

HYDRON-AIRE **EVI** AIR TO WATER HEAT PUMP



INSTALLATION & OPERATIONS MANUAL

Notice

- 1. Save this manual for future reference.**
- 2. In order to use this product better and more safely, please read this manual carefully before installation and initial operation.**
- 3. Children or persons with physical, sensory or mental disability should not play with nor operate this appliance.**
- 4. This appliance must be installed by a qualified and experienced technicians/tradesperson. Improper installation of this appliance may cause damage and danger.**
- 5. This appliance must be installed in accordance with North American Standard wiring regulations including an isolating switch from the supply mains and grounded power supply consistent with the power requirements of this appliance.**
- 6. The installation of this appliance must comply with the model's wiring chart in this manual and its power requirements as stated on the rating label on the side of the heat pump.**
- 7. Do not install this appliance close to flammable, explosive materials, or open flames.**
- 8. A filter in the main water supply inlet is recommended and should be checked/cleaned regularly.**
- 9. Checking and cleaning of the evaporator fin coil is recommended for good air flow.**
- 10. The battery should be removed from this appliance's controller at the end of its operating life and disposed of safely.**

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EVi Model Nomenclature

H-EVI-AWHP-035-1-N-M

HP - Heat Pump
PH - Pool Heater

035 - Unit Size
050
060
080

1 - Single Phase 240
3 - Three Phase 240





HYDRON-AIRE

EVI AIR TO WATER HEAT PUMP

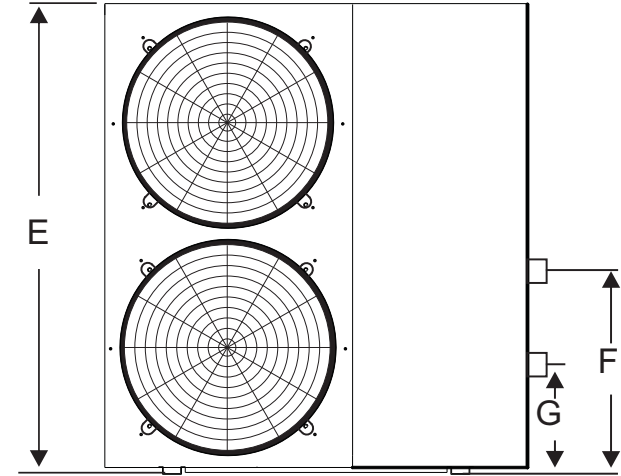
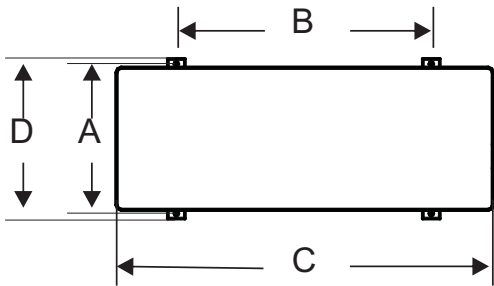
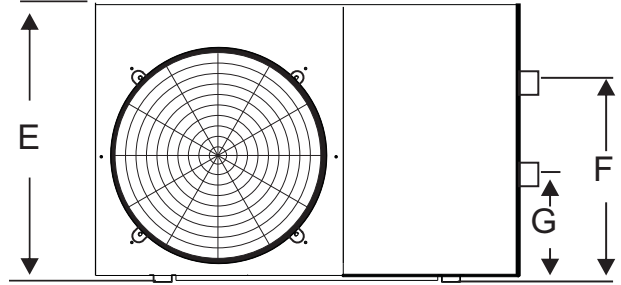
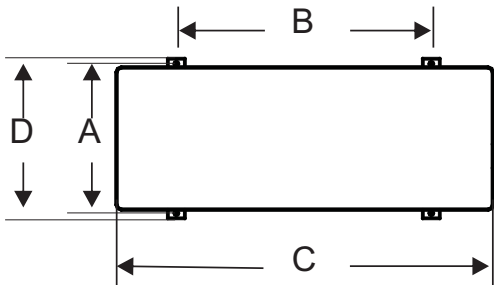


EVI DC Inverter Multi-Function Heat Pump

SPECIFICATION TABLE

Air Deg C	Water Deg C	Mode		UNIT	HEVIAWHP035	HEVIAWHP050	HEVIAWHP060	HEVIAWHP080
35	12	COOLING	CAPACITY	KW	7.50	12.50	14.00	16.00
			POWER INPUT	KW	2.90	4.80	5.40	6.10
			CURRENT INPUT	A	13.20	21.80	24.50	27.70
			EER		2.59	2.60	2.59	2.62
7	35	HEATING	CAPACITY	KW	9.00	15.00	18.00	20.00
			POWER INPUT	KW	2.14	3.63	4.38	4.85
			CURRENT INPUT	A	9.70	16.50	19.90	22.00
			COP		4.21	4.13	4.11	4.12
7	45	HEATING	CAPACITY	KW	9.00	15.00	18.00	20.00
			POWER INPUT	KW	2.77	4.50	5.50	6.15
			CURRENT INPUT	A	12.60	20.50	25.00	28.00
			COP		3.25	3.33	3.27	3.25
2	35	HEATING	CAPACITY	KW	8.00	13.50	15.50	18.50
			POWER INPUT	KW	2.22	3.80	4.40	5.25
			CURRENT INPUT	A	10.10	17.30	20.00	23.90
			COP		3.60	3.55	3.52	3.52
-7	35	HEATING	CAPACITY	KW	7.00	11.50	13.50	16.00
			POWER INPUT	KW	2.21	3.68	4.34	5.18
			CURRENT INPUT	A	10.00	16.70	19.70	23.50
			COP		3.17	3.13	3.11	3.09
-7	45	HEATING	CAPACITY	KW	7.00	11.50	13.50	16.00
			POWER INPUT	KW	2.55	4.17	4.98	5.95
			CURRENT INPUT	A	11.60	19.00	22.60	27.00
			COP		2.75	2.76	2.71	2.69
-15	35	HEATING	CAPACITY	KW	5.80	9.50	11.50	13.00
			POWER INPUT	KW	2.25	3.62	4.43	5.10
			CURRENT INPUT	A	10.20	16.50	20.10	23.20
			COP		2.58	2.62	2.60	2.55
POWER SUPPLY				V/P/Hz	220/1/60	220/1/60	220/1/60	220/1/60
MAXIMUM CURRENT INPUT				A	13.30	21.40	26.20	30.10
MAXIMUM POWER INPUT				KW	2.93	4.71	5.76	6.63
NOMINAL WATER FLOW VOLUME				L/S (GPM)	0.38 (6.0)	0.66 (10.5)	0.76 (12)	0.82 (13.0)
HEAT EXCHANGER PRESSURE DROP				KPA (PSI)	59 (8.6)	57 (8.3)	74 (10.7)	130 (18.8)
WATER INLET/OUTLET MPT				INCH	1	1	1	1
REFRIGERANT					R410A	R410A	R410A	R410A
SOUND LEVEL				dB(A)	43	45	46	48
WEIGHT				KG (LBS)	92 (202)	128 (282)	131 (288)	137 (302)
DIMENSIONS (L x W x H)				INCH	45x18.5x34.75	47x18.5x50.5	47x18.5x50.5	47x18.5x53.75
IP RATING					IPX4	IPX4	IPX4	IPX4
NOTE: Heating capacity/power input/COP/EER are based on measurement by the EN14511 standard. Individual site conditions, such as ambient temperatures, room temperature, humidity and controller adjustments may cause disparities between location specific performance and these values. Values are based on 35% Propylene Glycol mixture.								

Dimensional Data



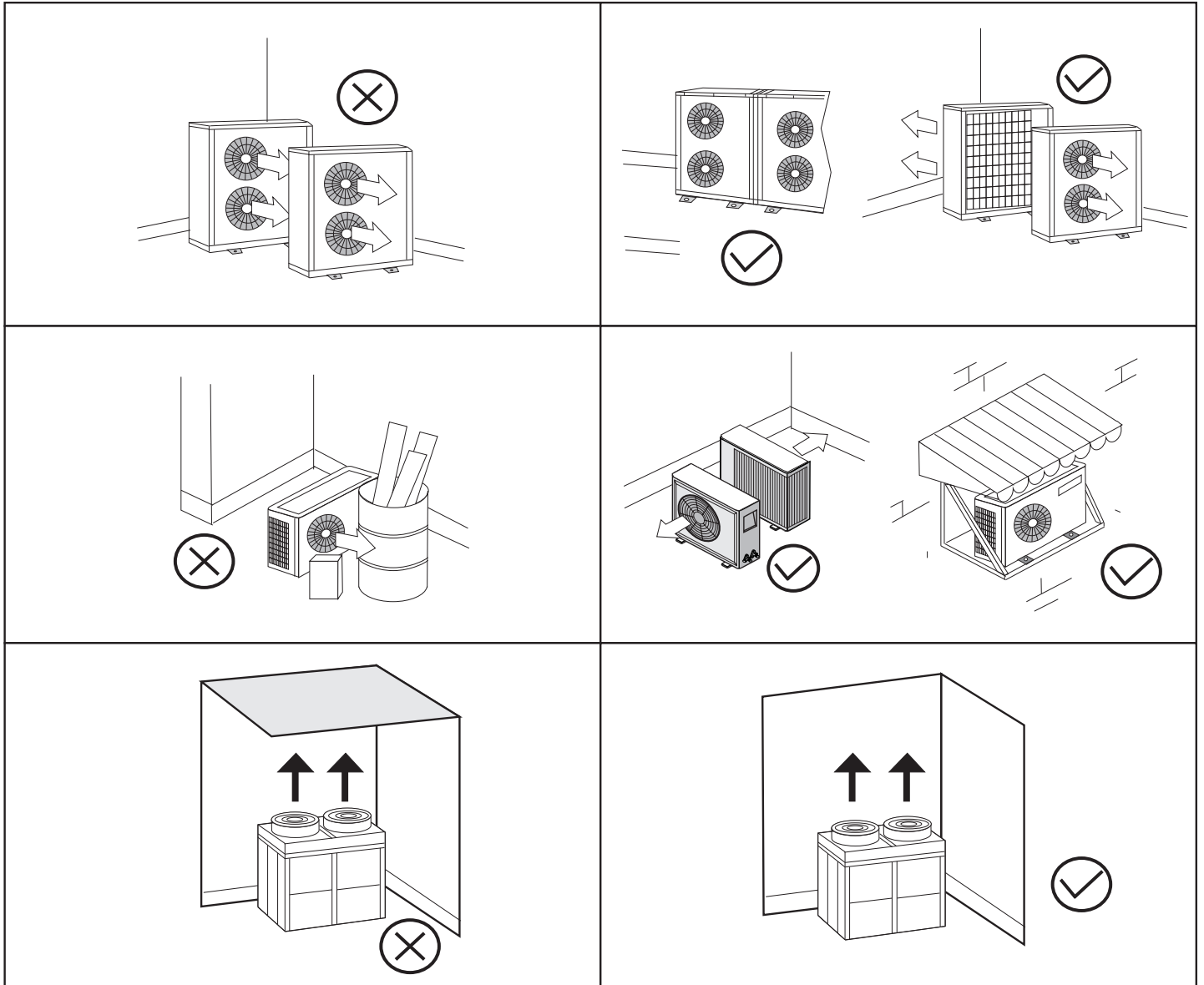
model	035	050	060	080
Dimensions mm				
A(F-R mounting port distance)	440	440	440	440
B(L-R mounting port distance)	760	760	760	760
C(Length)	1145	1195	1195	1195
D(Width)	470	470	470	470
E(Height)	883	1285	1285	1365
F(Water connection height)	383	395	395	482
G(Water connection height)	129	130	130	130

