WEIL-McLAIN

Contractor Quick Decision Information for Installation Guide

ECO Tec and HP ECO heat pump combination

Capacity and COP per outdoor temperature:

The charts below show the capacity derate and COP for each of the 41, 48 & 55 MBH units at different outside temperatures (see delta T note below). This information is necessary for correct sizing of the heat pump for each unique installation design temperature.

Heating: Outside air temperature: 44.6°F			**41 MBH**	**48 MBH**	**55 MBH**
Outlet water temperature: 95°F	Capacity	Btu/h	41,283	49,471	54,589
	COP	W/W	4.95	4.70	4.50
Outlet water temperature: 113°F	Capacity	Btu/h	41,965	48,448	54,589
	COP	W/W	3.80	3.65	3.60
Outlet water temperature: 131°F	Capacity	Btu/h	40,942	47,083	54,589
	COP	W/W	3.10	3.00	2.90
Heating: Outside air temperature: 35.6°F			**41 MBH**	**48 MBH**	**55 MBH**
Outlet water temperature: 95°F	Capacity	Btu/h	31,730	38,895	44,353
	COP	W/W	3.95	3.65	3.50
Outlet water temperature: 113°F	Capacity	Btu/h	36,506	39,918	43,671
	COP	W/W	3.00	2.86	2.85
Outlet water temperature: 131°F	Capacity	Btu/h	38,895	42,306	45,718
	COP	W/W	2.55	2.45	2.40
Heating: Outside air temperature: 19.4°F			**41 MBH**	**48 MBH**	**55 MBH**
Outlet water temperature: 95°F	Capacity	Btu/h	34,118	40,942	45,377
	COP	W/W	3.00	2.80	2.70
Outlet water temperature: 113°F	Capacity	Btu/h	34,800	40,259	44,012
	COP	W/W	2.40	2.35	2.23
Outlet water temperature: 131°F	Capacity	Btu/h	34,118	37,530	42,648
	COP	W/W	2.05	2.05	2.02

NOTE:

1. The test flow rate for the above working conditions is determined based on a temperature difference of 9 F between the inlet and outlet water.
2. The gray-highlighted columns will be available on a later date. 55 MBH is the only heat-pump size currently available.

Weights and Dimensions:

		Weight	Height	Width	Thickness	Inlet H2O	Outlet H2O	Refrigerant liquid	Refrigerant vapor
Unit	**Unit type**	**(lbs)**	**(inches)**	**(inches)**	**(inches)**	**(connection)**	**(connection)**	**(connection)**	**(connection)**
ECO Tec	Boiler 80/110	141	33	19	20	1” NPT	1” NPT	N/A	N/A
	Boiler 150	162	33	19	20	1” NPT	1” NPT	N/A	N/A
	Boiler 199	178	33	19	20	1” NPT	1” NPT	N/A	N/A
ECO HP	Heat Pump-IDU	68	31-1/8	16-1/2	11-1/16	1” NPT	1” NPT	3/8”-18 UNF (flare)	5/8”-18 UNF (flare)
	Heat Pump-ODU	212	44	34-1/16	20-9/16	N/A	N/A	3/8”-18 UNF (flare)	5/8”-18 UNF (flare)

Notes

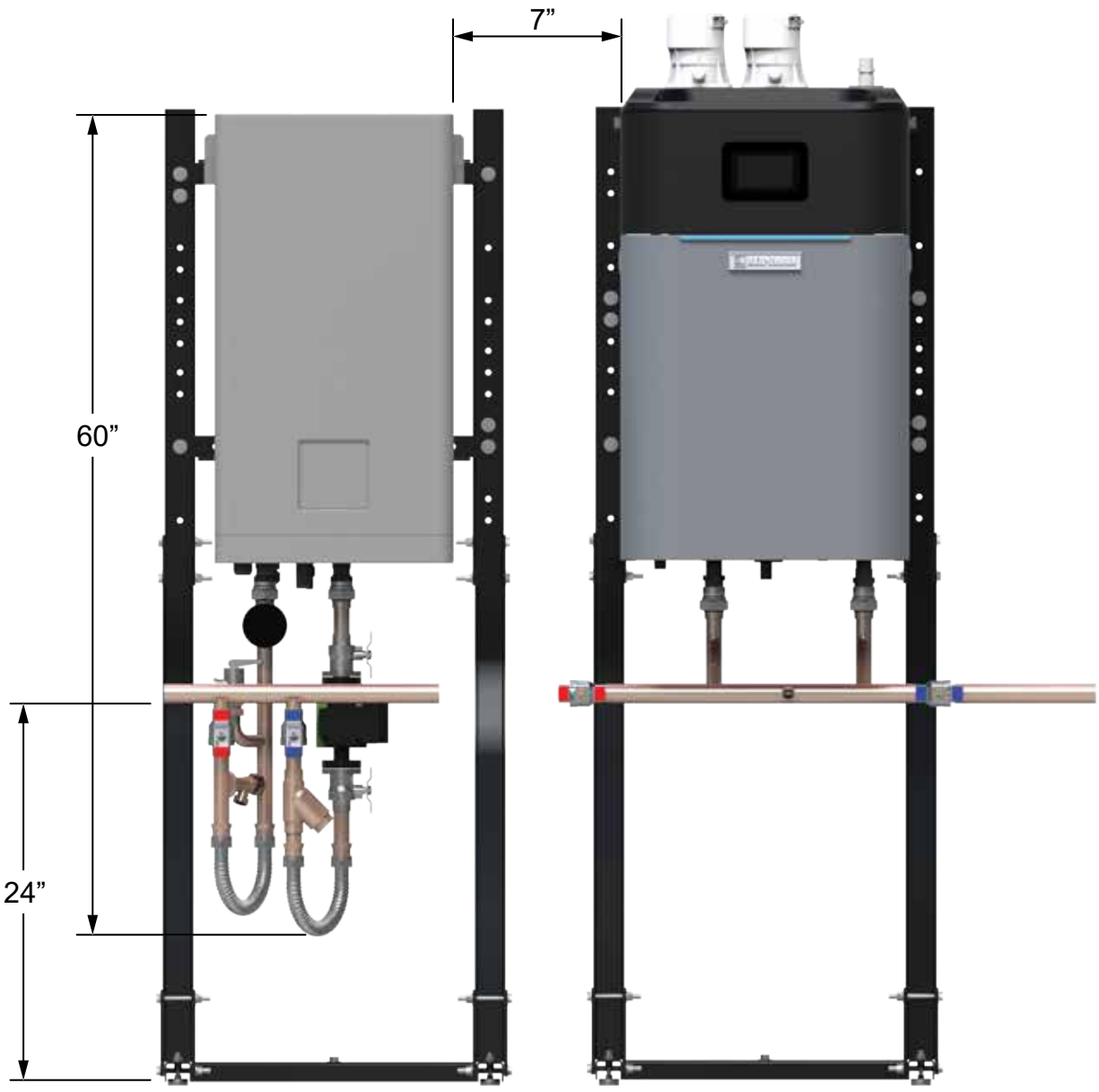
1. All weights are without water or refrigerant. Add 22 lbs of weight to the ECO Tec boiler weight if choosing a combi model.
2. Note: Refrigerant lines are standard 45-degree flares. It is recommended to use flare connection seals with the line set flare to avoid connection loosening over time from compressor and/or circulator vibration.

