



BUFFER TANKS

ASME Commercial Buffer Tanks



For Closed Loop Systems



BUFFER TANKS

Amtrol ASME Buffer Tanks add capacity to non-potable, closed systems to help reduce cycling, improve temperature control and provide more consistent system operation.

Available for chilled water and hot water applications, these Buffer Tanks are all made in the USA at our ISO 9001:2008 registered facilities.



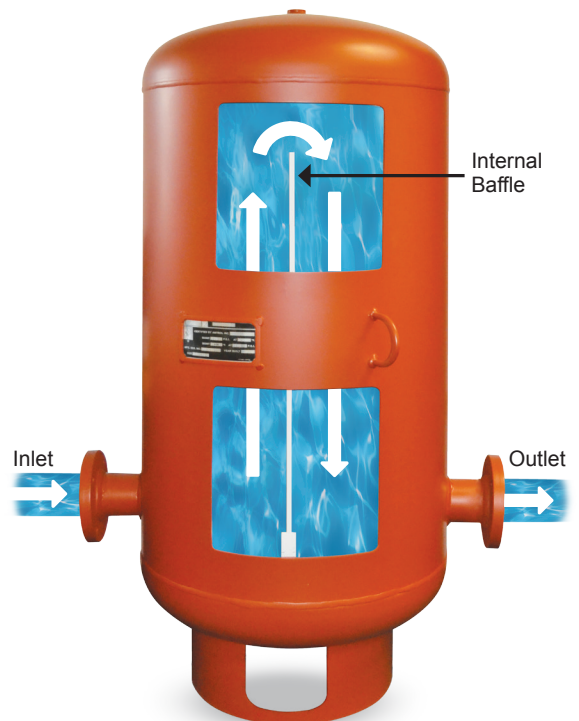
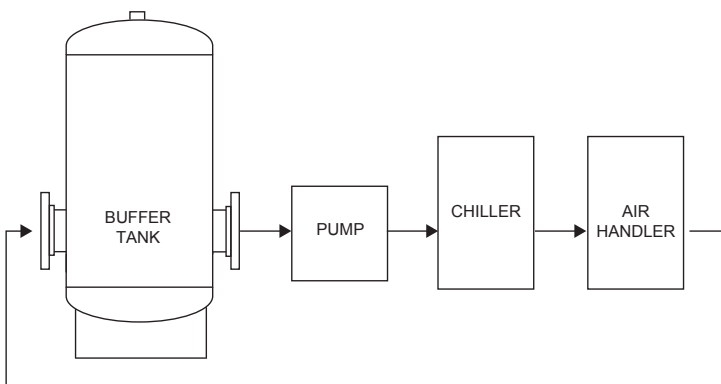
Chilled Water Buffer Tank CWBT Series

- Meets all ASME Section VIII, Division I standards.
- Available up to 1,040 gallons.
- Connections from 3" to 12".
- Internal baffle helps properly circulate water.
- Maximum Working Pressure: 125 or 150 psig.
- Maximum Operating Temperature: 450° F.

How It Works

Water enters the buffer tank and is diverted up and over the internal baffle to circulate the water and take full advantage of the tank volume.

Typical Installation



for Chilled and Hot Water Systems



Hot Water Buffer Tank HWBT Series

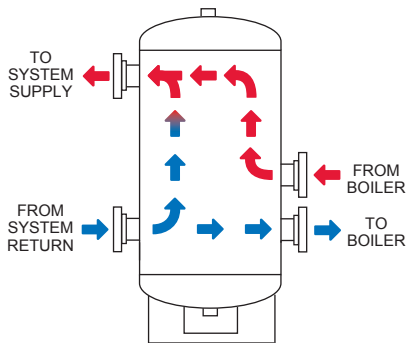
- Meets all ASME Section VIII, Division I standards.
- Available in 2 or 4 port options.
- Available up to 300 gallons.
- Available in 2", 3" & 4" connections.
- Maximum Working Pressure: 125 or 150 psig.
- Maximum Operating Temperature: 450° F.

How It Works

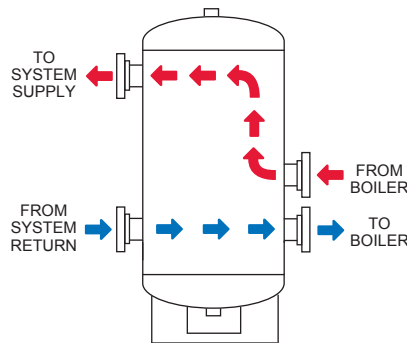
Tank provides added capacity in high efficiency systems that incorporate small, modular, low-mass condensing boilers.

