



# Hydronic Air Handlers

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A decorative graphic consisting of a horizontal line above a light gray, wavy, downward-pointing shape that resembles a stylized snowflake or a water droplet.

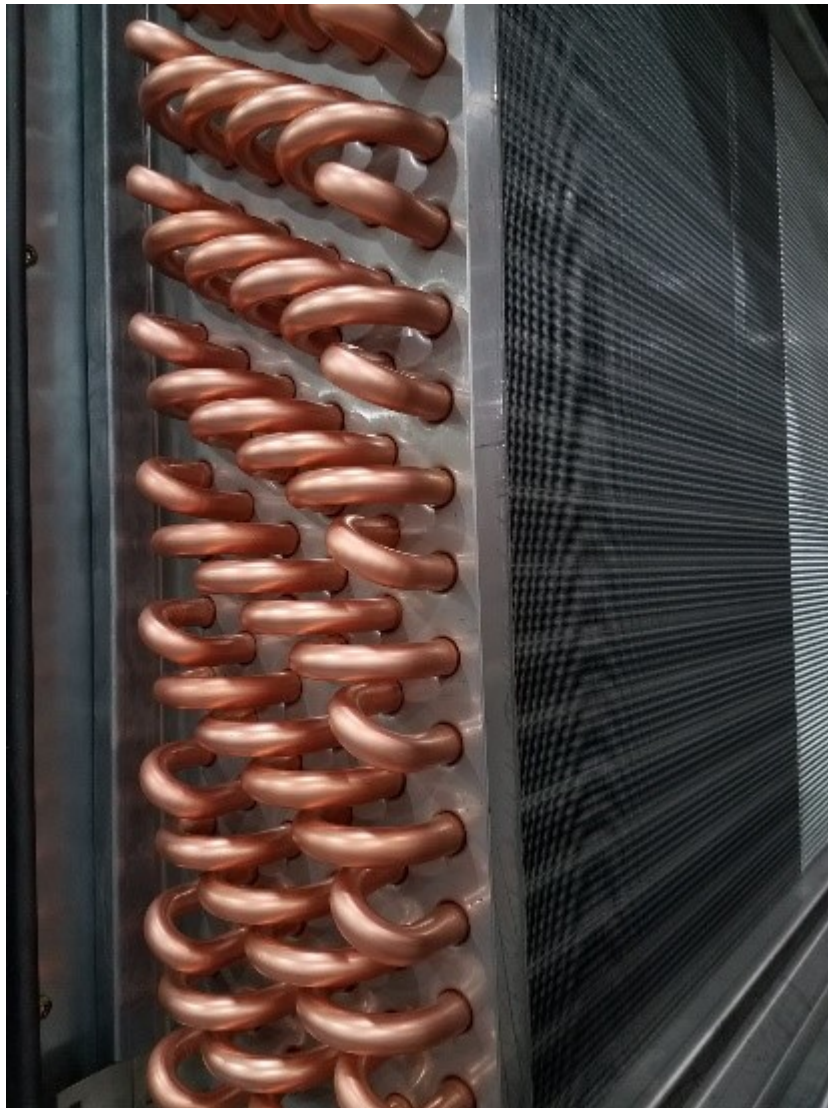


## Advanced Heating/Cooling for Heat Pumps

**H**ydronic Air Handlers have been around for years as a means to transfer energy from hydronic boilers and A/C units throughout the house by way of centralized duct work. However, in the past most air handlers were designed for high temperature water sources ranging from 140-180 F. This mean that the heat exchangers could be relatively under sized and still do the job. With modern high efficient energy sources gaining in popularity, these old air handlers simply cannot do the job! Arctic Air Handlers are the new bread in efficiency and technology. With features such as Variable Frequency Drive VFD and 6 row heat exchangers, Arctic Hydronic Air Handlers are the

most effecient air handlers on the market for delivering lower temperature heating sources such as **hydronic heat pumps** (/), geothermal and condensing boiler, all of which are more efficient at lower temperatures.

