Hi-Velocity Systems

Small Duct High Velocity Heating, Cooling and Home Comfort Systems

WBM Chilled Water Base Coil

Installation Manual

WBM-50 (1.5-2 Tons)
WBM-70 (2.5-3 Tons)
WBM-100 (3.5-5 Tons)

Includes:
T-Mounting Brackets
Mounting Tape
Hole Plugs (2)

Manufactured By
Energy Saving Products Ltd

Water Base Modules (WBM)

The WBM coil is a High Capacity Hydronic Water Coil available as an add-on module to the Hi-Velocity System. Mainly used in the chilled water applications for cooling, this coil can also be used for heating with water temperatures up to130°F (54°C). It can be installed in a variety of orientations depicted below. (Figs. 01, 02)

Coil Configuration

The WBM module can be installed as a stand (return air base) for the air handler or as a side mounted coil. When the desired air inlet side has been determined, the module can be adapted. The module comes ready as left to up/right orientation (Fig. 01) but can easily be changed to a right to up/left orientation. (Fig. 02) See page 3 for steps to adapt the coil to up/left.

The WBM Module can be installed in four different configurations:

A - Entering air in through the left, leaving through the top.

B - Entering air in through the left, leaving through the right.

Or (with adaptation)

C - Entering air in through the right, leaving through the top.

D - Entering air in through the right, leaving through the left.

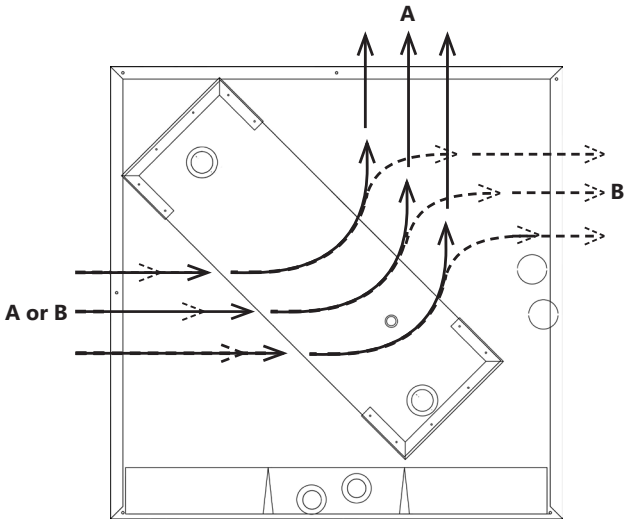


Fig. 01 - Up/Right Orientation

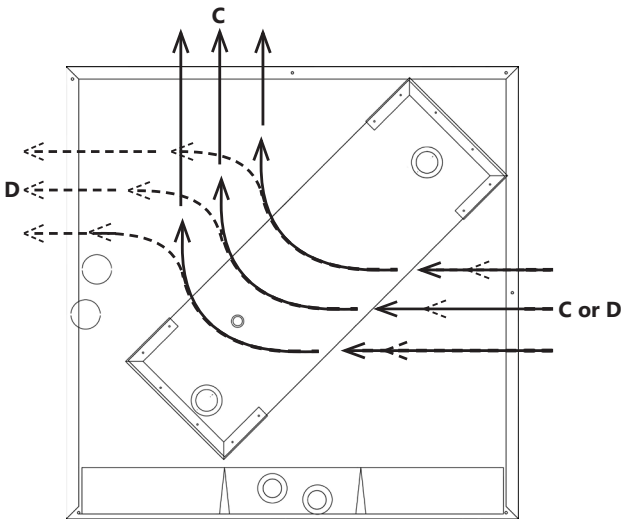


Fig. 02 - Up/Left Orientation

Change Configuration

To change from up/right (standard) configuration to up/left configuration, follow the steps below.

