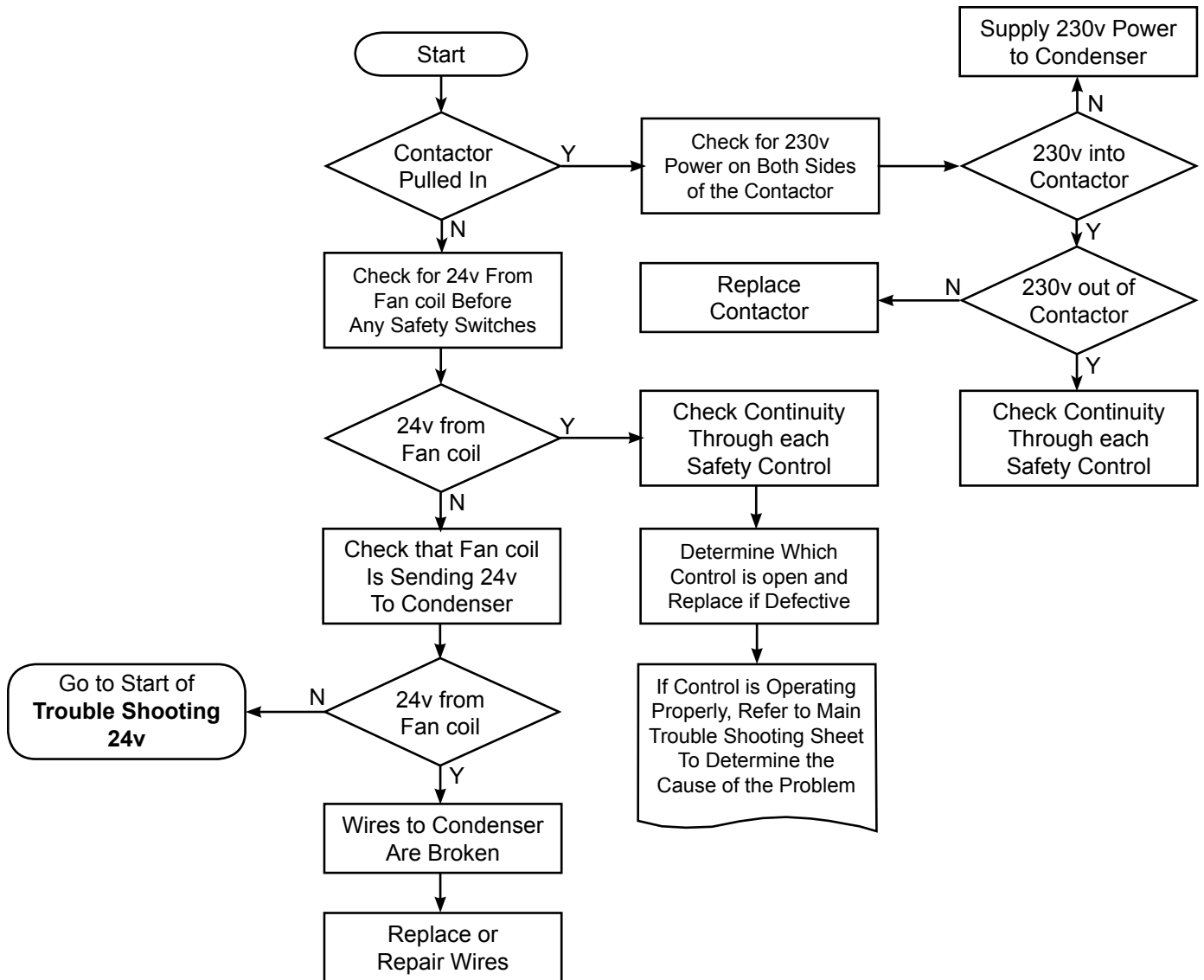
P.C.B. Printed Circuit Board
 Cond Condenser
 T'Stat Thermostat