## FEATURES



**6** row hydronic copper & aluminum heat exchanger with 1" in/out lines. Unlike most hydronic air handlers our 6 row heat exchanger is nearly 400% larger than others. This is how we maximize the heat transfer when using lower water temperatures.

However this does not mean it will not work with traditional high temperature boilers. In fact the Arctic Air Handler can output up to 150,000 BTU at 190 F. The special internal loop design in the heat exchanger allows for low pressure loss of 3.1 Feet Head @ 10 GPM.



**3** phase Direct Drive Motors use variable speed. This means no start up capacitor is needed on the motor and makes it quite and ultra-energy efficient. The motor only uses what it needs at all times, however, powerful enough to deliver up to 1750 cubic of air feet per minute! Single phase power is converted to 3-Phase for the motor by the VFD controller.



**W**EG Variable Speed Drive Controller – converts single phase 120 VAC to more efficient 3-Phase to operate the fan motor and modulates power output to match the load. (Less than 100 watts on constant fan speed). Easy touch setting allows users to

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program individual fan speed setting for cooling mode, heating mode, and fan only mode. The static pressure of the heating/cooling system is monitored and adjusted according to any changes such as closed vents or dirty filters.

## How does it work

Variable Speed fan control allows one size of hydronic air handler to cover a much larger spectrum. The Artic LV-Z-1750 can produce 3.5 to 5 tons of heating/cooling while the smaller LV-Z1050 can supply 1.5 to 3 tons of heating/cooling. The VFD hydronic air handler has a built in static pressure sensor that allows it to automatically set the optimum fan speed for the given house design. This means sizing the fan to the duct size is virtually eliminated. You can allow it to automatically select the best speed for any given construction or manually adjust the speed. This is all done by measuring the static pressure and optimizing the flow curve base on that pressure.