- 4-port tanks allow for primary / secondary flow through the vessel. This is usually required for systems with multiple small or low volume zones to maximize boiler efficiency and overall system performance.
- 2-port tanks are typically used in standard applications where all zones are similarly sized.

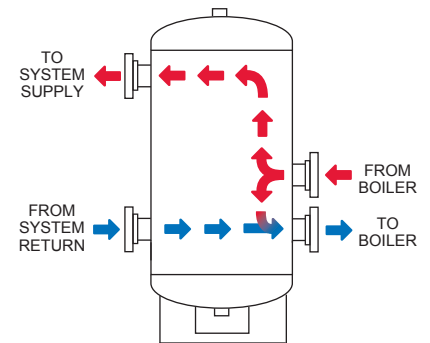
System Flow > Boiler Flow



System Flow = Boiler Flow

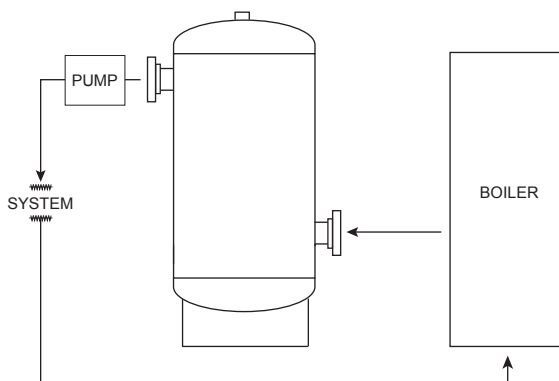


System Flow < Boiler Flow

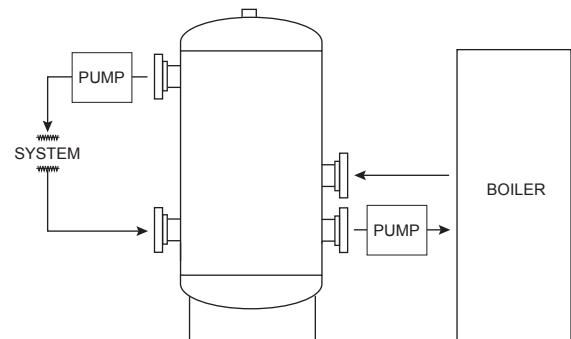


Typical Installations

2 Port Installation



4 Port Installation



Sizing Hot Water Buffer Tanks

For Adding Capacity to Closed, Non-Potable Hot Water Systems

Required Information

- Boiler Cycle Time (minutes)
- Minimum Boiler Output (BTU/hr)
- Minimum System Load (BTU/hr)
- Temperature Differential (°F)

Example:

Boiler Cycle Time: 5 minutes
 Minimum Boiler Output: 200,000 BTU/s
 Minimum System Load: 25,000 BTU/s
 Temperature Differential: 170° - 180° = 10° F
 Pipe Size: 2"
 Relief Valve: 50 PSI

$$\frac{5 (200,000 - 25,000)}{10 \times 500} = 175 \text{ Gallons}^*$$

Recommendation: HWBT200-2-125

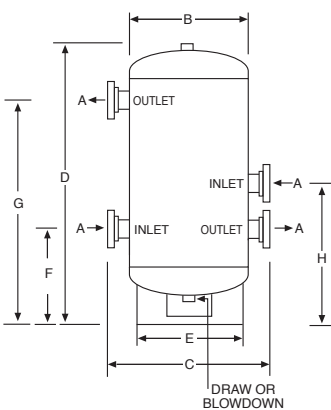
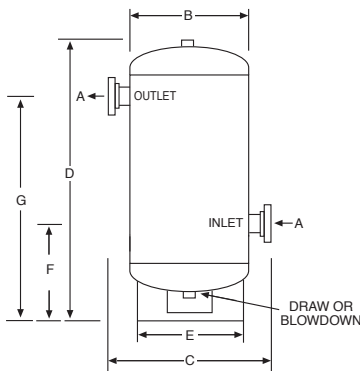
*Select tank equal to or greater

$$\frac{\text{Manufacturer's recommended minimum boiler cycle time}^* \left(\text{Minimum Boiler Output} - \text{Minimum System Load}^{**} \right)}{\text{Temperature differential within tank}^{***} \times 500} = \text{Buffer Tank Size (Gallons)}$$

* Typical 1-10 min. (use 5 if unknown).