Indoor Unit Installation:

- The picture below represents an ECO HP heat pump and ECO Tec boiler on optional Weil-McLain floor stands. However, these two units could also be simply installed on a wall in the same fashion.
- The 60” dimension in the picture below shows the minimum distance required from the top of the ECO HP heat pump and the floor when using the optional ECO HP heat pump “Easy-up” manifold during the installation of the heat pump.
- If a shorter distance is required for a particular installation, strainer, pump, T&P gage, relief valve and drain valve can be configured without the use of the “Easy-up” manifold during the system piping process to accommodate a shorter distance. I minimum of 24” below the heat pump is required for service requirements.
- The heat trap shown by the inlet and outlet piping below the system manifold in the optional “Easy-up” manifold of the heat pump is an industry best practice to avoid reserved heat loss from the unit during non-operation which will lead to overall loss of system operating efficiency. It is highly recommended but not required.

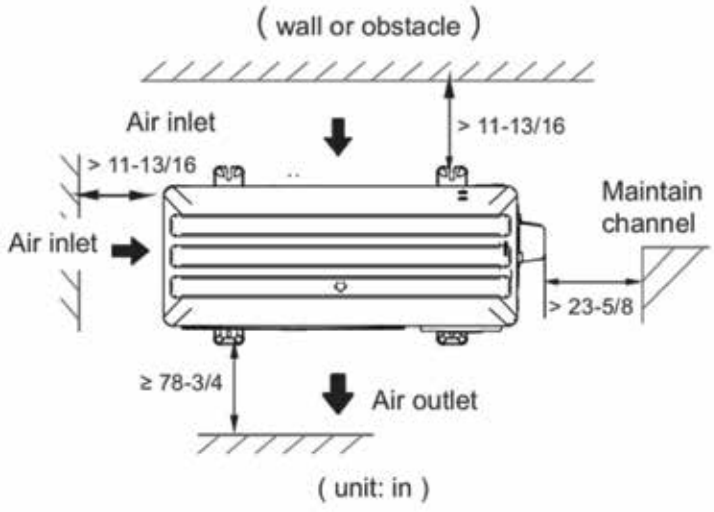
Note: The picture displays the boiler and heat pump side-by-side on aligned-stands or a flat wall aligned to each units-optional “Easy-up” manifold for ease of installation. However, depending on the installation scenario the units can be situated at different heights and different distances apart and on different wall planes as long as both units are installed vertically in the system piping installation.

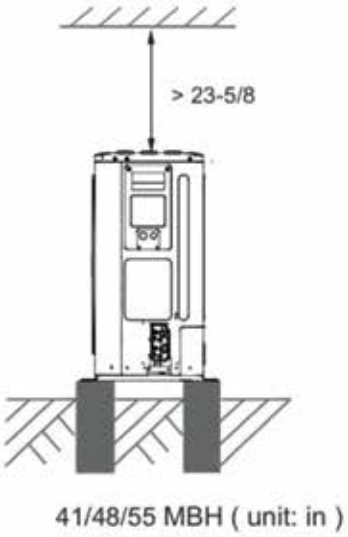
Dimensions shown are minimum distances for installation purposes.