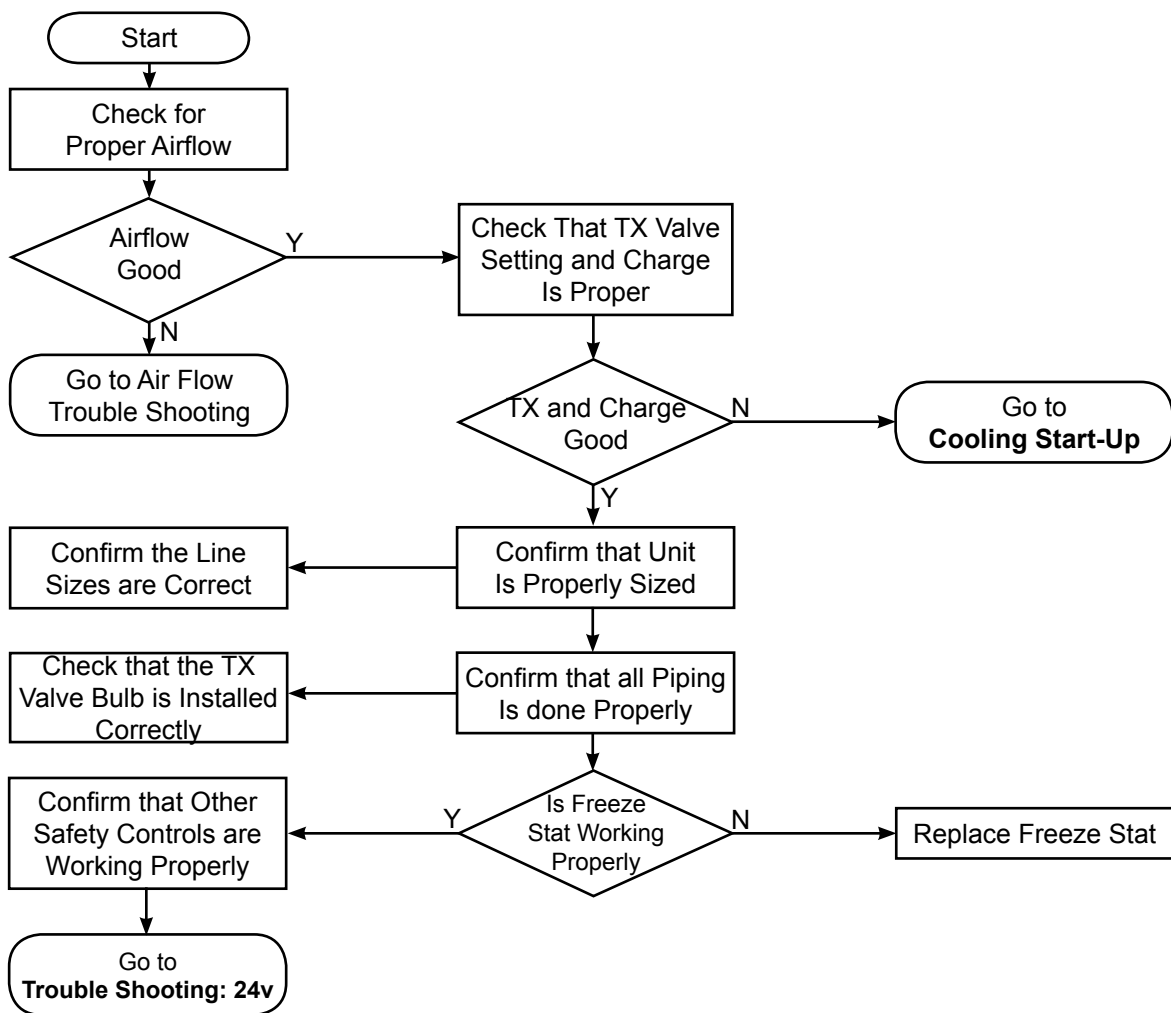
Trouble Shooting: Low Air Flow



Trouble Shooting: Outdoor Unit - Electrical



Trouble Shooting: Short Cycling



Appendix A – Hi-Velocity Fan Coil Specifications

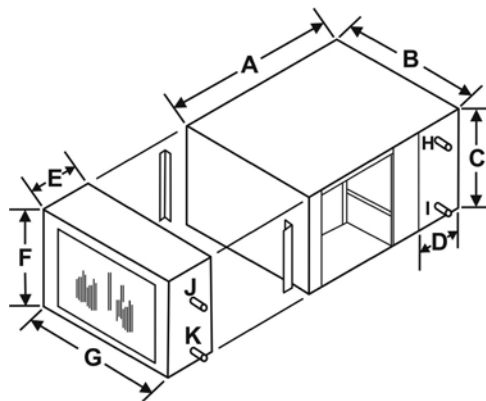
Hi-Velocity Specifications	HV-50/51	HV-52	HV-70/71	HV-100/101	HV-140
BTUH @ 190°F E.W.T.	56,200	58,636	79,700	113,400	150,400
BTUH @ 180°F E.W.T.	52,300	54,042	73,800	105,000	138,200
BTUH @ 170°F E.W.T.	48,500	49,455	67,500	95,500	126,000
BTUH @ 160°F E.W.T.	44,400	44,877	62,900	86,300	113,800
BTUH @ 150°F E.W.T.	41,500	40,309	55,000	77,000	101,600
BTUH @ 140°F E.W.T.	37,500	35,753	49,500	68,700	89,500
BTUH @ 130°F E.W.T.	32,700	31,210	44,500	59,300	77,400
BTUH @ 120°F E.W.T.	29,500	26,682	38,000	49,600	65,300
BTUH @ 110°F E.W.T.	23,200	22,171	30,000	37,200	53,300
Electrical Strip Heater	5 - 15 Kw	N/A	5 - 18 Kw	5 - 23 Kw	N/A
TX Cooling MBH ⁽¹⁾	18 - 24	18 - 24	30 - 36	42 - 60	60
BTUH @ 44°F E.W.T.	24,400	23,700	35,000	51,000	57,900
BTUH @ 42°F E.W.T.	26,000	25,400	37,800	55,000	62,900
C.F.M. @ 1.5" E.S.P.	550	550	750	1100	1250
HP - RPM	1/4 - 1625	1/4 - 1625	1/3 - 1625	1/2 - 1625	3/4 - 1625
AMPS @ 115/1/60	4.5 (High)	4.5 (High)	5.0	7.5	8.5
G.P.M. FLOW RATINGS	5	5	7	10	10
S/A SIZE & MAX. LENGTH	8" - 70'	2 x 6" or 1 x 8" 50'	8" - 80'	10" - 100'	10" - 120'
R/A SIZE NEEDED	12"	12"	12"	14"	16"
MINIMUM OUTLETS ⁽²⁾	14	8	20	30	40
MAXIMUM OUTLETS	20	19	29	45	50

E.W.T. Entering Water Temperature
 E.S.P. External Static Pressure
 G.P.M. Gallons Per Minute
 HP Horse Power
 MBH Thousand British Thermal Units per Hour
 RPM Revolutions Per Minute
 R/A Return Air
 S/A Supply Air
 TX Thermal Expansion

1. Smaller condensers may be matched to the fan coil when needed (match TXV to condenser size).
2. Minimum number of **8 full outlets per ton** of cooling needed.

