Tanpera ®

Creates Difference..

FOR COOLING SYSTEMS

BF.. SERIES THERMAL BALANCE TANKS (BUFFER TANKS)

BF.. Series Thermal Balance (Buffer) Tanks

In all cooled water applications where the water volume is required to be increased...

Industrial Cooling Applications

Machine Cooling Systems
In all process cooling applications which require sensitive temperature control

Cooling applications for air-conditioning

Tall buildings-houses, business centers, hotels
Building which are cooled in winter-shopping malls, factories
All cooling systems which should be departed by a heat exchanger...

Tanpera
Thermal Balance Tanks

100 – 5000 liters capacity

Easy mounting

With partition plate

Self thermal insulation

We reserve the right to do amendments in product specifications.

It is a tank which is distinctively designed and manufactured to increase the system water volume in all cooled water applications where additional water volume is required.

It is provided in various capacities from 100 liters to 5000 liters for the use of our customers.

It has baffle plates in appropriate quantities in accordance with tank volume to prevent temperature stratification and maintain homogenous heat distribution. By this mean the air in the water is easily separated and evacuated out from the top of the tank.

To minimize energy loss, it is perfectly insulated before delivery.

The exterior of the tank is protected against corrosion by means of double layer industrial prime paint.

It is ready to be mounted into the system with its scaled connection inlets with flange.

It has inlets for air evacuation valve and relief valve.

Before delivery to the customer it is tested under a pressure which is 1.5 fold of operation pressure.

To operate a Cooling system for comfort and industrial purposes in a smooth and efficient way, the total water volume in the circuit should be above a defined amount. This amount is determined based on the capacity and required control sensitivity. If the total water volume is lower than the required amount, thermal capacity should be increased through suffixing **TANPERA-BF Series Thermal Balance Tank** to the circuit.

The average water temperature in Cooling Systems changes in accordance with the rate of the instant load met by cooling capacity as well as the changes in cooling load. If the instant load cooling capacity is low, that the average temperature decreases, if high it increases.

However, in majority of applications, the operator doesn't want the water temperature sent to the system to fluctuate and tries to keep it within defined limit values. Because, the big fluctuations in the average water temperature and in parallel the temperature of the water which gets into the system result in the following:
- It makes the control of environment temperatures in **air-conditioning systems** and providing the desired comfort level harder.
- It may cause severe damages and losses in **industrial cooling systems** which require sensitive temperature control

In applications where total Cooling load varies, it may be possible to prevent fluctuation to some extent through controlling cooling capacity. This control is generally maintained by activating/deactivating the compressor based on need or changing the Group capacity gradually or proportionally in accordance with the instant load. Proportional and gradual control is only for groups with certain specifications and its benefits are also limited. The switch number of the compressor can not be more than a few times in an hour due to technical limitations.

On the other hand, the total volume of the water circulating in the system also defines the thermal capacity of the system. The more the amount of water the more thermal energy it may have, thus the changes in the load will have proportionally less effect on the average temperature in the system. Depending on the capacity of thermal capacity, the need to control the capacity of the cooling assembly instantly to prevent the fluctuation of the temperature of the water getting into and out of the evaporator decreases, also the excessive switching of the compressor is prevented.

Whether there is a need for a buffer tank in Cooled water systems, if there is a need, the volume of the TANPERA-BF Series Thermal Balance Tank should be calculated as following:

Minimum Required Water Volume (l) = Total Cooling Capacity (kW) x B (l/kW)

In calculation of the **Minimum Required Water** in the system, the coefficients defined by Cooling Group manufacturers can be used.

In the next step the **Active Water Volume** of the Water should be calculated the volume of the water which circulates in evaporator in the lowest load condition is the volume to be considered here. The water volumes of the devices which are by-passed by automatic valves (or zones which are kept out of the circulation) during low loaded operations, their water volumes shouldn't be considered. It will be a safe solution to consider only the water volumes of the pipes in the system. The water capacity per meter for steel pipes used in the mechanical assembly is stated in the tables.