1) Remove front door from module. (Fig. 03)

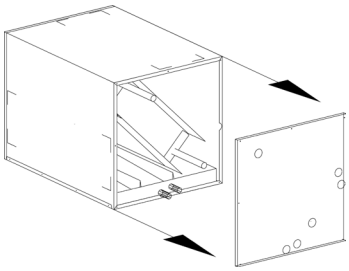


Fig. 03

2) Remove drain pan by sliding it out from the bottom of the coil casing, ensuring that the foam air dam is also removed. (Figs. 04a, 04b)

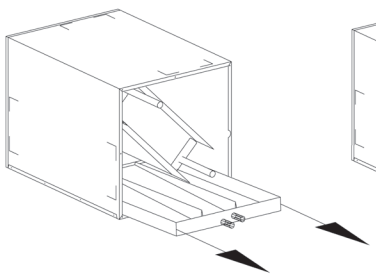


Fig. 04a

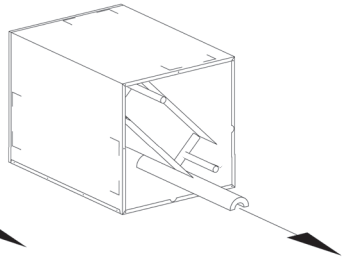


Fig. 04b

3) Rotate entire unit 90 deg. clockwise. (Fig. 05)

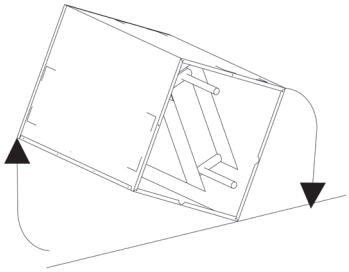


Fig. 05

4) Position the blue horse hair filter in front of the drain line inlets, to filter condensate and prevent any air from bypassing under the coil through the gap in the drain pan's air dam. (Figs. 06a, 06b)

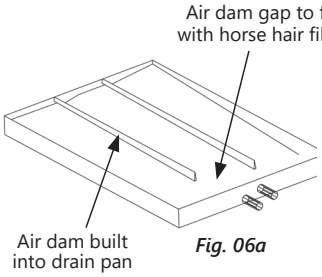


Fig. 06a

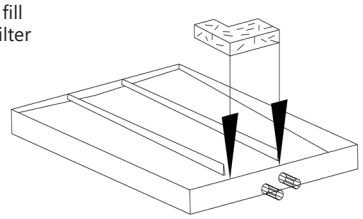


Fig. 06b

5) Replace the drain pan in (new) bottom location. (Fig. 07)

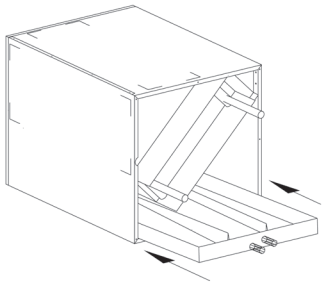


Fig. 07

6) Ensure the foam air dam is re-installed under the corner of the coil to prevent air from bypassing under the coil. (Fig. 08)

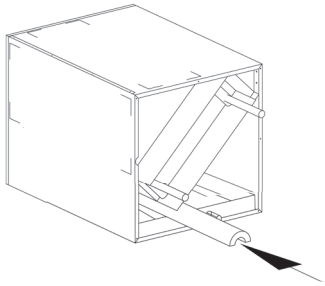


Fig. 08

7) Remove round knock-outs on the door to fit drain lines. Plug previously used drain holes with provided plugs. (Fig. 09)

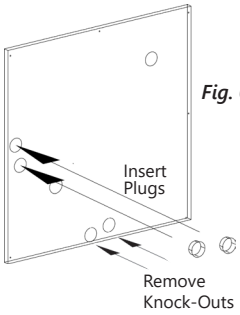


Fig. 09

8) Replace front door on module. (Fig. 10)