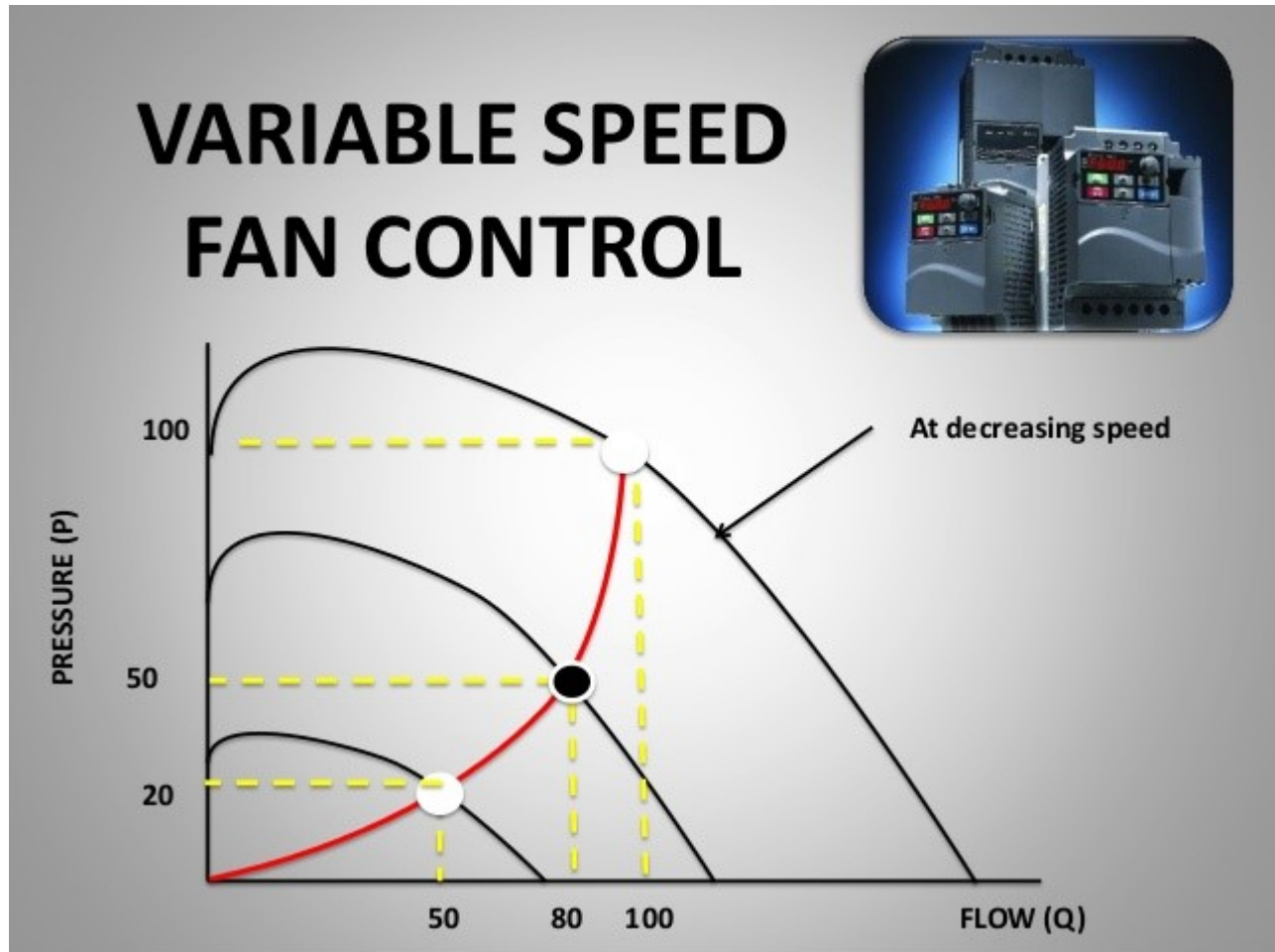
## Zoning

### Automatic Zone Valve



Zoning – with VFD you can create air heating zones similar to that in hydronic heating. Using zone flap controls set to individual thermostats, the zones will open and close based on the need for demand heating/cooling. If both zones require heat, then the vent controls will be open to supply flow to those zone. If one zone is turned off, the zone damper will close. This increases the system pressure. Normal furnaces will continue to run at the same speed using excess energy. With the Arctic Air Handler, the static pressure sensor senses and increase in pressure as a result of a closed zone and immediately turns down is RPM reducing the CFM and reducing operating cost as well as excess fan noise.