Outdoor Installation

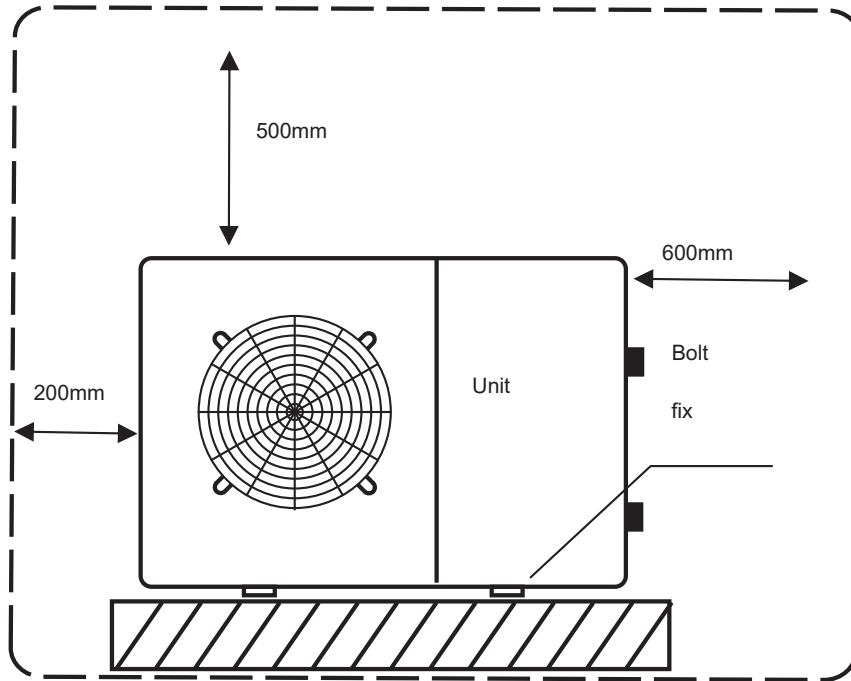
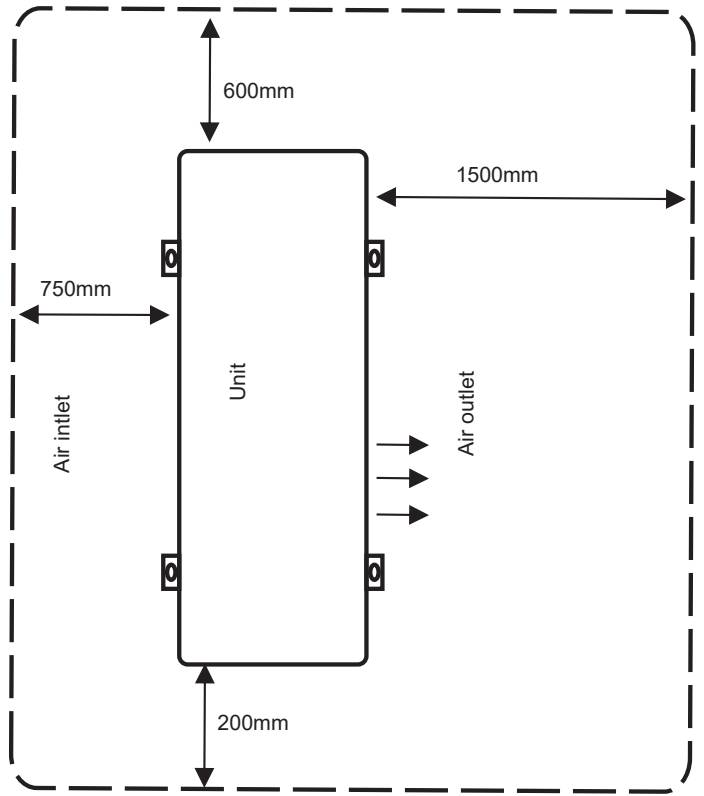
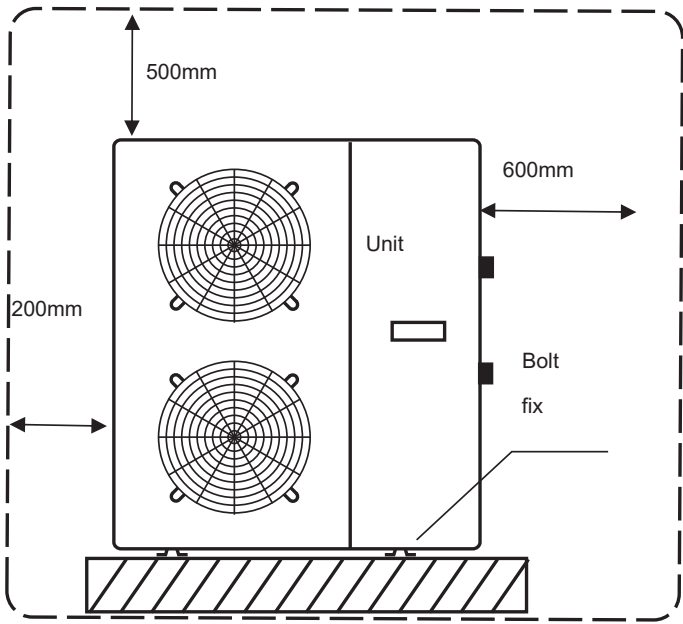
Ensure that the heat pump has adequate airflow all around and that enough space is left for maintenance and servicing. Please refer to the diagrams below for proper heat pump placement.

Incorrect

Correct



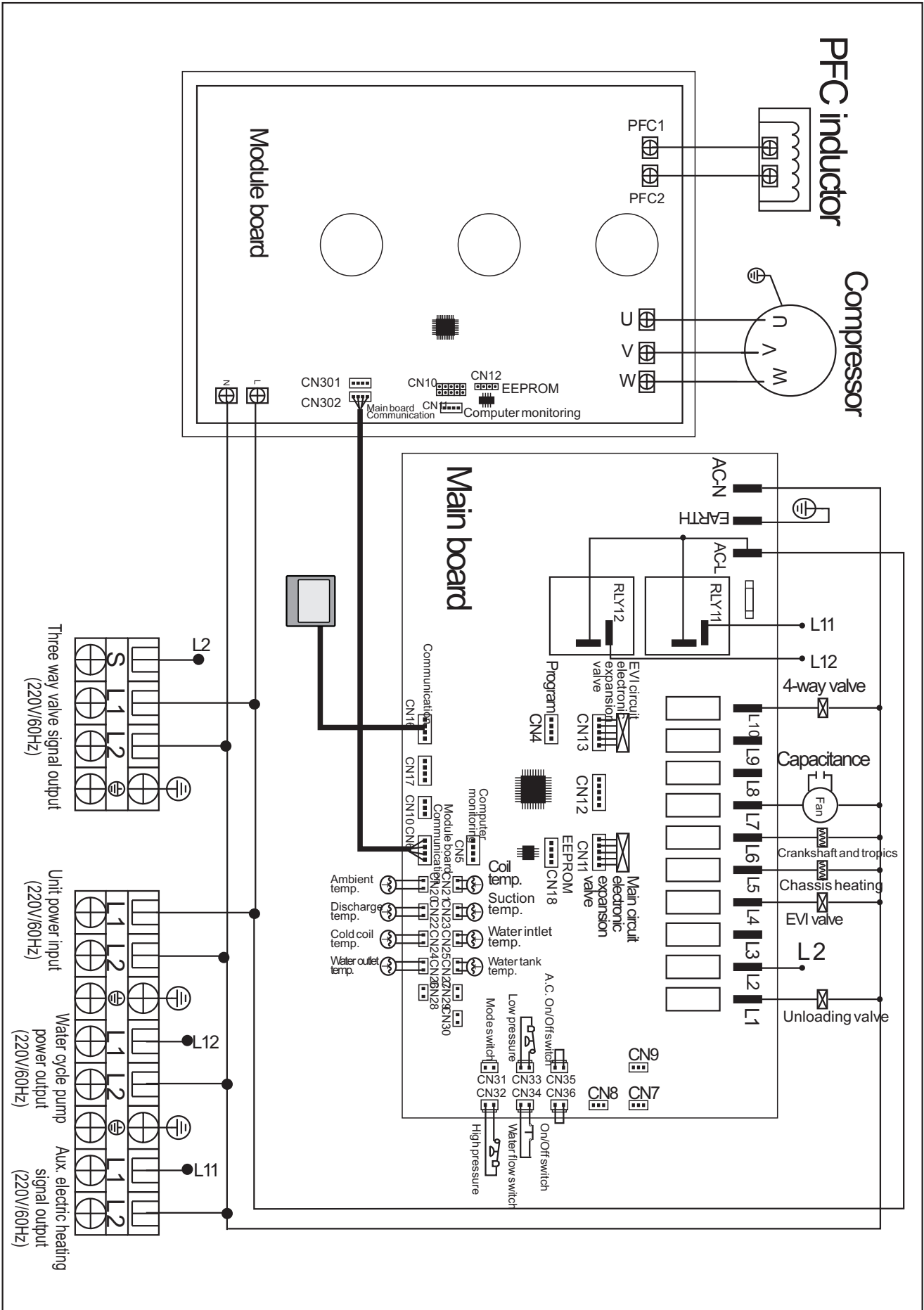
WARNING: For climates with snowfall accumulation please raise the outdoor unit to an adequate height to avoid accumulation around the outdoor unit.