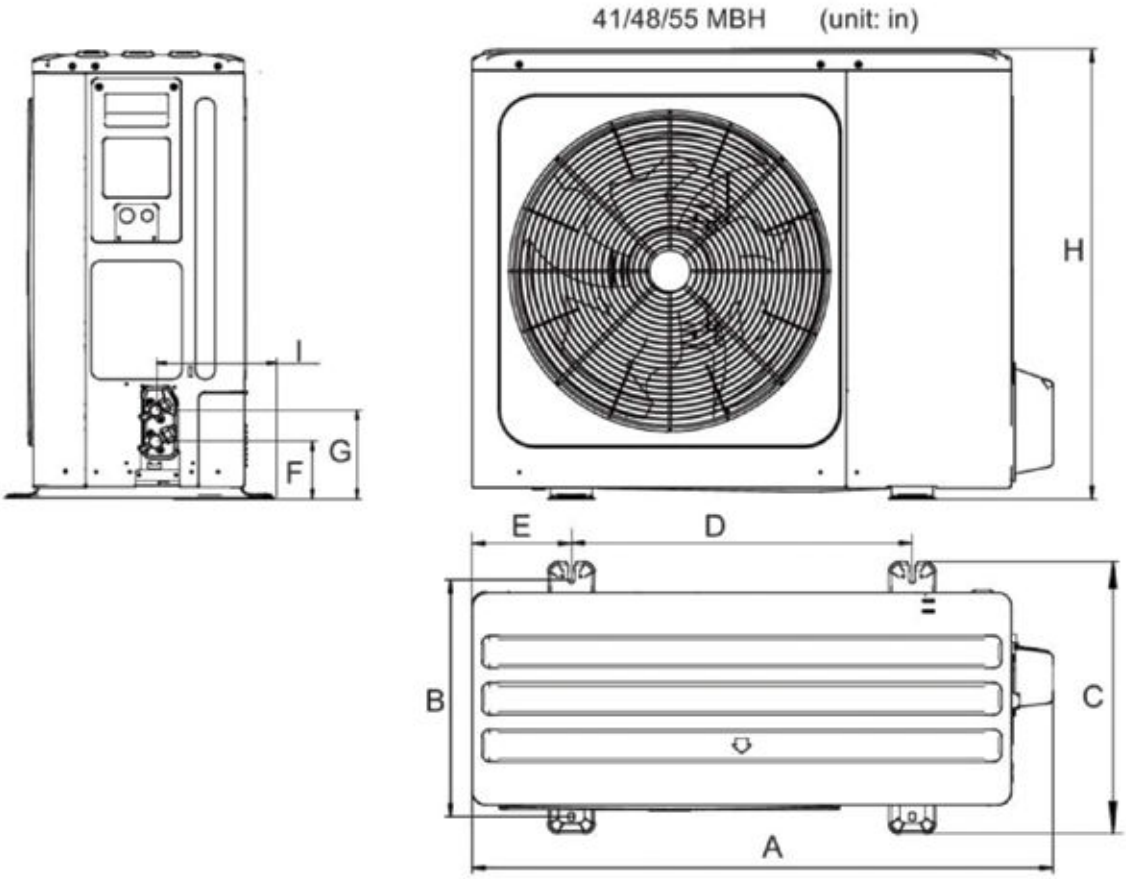


Outdoor Unit Installation:

- **The outdoor unit of the heat pump will require a stand or wall mount bracket that can securely fasten the unit outside. See figures below for minimum distances to air flow obstacles. This stand or bracket is field-supplied by others.**
- The dimensions of the four fastening locations required to secure the outdoor unit in its vertical position can be found in the figures below.



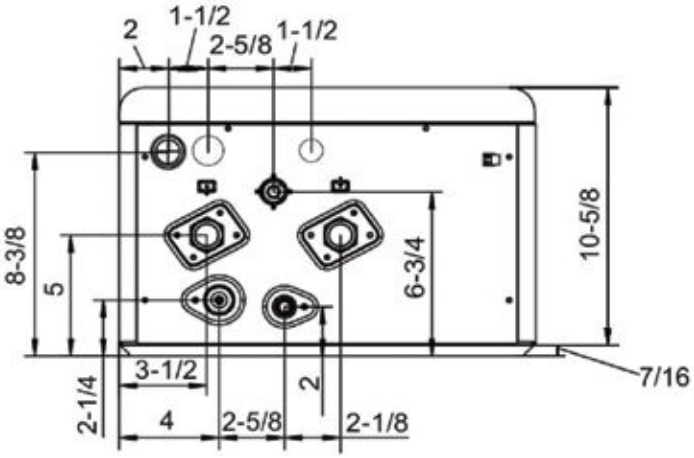


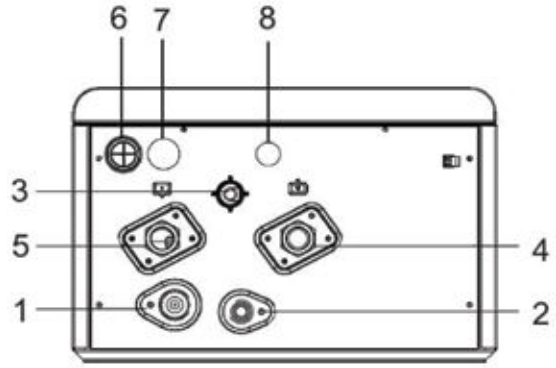


Model	A	B	C	D	E	F	G	H	I
41/48/55 MBH	44	17-7/8	20-9/16	15-13/16	7-9/16	4-5/16	6-11/16	34-1/16	9-1/16

