

VERTICAL WATER SOURCE HEAT PUMP (VHPW) CERTIFIED DRAWING

DWG. NO.

REV. -

PROJECT	PROJECT	DATE			BY		REVISIONS	
PURCHASER	PURCHASER	P.O. #			DATE	BY	DESCRIPTION	
ARCHITECT	ARCHITECT	SHIPPING DATES						
ENGINEER	ENGINEER							
HVAC CONTR.	HVAC CONTRACTOR							
GEN. CONTR.	GEN CONTRACTOR							

UNIT SPECIFICATIONS+

ELECTRICAL DATA

TABLE 4

MODEL	VOLTAGE/HZ-PHASE	COMPRESSOR RLA	COMPRESSOR LRA	FAN MOTOR FLA	TOTAL UNIT FLA	MINIMUM CIRCUIT AMPS	MAX FUSE /HACR
8VHPW09	208-230/60-1	3.9	18	0.5	4.4	5.4	15
8VHPW12	208-230/60-1	5.2	25	0.7	5.9	7.2	15
8VHPW15	208/230/60-2	5.8	30	1.0	6.8	8.3	15
8VHPW18	208/230/60-1	7.7	32	1.2	8.9	10.8	20
8VHPW24	208-230/60-1	13.5	58	1.8	15.3	18.7	30
8VHPW30	208/230/60-1	14.3	64	2.2	16.5	20.1	30
8VHPW36	208-230/60-1	15.7	77	2.5	18.2	22.1	35

AIR FLOW CORRECTION TABLE

TABLE 5

	% OF RATED AIR FLOW	70%	75%	80%	85%	90%	95%	100%	105%
COOLING FACTORS	TOTAL CAPACITY	0.92	0.93	0.95	0.96	0.97	0.99	1.00	1.02
	SENSIBLE CAPACITY	0.80	0.83	0.87	0.90	0.93	0.97	1.00	1.04
	POWER	0.97	0.97	0.98	0.99	0.99	1.00	1.00	1.01
	HEAT REJECTION	0.94	0.95	0.96	0.97	0.98	0.99	1.00	1.01
HEATING FACTORS	HEATING CAPACITY	0.94	0.95	0.96	0.97	0.98	0.99	1.00	1.01
	POWER	1.08	1.06	1.05	1.04	1.02	1.01	1.00	0.99
	HEAT EXTRACTION	0.93	0.95	0.96	0.97	0.98	0.99	1.00	1.01

AIR TEMPERATURE CORRECTION TABLE

TABLE 6

		HEATING							
EAT DB (°F)		45	50	55	60	65	70	75	80
HEATING CAPACITY FACTOR		1.11	1.09	1.06	1.04	1.02	1.00	0.98	0.95
POWER FACTOR		0.77	0.81	0.86	0.91	0.95	1.00	1.05	1.10
HEAT EXTRACTION FACTOR		1.18	1.14	1.11	1.07	1.04	1.00	0.96	0.92