Appendix B – Product Sizing

Item	Length	Width	Height		
Fan coils	A	B	C		
HV-50/51 H/BU	32 $\frac{5}{16}$ "	14 $\frac{1}{2}$ "	18 $\frac{1}{4}$ "		
HV-52 H/BU	30 $\frac{1}{2}$ "	18 $\frac{1}{2}$ "	14 $\frac{1}{4}$ "		
HV-70/71 H/BU	32 $\frac{5}{16}$ "	19 $\frac{1}{2}$ "	18 $\frac{1}{4}$ "		
HV-100/101 H/BU	32 $\frac{5}{16}$ "	25 $\frac{1}{2}$ "	18 $\frac{1}{4}$ "		
HV-140 H/BU	38 $\frac{1}{2}$ "	26 $\frac{1}{2}$ "	24 $\frac{1}{4}$ "		
Refrigerant Modules	G	E	F	J	K
RCM-50	14 $\frac{3}{8}$ "	10 $\frac{1}{8}$ "	18 $\frac{1}{2}$ "	$\frac{1}{2}$ "	$\frac{7}{8}$ "
RCM-70	19 $\frac{3}{8}$ "	10 $\frac{1}{8}$ "	18 $\frac{1}{2}$ "	$\frac{1}{2}$ "	$\frac{7}{8}$ "
RM-100	25 $\frac{3}{8}$ "	7"	18 $\frac{3}{8}$ "	$\frac{5}{8}$ "	$\frac{7}{8}$ "
RM-140	25 $\frac{3}{8}$ "	7"	18 $\frac{3}{8}$ "	$\frac{5}{8}$ "	$\frac{7}{8}$ "
There is no difference between the RM-100 and RM-1400					
Water Cooling Modules	G	E	F	J	K
WCM-50	14 $\frac{3}{8}$ "	10 $\frac{1}{8}$ "	18 $\frac{1}{2}$ "	$\frac{3}{4}$ "	$\frac{3}{4}$ "
WCM-70	19 $\frac{3}{8}$ "	10 $\frac{1}{8}$ "	18 $\frac{1}{2}$ "	$\frac{3}{4}$ "	$\frac{3}{4}$ "
WCM-100	25 $\frac{3}{8}$ "	7"	18 $\frac{3}{8}$ "	$\frac{3}{4}$ "	$\frac{3}{4}$ "
WCM-140	26 $\frac{1}{4}$ "	8"	22 $\frac{5}{8}$ "	1"	1"
Hot Water Coils (4 Row)	B	D	C	H	I
50	13 $\frac{1}{2}$ "	5 $\frac{5}{8}$ "	16"	$\frac{1}{2}$ "	$\frac{1}{2}$ "
70	19"	5 $\frac{1}{2}$ "	16"	$\frac{3}{4}$ "	$\frac{3}{4}$ "
100	25"	5 $\frac{1}{2}$ "	16"	$\frac{3}{4}$ "	$\frac{3}{4}$ "
140	25 $\frac{7}{8}$ "	6"	22"	1"	
Heating Coil Add-on does not come as a module, it slides into the Hi-Velocity fan coil					
Electrical Strip Heater	B	D	C		
HV-650	13 $\frac{3}{4}$ "	5 $\frac{5}{8}$ "	15 $\frac{1}{2}$ "		
HV-750	18 $\frac{3}{4}$ "	5 $\frac{5}{8}$ "	15 $\frac{1}{2}$ "		
HV-1100	24 $\frac{3}{4}$ "	5 $\frac{5}{8}$ "	15 $\frac{1}{2}$ "		
Dimensions for the ESH do not include the electrical access panel, add 4" to ESH for Total Length					
Refrigerant Pre-Piped Module	G	F	E	J (Liquid Line)	K (Suction Line)
RPM-E - 50	19 $\frac{1}{4}$ "	18 $\frac{5}{8}$ "	14 $\frac{5}{8}$ "	$\frac{1}{2}$ "	$\frac{7}{8}$ "
RPM-E - 70	24 $\frac{1}{2}$ "	18 $\frac{5}{8}$ "	14 $\frac{5}{8}$ "	$\frac{1}{2}$ "	$\frac{7}{8}$ "
RPM-E - 100	32 $\frac{1}{2}$ "	18 $\frac{5}{8}$ "	14 $\frac{5}{8}$ "	$\frac{5}{8}$ "	1 $\frac{1}{4}$ "