Example showing VFD Air Handler operation with 3 ducting zones

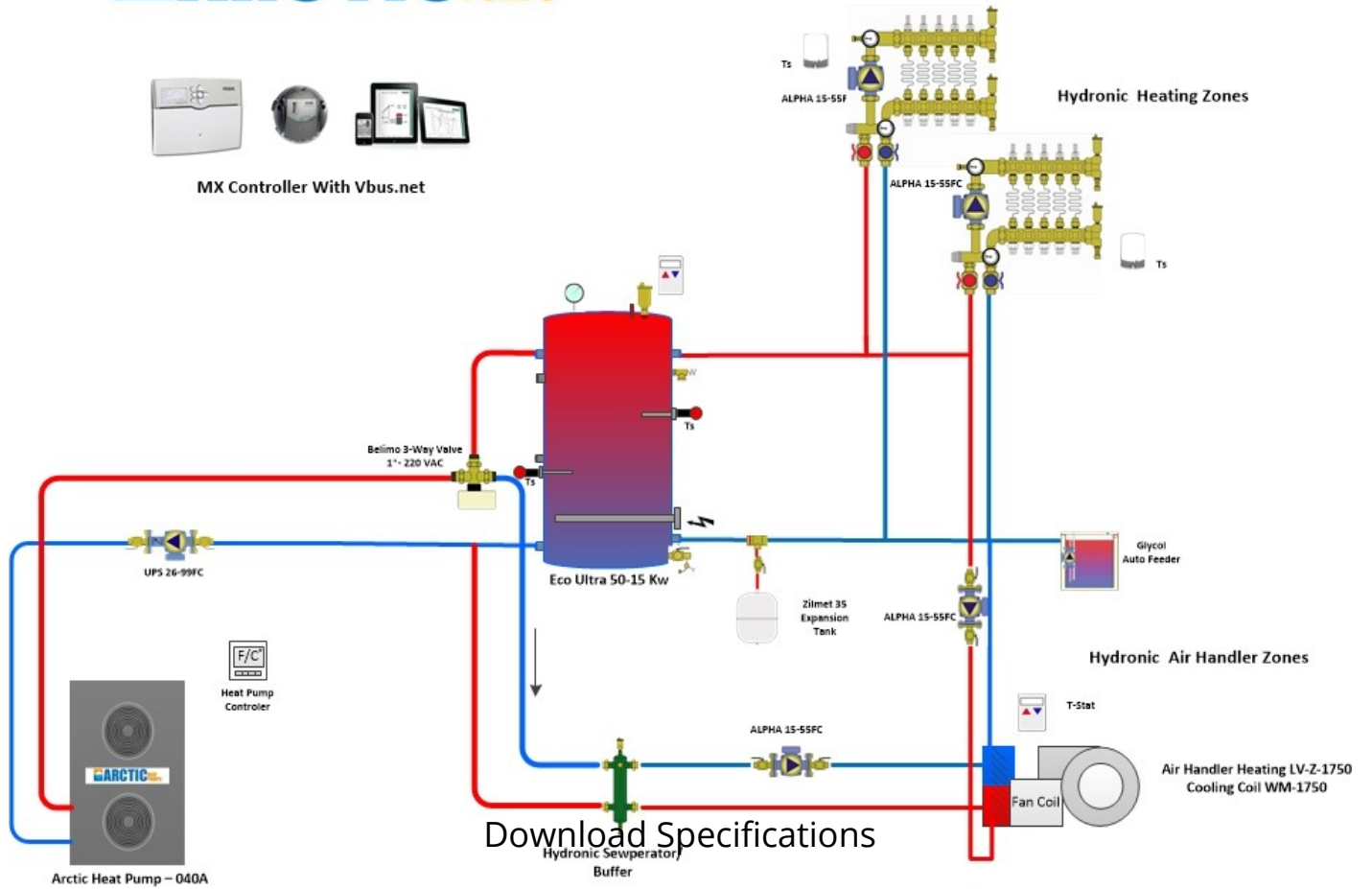


Sample Layout





MX Controller With Vbus.net



Download Specifications





Matching Coils  
Chilled Water Coils  
WCM-70/1050, 100/1050  
Hot Water Coils  
HWC-50, 70, 100  
Electrical Coils  
ESH-750 (5-18 kW)