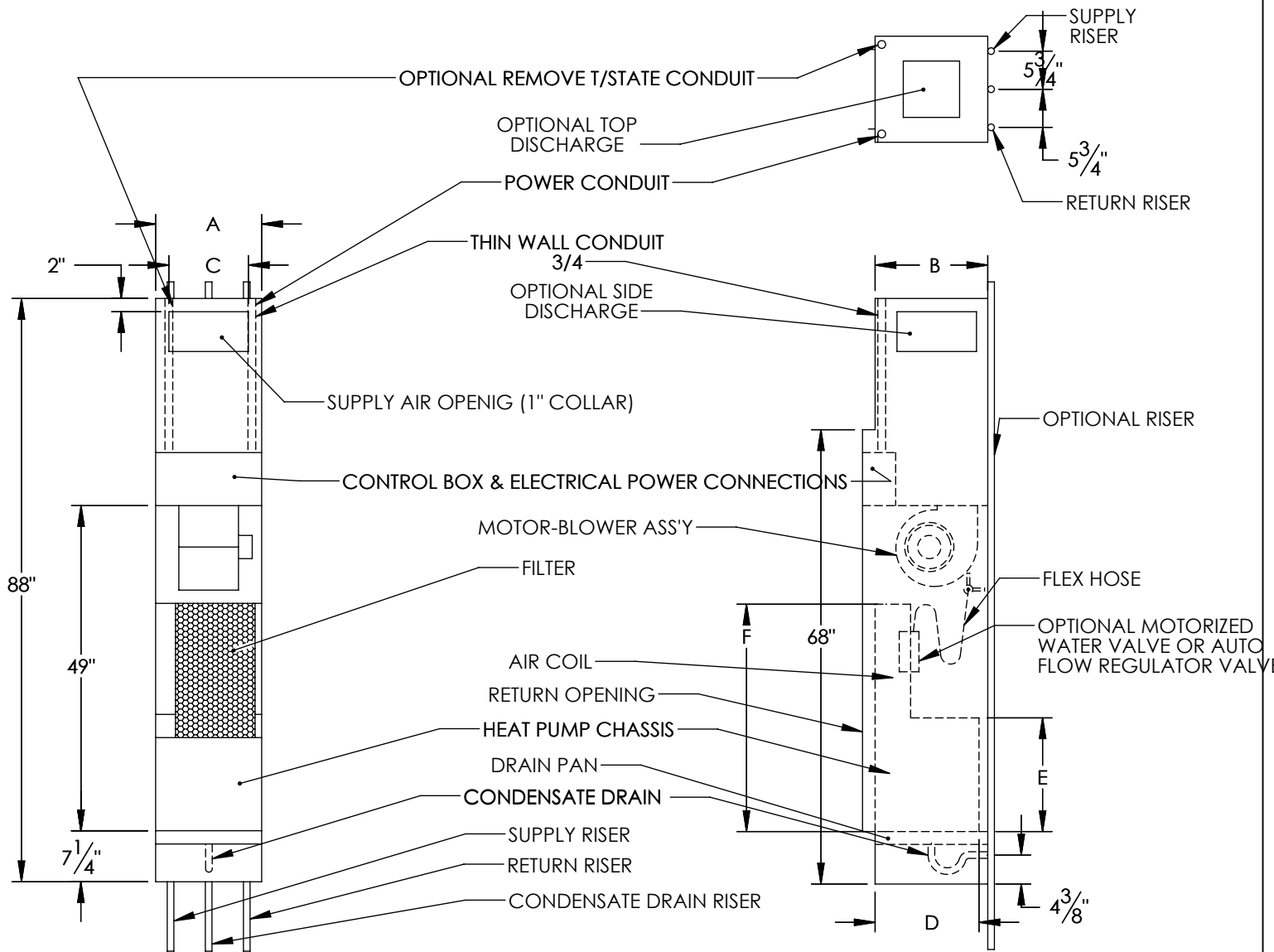
TABLE 7

		COOLING				
EAT WB (°F)		60	65	67	70	75
TOTAL CAPACITY FACTOR		0.85	0.96	1.00	1.06	1.17
SENSIBLE CAPACITY FACTOR EAT DB	70	0.85	0.62	0.52	-	-
	75	1.09	0.86	0.76	0.62	-
	80	1.33	1.09	1.00	0.86	0.63
	85	*	1.33	1.23	1.09	0.85
	90	*	*	1.48	1.34	1.10
95	*	*	*	1.56	1.32	
POWER FACTOR		1.00	1.00	1.00	1.00	1.01
HEAT REJECTION FACTOR		0.90	0.97	1.00	1.05	1.12

DB - DRY BULB AIR TEMPERATURE
 WB - WET BULB AIR TEMPERATURE
 EAT - ENTERING AIR TEMPERATURE
 ALL TEMPERATURES ARE IN °F
 * = SENSIBLE CAPACITY EQUALS TOTAL CAPACITY