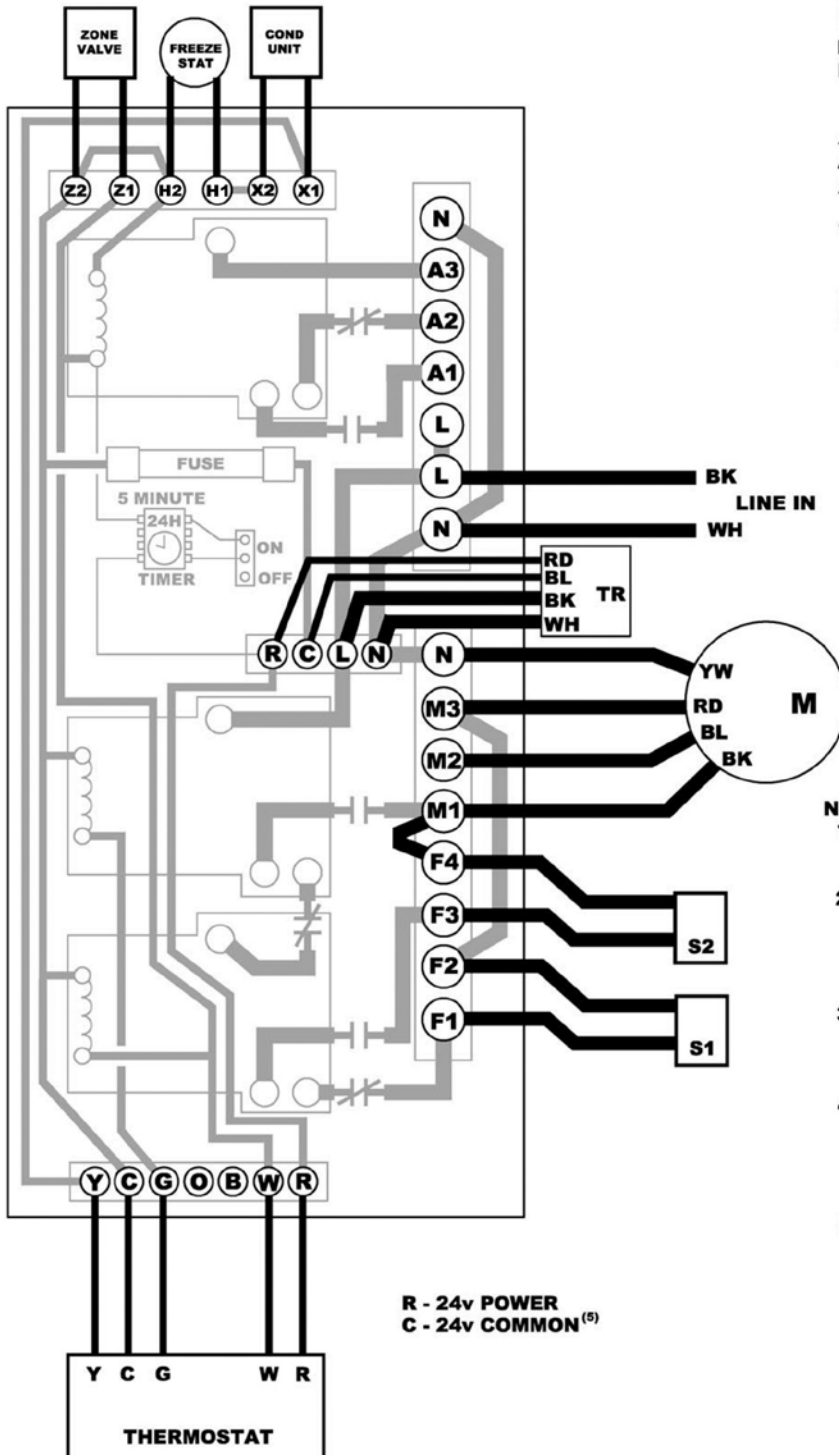
Appendix C – Standard Wiring

Printed Circuit Board Wiring

H - FREEZE STAT TERMINALS
X1 - COOLING MODE 24v OUTPUT
X2 - 24 VAC COMMON
Z1 - HEATING MODE 24v OUTPUT
Z2 - 24 VAC COMMON

M1 - MOTOR HIGH SPEED
M2 - MOTOR MEDIUM SPEED
M3 - MOTOR LOW SPEED
S1 - CONSTANT FAN CONTROL
S2 - HEATING SPEED CONTROL
F1 - CONSTANT FAN CONTROL TO RELAY ⁽¹⁾
F2 - CONSTANT FAN CONTROL TO MOTOR
F3 - HEATING SPEED CONTROL TO RELAY ⁽²⁾
F4 - HEATING SPEED CONTROL TO MOTOR ⁽³⁾
N - 115/1/60 NEUTRAL
L - 115/1/60 LINE
A1 - AUXILIARY NORMALLY OPEN
A2 - AUXILIARY NORMALLY CLOSED
A3 - AUXILIARY COMMON ⁽⁴⁾

YW - YELLOW (NEUTRAL)
RD - RED
BL - BLUE
BK - BLACK
WH - WHITE
M - MOTOR
TR - 20 VA TRANSFORMER
(115 VAC PRIMARY, 24V SECONDARY)