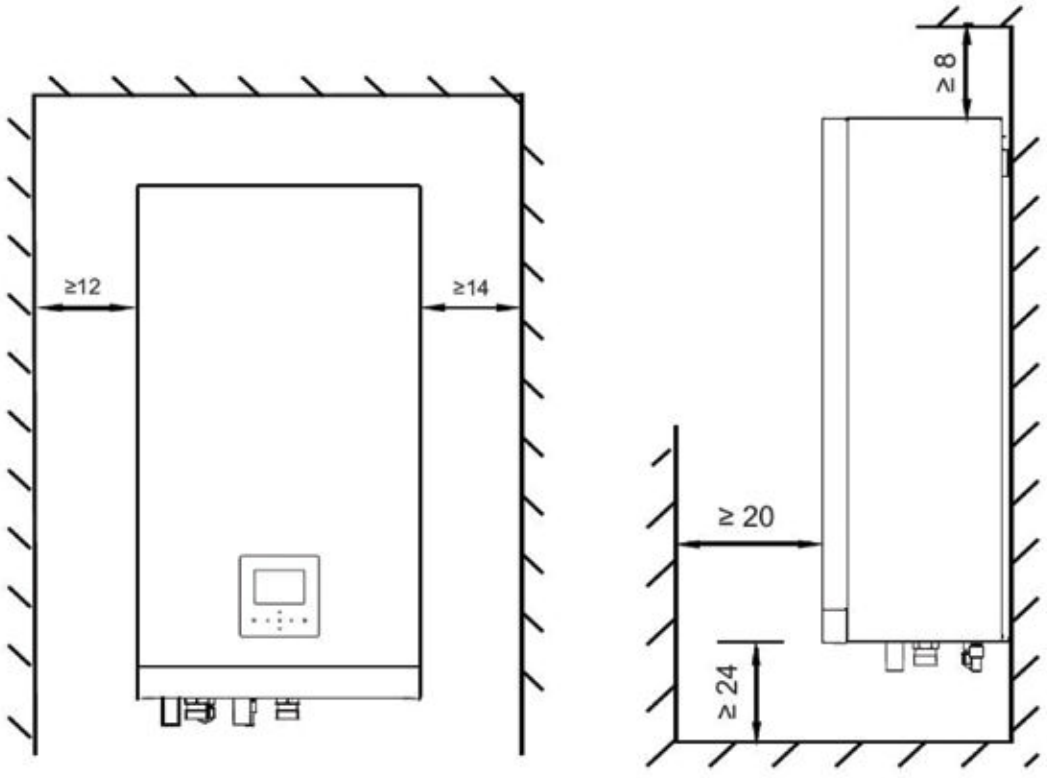
System Connections – ECO HP Heat Pump

No	Name
1	Refrigerant gas pipe size 5/8”, connection size 7/8”-14UNF
2	Refrigerant liquid pipe size 3/8”, connection size 5/8”-18UNF
3	Drain 1”
4	Water Inlet 1” NPT
5	Water Outlet 1” NPT
6	Wiring hole for 3/4” conduit
7	Wiring hole for 3/4” conduit
8	Wiring hole for 1/2” conduit





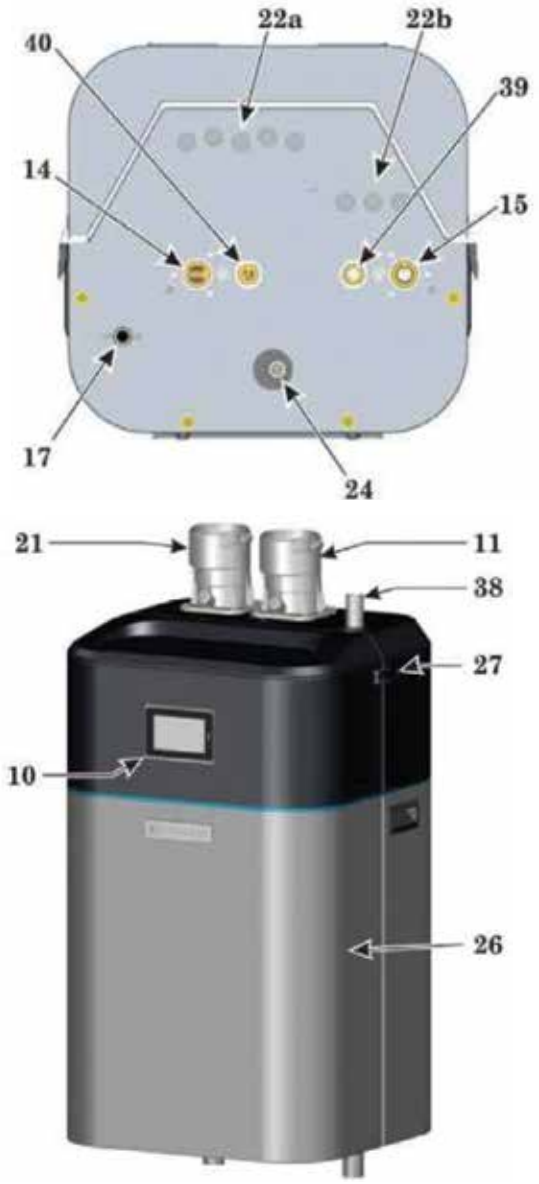
Recommended Servicing Space



unit:in

System Connections – ECO Tec Boiler

No	Name
10	Electronic Display
11	Flue adapter 3” PVC, 3” PP, 3” SS
14	Boiler water outlet pipe 1” male NPT
15	Boiler water inlet pipe 1” male NPT
17	Gas line 1/2” male NPT
21	Air Intake 3” PVC, 3” PP, 3” SS
22a	Electrical conduit hole (line voltage)
22b	Electrical conduit hole (low voltage)
24	Condensate tube
26	Jacket door
27	Door latches
38	Water pipe 3/4” male NPT
39	DHW Inlet (combi only) 3/4” male NPT
40	DHW Outlet (combi only) 3/4” male NPT



Refrigerant Charge Requirements:

- **Reminder that standard US 3/8 & 5/8 liquid/gas refrigerant lines are required and sold separately.** Local HVAC distributors will have these standard line sets available in both un-flared and pre-flared versions dependent on the installer’s preference.
- The ODU of the heat pump is pre-charged with 4.04-lbs of R32 refrigerant.
- This amount of refrigerant allows installation of the IDU and ODU combination with a line set length of 49.2 feet or shorter without adding refrigerant charge. If a line set length greater than 49.2 feet is required, please contact Weil-McLain about additional site installation requirements for systems requiring refrigerant charge above the 4.04-lbs.