**ARCTIC** HEAT PUMPS  
www.arcticheatpump.com  
**LV-Z Series Specifications**  
Low Velocity Fan Coil w/ VFD



		LV-Z-1050				LV-Z-1750		
<b>Hot Water Heating<sup>1)</sup></b>		<b>1.5 Ton Airflow</b> (3.8 kW)	<b>2 Ton Airflow</b> (7.9 kW)	<b>2.5 Ton Airflow</b> (8.8 kW)	<b>3 Ton Airflow</b> (8.8 kW)	<b>3.5 Ton Airflow</b> (9.2 kW)	<b>4 Ton Airflow</b> (9.4 kW)	<b>5 Ton Airflow</b> (9.7 kW)
Coil		70/1050	70/1050	70/1050 <sup>2)</sup>	70/1050 <sup>2)</sup>	1750	1750	1750
Coil Type		6 Row/10 FPI	6 Row/10 FPI	6 Row/10 FPI	6 Row/10 FPI	6 Row/10 FPI	6 Row/10 FPI	6 Row/10 FPI
Max. BTUH @ 190°F E.W.T. (9W @ 86°C)		50,100 (14.67 kW)	63,200 (18.51 kW)	75,200 (22.02 kW)	86,000 (25.18 kW)	112,800 (33.03 kW)	125,500 (36.78 kW)	149,200 (43.68 kW)
Max. BTUH @ 180°F E.W.T. (9W @ 82°C)		45,900 (13.44 kW)	58,000 (16.98 kW)	69,000 (20.20 kW)	78,900 (23.10 kW)	103,400 (30.28 kW)	115,100 (33.78 kW)	136,800 (40.08 kW)
Max. BTUH @ 170°F E.W.T. (9W @ 77°C)		41,800 (12.24 kW)	52,800 (15.48 kW)	62,700 (18.28 kW)	71,700 (20.99 kW)	94,200 (27.58 kW)	104,700 (30.64 kW)	124,400 (36.43 kW)
Max. BTUH @ 160°F E.W.T. (9W @ 71°C)		37,700 (11.04 kW)	47,500 (13.91 kW)	56,500 (16.54 kW)	64,600 (19.02 kW)	84,800 (24.83 kW)	94,300 (27.61 kW)	112,100 (32.80 kW)
Max. BTUH @ 150°F E.W.T. (9W @ 66°C)		33,600 (9.84 kW)	42,300 (12.39 kW)	50,300 (14.79 kW)	57,400 (16.81 kW)	75,500 (22.11 kW)	83,900 (24.57 kW)	99,700 (29.18 kW)
Max. BTUH @ 140°F E.W.T. (9W @ 62°C)		29,400 (8.61 kW)	37,000 (10.83 kW)	43,900 (12.85 kW)	50,100 (14.67 kW)	66,100 (19.23 kW)	73,400 (21.49 kW)	87,000 (25.47 kW)
Max. BTUH @ 130°F E.W.T. (9W @ 54°C)		25,200 (7.38 kW)	31,700 (9.25 kW)	37,500 (10.98 kW)	42,700 (12.50 kW)	56,600 (16.57 kW)	62,800 (18.39 kW)	74,400 (21.75 kW)
Max. BTUH @ 120°F E.W.T. (9W @ 49°C)		21,100 (6.18 kW)	26,500 (7.76 kW)	31,500 (9.22 kW)	35,900 (10.51 kW)	47,400 (13.88 kW)	52,600 (15.40 kW)	62,300 (18.24 kW)
Max. BTUH @ 110°F E.W.T. (9W @ 42°C)		17,100 (5.01 kW)	21,400 (6.27 kW)	25,500 (7.47 kW)	29,100 (8.52 kW)	38,300 (11.21 kW)	42,600 (12.47 kW)	50,500 (14.79 kW)
GPM Flow ratings (L/s Flow Ratings)		5 (0.32 L/s)	5 (0.32 L/s)	5 (0.32 L/s)	5 (0.32 L/s)	10 (0.63 L/s)	10 (0.63 L/s)	10 (0.63 L/s)
Pressure Drop in FT. H <sub>2</sub> O (Drop in KPa)		3.9 (11.66 KPa)	3.9 (11.66 KPa)	3.9 (11.66 KPa)	3.9 (11.66 KPa)	3.1 (9.27 KPa)	3.1 (9.27 KPa)	3.1 (9.27 KPa)
<b>Chilled Water Cooling<sup>2)</sup></b>		<b>WCM-70/1050</b>		<b>WCM-100/1050</b>		<b>WM-1750</b>		
Coil Type		70/1050	70/1050	100/1050 <sup>2)</sup>	100/1050 <sup>2)</sup>	1750	1750	1750
E.W.T.								
Max. BTUH @ 48°F E.W.T. (9W @ 8.9°C)		20,200 (5.91 kW)	23,800 (6.97 kW)	31,500 (9.22 kW)	34,500 (10.22 kW)	46,700 (13.67 kW)	50,400 (14.76 kW)	56,200 (16.46 kW)
Max. BTUH @ 46°F E.W.T. (9W @ 7.8°C)		22,000 (6.44 kW)	25,800 (7.55 kW)	34,200 (10.01 kW)	37,900 (11.10 kW)	50,700 (14.88 kW)	54,600 (15.90 kW)	60,900 (17.80 kW)