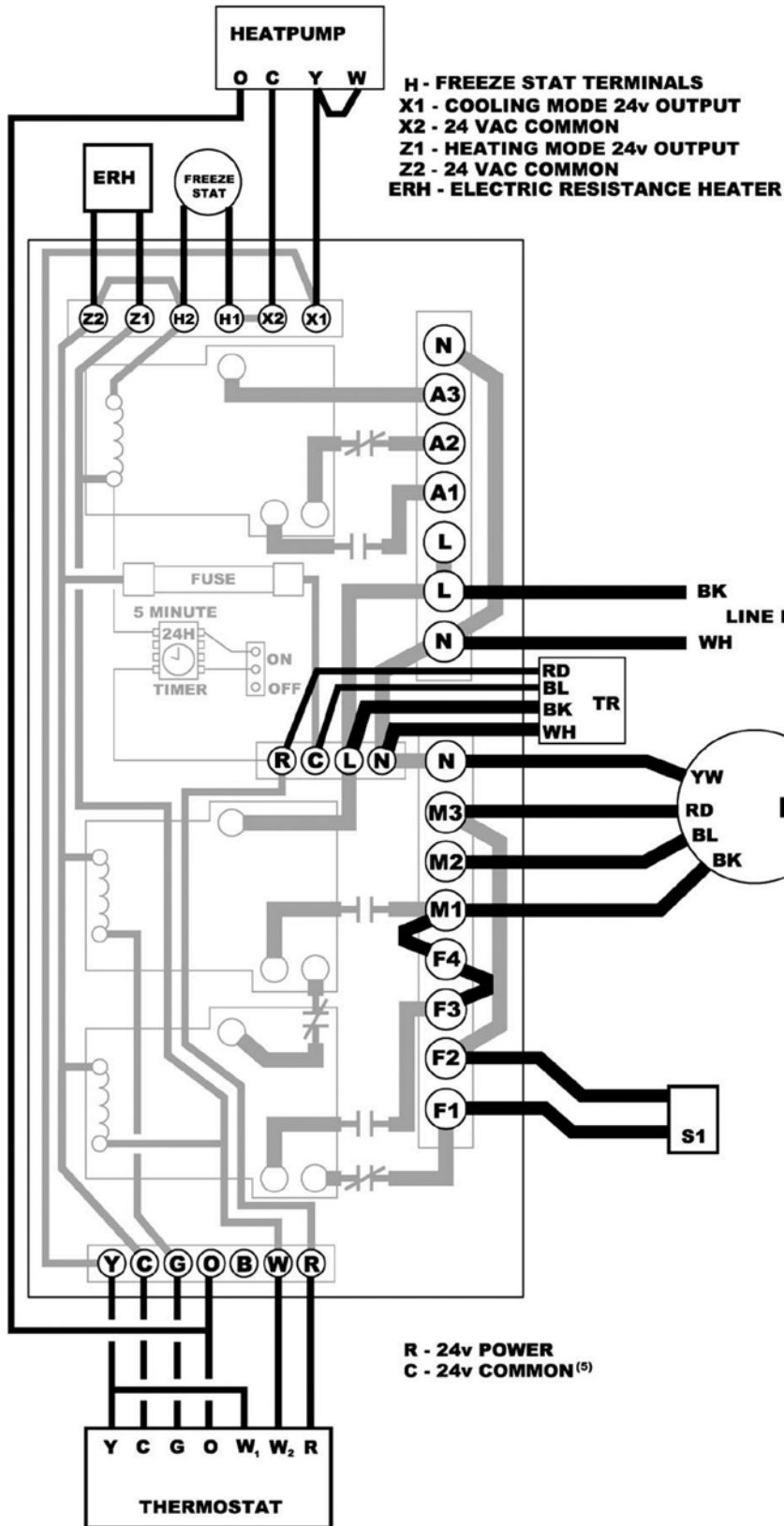
NOTES:

- 1) CONSTANT FAN CONTROL OR JUMPER WIRE MUST BE USED TO COMPLETE THE F1 TO F2 CIRCUIT
- 2) HEATING SPEED CONTROL OR JUMPER WIRE MUST BE USED TO COMPLETE THE F3 TO F4 CIRCUIT. HEATING SPEED CONTROL IS NOT TO BE USED ON ELECTRIC HEAT SYSTEMS.
- 3) TERMINAL F4 REQUIRES AN EXTERNAL JUMPER TO TERMINAL M1 FOR HIGH SPEED HEATING OR M2 FOR MEDIUM SPEED HEATING
- 4) AUXILIARY RELAY COMMON(A3) CAN BE USED WITH A1 AND/OR A2 AS DRY CONTACTS, ARMED 24v FROM THE 'R' TERMINAL, OR ARMED 115v FROM THE 'L' TERMINAL
- 5) 'C' TERMINAL ON THERMOSTAT IS NOT NEEDED FOR SOME THERMOSTATS. CONSULT THERMOSTAT INSTRUCTIONS FOR DETAILS.

STANDARD WIRING

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Appendix C – Heat Pump Wiring



YW - YELLOW (NEUTRAL)
RD - RED
BL - BLUE
BK - BLACK
WH - WHITE
M - MOTOR
M1 - MOTOR HIGH SPEED
M2 - MOTOR MEDIUM SPEED
M3 - MOTOR LOW SPEED
S1 - CONSTANT FAN CONTROL
S2 - HEATING SPEED CONTROL
F1 - CONSTANT FAN CONTROL TO RELAY ⁽¹⁾
F2 - CONSTANT FAN CONTROL TO MOTOR
F3 - HEATING SPEED CONTROL TO RELAY ⁽²⁾
F4 - HEATING SPEED CONTROL TO MOTOR ⁽³⁾
N - 115/1/60 NEUTRAL
L - 115/1/60 LINE
A1 - AUXILIARY NORMALLY OPEN
A2 - AUXILIARY NORMALLY CLOSED
A3 - AUXILIARY COMMON ⁽⁴⁾
TR - 20 VA TRANSFORMER
(115 VAC PRIMARY, 24V SECONDARY)

HEATPUMP NOTES:

HEATING SPEED CONTROL IS NOT TO BE USED ON ELECTRIC HEAT SYSTEMS.
REMOVE STATIC PRESSURE PLATE FROM BLOWER DISCHARGE WHEN INSTALLING THE ELECTRIC COIL.
DEPENDING ON THE REVERSING VALVE, SOME HEATPUMP UNITS REQUIRE 'B' INSTEAD OF 'O' CONNECTIONS ON BOTH THE THERMOSTAT AND THE OUTDOOR UNIT. CONSULT YOUR HEATPUMP MANUAL TO SEE IF THIS IS REQUIRED.
TIMER CIRCUIT CAN BE DISABLED WHEN USING A HEATPUMP AND ELECTRIC BACKUP HEAT

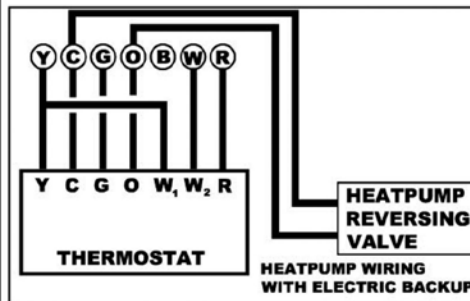
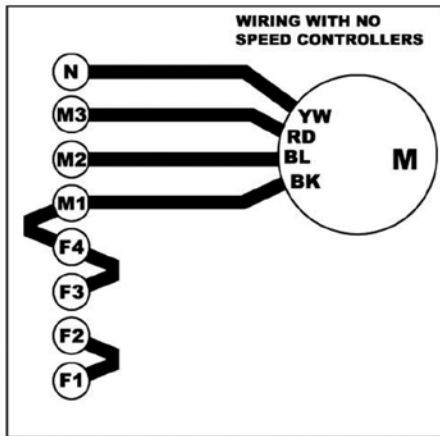
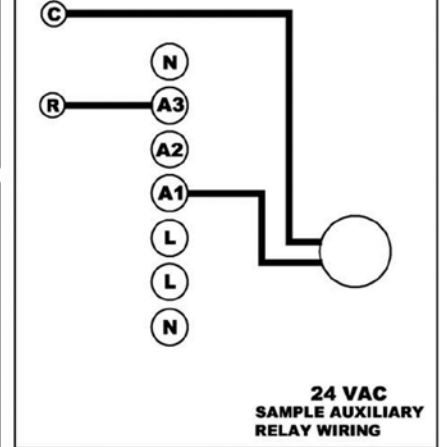
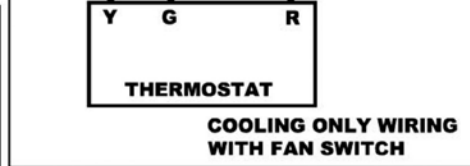
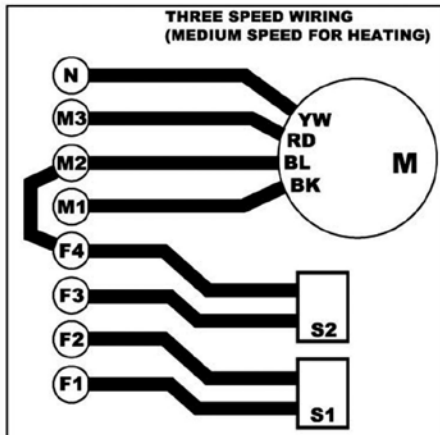
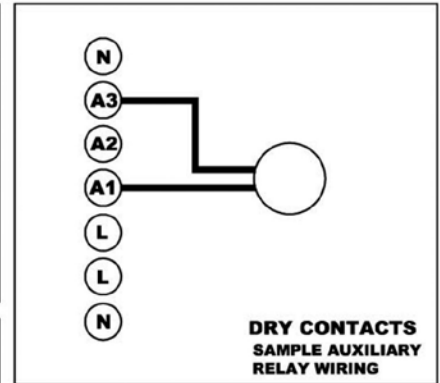
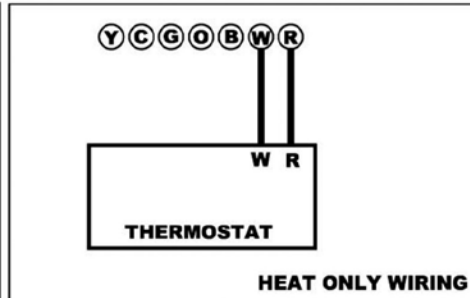
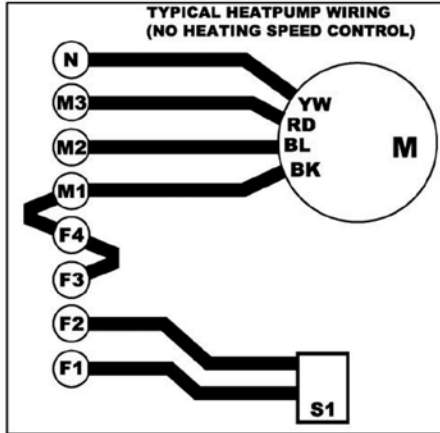
NOTES:

- 1) CONSTANT FAN CONTROL OR JUMPER WIRE MUST BE USED TO COMPLETE THE F1 TO F2 CIRCUIT
- 2) JUMPER WIRE MUST BE USED TO COMPLETE THE F3 TO F4 CIRCUIT. HEATING SPEED CONTROL IS NOT TO BE USED ON ELECTRIC HEAT SYSTEMS.
- 3) TERMINAL F4 REQUIRES AN EXTERNAL JUMPER TO TERMINAL M1 FOR HIGH SPEED HEATING OR M2 FOR MEDIUM SPEED HEATING
- 4) AUXILIARY RELAY COMMON(A3) CAN BE USED WITH A1 AND/OR A2 AS DRY CONTACTS, ARMED 24v FROM THE 'R' TERMINAL, OR ARMED 115v FROM THE 'L' TERMINAL
- 5) 'C' TERMINAL ON THERMOSTAT IS NOT NEEDED FOR SOME THERMOSTATS. CONSULT THERMOSTAT INSTRUCTIONS FOR DETAILS.