Performance Table																																											
8VHPW09																																											
EWT		60						70						80						85						90						100						110					
GPM		1.1	1.7	2.3	1.1	1.7	2.3	1.1	1.7	2.3	1.1	1.7	2.3	1.1	1.7	2.3	1.1	1.7	2.3	1.1	1.7	2.3	1.1	1.7	2.3	1.1	1.7	2.3															
Water dP (Ft)		1.1	3.4	6.6	1.1	3.3	6.3	1.0	3.2	6.1	1.0	3.2	6.1	1.0	3.1	6.0	1.0	3.0	5.9	0.9	3.0	5.8	1.0	3.0	5.9	0.9	3.0	5.8															
Cooling	Total	10.4	10.9	11.0	9.9	10.3	10.5	9.3	9.7	9.9	8.9	9.4	9.6	8.5	9.0	9.3	7.5	8.2	8.5	6.5	7.1	7.4	7.2	7.3	7.3	7.1	7.2	7.2															
	Sensible	7.2	7.3	7.3	7.1	7.2	7.2	6.8	7.0	7.1	6.7	6.9	7.0	6.5	6.7	6.8	6.0	6.3	6.5	5.4	5.8	6.0	6.0	6.1	6.1	6.0	5.9	5.9															
	Power (KW)	0.6	0.6	0.5	0.7	0.6	0.6	0.7	0.7	0.7	0.8	0.7	0.8	0.7	0.8	0.8	0.9	0.9	0.8	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.8	1.0	0.9														
	Heat Rejection	12.5	12.7	12.7	12.2	12.4	12.5	11.8	12.1	12.2	11.6	11.9	12.0	11.3	11.7	11.8	10.7	11.1	11.3	9.9	10.3	10.7	10.7	10.8	10.8	10.7	10.6	10.5	10.5														
	EER	17.4	19.4	20.4	14.8	16.6	17.6	12.4	14.0	14.9	11.4	12.9	13.7	10.3	11.7	12.4	8.3	9.5	10.2	6.6	7.6	8.2	8.3	8.4	8.4	8.3	8.2	8.1	8.1														
Heating	Total	10.4	11.1	11.5	11.7	12.5	12.9	13.0	13.8	14.2	13.6	14.4	14.8	14.1	14.9	15.4	10.4	11.1	11.5	11.7	12.1	11.5	12.2	12.6	12.6	12.6	12.6	12.6	12.6														
	Power (KW)	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8														
	Heat Extraction	8.0	8.6	8.9	9.2	9.9	10.3	10.4	11.1	11.5	11.0	11.7	12.1	11.5	12.2	12.6	8.0	8.6	8.9	9.2	9.9	10.3	10.4	11.1	11.5	11.0	11.7	12.1	11.5														
	Heat Extraction	4.1	4.4	4.5	4.6	4.8	4.9	4.9	5.2	5.3	5.1	5.4	5.5	5.3	5.5	5.6	4.1	4.4	4.5	4.6	4.8	4.9	4.9	5.2	5.3	5.1	5.4	5.5	5.3														
	COP	4.1	4.4	4.5	4.6	4.8	4.9	4.9	5.2	5.3	5.1	5.4	5.5	5.3	5.5	5.6	4.1	4.4	4.5	4.6	4.8	4.9	4.9	5.2	5.3	5.1	5.4	5.5	5.3														
Operation Not Recommended																																											
8VHPW12																																											
EWT		60						70						80						85						90						100						110					
GPM		1.5	2.3	3.0	1.5	2.3	3.0	1.5	2.3	3.0	1.5	2.3	3.0	1.5	2.3	3.0	1.5	2.3	3.0	1.5	2.3	3.0	1.5	2.3	3.0	1.5	2.3	3.0															
Water dP (Ft)		2.8	6.6	12.1	2.6	6.1	11.5	2.5	5.8	10.9	2.4	5.7	10.7	2.3	5.6	10.5	2.3	5.5	10.3	2.2	5.3	10.0	2.3	5.5	10.3	2.2	5.3	10.0															
Cooling	Total	14.4	15.0	15.3	13.6	14.2	14.4	12.5	13.3	13.6	12.0	12.7	13.0	11.4	12.2	12.5	10.3	11.0	11.3	9.2	9.8	10.1	10.3	11.0	11.3	9.2	9.8	10.1															
	Sensible	9.4	9.6	9.7	8.9	9.3	9.4	8.5	8.8	8.9	8.3	8.6	8.7	8.1	8.4	8.5	7.7	7.9	8.1	7.1	7.4	7.5	7.4	7.5	7.4	7.5	7.4	7.5															
	Power (KW)	0.8	0.7	0.7	0.9	0.8	0.8	1.0	0.9	0.9	1.0	1.0	0.9	1.1	1.0	1.0	1.2	1.1	1.1	1.3	1.2	1.5	1.4	1.3	1.2	1.5	1.4	1.4															
	Heat Rejection	17.1	17.5	17.7	16.6	17.0	17.1	15.8	16.4	16.6	15.5	16.0	16.2	15.1	15.6	15.8	14.3	14.9	15.1	13.6	14.0	14.2	14.0	14.1	14.0	13.9	13.8	13.7	13.6														
	EER	18.1	20.3	21.6	15.2	17.1	18.2	12.7	14.3	15.2	11.6	13.1	13.9	10.6	11.9	12.6	8.7	9.8	10.4	7.1	8.0	8.5	8.7	9.0	9.3	7.1	8.0	8.5															
Heating	Total	12.8	13.6	14.0	14.3	15.1	15.6	15.8	16.6	17.1	16.4	17.3	17.8	17.1	18.0	18.4	12.8	13.6	14.0	14.3	15.1	15.6	15.8	16.6	17.1	16.4	17.3	17.8															
	Power (KW)	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0															
	Heat Extraction	9.7	10.4	10.8	11.1	11.9	12.3	12.5	13.3	13.7	13.1	14.0	14.3	13.8	14.5	14.9	9.7	10.4	10.8	11.1	11.9	12.3	12.5	13.3	13.7	13.1	14.0	14.3															
	Heat Extraction	4.1	4.3	4.4	4.5	4.6	4.7	4.8	5.0	5.1	4.9	5.1	5.2	5.1	5.2	5.3	4.1	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0	5.1	5.1	5.2	5.3														
	COP	4.1	4.3	4.4	4.5	4.6	4.7	4.8	5.0	5.1	4.9	5.1	5.2	5.1	5.2	5.3	4.1	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0	5.1	5.1	5.2	5.3														
Operation Not Recommended																																											

COP — Coefficient of Performance
EER — Energy Efficiency Ratio
EWT — Entering Water Temperature
GPM — Gallons Per Minute
dP — Pressure Drop
All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.
All capacities are in 1000 BTU/h
All temperatures are in F

