CLOSED LOOP WATER SOURCE HEAT PUMP SYSTEM

- Ideal for Low-temperature Systems
- High Recovery, High Efficiency
- Thermal Shock Proof
- Outdoor / Indoor
- Lightweight

Why use Raypak for heat pump applications?

Water source heat pump applications utilize low system return temperatures, and most boiler designs, such as cast iron and smooth tube, can not operate with system temperatures below 140°F without condensing. When a boiler condenses, soot is formed which builds up on the heat exchanger and burners and reduces its thermal efficiency. This results in a noticeable loss of performance, higher service and maintenance costs, and shortened boiler life.

Raypak boilers use copper finned tubes that can operate at temperatures as low as 105°F without condensing. Most other boilers must operate above 140°F to avoid condensation. This means that a Raypak boiler can provide added years of reliable service with less maintenance in a much wider range of applications.

FAST RESPONSE

Raypak copper finned tube boilers are much smaller and lighter than any other boiler design. The operating weight can be up to 35 times lighter due to water content alone! Typical water content in a 624 MBH boiler is:

Raypak	1.4 gallons
Smooth tube	50.0 gallons
Cast Iron	55.0 gallons

As you can see, a Raypak boiler has minimal water content thus requiring no pick-up load factors. A hydronic system with a responsive Raypak boiler will operate more efficiently and under better control at all times.

THERMAL SHOCK PROOF

Another prime concern of low-temperature hydronic systems is thermal shock. Thermal shock takes place when the system temperature undergoes a rapid temperature change. Both cast iron and multi-row, smooth tube boilers are not designed to withstand thermal shock, and thermal shock damage is not covered under warranty. Raypak's single-row heat exchanger and floating return header design is guaranteed against thermal shock for 20 years from the date of installation. (For complete warranty information see Catalog No. 1900.10.)

COMPLETE PRODUCT LINE

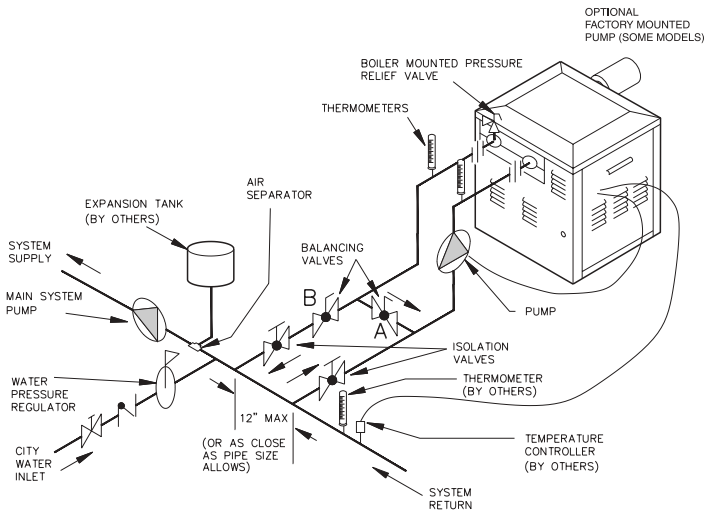
Raypak has three models of boilers for Heat Pump applications: the atmospheric; the sealed combustion Hi Delta™; and, the sealed combustion, high efficiency Advanced Design Boiler.

With over 50 years of industry experience and a proven reputation for high quality, reliable products, Raypak is truly your "Hot Water Management Expert!"

Raypak®
A Rheem® Company

Catalog No. 2000.32 J Effective: 2-15-03 Replaces: 11-15-99

Closed Loop Water Source Heat Pump



Fig# 9267.1

To properly adjust boiler temperatures for this application:

1. Select the proper size of boiler based on the BTU requirement to meet the maximum boiler load of the water loop system.
2. Use boiler Type H4 (on/off). For Hi Delta 502 and larger, convert the stage firing to on/off by connecting a single-stage aquastat to stage 1 and connecting jumpers to stages 2 and up.
3. For the pipe connecting the boiler and the system loop main, select a size that is at least equal to the inlet/outlet header connections of the boiler.
4. Install recommended boiler pump (from chart).
5. Check that both isolation valves are open.
6. Adjust Balancing Valve **A** 1/2 open and Balancing Valve **B** fully open.
7. Fire the boiler and adjust Balancing Valve **A** to obtain a boiler inlet temperature approximately 50°F greater than the system loop return temperature. (Turning Valve **A** in the open direction will raise the boiler inlet temperature and closing Valve **A** will lower the boiler inlet temperature.) **Note: Boiler inlet should never be less than 105°F.**
8. If the boiler inlet temperature remains less than 50°F higher than system loop return temperature and Valve **A** is fully open, leave Valve **A** fully open and throttle Valve **B** until the boiler inlet temperature rises to be 50°F higher than system loop return temperature.
9. Main loop and boiler temperatures should be checked regularly throughout the heating season to prevent boiler condensation. If balancing valves are adjusted at the coldest loop temperature (typically 50°F) and the boiler inlet temperature adjusted to 105°F, then the entire heating season should have proper boiler operation. The boiler inlet temperature can be higher than 105°F without boiler damage, but operating at less than 105°F inlet can cause damage from condensation.

MODELS	RECOMMENDED PUMP TACO (or equivalent)
RAYTHERM™	
183-403	0012-1/7 Hp
514-624	120-1/6 Hp
724-824	1600-1/4 Hp
926-1125	1630-1/2 Hp
1178-1826	1632-3/4 Hp
2100-4001	1638-2 Hp
HI DELTA™	
302-502	120-1/6 Hp
652-752	1600-1/4 Hp
902-992	1630-1/2 Hp
1262	1632-3/4 Hp
1532-1802	1634-1 Hp
2002-2342	1634-1 Hp
ADB™	
500-750	1600-1/4 Hp
1000	1630-1/2 Hp

This chart provides a pump with sufficient head to work with approximately 50 equivalent feet of piping from the boiler, to the system, and back to the boiler. For example, the boiler may be 5 feet from the main system piping and have four elbows. (Assuming an elbow has 10 equivalent feet, this would be 40 feet + 5 + 5 = 50 feet).

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