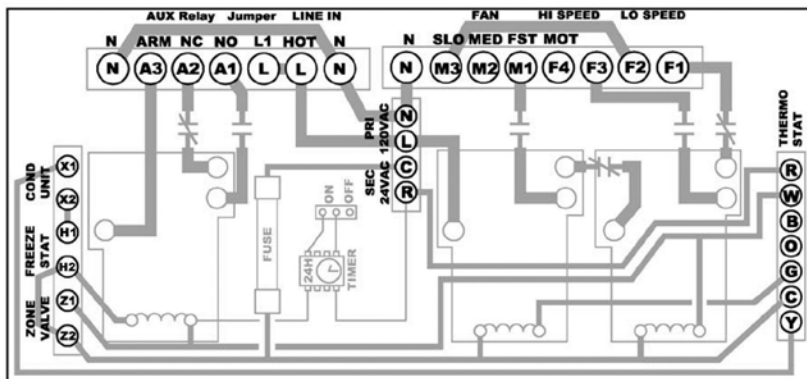
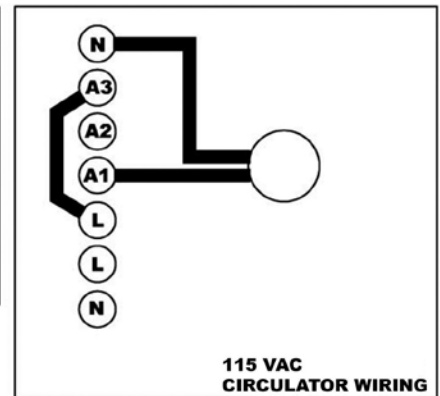
HEATPUMP WIRING