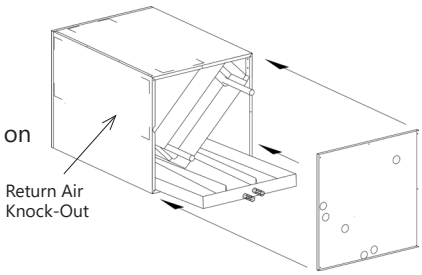
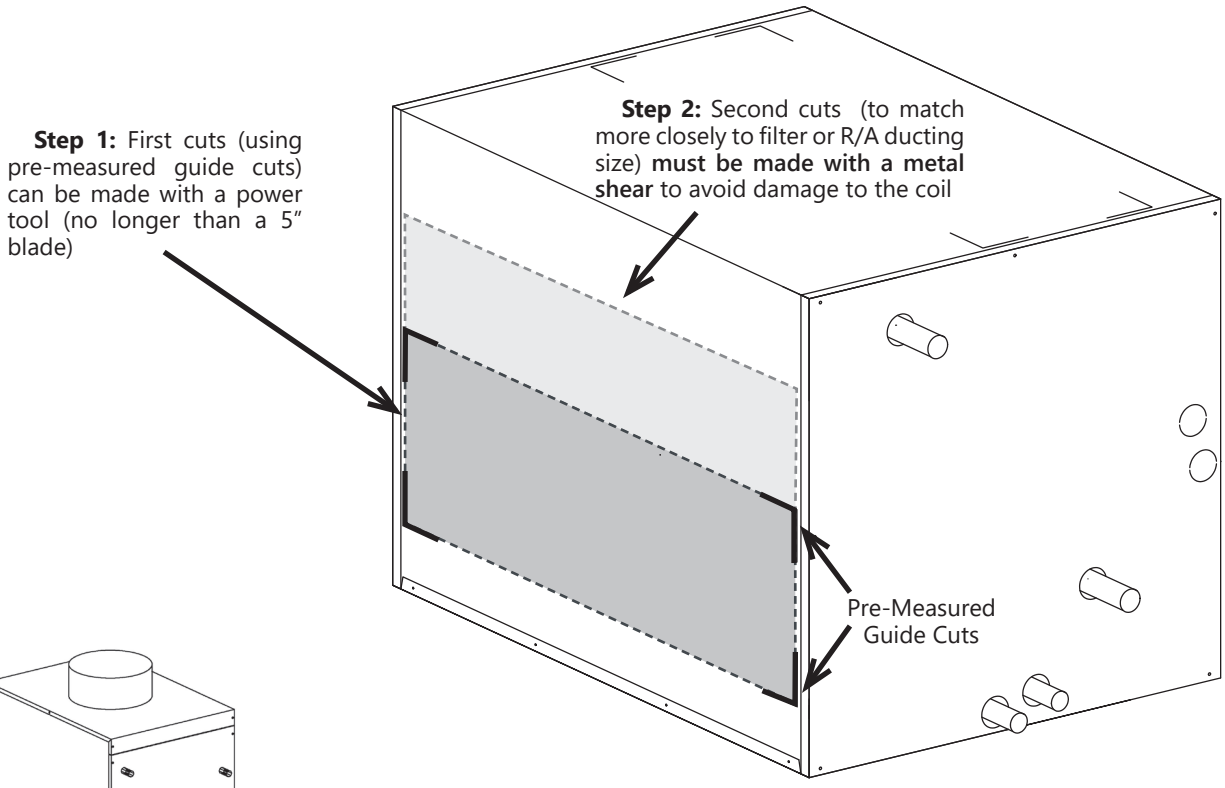


Fig. 10

Return Air Cutouts

Once the WBM coil configuration and placement of the return air ducting has been decided, the return air knockout(s) can be cut. The pre-measured guide cuts supplied with theWBM coil should always be used to make the first cut. For this first cut, do not use a saw blade longer than 5" (125mm) or damage to the coil can occur.