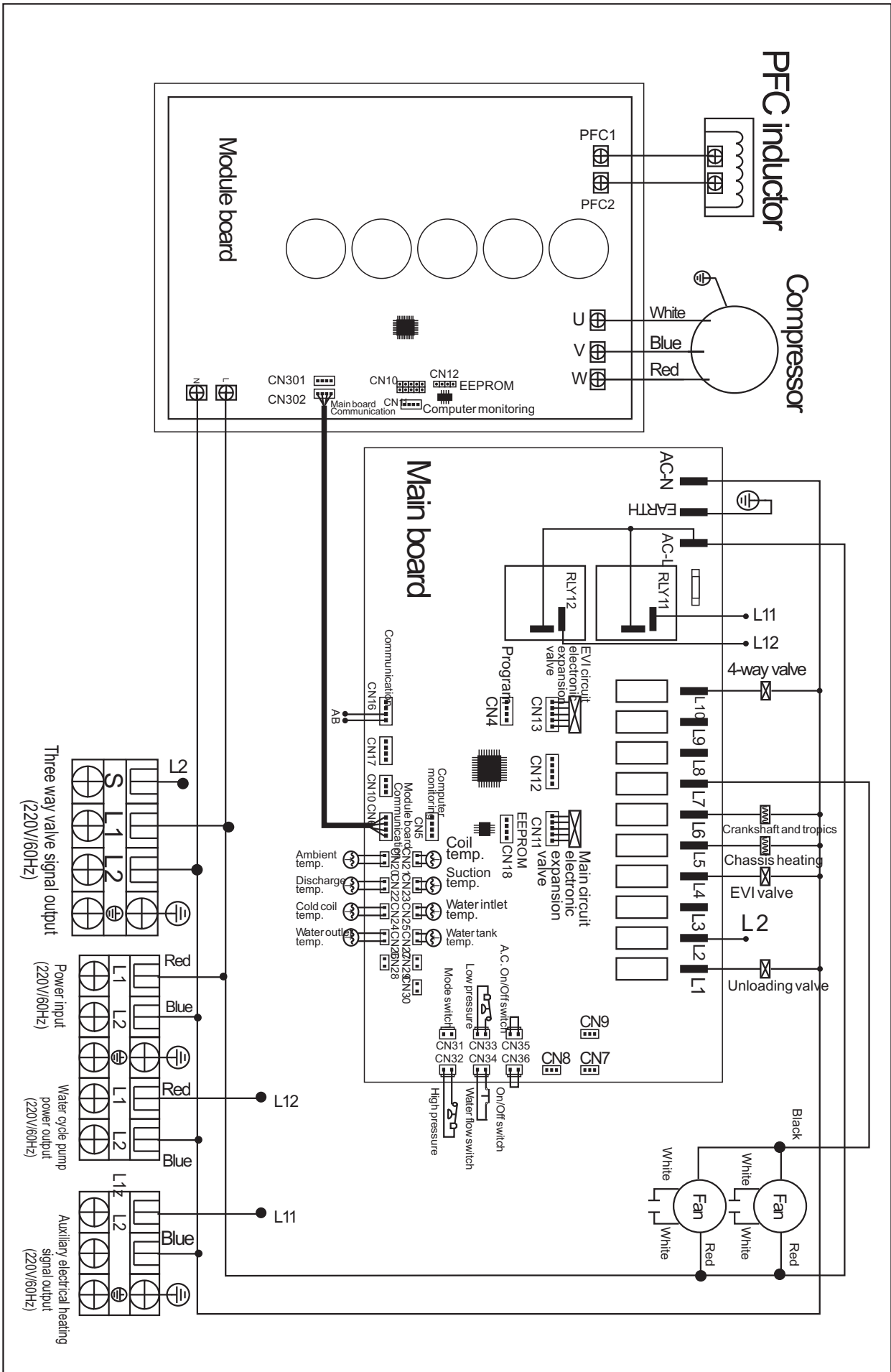
Notes:

1. Avoid installing unit where exposed to direct sunlight.
2. Unit should be protected from snow fall accumulation.
3. Unit can be installed on a balcony or other suspended structure as long as proper load bearing supports are in place.
4. Vibration isolation is recommended.
5. Use of expansion bolts for mounting to concrete or other ground platforms is recommended.
6. Ensure condensate is properly drained away from the unit.

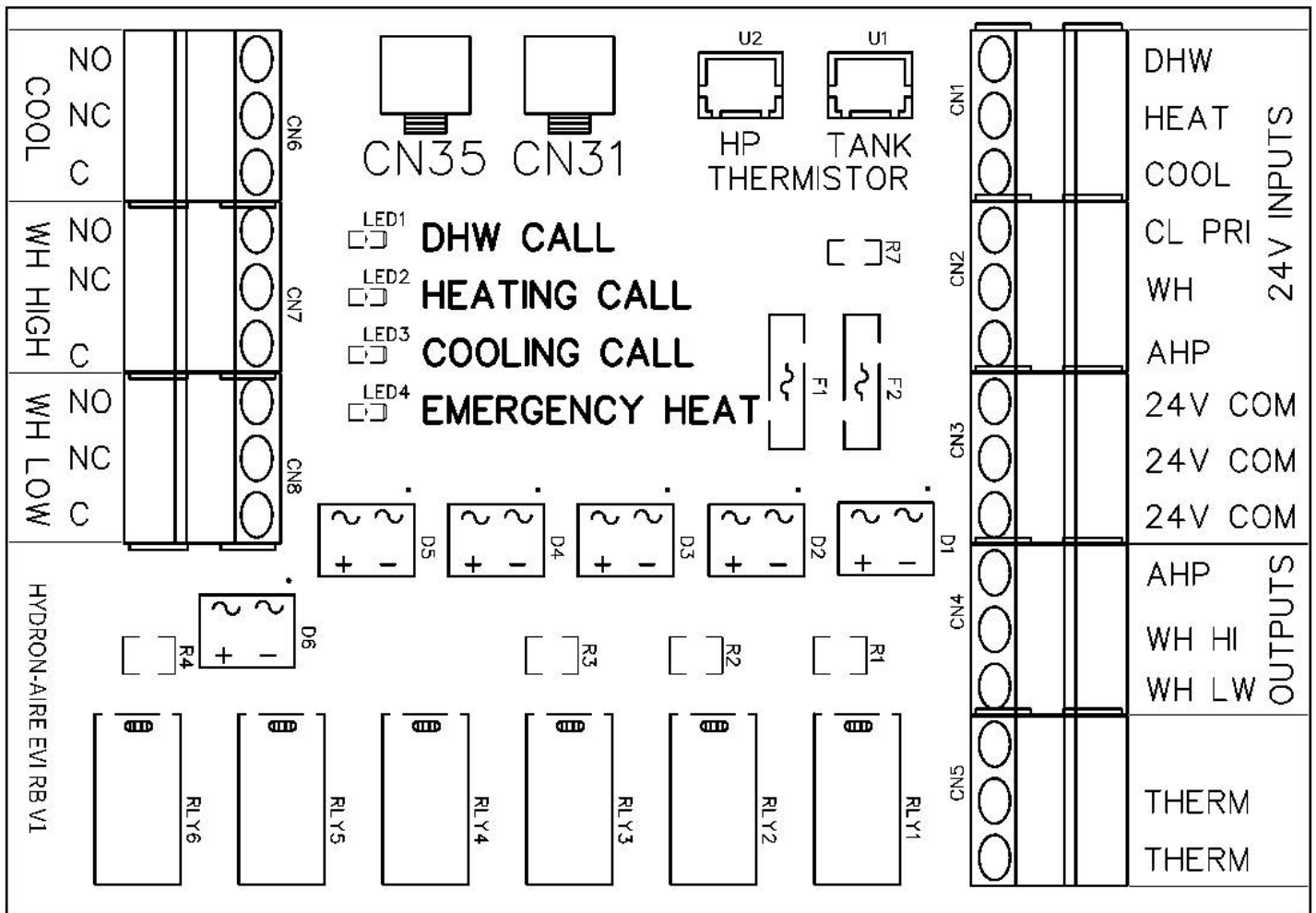
Wiring diagram model 035



Wiring diagram model 050, 060, & 080



Relay Board I/O Description



Note: All inputs require 24VAC (ungrounded side) power to operate and a 24V COM common connected.

THERM and U1 - Connection terminals for the tank thermistor sensor used in the DHW control mode. Only one should be connected at a time.

U2 - Connect to the CN27 Water Tank Temp input on main board or the cable marked "Water Tank".

CN31 - Connect to CN31 input on main board using the supplied cable.

CN35 - The heat pump main board ships with a factory installed jumper wire on CN35. This jumper will create a continuous heating mode enable signal and the heat pump will maintain the inlet water heating set point whenever the heat pump is powered unless there is a cooling or DHW demand. To operate the heat pump only when there is a 24V demand supplied to the I/O board, remove the main board jumper and connect CN35 on the I/O board to CN35 on the main board with the supplied cable.

cont...

...cont.

DHW - Supplying 24V to the DHW terminal will enable HP DHW (Hot Water) mode. When DHW mode is enabled the heat pump will monitor the temperature of the connected external temperature sensor. Regardless of the other heating or cooling demands present, when the temperature of the sensor drops below the DHW mode set point plus the set differential the heat pump will activate it's the three way valve output and start in heating mode. The unit will cease operation when the sensor reaches the set point temperature, and the heat pump will again monitor other cooling or heating demand calls. The DHW mode can be used as a secondary heating mode with its separate temperature set point and priority over other demand calls.