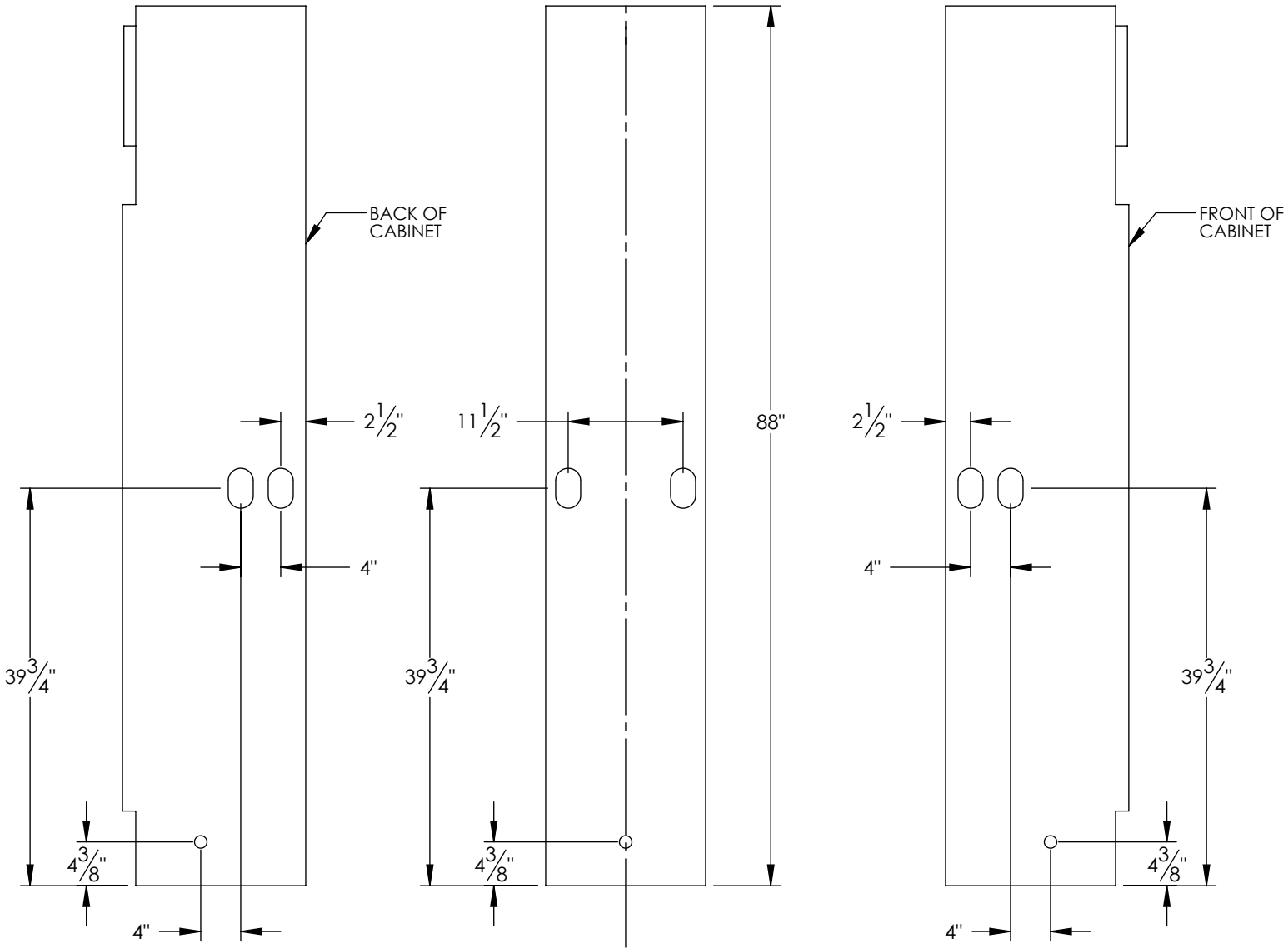


UNIT SIZE	A	B	C	D	E	F
VWSHP-09	16	17	12	15	18	42
VWSHP-12	16	17	12	15	18	42
VWSHP-15	16	17	12	15	18	42
VWSHP-18	18	20	14	18	19	46
VWSHP-24	18	20	14	18	19	46
VWSHP-30	22	24	18	22	20	47
VWSHP-36	22	24	18	22	20	47

PER ICE-AIR'S ONGOING DEVELOPMENT PROGRAM, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

MATERIAL:	ICE-AIR LLC. 80 HARTFORD AVENUE MOUNT VERNON, NY 10553		
WEIGHT (LBS):			
FINISH:	TITLE: PTAC PERFORMANCE DWG		
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ± 1/32 ANGULAR: MACH ± ° BEND ± 1° TWO PLACE DECIMAL ± .03 THREE PLACE DECIMAL ± .015	MODEL BY:	DATE:	DWG. NO.
	DRAWING BY:	DATE:	
	SIZE	SCALE: NONE	SHEET 4 OF 6
	A	DO NOT SCALE DRAWING	REV