TO AVOID DAMAGE: After the first initial cut using the return air knockout(s) a metal shear must be used to make the return air cutout opening match more closely to the filter or return air ducting size to maximize flow capacity. Use this cut method for both coil inlet and outlet.



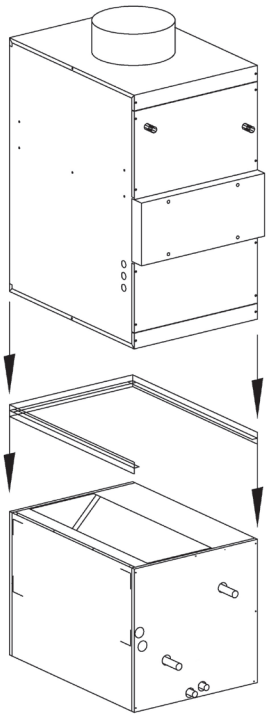


Fig. 11

Mounting Brackets

Mounting the WBM to the air handler can be done with the T brackets supplied (Fig. 11), ensure that no screws puncture the drain pan or coil. Use the provided mounting tape to air seal the WBM to the air handler. See specifications page for the dimensions of the air handler units and WBM modules.

Return Air

When designing the return air for a Hi-Velocity System, there are a few things to consider. It is common to use centralized return air with systems that have rooms that are within a common area. Separate floors or rooms that have high loads and require a large amount of supply air flow should have their own return air, or be tied into the centralized return air to allow the air to return back to the air handler. Rooms or areas that cannot be tied into the return air should have an air transfer grill to allow the air to escape the room and flow back to a centralized return air.

Important: Return Air must be filtered before entering the WBM module.

Duct Sizing

The Return Air is to be sized on a 0.15 static pressure (37 pa) as compared to 0.10 static pressure (25 pa) for conventional forced air systems. The maximum length for an individual return air duct is fifty feet (15.24m).

Please note: It is VERY important NOT to undersize the return air, as this will create noise, increase motor power consumption, reduce airflow and increase the possibility of condensate carry-over.

Important: When connecting a round Return Air to the WBM coil, a round to rectangular transition is required.

Table 01 has recommended return air sizes for round and rectangular ducts. A variance of **+20%** is allowable for sizing return ducts that connect to the WBM or Hi-Velocity Systems unit.

Table 01 – Return Air Duct Sizes

Unit	Rigid Ø	Flex Ø	Min Sq. Inches (Sq. cm)
50/51/52	12" (305mm)	14" (356mm)	120 (774cm)
70/71	12" (305mm)	14" (356mm)	120 (774cm)
100/101	14" (356mm)	16" (406mm)	168 (1084cm)

Remember: When using flexible duct for return air, use one duct size larger due to the higher friction loss.

Where allowed by local codes, a single return air grill may be used. Note: Return air grill must have equal minimum of free air area to return air.

Important: When using flexible duct for return air, use one duct size larger due to the higher friction loss.

Piping the RBM

The WBM comes complete with 2 built-in 3/4" M CPVC (19mm) drain lines, primary and secondary. Ensure the primary drain line is vented and P-trapped.

The use of a mixture of glycol will reduce capacities; refer to glycol manufacture reduction charts.

When the potential for gravity flow of the hot water exists, check valves may be needed on both the supply and return lines. 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 02.

Table 02 - WBM pipe sizing

Zone BTUH	Pipe Size up to 40 feet	Pipe Size 40 – 100 feet
0 - 35,000 (0 - 10.3 kW)	3/4" (19mm)	3/4" (19mm)
35,001 - 70,000 (10.4 - 20.5 kW)	3/4" (19mm)	1" (25mm)
70,001 - 140,000 (20.6 - 41 kW)	1" (25mm)	1 1/4" (32mm)

Drain Connections, P - Trap & Secondary Drain Pan

Important: Piping the condensate lines on a return side cooling coil can be dramatically different, be sure to read info below.