Control Logic Between the Boiler and Heat Pump:

- The boiler or the heat pump can both be the master control of the hydronic system
- Depending on the system and type of boiler and boiler control, there are pros and cons to the boiler and heat pump order within the system flow.

General Boiler and Heat Pump System Piping Example

- The piping example below shows the combi version of the ECO Tec boiler.
- Weil-McLain requires that the heat pump be installed before the boiler in the water flow of the system. This avoids much higher boiler temperatures disrupting the control logic temperatures of the heat pump and creating a potentially less efficient hydronic system. (Refer to the heat pump application guide and specific boiler manual for non-ECO Tec boiler system design examples)

System Type A

Application A2: Multi-zone Space Heating, Boiler only DHW

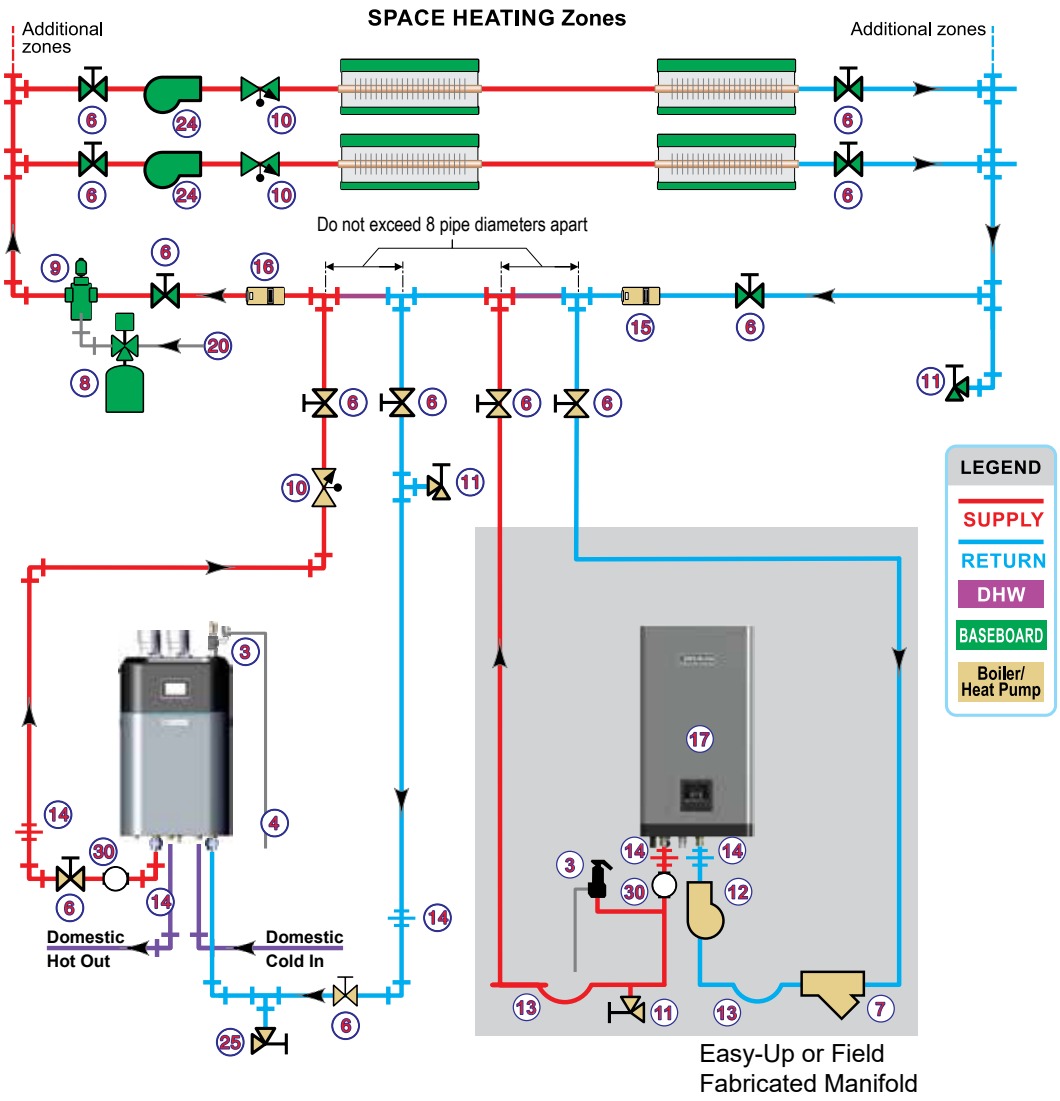
Application Piping

Legend

1. ■ Boiler.
2. Indirect water heater, if used (domestic water piping not shown).
3. ■ Relief valve, supplied with boiler and heat pump, field piped.
4. Relief valve piping to drain.
5. DHW circulator.
6. Isolation valves.
7. ■ Y-Strainer with 80 mesh screen.
8. Expansion tank.
9. Air separator.
10. Flow/check or spring check valves.
11. Purge/drain valves.
12. ■ Heat pump circulator.
13. Heat trap.
14. Unions as needed for service.
15. Return temperature sensor.
16. Supply temperature sensor.
17. ■ Eco™HP Heat Pump
20. Make-up water supply.
23. DHW Temperature and Pressure relief valve
24. Zone circulators.
25. ■ Boiler or heat pump drain valve, supplied with boiler or heat pump, field piped.
26. Zone Valves.
27. Bypass pressure regulator
30. ■ Pressure/temperature gauge, supplied with boiler and heat pump, field piped.