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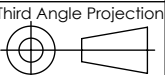


LEFT VIEW

REAR VIEW

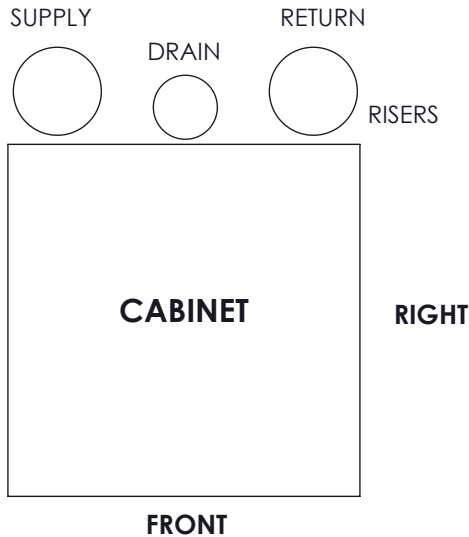
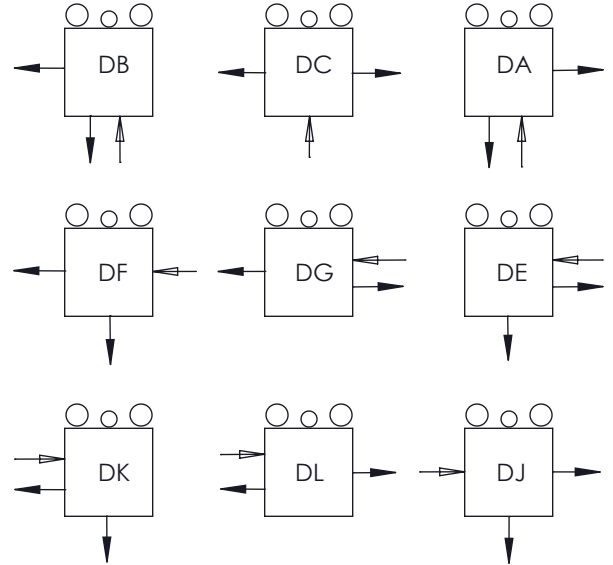
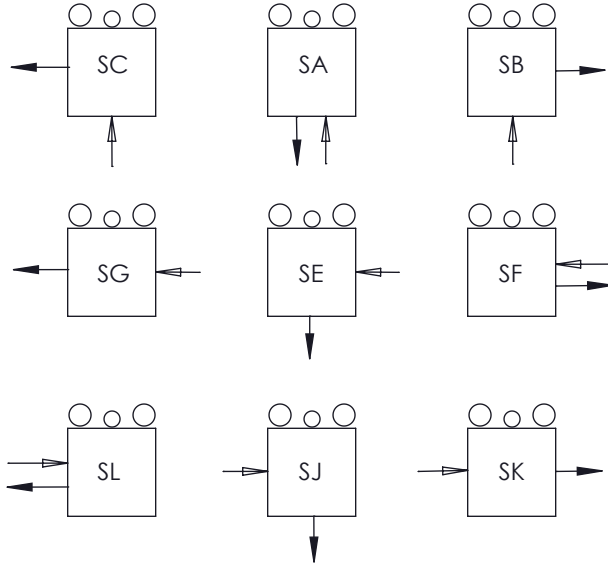
RIGHT VIEW

PER ICE-AIR'S ONGOING DEVELOPMENT PROGRAM, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

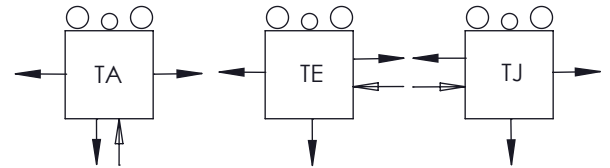
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WEIGHT (LBS):				
FINISH:	TITLE: DIMENSIONAL DRAWING			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/32$ ANGULAR: MACH \pm ° BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .03$ THREE PLACE DECIMAL $\pm .015$	MODEL BY:	DATE:	DWG. NO.	
	DRAWING BY:	DATE:		
	SIZE A		SCALE: NONE DO NOT SCALE DRAWING	SHEET 5 OF 6
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SINGLE SUPPLY

DOUBLE SUPPLY



TRIPLE SUPPLY



← RETURN AIR FROM ROOM
 ← SUPPLY AIR TO ROOM

Notes:

1. The Riser Compartment is defined as being the rear of each unit. Supply air grilles and return/access panel can be any side except rear.
2. Return air location also denotes the control location and service access.
3. Single discharge openings are not recommended for sizes 30-36. Triple discharge openings are not recommended for sizes 09, 12.