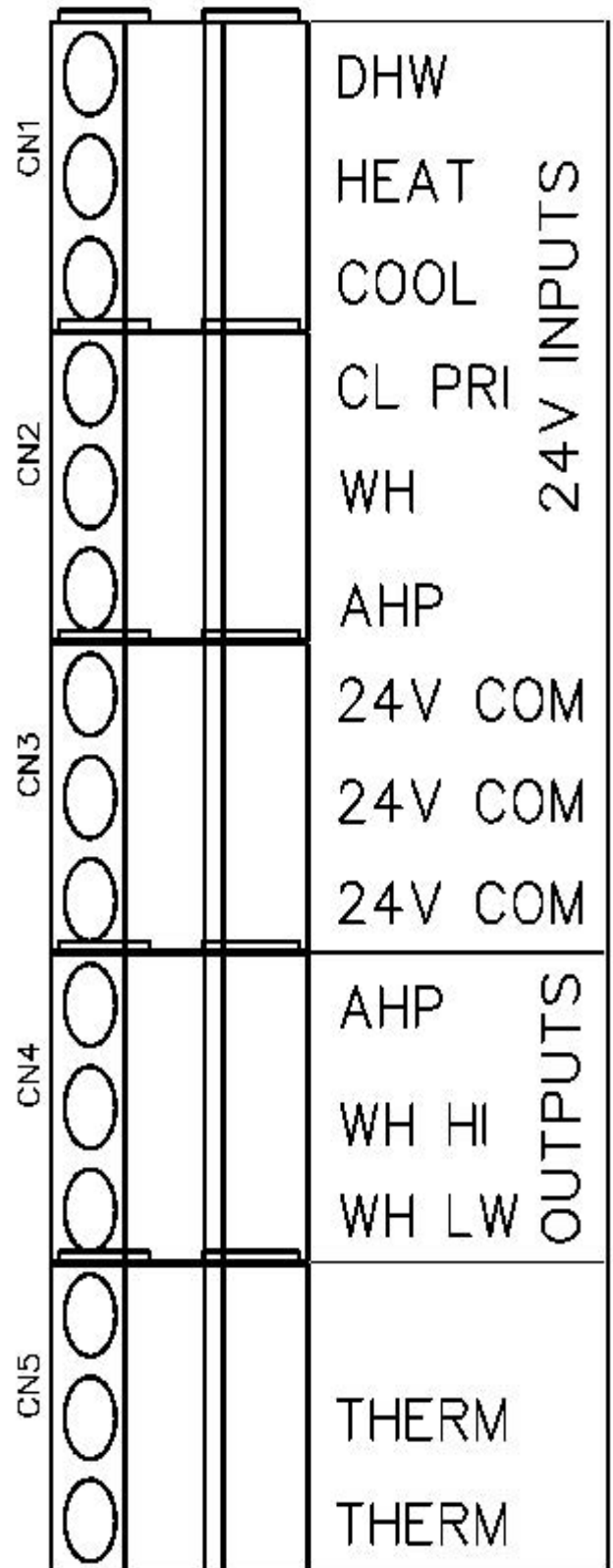
HEAT - Supplying 24V to the HEAT terminal will enable HP Heating mode. When Heating mode is enabled the heat pump will monitor the temperature of the inlet water temperature sensor. When the temperature of the sensor drops below the Heating mode set point plus the set differential, the heat pump will start in heating mode. The unit will cease operation when the sensor reaches the set point temperature.

COOL - Supplying 24V to the COOL terminal will enable HP Cooling mode and switch the COOL isolated relay contacts. When Cooling mode is enabled the heat pump will monitor the temperature of the inlet water temperature sensor. If there is no 24V input on the HEAT or DHW terminals, then when the temperature of the sensor rises above the Cooling mode set point plus the set differential the heat pump will start in cooling mode. The unit will cease operation when the sensor reaches the set point temperature, or when a HEAT or DHW demand is present.

CL PRI - Supplying 24V to the CL PRI terminal will enable HP Cooling mode even if a HEAT call is present and switch the COOL isolated relay contacts. When Cooling mode is enabled the heat pump will monitor the temperature of the inlet water temperature sensor. If there is no 24V input on DHW terminals, then when the temperature of the sensor rises above the Cooling mode set point plus the set differential the heat pump will start in cooling mode. The unit will cease operation when the sensor reaches the set point temperature, or when a DHW demand is present.

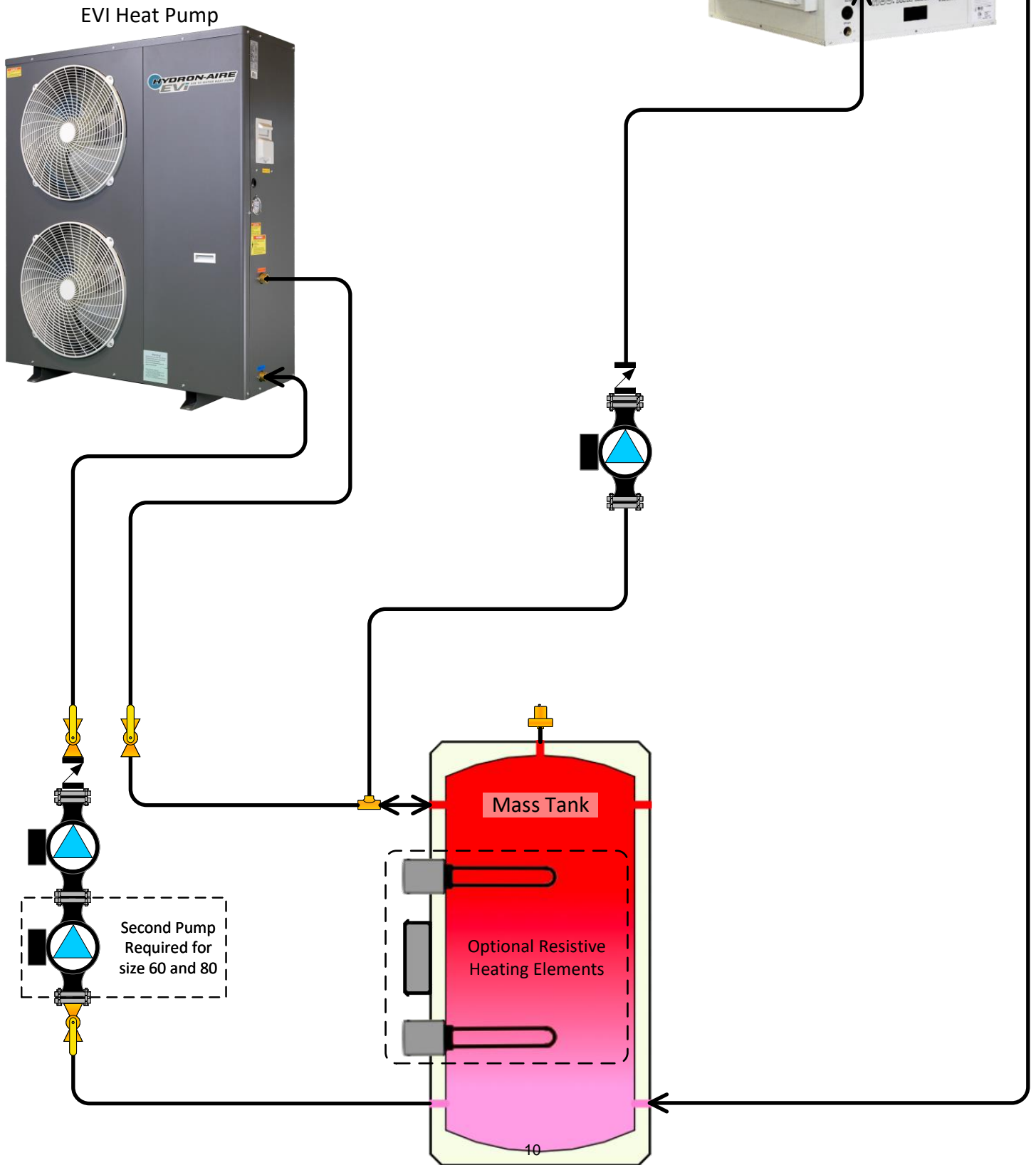
WH - Supplying 24V to the WH terminal has no effect on the heat pump. It produces a 24V output on the WH LW output terminal anytime there is no DHW call and switches the WH LOW isolated relay contacts. If there is 24V on the DHW terminals than the voltage is instead routed to the WH HI output terminal and switches the WH HIGH and WH LOW isolated relay terminals.

AHP - Supplying 24V to the AHP terminal has no effect on the heat pump. It produces a 24V output on the AHP output terminal except when there is both a COOL or CL PRI input and a DHW input. This allows the control voltage to an air handler circulator pump relay to be disconnected when the unit is operating in cooling mode in the case of a DHW call being activated which will override the cooling call.



Piping Diagram 1:

Air handler. Buffer tank with electric heat elements, 24V transformer and pump relay. Heating and cooling. Multi zone with radiant. Indirect domestic hot water tank.