■ = Items supplied with boiler or heat pump - all other Items supplied by installer.

Figure 1 Application A2: Multi-zone Space Heating, Boiler only DHW Application Piping



General Boiler and Heat Pump System Piping Example (continued)

- The piping example below shows a heat-only version of the ECO Tec boiler.
- Weil-McLain requires that the heat pump be installed before the boiler in the water flow of the system. This avoids much higher boiler temperatures disrupting the control logic temperatures of the heat pump and creating a potentially less efficient hydronic system. (Refer to the heat pump application guide and specific boiler manual for non-ECO Tec boiler system design examples)

System Type B

Application B3: Multi-zone Space Heating boiler only DHW

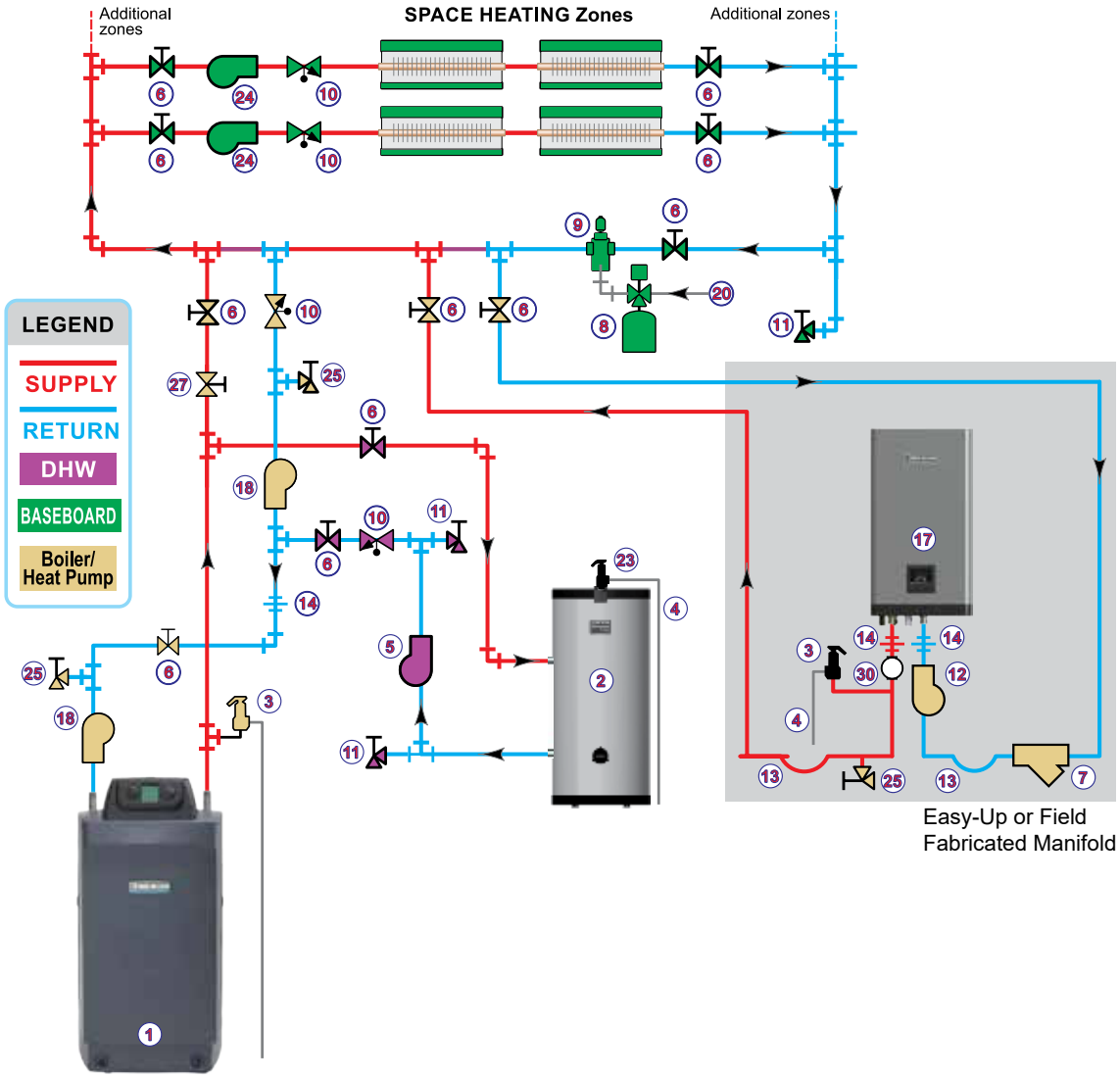
Application Piping

Legend

1. ■ Boiler.
2. Indirect water heater, if used (domestic water piping not shown).
3. ■ Relief valve, supplied with boiler and heat pump, field piped.
4. Relief valve piping to drain.
5. DHW circulator.
6. Isolation valves.
7. ■ Y-Strainer with 80 mesh screen.
8. Expansion tank.
9. Air separator.
10. Flow/check or spring check valves.
11. Purge/drain valves.
12. ■ Heat pump circulator.
13. Heat trap.
14. Unions as needed for service.
17. ■ Eco™HP Heat Pump
18. ■ Boiler Circulator
20. Make-up water supply.
23. DHW Temperature and Pressure relief valve
24. Zone circulators.
25. ■ Boiler or heat pump drain valve, supplied with boiler or heat pump, field piped.
26. Zone Valves.
27. Bypass pressure regulator
30. ■ Pressure/temperature gauge, supplied with boiler and heat pump, field piped.