DISCHARGE GRILLE ARRANGEMENTS

MODEL	SINGLE DISCHARGE	DOUBLE DISCHARGE	TRIPLE DISCHARGE
8VHPW09	12 X 12	10 X 8	NOT RECOMMENDED
8VHPW12	12 X 12	10 X 8	NOT RECOMMENDED
8VHPW15	12 X 12	10 X 8	8 X 8
8VHPW18	14 X 14	10 X 10	10 X 8
8VHPW24	14 X 14	10 X 10	10 X 8
8VHPW30	NOT RECOMMENDED	12 X 12	10 X 10
8VHPW36	NOT RECOMMENDED	12 X 12	10 X 10

NOTES:

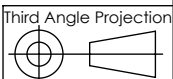
- 1) DIMENSIONS ARE IN INCHES
- 2) ALL DIMENSIONS ARE +/- 1/4"
- 3) DISCHARGE GRILLES ARE SHIPPED LOOSE FOR FIELD INSTALLATION
- 4) CONSTRUCTION IS ROLL FORMED ALUMINUM FRAME BLADES
- 5) STANDARD FINISH IS "POWDER COATED" AND WILL BE THE SAME COLOR AS THE RETURN GRILLE
- 6) MOUNTING HARDWARE INCLUDED

PER ICE-AIR'S ONGOING DEVELOPMENT PROGRAM, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

MATERIAL:	ICE-AIR LLC. 80 HARTFORD AVENUE MOUNT VERNON, NY 10553		
WEIGHT (LBS):			
FINISH:	TITLE: DIMENSIONAL DRAWING		
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ± 1/32 ANGULAR: MACH ± ° BEND ± 1° TWO PLACE DECIMAL ± .03 THREE PLACE DECIMAL ± .015	MODEL BY:	DATE:	DWG. NO.
	DRAWING BY:	DATE:	
	SIZE A	SCALE: NONE DO NOT SCALE DRAWING	SHEET 6 OF 6
			REV

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VERTICAL STACK, MODEL "8VHPW" SIZE 09-36
WATER SOURCE HEAT PUMP SPECIFICATIONS

Rev. May 18, 2009

General:

Furnish and install Ice Air Water Source Heat Pumps, as indicated on the plans with capacities and characteristics as listed in the schedule and the specifications that follow.

Vertical Stack Water Source Heat Pumps:

Units shall operate in range 60° to 120°F entering water. All equipment listed in this section must be rated in accordance with American Refrigeration Institute / International Standards Organization (ARI / ISO) and Environmental Testing Laboratories for United States and Canada (ETL-US-C). The units shall have ETL-US-C labels. All cabinets shall be factory tested under normal operating conditions, risers shall be pressure tested and chassis shall be factory tested under normal operating conditions and water flow rates. *Units tested without water flow are not acceptable.*

Basic Construction:

The cabinet panels shall be fabricated from heavy gauge galvanized steel. Cabinet shall be constructed so that it is self-supporting, and can be installed before chassis arrival. Top, base, and exterior panels are to be 16 gauge. The fan deck is 12 gauge. *Units that do not have these minimum sheet metal gauge are not acceptable.* Cabinet shall have a top panel and a bottom panel for structural rigidity of the cabinet; no open top or open bottom designs allowed.

The cabinet base shall contain a fully insulated secondary drain pan with a pressure differential drain trap connected to the condensate riser pipe, and guide rails to support and align the slide-in refrigeration chassis. Drain pan(s) shall be easily accessible for cleaning. All interior surfaces shall be lined with 1/2 inch (12.7mm) thick, dual density 1-3/4 lb/ft³ (28 kg/m³) acoustic type fiberglass insulation. All fiberglass shall be coated to prevent the introduction of glass fibers into the air stream.

Standard cabinet panel insulation must meet NFPA 90A requirements, air erosion and mold growth limits of UL-181, stringent fungal resistance test per ASTM-C1071 and ASTM G21, and shall meet zero level bacteria growth per ASTM G22. *Unit insulation must meet these requirements or unit(s) will not be accepted.*

Cabinet arrangements shall allow symmetrical placement of riser piping on any of the three sides of the cabinet not used for the chassis access. All Cabinet openings shall have dry wall flanges on all sides. Supply air openings shall be factory cut and flanged as shown on plans. For air noise attenuation purposes, the discharge air from fan shall discharge into an insulated plenum that also contains insulated air baffles at all cabinet supply air openings. *Units not having supply air noise baffles are not acceptable.* Cabinet design shall allow a full height base board (5 inches/127mm) beneath the chassis access. The cabinet shall contain an easily removable motor/blower assembly.