Max. BTUH @ 44°F E.W.T. (9W @ 6.7°C)		23,700 (6.94 kW)	27,800 (8.14 kW)	37,000 (10.83 kW)	40,800 (11.95 kW)	55,000 (16.10 kW)	58,800 (17.22 kW)	65,500 (19.18 kW)
Max. BTUH @ 42°F E.W.T. (9W @ 5.6°C)		25,400 (7.44 kW)	29,900 (8.78 kW)	39,600 (11.60 kW)	43,800 (12.88 kW)	58,300 (17.07 kW)	62,900 (18.42 kW)	70,000 (20.30 kW)
Max. BTUH @ 40°F E.W.T. (9W @ 4.4°C)		27,000 (7.91 kW)	31,800 (9.31 kW)	42,200 (12.36 kW)	46,600 (13.64 kW)	62,100 (18.18 kW)	66,900 (19.59 kW)	74,500 (21.91 kW)
S.H.R.								
Max. BTUH @ 48°F E.W.T. (9W @ 8.9°C)		69%	72%	71%	73%	69%	71%	74%
Max. BTUH @ 46°F E.W.T. (9W @ 7.8°C)		67%	70%	68%	70%	67%	68%	71%
Max. BTUH @ 44°F E.W.T. (9W @ 6.7°C)		65%	67%	66%	68%	65%	66%	69%
Max. BTUH @ 42°F E.W.T. (9W @ 5.6°C)		63%	66%	65%	67%	64%	65%	67%
Max. BTUH @ 40°F E.W.T. (9W @ 4.4°C)		62%	64%	63%	65%	62%	63%	65%
GPM Flow ratings (L/s Flow Ratings)		5 (0.32 L/s)	5 (0.32 L/s)	7 (0.44 L/s)	7 (0.44 L/s)	10 (0.63 L/s)	10 (0.63 L/s)	10 (0.63 L/s)
Pressure Drop in FT. H <sub>2</sub> O (Drop in KPa)		4.5 (13.43 KPa)	4.5 (13.43 KPa)	4.5 (13.43 KPa)	4.5 (13.43 KPa)	3.6 (10.76 KPa)	3.6 (10.76 KPa)	3.6 (10.76 KPa)
<b>Electrical Heating</b>		<b>HV-750 ESH</b>				<b>N/A</b>		
Kilowatt Range		5 - 18 kW				N/A		
<b>Fan Coil Specifications</b>		<b>LV-Z-1050</b>				<b>LV-Z-1750</b>		
Max Rated CFM @ 1" E.S.P. (L/s @ 249 Pa)		1200 (344 L/s)				1750 (505 L/s)		
Voltage		115/230/1/50/60 F.L.A. 8 amp				115/230/1/50/60 F.L.A. 8 amp		
Nominal Operating Amperage		6 Amps				8 Amps		
Integral Surge and Fuse System		Yes				Yes		
Horse Power/Watts		1/3hp - 515W				3/4hp - 695W		
Motor RPM		Variable				Variable		
Supply Air Size		15" X 16" (381mm X 406mm)				22 1/2" X 22 1/2" (572mm X 572mm)		
Return Size Needed		182 in <sup>2</sup> (0.12m <sup>2</sup> )				240 in <sup>2</sup> (0.12m <sup>2</sup> )		
Shipping Weight (no coil)		95 lbs (43 kg)				125 lbs (43 kg)		
Fan Coil Size	Length	32 5/8" (821mm)				38 5/8" (986mm)		
	Width	19 3/8" (493mm)				26 5/8" (676mm)		
	Height	18 3/4" (469mm)				24 3/4" (619mm)		

<sup>1)</sup> Heating specs are rated at 60°F E.A.T. Cooling specs are rated at 60/67°F (DB/WB)  
<sup>2)</sup> WCM-100 will provide approximately the same heating capacities.  
<sup>3)</sup> Use a full transition when using the WCM-100 to ensure even airflow across the coil.  
 The WCM-70 is not to be used at these airflow rates.  
 BTUH - British Thermal Units per Hour  
 E.W.T. - Entering Water Temperature  
 SHR - Sensible Heat Ratio  
 GPM - US Gallons per Minute  
 L/s - Liters per Second  
 CFM - Cubic Feet per Minute  
 F.L.A. - Full-Load Amperage  
 RPM - Revolutions per Minute  
 E.S.P. - External Static Pressure  
 E.A.T. - Entering Air Temperature  
 DB/WB - Dry Bulb/Wet Bulb

Download Specifications Brochure <https://www.arcticheatpumps.com/pdfs/arctic-air-handler.pdf>

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