■ = Items supplied with boiler or heat pump - all other Items supplied by installer.

Figure 2 Application B3: Multi-zone Space Heating boiler only DHW Application Piping



General Boiler and Heat Pump System Piping Example (continued)

- The piping example below shows a heat-only version of the ECO Tec boiler.
- Weil-McLain requires that the heat pump be installed before the boiler in the water flow of the system. This avoids much higher boiler temperatures disrupting the control logic temperatures of the heat pump and creating a potentially less efficient hydronic system. (Refer to the heat pump application guide and specific boiler manual for non-ECO Tec boiler system design examples)

System Type A

Application A1: Multi-zone space heating, DHW as zone

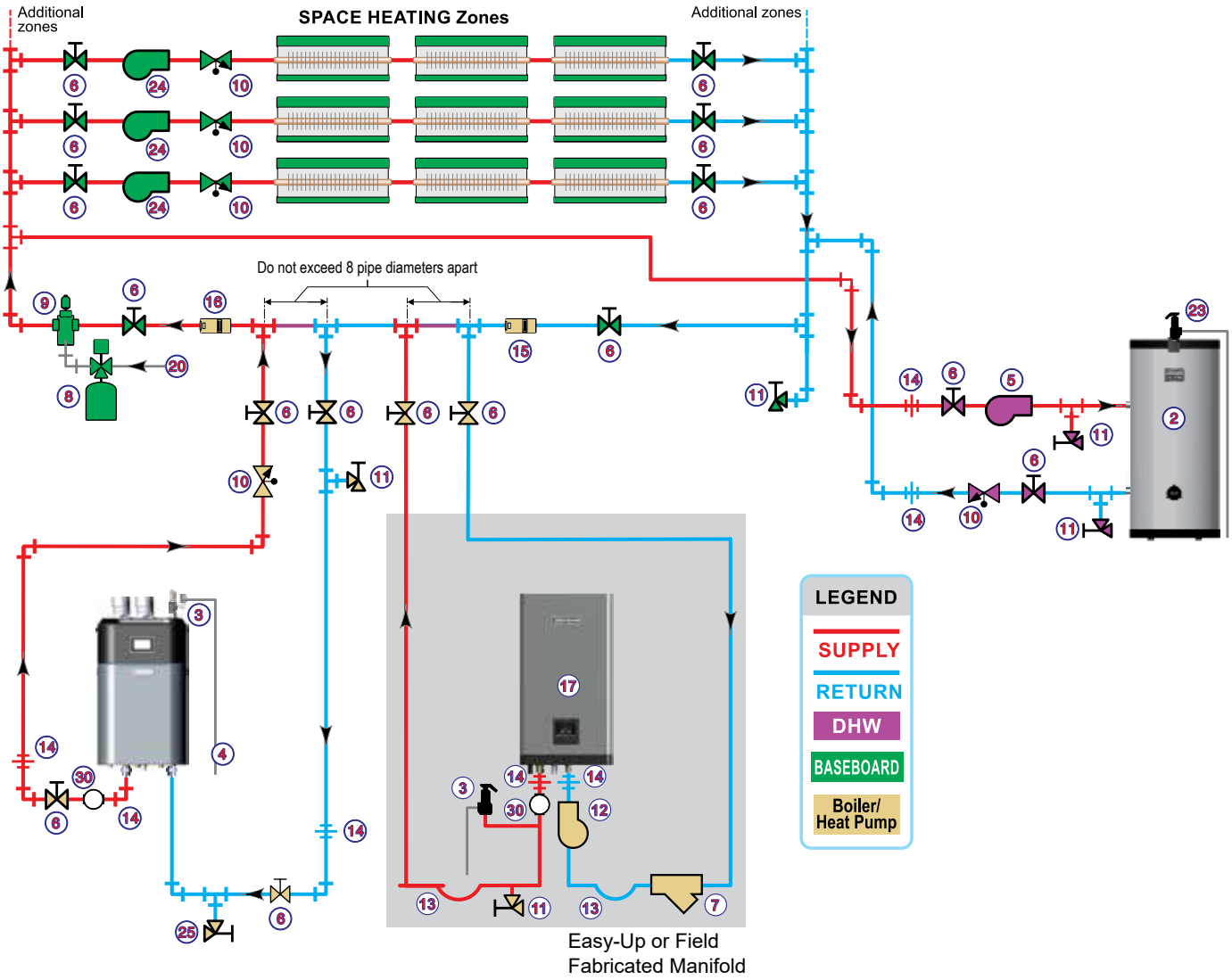
Application Piping

Legend

1. ■ Boiler.
2. Indirect water heater, if used (domestic water piping not shown).
3. ■ Relief valve, supplied with boiler and heat pump, field piped.
4. Relief valve piping to drain.
5. DHW circulator.
6. Isolation valves.
7. ■ Y-Strainer with 80 mesh screen.
8. Expansion tank.
9. Air separator.
10. Flow/check or spring check valves.
11. Purge/drain valves.
12. ■ Heat pump circulator.
13. Heat trap.
14. Unions as needed for service.
15. Return temperature sensor.
16. Supply temperature sensor.
17. ■ Eco™HP Heat Pump
20. Make-up water supply.
23. DHW Temperature and Pressure relief valve
24. Zone circulators.
25. ■ Boiler or heat pump drain valve, supplied with boiler or heat pump, field piped.
26. Zone Valves.
27. Bypass pressure regulator
30. ■ Pressure/temperature gauge, supplied with boiler and heat pump, field piped.

■ = Items supplied with boiler or heat pump - all other Items supplied by installer.