Provide optional, factory-installed supply, return, and condensate water risers, which shall be copper (Project Engineer to specify copper type). (If Code compliant, PVC condensate drain risers may be specified and supplied). Factory or field installed Risers to include integral internal piping with ball valves (for shut off purposes at unit). Field installed hose kits are required to connect the chassis piping to the cabinet piping. The condensate riser shall be insulated with 3/8" (9.5mm) Armaflex type insulation. Supply and return risers may also be insulated (Engineer to specify). The top of each Factory-supplied riser shall be swaged (3 in./76.2mm) to accept connection to the riser above, allowing for a floor-to-floor dimensional variance of \pm one inch (25.4mm). ***Units with Factory-supplied risers not having swaged riser-piping connections shall not be acceptable.***

Fan and Motor Assembly:

The cabinet shall contain a removable motor/blower assembly. Units shall have a direct-drive centrifugal fan. The fan motor shall be 3-speed, permanently lubricated, PSC type with thermal overload protection. The fan motor shall be isolated from the fan housing by a torsionally flexible motor mounting system with rubber type grommets to inhibit vibration-induced high noise levels associated with hard wire belly band motor mounting. Airflow/External static pressure rating of the unit shall be based on a wet coil and clean filter. Fan deck is designed to slide out from the front without removing other sheet metal parts besides the fan cover. ***Units with fan decks that do not have comparable easy front slide-out design are not acceptable.***

Chassis:

The chassis, which incorporates the air coil, water coil, drain pan, and compressor, shall be an easily installed, slide-in type for quick jobsite installation and future servicing purposes. The slide-in chassis shall have an insulated panel separating the fan compartment from the compressor compartment. Compressors are not in the air stream. The chassis base shall be fabricated from heavy gauge galvanized steel formed to match the slide-in rails of the cabinet. All electrical connections between the chassis and cabinet shall be made via locking Molex type connectors. Units shall have a factory installed 1-inch (25.4mm) thick filter bracket and throwaway type glass fiber, aluminum or poly filter.

Water connections between chassis and the cabinet shall be accomplished via a hose kit with a stainless-steel braid. Hose kit shall have brass fittings with stainless-steel ferrules. Hose ends shall be solid External NPT which connects to mating fitting on cabinet shut off ball valve(s), and Internal NPSM (National Pipe Straight Mechanical) swivel end with fiber or EPDM washer which connects to mating threaded end connection on chassis. The hose kit shall be rated for 350 psi (2412 kPa) design working pressure.

Refrigerant Circuit:

All units shall contain an HFC 410A sealed refrigerant circuit including a high efficiency scroll or rotary compressor designed for heat pump operation, an enhanced corrugated aluminum lanced fin and rifled copper tube refrigerant-to-air heat exchanger, reversing valve, coaxial (tube in tube) refrigerant-to-water heat exchanger, and safety controls including a high pressure switch, low pressure switch (loss of charge), water coil low temperature sensor, and air coil low temperature sensor. Access fittings shall be factory installed on high and low pressure refrigerant lines to

facilitate field service. Activation of any safety device shall prevent compressor operation via a microprocessor lockout circuit.

Hermetic compressors shall be internally sprung and externally isolated. The compressor shall have an external, dual level vibration isolation system. The compressor will be mounted on rubber grommets to a large heavy gauge compressor mounting tray plate, which is then isolated from the cabinet base with vibration isolators for maximized vibration attenuation. Compressor shall have thermal overload protection.

Refrigerant-to-air heat exchanger shall utilize enhanced corrugated lanced aluminum fins and rifled copper tube construction. Refrigerant-to-water heat exchangers shall be of copper inner water tube and steel refrigerant outer tube design. The refrigerant-to-water heat exchanger shall be electro-coated with a low cure cathodic epoxy material a minimum of 0.4 mils thick (0.4 to 1.5 mils range) on all surfaces.

Reversing valve shall be four-way solenoid activated refrigerant valve, which shall default to heating mode should the solenoid fail to function. If the reversing valve solenoid defaults to cooling mode, an additional low temperature thermostat must be provided to prevent over-cooling of an already cold room.

Option: The unit will be supplied with internally factory mounted two-way water valve for variable speed pumping requirements.

Option: The unit will be supplied with internally factory mounted automatic water flow regulators.

Cabinet Drain Pan:

The drain pan shall be constructed of galvanized steel and have a powder coat paint application to further inhibit corrosion. This corrosion protection system shall meet the stringent 1000 hour salt spray test per ASTM B117. Drain pan shall be fully insulated. Drain pan shall have at a minimum a doubled sloped surface to allow positive drainage to the outlet opening, which shall be at the lowest level of the entire pan surface. Drain outlet shall be connected from pan outlet to condensate riser with factory installed trap inside of cabinet. The unit as standard will be supplied with solid-state electronic condensate overflow protection. ***Mechanical float switches will NOT be accepted.***

Electrical:

A control box shall be located within the unit cabinet and shall contain a 25VA transformer, 24 volt activated, compressor relay, terminal block for thermostat wiring and solid-state controller for complete unit operation. Reversing valve and fan motor wiring shall be routed through this electronic controller. Units shall be name-plated for use with time delay fuses or HACR circuit breakers. Unit controls shall be 24 Volts and provide heating or cooling as required by the remote thermostat / sensor.