The primary condensate drain **must have a minimum 3" P-Trap installed** (Fig. 12). The drain line must run at a slope of ¼" per foot in the direction of the drain. WBM modules come with a ¾" male CPVC primary and secondary outlet. It is good practice to install a clean out right above the P-Trap. Using a "tee fitting" and cap in the P-Trap's construction can be used as the clean out and as a way to prime the P-Trap if it ever dries out. A wet P-Trap is important. A dry P-Trap can be detrimental to proper drainage. If code requires a secondary drain line, run the secondary line using the same method as primary. Otherwise, capping off the secondary drain line is acceptable. Do not run the secondary drain line to the secondary drain pan or use it as a vent to atmosphere! An equipment stand/riser or rubber equipment mat may be necessary to elevate the module off of the ground to allow for a P-Trap.

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.

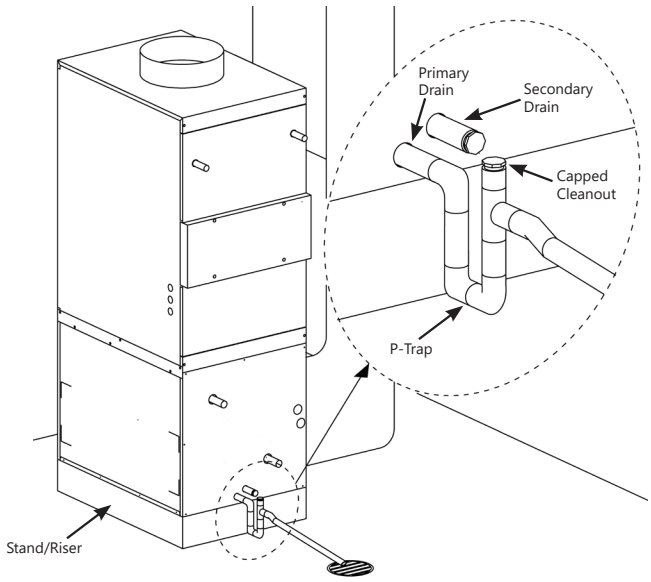


Fig. 12 - Example of Recommended Condensate Piping

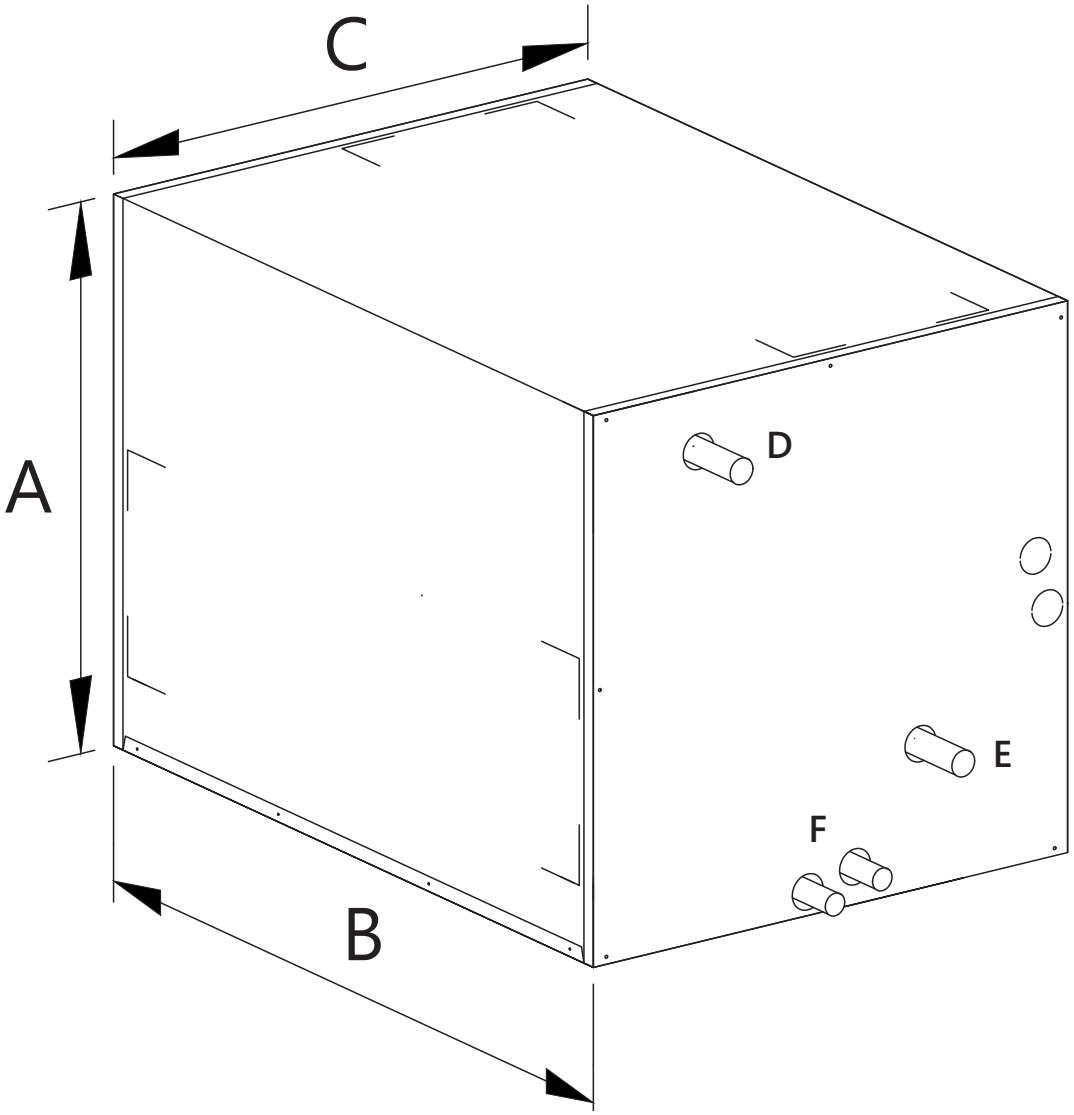