Figure 3 Application A1: Multi-zone space heating, DHW as zone Application Piping



General Boiler and Heat Pump System Piping Example (continued)

- The piping example below shows a heat-only version of the ECO Tec boiler.
- Weil-McLain requires that the heat pump be installed before the boiler in the water flow of the system. This avoids much higher boiler temperatures disrupting the control logic temperatures of the heat pump and creating a potentially less efficient hydronic system. (Refer to the heat pump application guide and specific boiler manual for non-ECO Tec boiler system design examples)

System Type B

Application B1: Multi-zone space heating DHW as zone, boiler direct piped

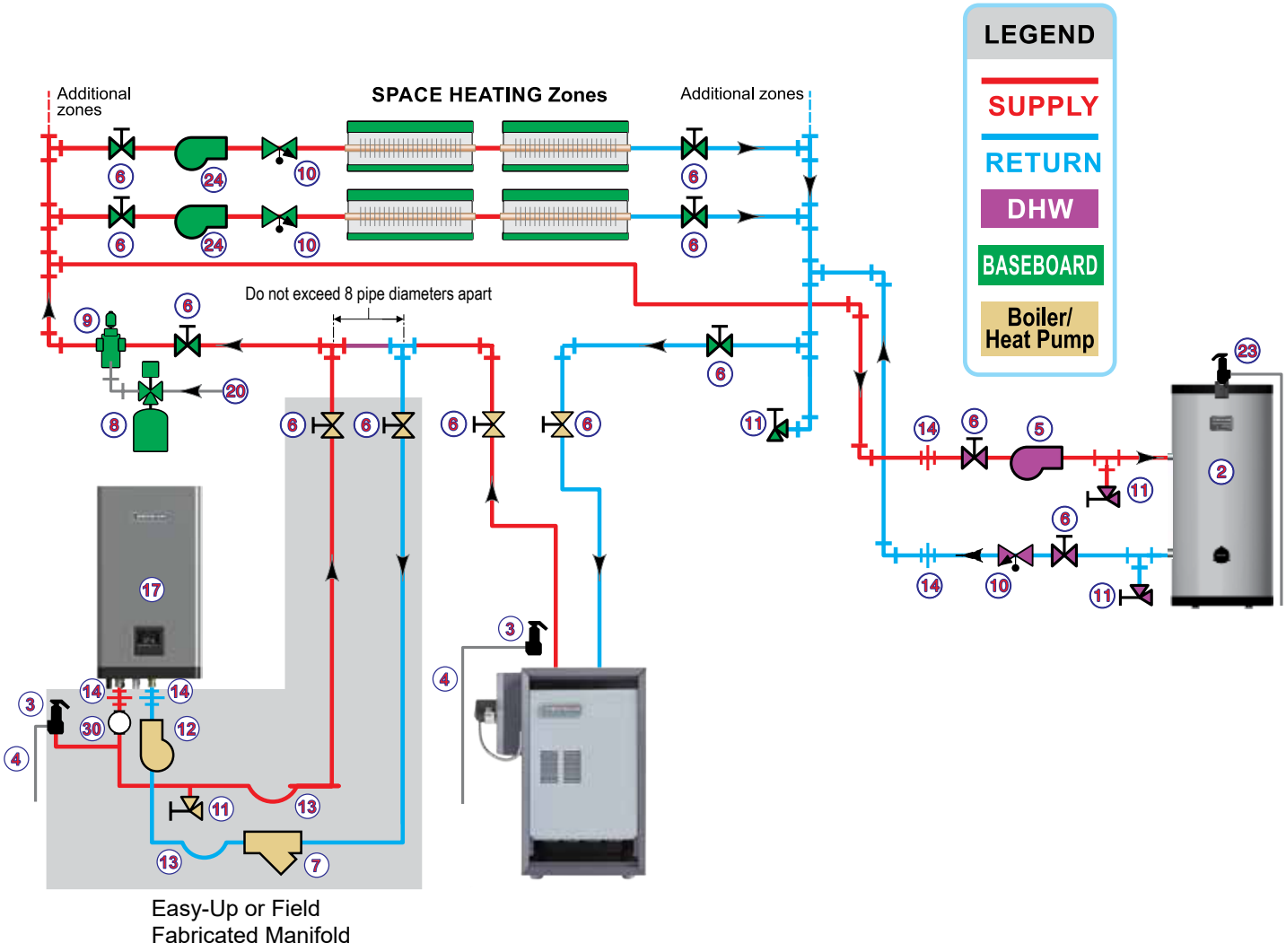
Application Piping

Legend

1. ■ Boiler.
2. Indirect water heater, if used (domestic water piping not shown).
3. ■ Relief valve, supplied with boiler and heat pump, field piped.
4. Relief valve piping to drain.
5. DHW circulator.
6. Isolation valves.
7. ■ Y-Strainer with 80 mesh screen.
8. Expansion tank.
9. Air separator.
10. Flow/check or spring check valves.
11. Purge/drain valves.
12. ■ Heat pump circulator.
13. Heat trap.
14. Unions as needed for service.
17. ■ Eco™HP Heat Pump
20. Make-up water supply.
23. DHW Temperature and Pressure relief valve
24. Zone circulators.
25. ■ Boiler or heat pump drain valve, supplied with boiler or heat pump, field piped.
26. Zone Valves.
27. Bypass pressure regulator
30. ■ Pressure/temperature gauge, supplied with boiler and heat pump, field piped.

■ = Items supplied with boiler or heat pump - all other Items supplied by installer.

Figure 4 Application B1: Multi-zone space heating DHW as zone, boiler direct piped Application Piping



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