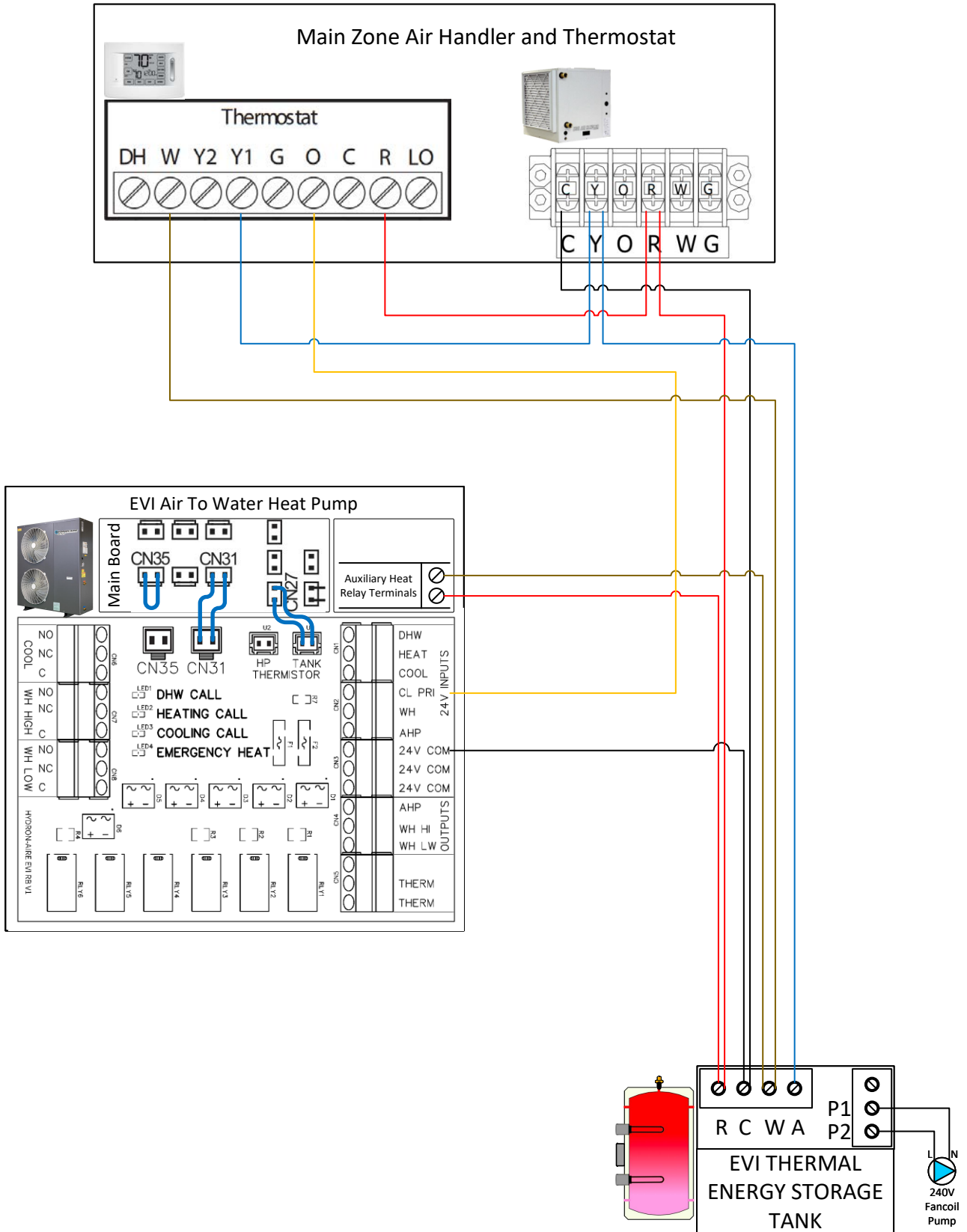


Wiring Diagram 1:

Notes:

Fan Coil System. Heat and Cool. Buffer tank with electric heat elements, 24V transformer and pump relay. Single zone or zoning by existing controls.

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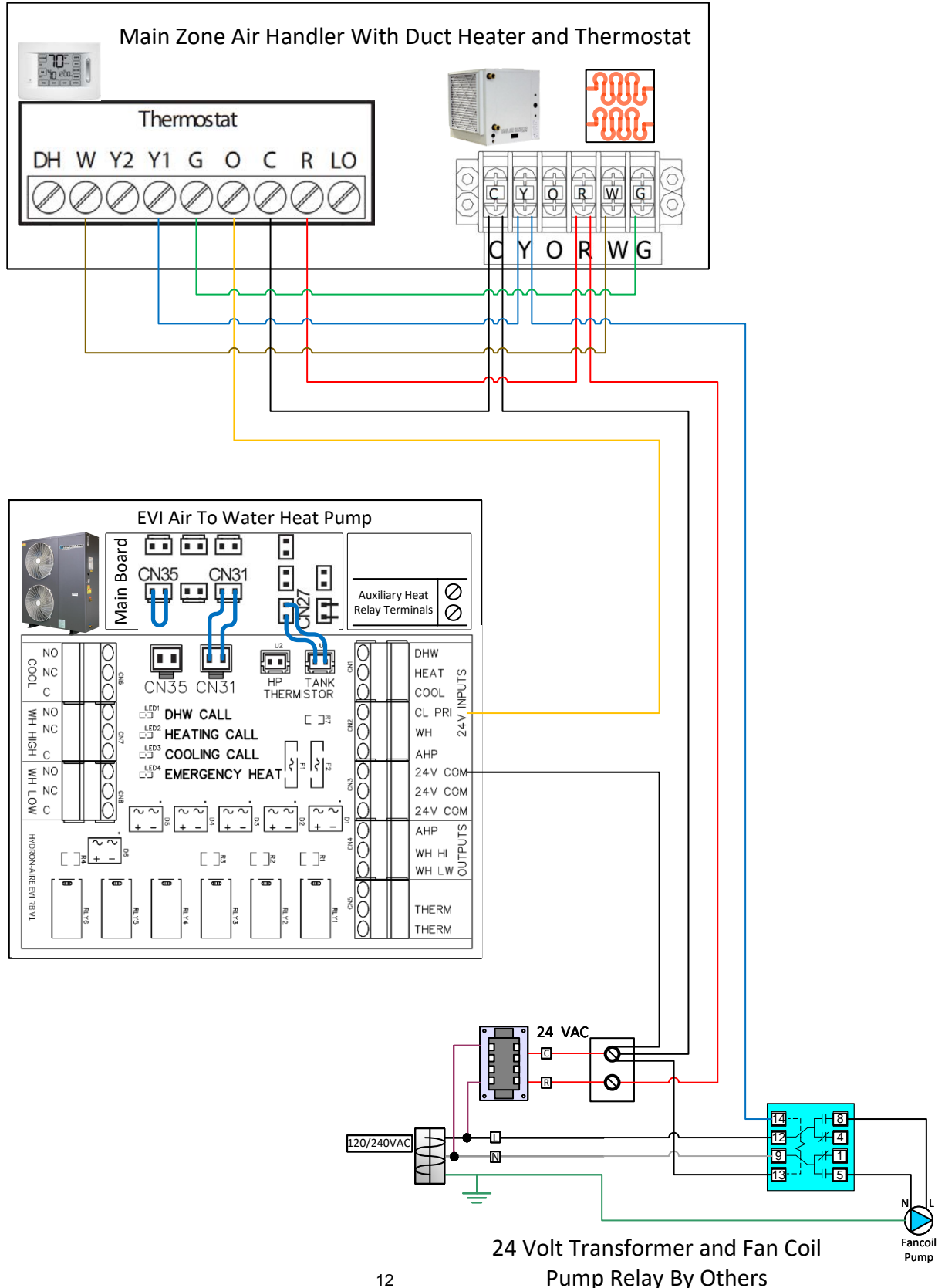


Wiring Diagram 1B:

Notes:

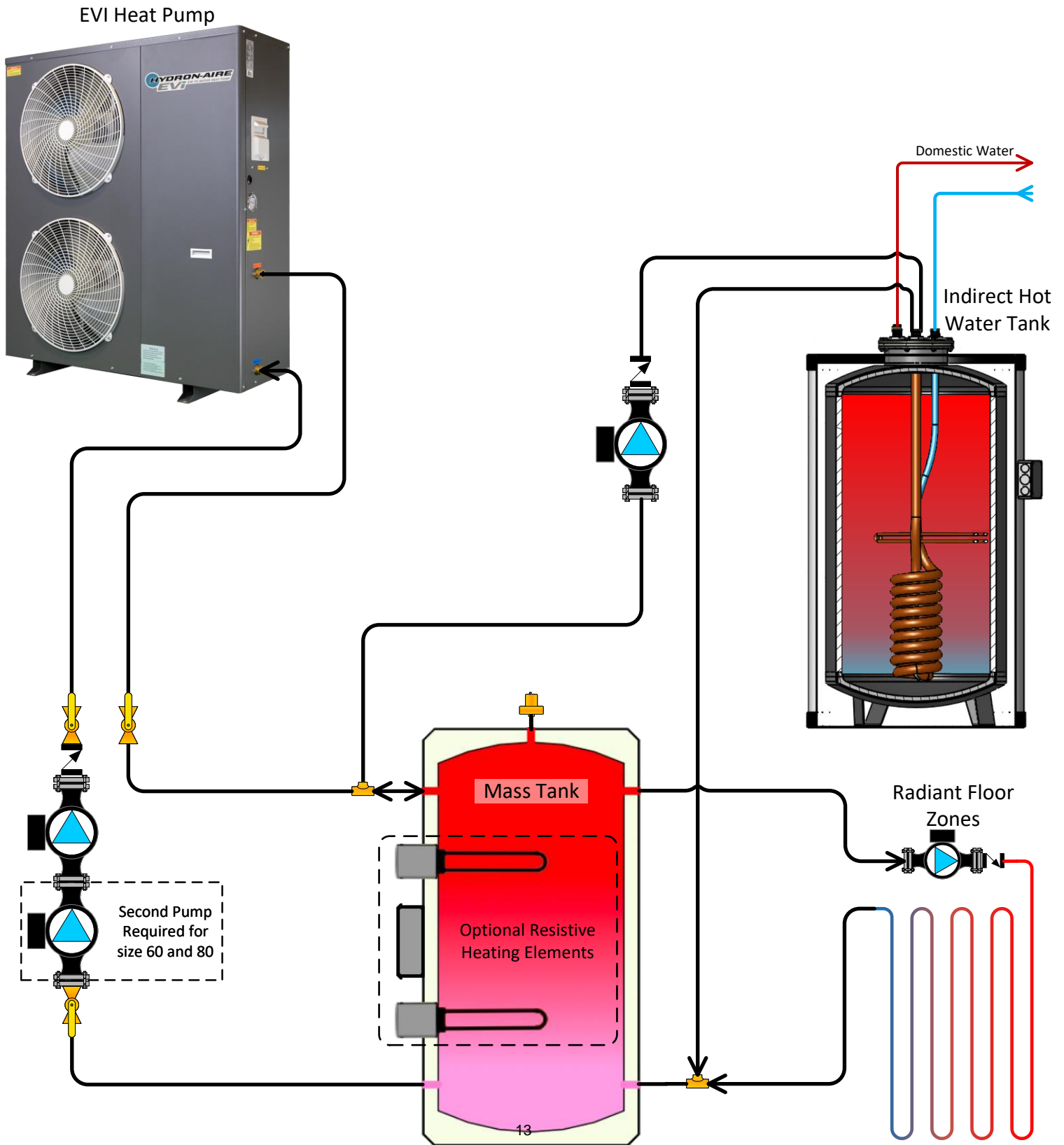
Fan Coil System with Duct Heater. Heat and Cool. Single zone or zoning by existing controls. 24 Volt transformer and pump relay by others.

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Piping Diagram 2:

Radiant System. Heat only. Indirect domestic hot water tank. Buffer tank with electric heat elements, 24V transformer and pump relay. Single zone or existing zoning controls.