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Appendix C – Wiring Options

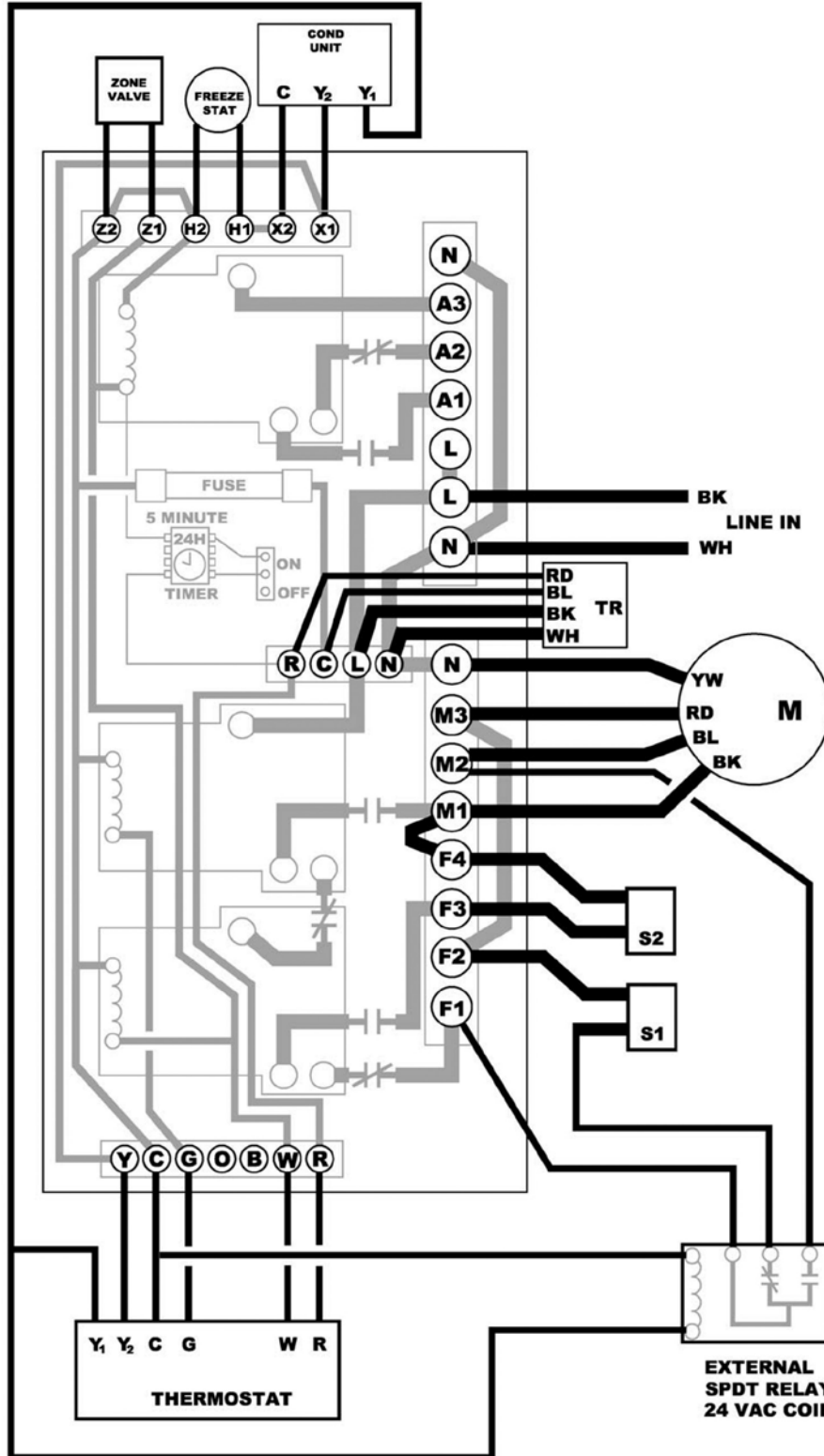


SEE HEATPUMP WIRING PAGE FOR MORE
DETAILED HEATPUMP INFORMATION



WIRING OPTIONS
PCBW-017
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Appendix C – 1 stage Heat, 2 Stage Cooling



YW - YELLOW (NEUTRAL)
 RD - RED
 BL - BLUE
 BK - BLACK
 WH - WHITE
 M - MOTOR

TR - 20 VA TRANSFORMER
 (115 VAC PRIMARY, 24V SECONDARY)

M1 - MOTOR HIGH SPEED
 M2 - MOTOR MEDIUM SPEED
 M3 - MOTOR LOW SPEED
 S1 - CONSTANT FAN CONTROL
 S2 - HEATING SPEED CONTROL
 F1 - CONSTANT FAN CONTROL TO RELAY
 F2 - CONSTANT FAN CONTROL TO MOTOR
 F3 - HEATING SPEED CONTROL TO RELAY
 F4 - HEATING SPEED CONTROL TO MOTOR
 N - 115/1/60 NEUTRAL
 L - 115/1/60 LINE
 A1 - AUXILIARY NORMALLY OPEN
 A2 - AUXILIARY NORMALLY CLOSED
 A3 - AUXILIARY COMMON⁽⁴⁾

NOTES:

- 1) CONSTANT FAN CONTROL OR JUMPER WIRE MUST BE USED TO COMPLETE THE F1 TO F2 CIRCUIT
- 2) HEATING SPEED CONTROL OR JUMPER WIRE MUST BE USED TO COMPLETE THE F3 TO F4 CIRCUIT. HEATING SPEED CONTROL IS NOT TO BE USED ON ELECTRIC HEAT SYSTEMS.
- 3) TERMINAL F4 REQUIRES AN EXTERNAL JUMPER TO TERMINAL M1
- 4) AUXILIARY RELAY COMMON(A3) CAN BE USED WITH A1 AND/OR A2 AS DRY CONTACTS, ARMED 24v FROM THE 'R' TERMINAL, OR ARMED 115v FROM THE 'L' TERMINAL
- 5) 'C' TERMINAL ON THERMOSTAT IS NOT NEEDED FOR SOME THERMOSTATS. CONSULT THERMOSTAT INSTRUCTIONS FOR DETAILS.

R - 24v POWER
 C - 24v COMMON⁽⁵⁾
 V - FREEZE STAT TERMINALS
 X1 - COOLING MODE 24v OUTPUT
 X2 - 24 VAC COMMON
 Z1 - HEATING MODE 24v OUTPUT
 Z2 - 24 VAC COMMON

1-STAGE HEAT
2-STAGE COOL
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WARRANTY

One year limited warranty. The heat exchanger, motor, controls, and wiring are free from defects in workmanship for one year from date of purchase.

Two year limited warranty. The electrical strip heater is free from defects in workmanship for two years from date of purchase

This warranty applies only to the fan coil unit and does not include connections, attachments, and other products or materials furnished by the installer. This warranty applies only to the first purchaser at retail and excludes any damages caused by changes, relocation to, or installation in a new site. This warranty does not cover any defects caused by failure to follow the installation and operating instructions furnished with the fan coil, local building codes, and good industry standards. Failure to correctly install the fan coil, or material related to the unit, may result in improper system performance and/or damages and will void this warranty.

TERMS AND CONDITIONS

- Any repair performed under warranty must be approved by Energy Saving Products Ltd. for this warranty to be valid.
- The manufacturer is not liable for any other damages, personal injury, or any other losses of any nature.
- The liability of the manufacturer is limited to and shall not exceed the cost of replacement parts and shall not include transportation to and from the factory, and field labour.
- Inoperative parts must be returned with serial number, purchase date, and a detailed description of the entire problem with an ESP RMA Form.
- This warranty replaces all other warranties expressed or implied.

ENERGY SAVING PRODUCTS LTD.
12615-124 STREET
EDMONTON, ALBERTA, CANADA T5L 0N8
PHONE (780) 453-2093 FAX (780) 453-1932
TOLL FREE 1-888-652-2219
www.hi-velocity.com

Installing Company:

Installed By:

Installed Date:

Fan coil Serial Number:

Coil Serial Number:

Installation Notes

Energy Saving Products Ltd., established in 1983, manufactures the **Hi-Velocity Systems** product line for residential, commercial and multi-family markets. Our facilities house Administration, Sales, Design, Manufacturing, as well as Research & Development complete with an in-house test lab. Energy Saving Products prides itself on Customer Service and provides design services and contractor support.

***Comfort from floor to ceiling,
Satisfaction from room to room,***

with



It's not just a dream, it's reality.



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