



Providing Solutions through Superior Design.

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Hydronic Buffer Tanks

Increase System Efficiency

- Eliminate Short Cycling
- Hydraulically Separate the Source from the Distribution System
- Available in 22, 40, 60, 80, and 115 gallons.
- Choice of Fitting Sizes: 1-1/4", 1-1/2", or 2"

Heat-Flo
HEATING PRODUCTS



Conforms to UL STD 174 and NSF/ANSI 372
Certified to CAN/CSA STD C22.2 No. 110-94

Hydronic Buffer Tanks

Application: Geothermal Heat Pumps/ Chillers/ Low Mass Boilers

The primary application of a buffer tank is to reduce heat pump, chiller, or boiler short cycling. Hydronic buffer tanks are used in systems operating below the design load condition, which is most of the time, or in systems having several low BTU cooling or heating loads calling at different times. This can cause the chiller or heater to short cycle, resulting in reduced operating efficiency and shorter equipment life.

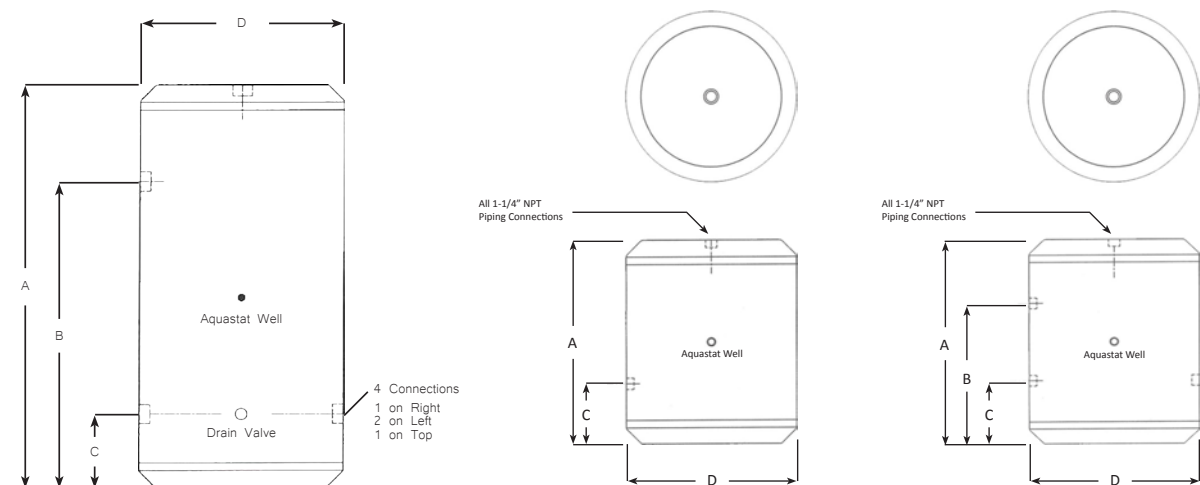
The hydronic buffer tanks are built with 4 connections. Two connections can be piped to the chiller or boiler, and two connections can be piped to the distribution system. If piped correctly, the tank can serve as both a thermal buffer and a hydraulic separator. The chiller or boiler can be hydraulically decoupled from the distribution system. The tanks are all 316L stainless steel construction with R-12 insulation and an ABS jacket. Buffer tanks are available in 22, 40, 60, 80, and 115 gallon capacities.

A 3/8" ID thermal well is located mid-tank. Thermistors can be inserted 3" into the well, or the well will accept the Honeywell L4006A Controls.

Buffer tanks are available in 22, 40, 60, 80, and 115 gallon capacities.

Specify 1-1/4", 1-1/2", or 2" connections.

Model	Storage Volume (Gal.)	Dimensions (Inches)				Piping Connections (NPT)	Max. Tank Working Pressure (psi)	Approx. Shipping Wt. (Lbs.)
		A. (Ht.)	B.	C.	D. (Dia.)			
HF-22-BT-2	22	24.5	--	8.0	22.5	1-1/4"	60	35
HF-22-BT-4	22	24.5	15	8.0	22.5	1-1/4"	60	35
HF-40-BT-114	40	42.0	31.0	11.0	23.5	1-1/4"	60	87
HF-40-BT-112	40	42.0	31.0	11.0	23.5	1-1/2"	60	87
HF-40-BT-2	40	42.0	31.0	11.0	23.5	2"	60	87
HF-60-BT-114	60	44.0	31.5	11.5	28.0	1-1/4"	60	115
HF-60-BT-112	60	44.0	31.5	11.5	28.0	1-1/2"	60	115
HF-60-BT-2	60	44.0	31.5	11.5	28.0	2"	60	115
HF-80-BT-114	80	54.0	40.5	11.5	28.0	1-1/4"	60	125
HF-80-BT-112	80	54.0	40.5	11.5	28.0	1-1/2"	60	125
HF-80-BT-2	80	54.0	40.5	11.5	28.0	2"	60	125
HF-115-BT-114	115	72.0	61.5	11.5	28.0	1-1/4"	60	160
HF-115-BT-112	115	72.0	61.5	11.5	28.0	1-1/2"	60	160
HF-115-BT-2	115	72.0	61.5	11.5	28.0	2"	60	160