** Assume to be 0 if no system load or if rate is unknown.

*** Temperature differential can range from 5 to 25°F, 10°F is typical.



HWBT Series Specifications

Model Number	Ports	Tank Volume (Gallons)	Dimensions (Inches)								Shipping Weight (lbs.)	
			Connection Size A	B	C	D	E	F	G	H	125 PSI	150 PSI
HWBT120-2	2	120	2	24	33 $\frac{1}{8}$	55 $\frac{3}{4}$	16	15	45	-	254	279
HWBT120-3	2	120	3	24	33 $\frac{1}{8}$	55 $\frac{3}{4}$	16	15	45	-	268	295
HWBT200-2	2	200	2	30	39	62 $\frac{1}{2}$	24	21 $\frac{1}{2}$	45 $\frac{1}{2}$	-	475	523
HWBT200-3	2	200	3	30	39 $\frac{1}{8}$	62 $\frac{1}{2}$	24	21 $\frac{1}{2}$	45 $\frac{1}{2}$	-	490	539
HWBT300-2	2	300	2	36	45 $\frac{1}{8}$	80 $\frac{3}{8}$	30	32 $\frac{1}{4}$	61 $\frac{1}{4}$	-	668	735
HWBT300-3	2	300	3	36	45 $\frac{1}{8}$	80 $\frac{3}{8}$	30	32 $\frac{1}{8}$	61	-	683	751
HWBT120-2/2	4	120	2/2	24	33 $\frac{1}{8}$	55 $\frac{3}{4}$	16	15	45	27	267	294
HWBT120-2/3	4	120	2/3	24	33 $\frac{1}{8}$	55 $\frac{3}{4}$	16	15	45	27	282	310
HWBT120-3/3	4	120	3/3	24	33 $\frac{1}{8}$	55 $\frac{3}{4}$	16	15	45	27	297	327
HWBT120-4/4	4	120	4/4	24	33 $\frac{1}{8}$	55 $\frac{3}{4}$	16	15 $\frac{1}{2}$	44 $\frac{1}{2}$	27 $\frac{1}{2}$	338	372
HWBT200-2/2	4	200	2/2	30	39	62 $\frac{1}{2}$	24	21 $\frac{1}{2}$	45 $\frac{1}{2}$	35 $\frac{1}{2}$	489	538
HWBT200-2/3	4	200	2/3	30	39	62 $\frac{1}{2}$	24	21 $\frac{1}{2}$	45 $\frac{1}{2}$	35 $\frac{1}{2}$	503	553
HWBT200-3/3	4	200	3/3	30	39 $\frac{1}{8}$	62 $\frac{1}{2}$	24	21 $\frac{1}{2}$	45 $\frac{1}{2}$	35 $\frac{1}{2}$	518	570
HWBT200-4/4	4	200	4/4	30	39 $\frac{1}{8}$	62 $\frac{1}{2}$	24	21 $\frac{1}{2}$	45 $\frac{1}{2}$	35 $\frac{1}{2}$	560	617
HWBT300-2/2	4	300	2/2	36	45 $\frac{1}{8}$	80 $\frac{3}{8}$	30	32 $\frac{1}{4}$	61 $\frac{1}{4}$	48 $\frac{1}{4}$	682	750
HWBT300-2/3	4	300	2/3	36	45 $\frac{1}{8}$	80 $\frac{3}{8}$	30	32 $\frac{1}{8}$	61	48 $\frac{3}{8}$	696	766
HWBT300-3/3	4	300	3/3	36	45 $\frac{1}{8}$	80 $\frac{3}{8}$	30	32 $\frac{1}{8}$	61	48 $\frac{3}{8}$	711	782
HWBT300-4/4	4	300	4/4	36	45 $\frac{1}{8}$	80 $\frac{3}{8}$	30	32 $\frac{1}{8}$	61	48 $\frac{3}{8}$	753	828

Sizing Chilled Water Buffer Tanks

For Adding Capacity to Closed, Non-Potable Chilled Water Systems

Required Information

Total Chilled Capacity in Tons = C

System Volume per Ton* = V_R

Actual System Volume in Gallons = V_A

*Check with Chiller Manufacturer for specific requirements. Typical HVAC chiller systems are between 3 and 6 gallons per ton. Applications where temperature accuracy is critical requires 6 to 10 gallons.