WBM Specifications

Specifications		WBM-50	WBM-70	WBM-100
Matching Air Handler		HE-Z/HE-B/HE-50/51 HV-50/51/52 CU-51 LV-50	HE-Z/HE-B/HE/HV-70/71 LV-70 LV-Z/LV-E-1050	HE-Z/HE-P/HE-B/HE-100/101 HV-100/101 LV-120/140 LV-Z/LV-E-1050
Part Number		40090400050	40090400070	40090400100
BTUH 80°/67° @ 42°F E.W.T. (27°/19 @ 5.5°C E.W.T.)		18,000-24,000 (5.3-7.0 kW)	30,000-36,000 (8.8-10.6 kW)	42,000-60,000 (12.3-17.6 kW)
Fin Material		Aluminum	Aluminum	Aluminum
Tubing Material		Copper	Copper	Copper
Type of Fins		.006 Al (0.1524mm)	.006 Al (0.1524mm)	.006 Al (0.1524mm)
GPM Flow Ratings (L/s Flow Ratings)		5 (0.32 L/s)	7 (0.44 L/s)	10 (0.63 L/s)
Hydronic Connection Sizes	Supply Line	3/4" (19mm)	3/4" (19mm)	3/4" (19mm)
	Return Line	3/4" (19mm)	3/4" (19mm)	3/4" (19mm)
	Drain Connection	3/4" M CPVC (19mm)	3/4" M CPVC (19mm)	3/4" M CPVC (19mm)
Shipping Weight		35 lbs (15.9 kg)	45 lbs (20.4 kg)	55 lbs (25.0 kg)
Module Size (L x W x H)		14 1/2" x 18 1/4" x 18 1/4" (368mm x 464mm x 464mm)	19 1/2" x 18 1/4" x 18 1/4" (495mm x 464mm x 464mm)	25 1/2" x 18 1/4" x 18 1/4" (648mm x 464mm x 464mm)