Solid State Control System:

Units shall have a solid-state control system. ***Units utilizing electro-mechanical control shall not be acceptable.*** The control system shall interface with a heat pump type thermostat. The control system shall have the following features:

- a. Anti-short cycle time delay on compressor operation.
- b. Random start on power up mode.
- c. Low voltage protection.
- d. High voltage protection.
- e. Unit shutdown on high or low refrigerant pressures.
- f. Unit shutdown on low water temperature.
- g. Condensate overflow electronic protection.
- h. Automatic intelligent reset. Unit shall automatically reset 5 minutes after trip if the fault has cleared. If a fault occurs 3 times sequentially without thermostat meeting temperature, then lockout requiring manual reset will occur.
- i. Ability to disable time delays for servicing.
- j. Light emitting diodes (LEDs) on circuit board to indicate high pressure, low pressure, low voltage, high voltage, low water/air temperature cut-out, condensate overflow, and control voltage status.
- k. The low-pressure switch shall not be monitored for the first 120 seconds after a compressor start command to prevent nuisance safety trips.
- l. 24V output to cycle a motorized water valve or other device with compressor contactor.
- m. Water coil low temperature sensing (selectable for water or anti-freeze).
- n. Air coil low temperature sensing.

NOTE: Units not providing the 8 safety protections of anti-short cycle, low voltage, high voltage, high refrigerant pressure, low pressure (loss of charge), air coil low temperature cut-out, water coil low temperature cut-out, and condensate overflow protections will not be accepted.

Return Panel / Supply Grilles:

The return panel shall be architecturally designed, acoustic type, flush mounted panel with hinged door for easy and quick access to filter and unit interior. Chassis shall be easily removable. The hinged return panel shall be made of heavy gauge die formed galvanized steel with a powder coat finish. ***Return air panels that protrude from wall more than 5/8 inch (15.9mm) are not acceptable.*** Supply grille(s) shall be architecturally designed brushed aluminum or powder coated steel.

Warranty:

Ice Air shall warranty equipment for a period of 12 months from start up or 18 months from shipping (which ever occurs first). Standard warranty covers replacement of defective parts, with optional warranty add-ons for labor coverage and extended warranty periods.

FIELD INSTALLED OPTIONS

Hose Kits (required for field water connections):

Water connections between chassis and the cabinet shall be accomplished via a hose kit surrounded by a stainless-steel braid. Hose kit shall have brass fittings with stainless-steel ferrules. Hose ends shall be solid External NPT which connects to mating fitting on cabinet shut off ball valve(s), and Internal NPSM (National Pipe Straight Mechanical) swivel end with fiber or EPDM washer which connects to mating threaded end connection on chassis. This dual hose kit accessory is required for each cabinet.

Thermostats:

The thermostat shall be a Ice Air mechanical or electronic type thermostat as selected below with the described features:

a. Single Stage Standard Manual Changeover

Thermostat shall be a single-stage, vertical mount, manual changeover with HEAT-OFF-COOL system switch and fan ON-AUTO switch. Thermostat shall have a mechanical temperature indicator and set point indication. Thermostat shall only require 4 wires for connection. Mercury bulb thermostats are not acceptable.

b. Single Stage Digital Manual Changeover with Two-Speed Fan Control

Thermostat shall be a single-stage, digital, manual changeover with HEAT-OFF-COOL system switch, fan ON-AUTO switch, and fan LO-HI switch. Thermostat shall have an LCD display with temperature and set-point(s) in °F or °C. The Thermostat shall provide permanent memory of set-point(s) without batteries. A fault LED shall be provided to display specific fault condition. Thermostat shall come standard with remote temperature sensor, but may be operated with internal sensor if desired via installation of a jumper.

c. Single Stage Digital Auto or Manual Changeover

Thermostat shall be a single-stage, digital, auto or manual changeover with HEAT-OFF-COOL-AUTO system switch and fan ON-AUTO switch. Thermostat shall have an LCD display with temperature and set-point(s) in °F or °C. The Thermostat shall provide permanent memory of set-point(s) without batteries. A fault LED shall be provided to display specific fault condition. Thermostat shall provide temperature display offset for custom applications.

d. Single Stage Digital Automatic Changeover with Two-Speed Fan Control

Thermostat shall be a single-stage, digital, auto or manual changeover with HEAT-OFF-COOL-AUTO system switch, fan ON-AUTO switch, and fan LO-HI switch. Thermostat shall have an LCD display with temperature and set-point(s) in °F or °C. The Thermostat shall provide permanent memory of set-point(s) without batteries. A fault LED shall be provided to display specific fault condition. Thermostat shall come standard with remote temperature sensor, but may be operated with internal sensor if desired via installation of a jumper..

e. Single Stage Manual Changeover Programmable 5/2 Day

Thermostat shall be 5 day/2 day programmable (with up to 4 set points per day), single stage (1H/1C), manual changeover with HEAT-OFF-COOL system settings and fan ON-AUTO settings. Thermostat shall have an LCD display with temperature, set-point(s), mode, and status indication. The temperature indication shall be selectable for °F or °C. The thermostat shall provide permanent memory of set-point(s) without batteries. Thermostat shall provide convenient override feature to temporarily change set point.