Buffer Tank Sizing: Calculating Capacity

The Heat-Flo buffer tanks are a simple, cost effective way to improve overall system efficiency by reducing unnecessary equipment short cycling. The recommended capacity or volume of a buffer tank is based on four variables:

- The duration of the heating or cooling source "on time." (Minutes)
 - The desired length of "on time" for each run cycle depends on the type of equipment used. Heat pump and chiller manufacturers typically recommend a minimum of 5 to 10 minutes "on time," and boiler manufacturers may recommend a minimum of 10 minutes "on time." Check with your equipment manufacturer. Generally, the longer the "on time," the higher the overall operating efficiency.
- The minimum rate of heat input. (BTU/ HR)
 - This is based on the heat pump or chiller output, or the boiler output at the minimum firing rate if the boiler has a variable input system that ramps input down as the demand decreases.
- The minimum system load (BTU/ HR)
 - This is the demand place on the system with the smallest zone calling for heat.
- The allowable tank temperature rise. (Deg. F)
 - This varies depending on the type of heating or cooling system used, and on the design of the distribution system. Chillers may require a tight (6 deg. F) differential to assure good dehumidification and prevent freezing; heat pumps may require a 10 deg. F differential to maintain a high COP; and boilers with hydronic heating distribution systems may require a differential anywhere between 10 to 40 deg. F depending on the application.

The following formula determines the tank volume:

$$V = \frac{T \times (Q \text{ heat input} - Q \text{ min. heat load})}{\text{Tank temp. rise} \times 500}$$

V = Buffer Tank Volume (Gallons)

T = Desired Heat Source "on cycle" (Min.)

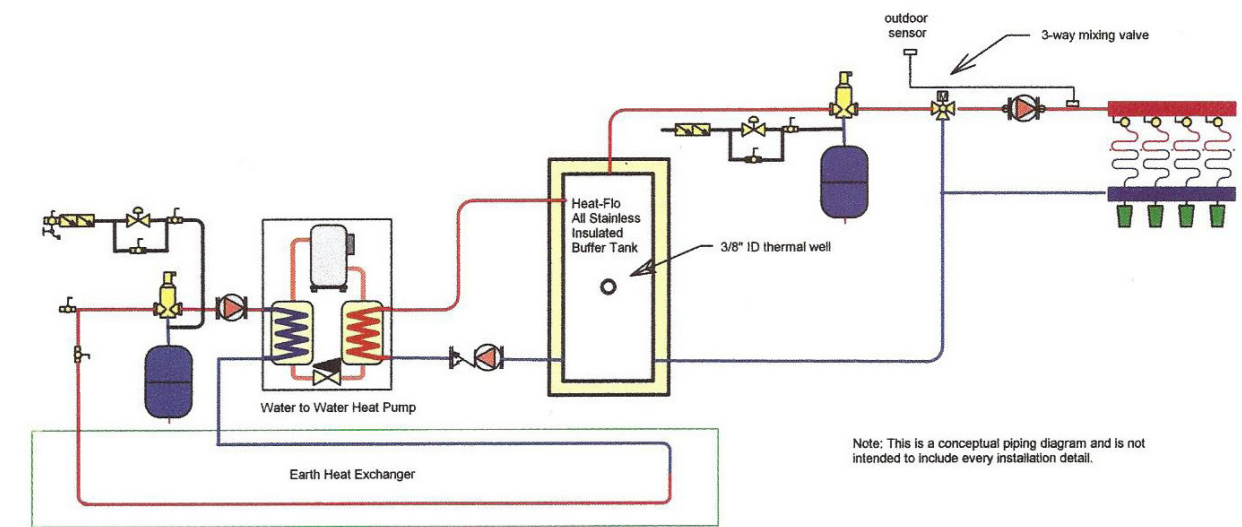
Q Heat Source = Heat Source Output to Minimum Load

Q Min. Heat Load = Heat Output to Minimum Load

Tank Temp. Rise (deg. F)

Water to Water Heat Pump Example: Town and Country Mechanical wants a minimum heat pump on time of 10 minutes. The heat pump output is 46,500 BTU/ HR. The smallest zone is a 7,000 BTU/ HR bathroom. The allowable temperature differential is 90 to 100 deg. F for the radiant heat zones.

$$V = \frac{10 \times (46,500 - 7,000)}{(100-90) \times 500} = 79.0 \text{ Gallons minimum volume. Choose the HF-80-BT buffer tank.}$$



Hydronic Buffer Tank applied to Water source heat pump application