$$\left(\begin{array}{c} \text{Total} \\ \text{Chilled} \\ \text{Capacity} \\ \text{---} \\ \text{Tons} \\ \text{(C)} \end{array} \right) \times \left(\begin{array}{c} \text{System} \\ \text{Volume} \\ \text{Per Ton} \\ \text{---} \\ \text{Gallons/Ton} \\ \text{(V}_R\text{)} \end{array} \right) - \left(\begin{array}{c} \text{System} \\ \text{Volume} \\ \text{---} \\ \text{Gallons} \\ \text{(V}_A\text{)} \end{array} \right) = \left(\begin{array}{c} \text{Buffer} \\ \text{Tank} \\ \text{Size} \\ \text{---} \\ \text{Gallons} \end{array} \right)$$

Example:

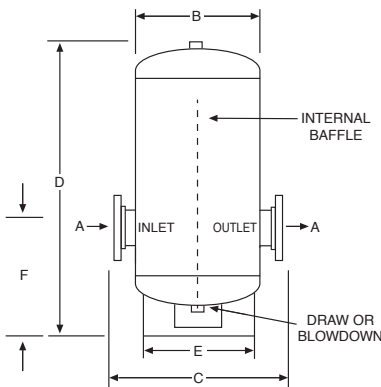
Total Chilled Capacity (C): 100 Tons
 System Volume (V_R): 10 Gallons Per Ton
 Actual System Volume (V_A): 800 Gallons
 Pipe Size: 4"
 Relief Valve: 50 PSI
 (100 x 10) - 800 = 200 Gallons*

Recommendation: CWBT200-4-125

*Select tank equal to or greater

CWBT Series Specifications

Model Number	Tank Volume (Gallons)	Dimensions (Inches)						Shipping Weight (lbs.)	
		Connection Size A	B	C	D	E	F	125 PSI	150 PSI
CWBT120-3	120	3	24	33 $\frac{3}{8}$	55 $\frac{3}{4}$	16	15	294	323
CWBT120-4	120	4	24	33 $\frac{3}{8}$	55 $\frac{3}{4}$	16	15 $\frac{1}{2}$	315	347
CWBT120-6	120	6	24	33 $\frac{3}{8}$	55 $\frac{3}{4}$	16	16 $\frac{1}{2}$	333	366
CWBT200-3	200	3	30	39 $\frac{3}{8}$	62 $\frac{3}{8}$	24	21 $\frac{1}{2}$	527	580
CWBT200-4	200	4	30	39 $\frac{3}{8}$	62 $\frac{3}{8}$	24	22	547	602
CWBT200-6	200	6	30	39 $\frac{3}{8}$	62 $\frac{3}{8}$	24	23	566	623
CWBT300-4	300	4	36	45	80 $\frac{3}{8}$	30	32 $\frac{3}{8}$	753	828
CWBT300-6	300	6	36	45	80 $\frac{3}{8}$	30	33 $\frac{3}{8}$	772	849
CWBT300-8	300	8	36	45	80 $\frac{3}{8}$	30	34 $\frac{3}{8}$	801	881
CWBT500-6	500	6	42	51	99 $\frac{1}{2}$	30	36 $\frac{1}{2}$	1,366	1,503
CWBT500-8	500	8	42	51	99 $\frac{1}{2}$	30	37 $\frac{1}{2}$	1,395	1,535
CWBT500-10	500	10	42	51	99 $\frac{1}{2}$	30	38 $\frac{1}{2}$	1,490	1,639
CWBT850-6	850	6	54	64 $\frac{1}{8}$	114 $\frac{7}{16}$	42	39 $\frac{1}{2}$	2,707	2,978
CWBT850-8	850	8	54	64 $\frac{1}{8}$	114 $\frac{7}{16}$	42	40 $\frac{1}{2}$	2,736	3,010
CWBT850-10	850	10	54	64 $\frac{1}{8}$	114 $\frac{7}{16}$	42	41 $\frac{1}{2}$	2,771	3,048
CWBT1040-8	1040	8	60	70	107 $\frac{3}{8}$	45	36	3,136	3,450
CWBT1040-10	1040	10	60	70	107 $\frac{3}{8}$	45	37	3,171	3,488
CWBT1040-12	1040	12	60	70	107 $\frac{3}{8}$	45	38	3,283	3,611





Made in the USA

From modest beginnings in 1946, to our current, state-of-the-art facilities, Amtrol is still proudly manufacturing products in the USA. Our talented, dedicated associates are committed to providing you with the highest quality, most reliable and best performing products on the market.



Associates at our West Warwick, Rhode Island manufacturing facility.

Additional support materials available on amtrol.com.



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