BTUH - British Thermal Units per Hour
EWT - Entering Water Temperature
GPM - US Gallons per Minute
L/s - Litres per Second

WBM Series Sizing

Item	Length	Width	Height	Return Line	Supply Line	Drain Conn.
Water Modules	B	C	A	D	E	F
WBM-50	14 1/2" (368mm)	18 1/4" (464mm)	18 1/4" (464mm)	3/4" o.d. (19mm)	3/4" o.d. (19mm)	3/4" M CPVC (19mm)
WBM-70	19 1/2" (495mm)	18 1/4" (464mm)	18 1/4" (464mm)	3/4" o.d. (19mm)	3/4" o.d. (19mm)	3/4" M CPVC (19mm)
WBM-100	25 1/2" (648mm)	18 1/4" (464mm)	18 1/4" (464mm)	3/4" o.d. (19mm)	3/4" o.d. (19mm)	3/4" M CPVC (19mm)



WARRANTY

Energy Saving Products Ltd. is proud to offer a limited warranty. This warranty applies strictly to the first purchaser at wholesale level and only to the Air Handler unit and module. It does not include connections, attachments and other products or materials furnished by the installer.

This warranty 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 Air Handler. This warranty does not cover defects caused by failing to adhere to local building codes and following good industry standards. Failure to correctly install the Air Handler, or material related to the unit, may result in improper system performance and/or damages and will void this warranty. This warranty does not cover material installed in or exposed to a corrosive environment. This warranty does not cover products subjected to abnormal use, misuse, improper maintenance, or alteration of the product. Using the Air Handler and/or module as a source of temporary heating/cooling during construction will void this warranty.

A **Five (5) Year Limited Warranty** is extended on all components in products manufactured exclusively by Energy Saving Products. These components include Motors, WEG Controller, Circuit Boards, Dampers, Zoning Controls, Blowers, Motor & Blower Assemblies, Heating Coils, Chilled Water Coils, and Air Conditioning Coils. Note: If any product is installed in or exposed to a corrosive environment, warranty will be void.

A **Three (3) Year Limited Warranty** is extended on Electric Strip Heaters.

A **One (1) Year Limited Warranty** is extended on replacement parts.

Products sold by Energy Saving Products but manufactured by others, will carry the original manufacturer's warranty.

TERMS & CONDITIONS

- **Warranty will not be considered unless a contractor has contacted Energy Saving Products Ltd. Technical Support department for assistance, and received a tech code.**
- Any repair performed under warranty must be approved by Energy Saving Products Ltd. for this warranty to be valid.
- The liability of Energy Saving Products Ltd. is limited to and shall not exceed the cost of pre-approved replacement parts.
- This warranty does not cover shipping costs to and from the factory, labor costs or any other cost associated with the installation of the replacement part.
- Inoperative parts must be returned to Energy Saving Products Ltd. with an ESP RMA Form that includes model, serial number, and a detailed description of the entire problem. Inoperative parts must be returned in testable condition.
- Energy Saving Products Ltd. is not liable for any other damages, personal injury, or any other losses of any nature.

Follow these steps for Service or Repair:

1. Contact the installer of the product or a licensed service company
2. Contact the distributor
3. Contact Energy Saving Products Ltd. Mon-Fri 8 am – 4:30 pm MT 1-888-652-2219

This warranty replaces all other warranties expressed or implied.

www.hi-velocity.com

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.

For all of your Heating, Cooling and Indoor Air Quality needs, the Hi-Velocity System is the right choice for you!

Hi-Velocity Systems™

Small Duct Heating, Cooling and IAQ Systems

Build Smart, Breathe *Easy*

Hi-Velocity HE-Z Air Handlers, Green Technology

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