The volume of the Thermal Balance Tank is calculated by subtracting water volume of the system from the required water volume.

Application Type	B
General Comfort Applications	6
Applications Which Require Sensitive Temperature Control (Process etc.)	10

Pipe Diameter (inches)	Water Capacity (l/m)
1/2″	0,2
3/4″	0,3
1″	0,5
1 1/4″	0,8
1 1/2″	1,3
2″	2,1
2 1/2″	3,1
3″	4,8
4″	8,3
5″	13,0
6″	18,8
8″	32,4
10″	51,1
12″	72,8

Volume of Buffer Tank (l) = Min. Required Water Volume – Active Water Volume of System

If a positive value exists as a result of the calculation, it will be proper to use a buffer tank and to choose the tank with a superior capacity closest to the resulting value. If the defined need is more than 5000 liters or there are limitations with alignment, more than one tank can be used in the system.

Sample Calculation

In a Process Cooling System which requires sensitive temperature control and has a Cooling capacity of 700 kW, there are 550 meters of steel pipes which are not by-passed by automatic valves. The diameter of 150 meters long pipes is 6", 100 meters long pipes is 4", 200 meters long pipes is 3". Let's find if there is a need for a buffer tank requirement in this system.

Required Minimum Water Volume=700 kW x 10 l/kW=7000 lt
Active Water Volume of the System = (150 x 18, 8) + (100 x 8, 3) + (200 x 4, 8) = 4610 lt
Buffer Tank Volume=7000-4610=2390 lt

Result: TANPERA-BF 2500/10 – V type thermal balance tank with 2500 lt capacity should be used.

BF.. Series Thermal Balance (Buffer) Tanks

TANPERA-BF Series Thermal Balance Tank is used to prevent the compressor of the cooling group from over switching and to prevent the excessive fluctuations getting into the system, so the place of the tank on the cooled water circuit should be in accordance with its purpose of use.

LOAD　　　　**TANPERA-BF SERIES THERMAL BALANCE TANK**　　　　**COOLING GROUP**

In typical comfort applications where the prevention of over switching of the compressor function of the buffer tank is more important, it is recommended that tank is placed in front of cooling group.

LOAD　　　　**TANPERA-BF SERIES THERMAL BALANCE TANK**　　　　**COOLING GROUP**

If tank is used in an industrial cooling system, the main purpose is a more sensitive temperature control of the water thus, placing the tank after the group and before thesystem should be proper.

Important note: If more than one tank shall be used in the system, to ensure a proper circulation without any short circuits, these tanks should be connected in a serial way instead of parallel.
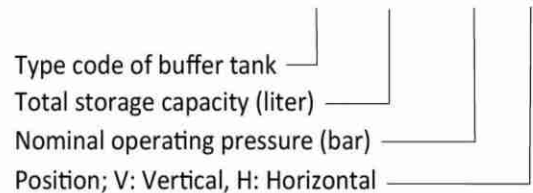
We reserve the right to do amendments in product specifications.

TECHNICAL SPECIFICATIONS AND MOUNTING SIZES

Tanpera®

Product Coding

TANPERA - BF 1000 / 10 - V

Type code of buffer tank
Total storage capacity (liter)
Nominal operating pressure (bar)
Position; V: Vertical, H: Horizontal

Technical Specifications

Capacity	: 100 - 5000 liters
Usage	: Water not hotter than 90 C°
Operating Pressure	: 10 bar
Mounting Position	: Vertical (optional: horizontal)
Coating	: 2 fold anti corrosion paint
Heat Insulation	: Open celled polyurethane with a thickness of 50 mm (k = 49 W/m2 °C)
Protective Shield	: Vinyl