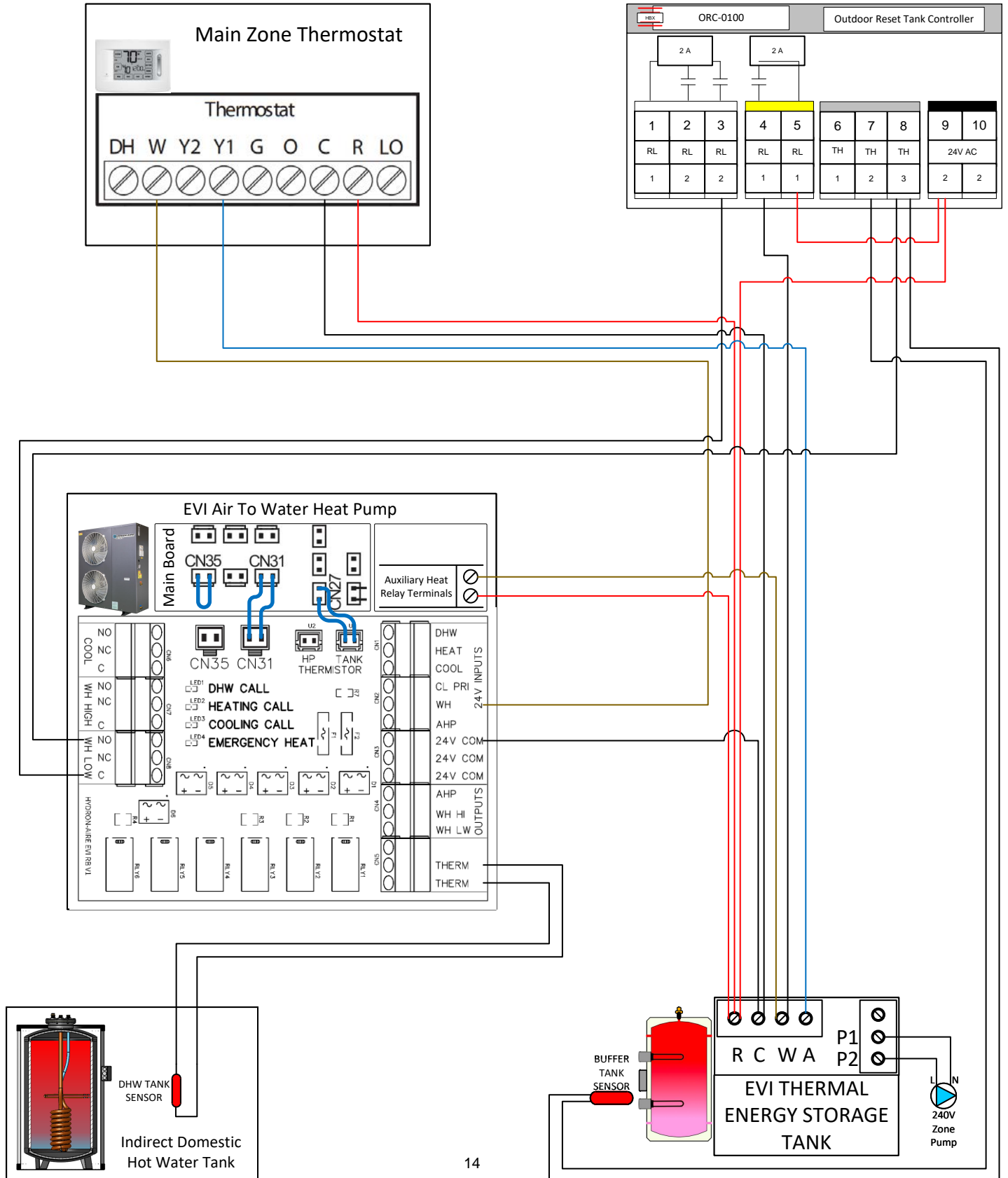


Wiring Diagram 2:

Notes:

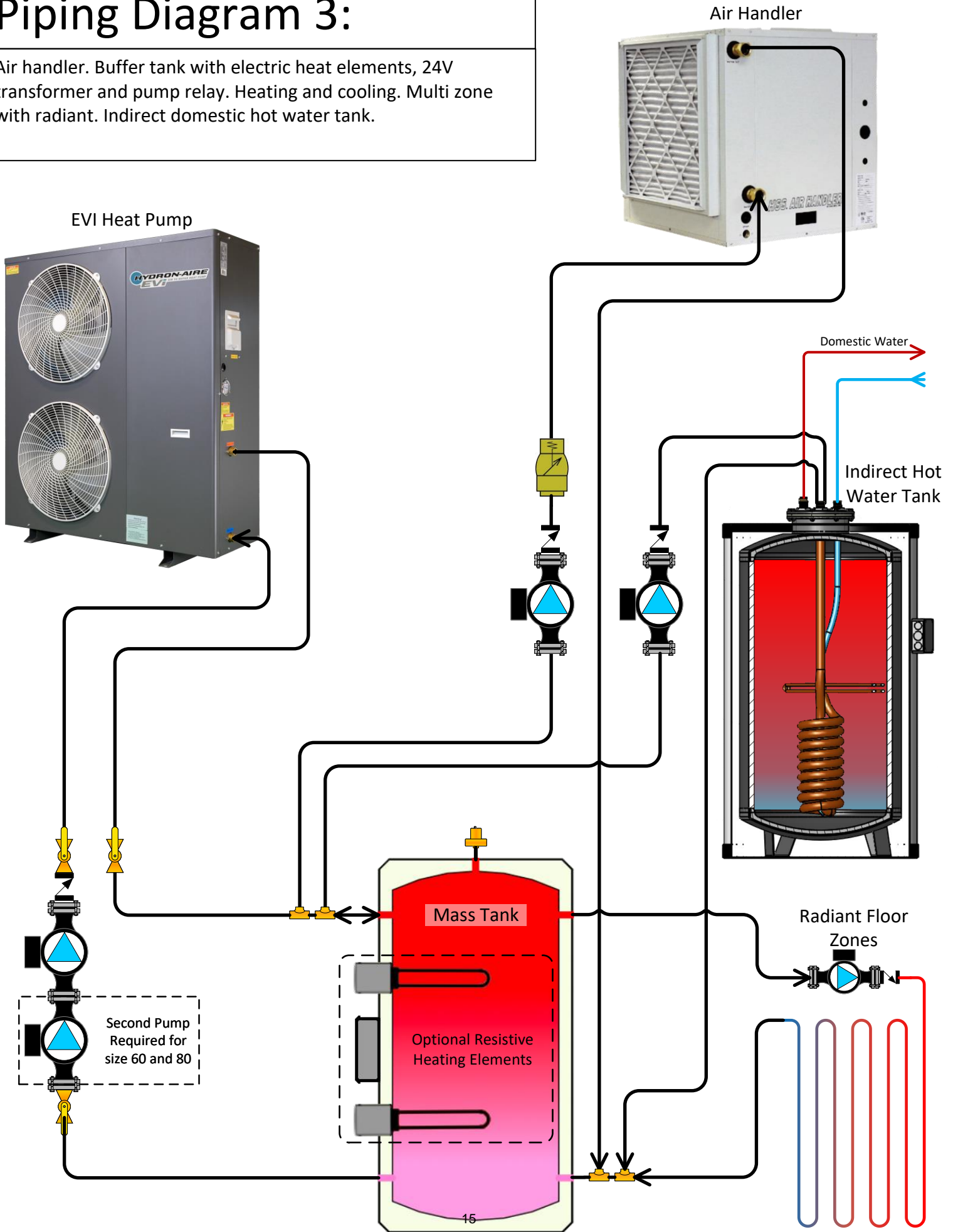
Radiant System. Heat only. Indirect domestic hot water tank. Buffer tank with electric heat elements, 24V transformer and pump relay. Single zone.

7-19-21



Piping Diagram 3:

Air handler. Buffer tank with electric heat elements, 24V transformer and pump relay. Heating and cooling. Multi zone with radiant. Indirect domestic hot water tank.

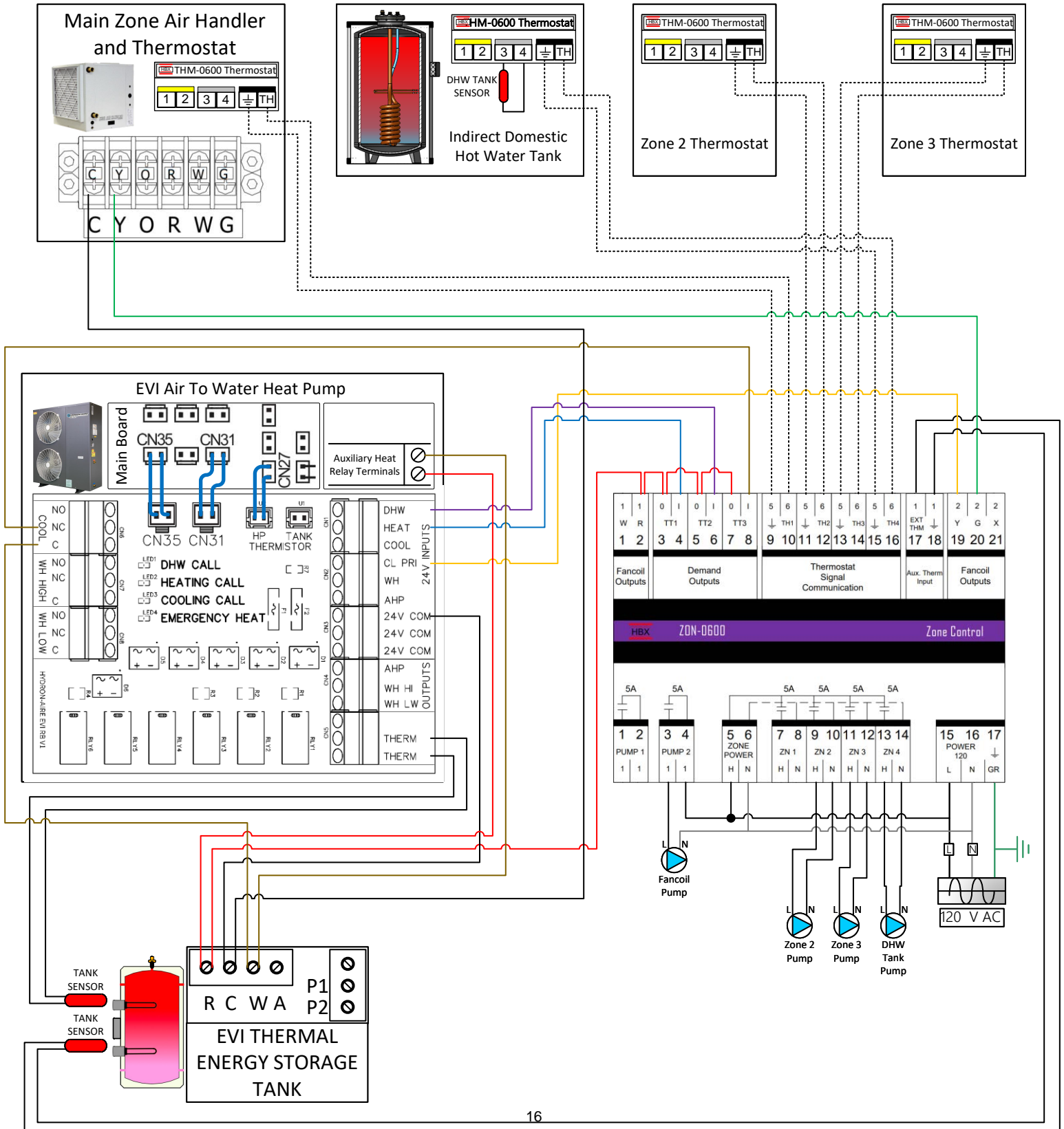


Wiring Diagram 3:

Notes:

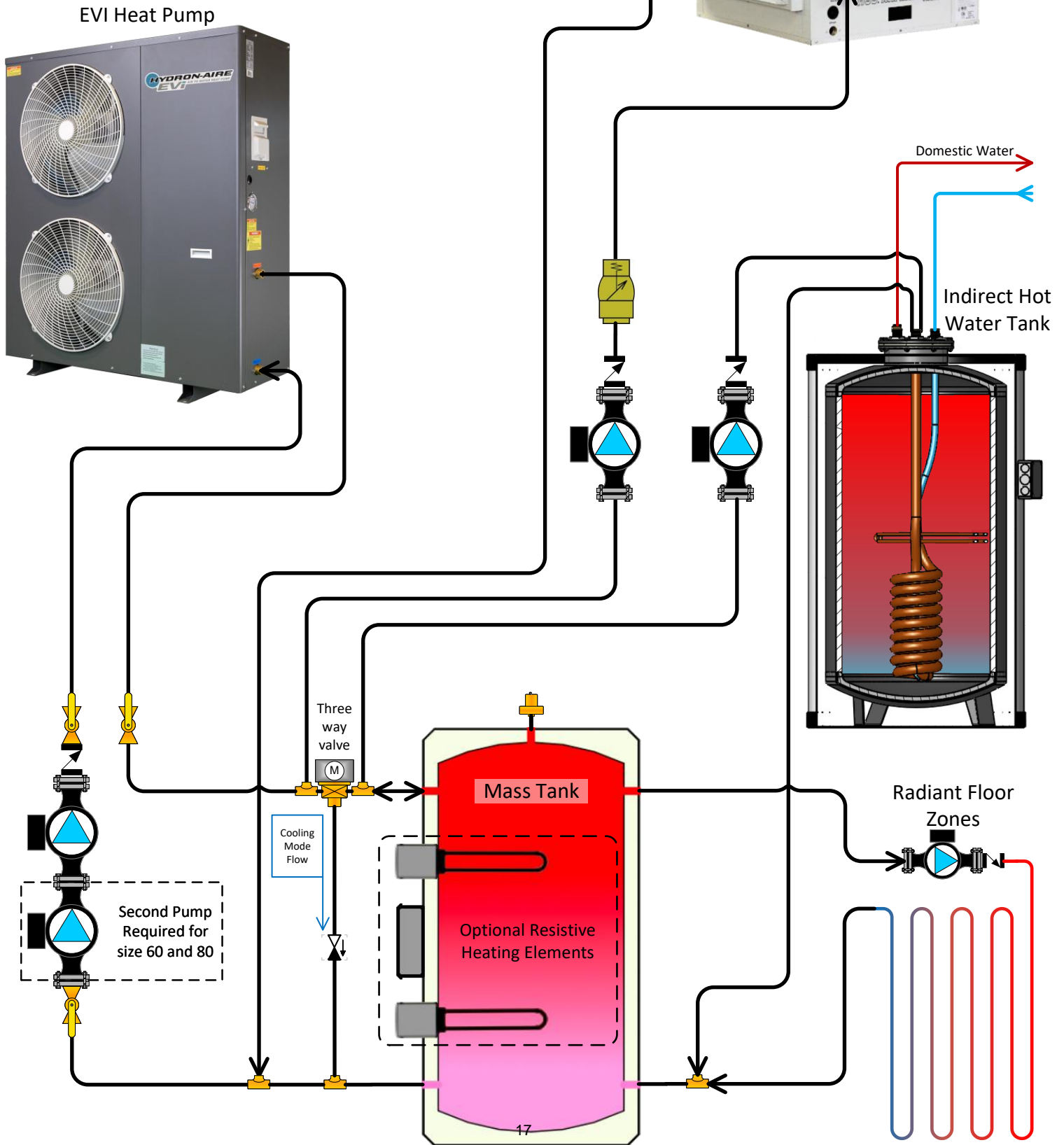
Fan Coil and Radiant Floor System. Heat and Cool. Indirect domestic hot water tank. Buffer tank with electric heat elements, 24V transformer and pump relay. Multiple zones.

7-19-21



Piping Diagram 4:

Air handler. Buffer tank with electric heat elements, 24V transformer and pump relay. Heating and cooling simultaneous with cooling mode three way valve. Multi zone with radiant. Indirect domestic hot water tank.

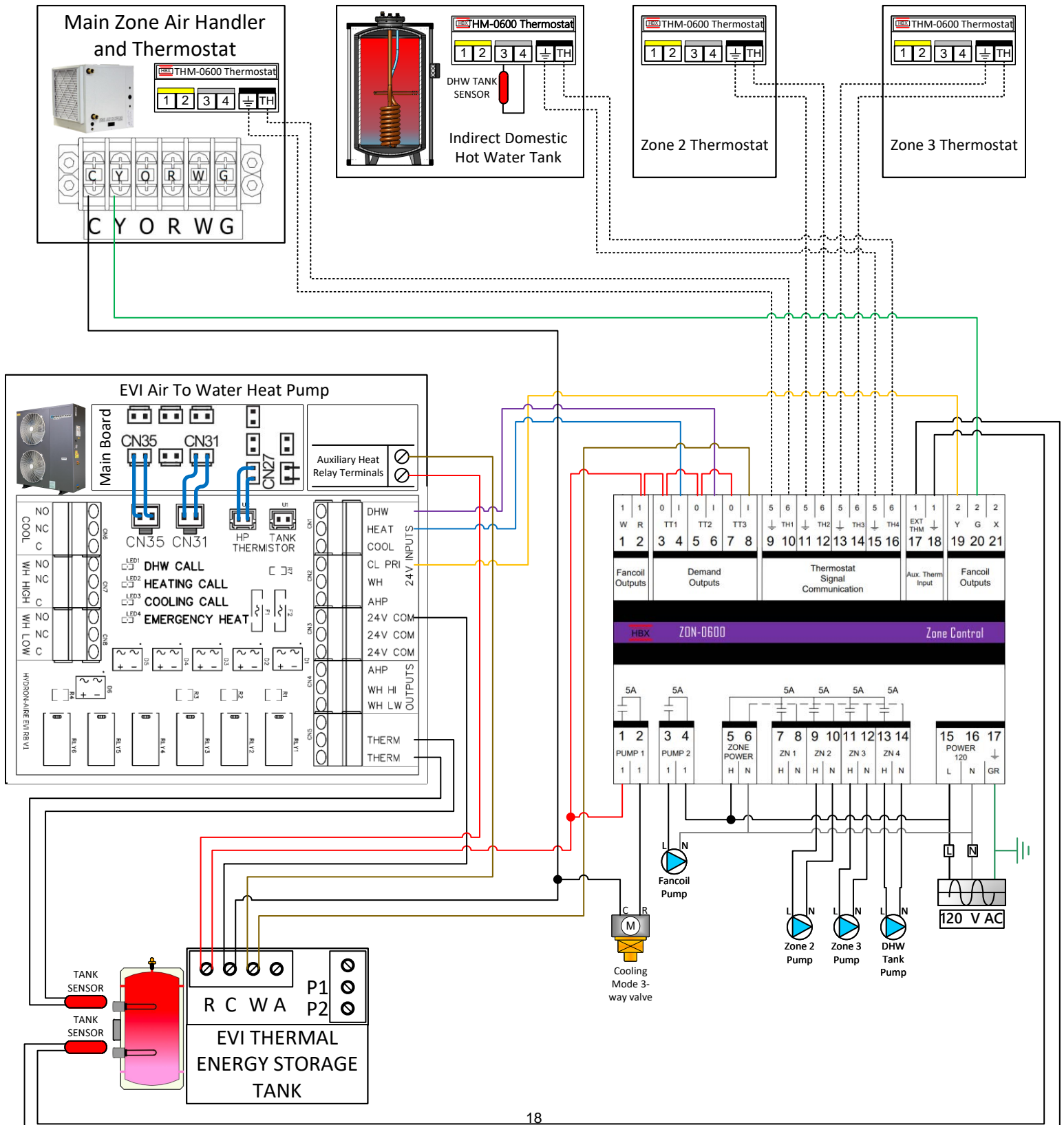


Wiring Diagram 4:

Notes:

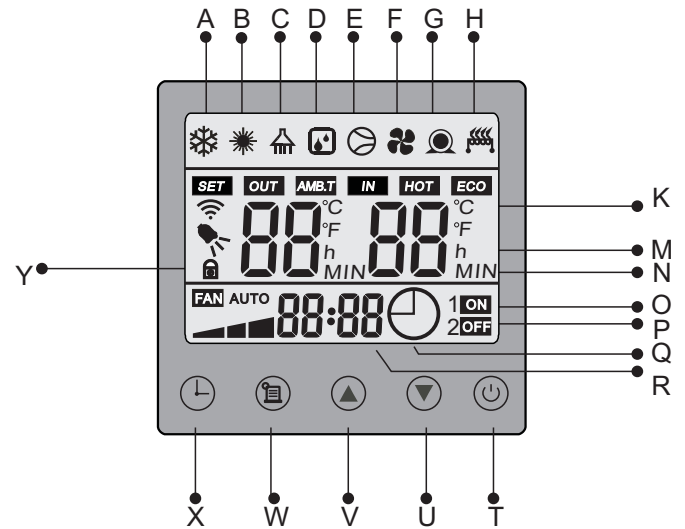
Fan Coil and Radiant Floor System. Heat and Cool. Three way cooling valve. Indirect domestic hot water tank. Buffer tank with electric heat elements, 24V transformer and pump relay. Multiple zones.