Mounting Sizes

Device Type	Building Group	Capasity (liter)	ø D mm	H mm	Connection Inlets A	B	C	Empty Weight Kg
BF-100/10-V		100	500	1050	DN32	1/2"	3/4"	60
BF-300/10-V	I	300	700	1350	DN50	1/2"	3/4"	105
BF-500/10-V		500	850	1450	DN65	1/2"	1"	180
BF-750/10-V		750	850	2050	DN80	1/2"	1"	230
BF-1000/10-V		1000	950	2110	DN80	3/4"	1 1/4"	310
BF-1500/10-V	II	1500	1150	2000	DN100	3/4"	1 1/2"	480
BF-2000/10-V		2000	1250	2350	DN100	3/4"	1 1/2"	580
BF-2500/10-V		2500	1400	2350	DN125	3/4"	2"	670
BF-3000/10-V		3000	1400	2770	DN125	3/4"	2"	850
BF-4000/10-V	III	4000	1500	3150	DN150	3/4"	2"	1120
BF-5000/10-V		5000	1600	3070	DN150	3/4"	2"	1410

B Air Evacuation   B Air Evacuation   B Air Evacuation

A   A   A   A

øD   øD   øD

H   H   H

C Discharge **I**   C Discharge **II**   A   A   C Discharge **III**

Tanpera®
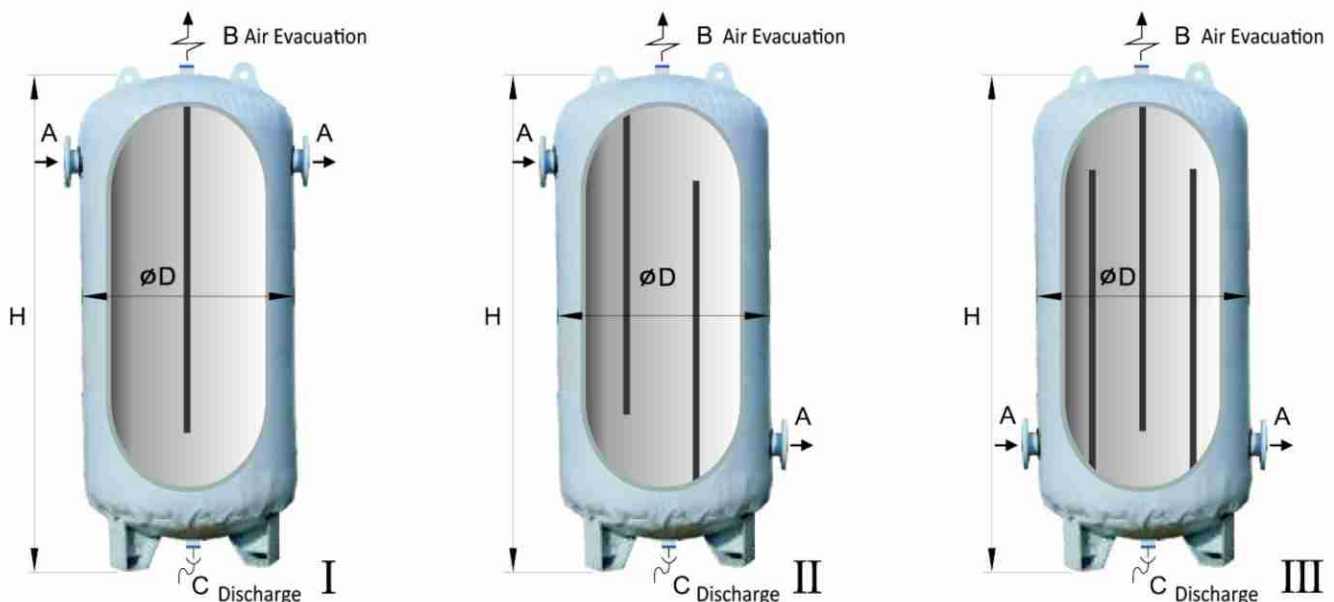
OTHER PRODUCTS

· PLATED HEAT EXCHANGERS
· HOT WATER ACCUMULATION TANKS
· ELECTRICAL WATER-HEATER
· PACKET SYSTEM HOT WATER SYSTEMS
· BOILERS

Great Egret can stay in cold water for a long time thanks to the heat exchange it makes between the blood pumped from its hearth at 40 C° and turns back from its feet at 1 C° .

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