7-19-21



User interface and functions

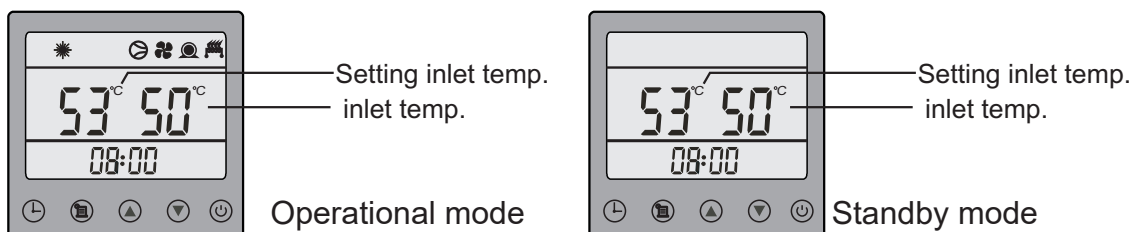
symbol	icon	instructions
A		Cool mode icon
B		Heating mode icon
C		Hot water mode icon
D		defrost mode icon
E		Compressor run icon
F		Fan run icon
G		Pump run icon
H		Auxiliary electrical heating icon
K	°C	The temperature icon
M	h	Hours icon
N	MIN	Minutes icon
O		Timing ON icon
P		Timing OFF icon
Q		Set the time icon
R	88:88	Time icon
T		The unit switch
U		Down button icon
V		Up button icon
W		Function button icon
X		Timing button icon
Y		Lock icon



WARNING: For wired external inputs the wired controller must be disconnected. When the wired controller is connected it will override external inputs.

Keyboard lock/unlock

When not in use the controller will lock after 30 seconds. A lock icon will be displayed on the controller screen. To unlock the controller, press the power button for 3 seconds.



Unit on/off

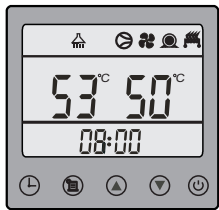
In standby mode press the power button to turn on the unit and press it again to enter standby mode.

Change the temperature set point

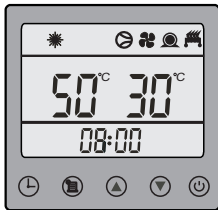
While in any of the operational modes press the up and down keys to change the temperature set point. For heating and cooling mode, the unit controls to the inlet water temperature. For hot water mode, the unit controls to the external thermistor/temperature sensor.

Operational mode selection

Press and hold the up key to change between operational modes.



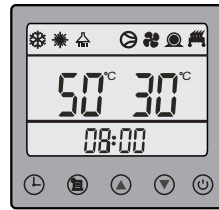
Hot water mode



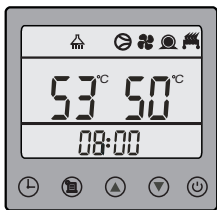
Heating mode



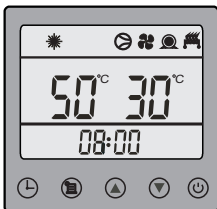
Cooling mode



Hot water +
Cooling +Heating
mode



Hot Water Mode: The temperature on the left side of the display is the hot water tank setpoint. The temperature on the right side of the display is the current temperature inside the hot water tank.



Heating/Cooling Mode: The temperature on the left side of the display is the indoor ambient setpoint. The temperature on the right side of the display is the inlet water temperature.

Switching between Celsius and Fahrenheit

Press and hold the function and power buttons at the same time to switch between types.

Clock Settings

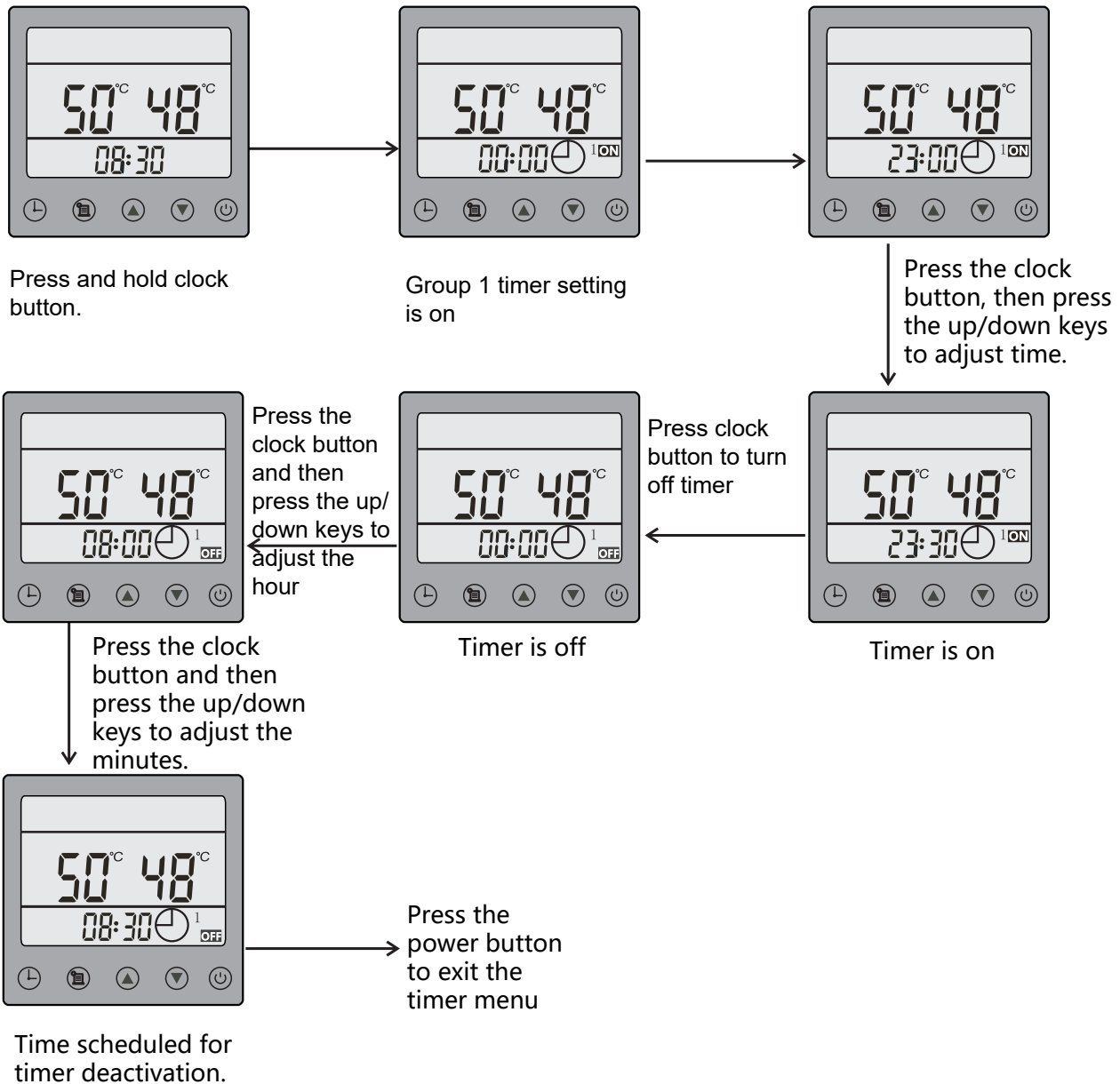
Press the clock button on the controller. The time on the display will flash. Press the clock button again to adjust the hour using the up/down keys and press the clock button again to adjust the minutes. When complete, press the clock button again to confirm and set the time.

Operational Parameters

Press the function button to enter the operational parameters menu. Use the up/down keys to cycle through the different parameters show on the chart below.

Display	Meaning	Display	Meaning
o1	Water tank temperature	A5	Main elec. expansion valves opening
o2	Water inlet temperature	A6	Condensing coil temperature
o3	Water outlet temperature	A7	Dc bus voltage
o4	Ambient temperature	A8	IPM modular temperature
o5	Reserved	A9	Real-time power
o6	Auxiliary electric expansin value opening	A10	Dc motor speed
A1	Discharge temperature	A11	High pressure value
A2	Coil temperature	A12	Low pressure value
A3	Suction temperature	A13	The input ac voltage
A4	The input ac current	A14	Actual frequency of compressor

Unit Timer Function (See diagram below)



Cancel Unit Timer

Press and hold the clock button until group 1 on the display is flashing, pressing the function button will cancel the timer.

Forced Defrost

In heating mode, press the down key and function key at the same time to run defrost mode.

Error Code Table

Error Code	Definition
E01	Discharge temperature sensor fault
E05	Outdoor coil temperature sensor fault
E09	Suction temperature sensor fault
E13	Condensing coil temperature sensor fault
E18	Outlet water temperature sensor fault
E19	Inlet water temperature sensor fault
E20	Buffer tank temperature sensor fault
E21	Controller communication fault
E22	Outdoor ambient temperature sensor fault
E26	Board to board communication fault (split unit)
E27	Driving board communication fault
E28	EE fault
E33	High pressure sensor fault
E34	Low pressure sensor fault
R01	IPM modular temperature too high
R02	Compressor start fault
R06	Compressor phase current protection
R10	AC voltage too high or too low
R11	DC voltage too high or too low
R13	IPM modular fault
R20	Compressor protection
P01	Water flow switch protection
P02	High pressure fault
P06	Low pressure fault
P11	Discharge temperature too high
P15	Inlet and outlet water delta T too high
P16	Outlet water temperature too low
P19	AC current protection
P27	Condensing coil temperature too high
P30	Condensing coil temperature too low
EA	EEV loop low pressure sensor fault
EB	High pressure protection
EC	Low pressure protection
ED	EEV low pressure protection
FA	DC fan motor protection
FE	Start pressure difference protection
FF	Running pressure difference protection
PA	Outlet water temperature too high
PC	Ambient temperature too high/low (heating mode) or too low/high (cooling mode)

