

BIG BRO™

TOWER BIOCIDIC BROMINATOR

Installation and operating Instructions

CAUTION:

The Tower Biocide Brominator is designed

For use only with approved tablets.

NEVER MIX with other types of
Sanitizers or chemicals. Explosion
Or fire may result.

Exercise extreme caution when operating or servicing your Brominator.

always shut off the pump and available valves before opening unit.

DO NOT inhale fumes from any chemical feeder or container.

Wear polyvinyl gloves and safety glasses or chemical Goggles at all times.

To prevent the buildup of gas in the Brominator, make certain
the discharge line to the tower is unrestricted and not blocked by
valves of any kind. If automating the Brominator feed,

DO NOT ADD AUTOMATED CONTROL VALVES DOWNSTREAM FROM THE UNIT.



TO OPEN THE BROMINATOR:

1. Shut off incoming water supply. Never use operating valves of any kind to isolate the Big Bro. To avoid backflow into the unit provide a check valve at the discharge port.
2. Remove the lid closure ring, remove the cover and allow the unit to drain.

CAUTION: Do not inhale the fumes from the Brominator.

TO CLOSE THE BROMINATOR:

1. Make certain the cover seal ring is in place.
Replace the cover and lid closure ring.
2. Open the bleed screw in cover and fill.
When full close bleed screw.

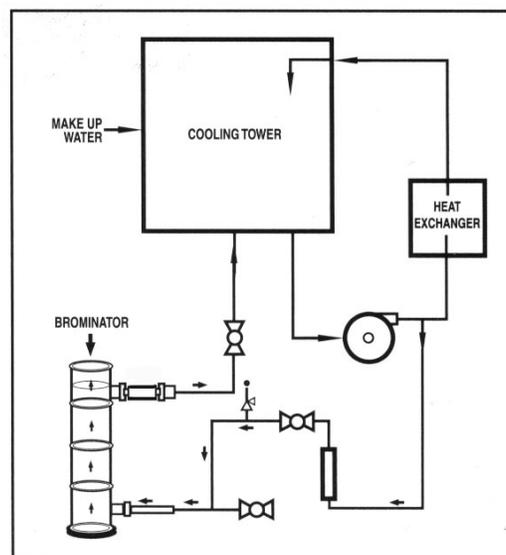
LUBRICATION:

Never use petroleum-type lubricants on the
cover seal ring.

To lubricate, use ivory bar soap or Jacks No. 327
lube only.

WINTERIZING:

Where freezing temperatures can be expected, drain all water from the Brominator. Carefully remove Undissolved tablets and rinse the Brominator thoroughly with water. Replace the cover and lid closure ring.



(OVER)

BIG BRO™

TOWER BIOCIDES BROMINATOR

TROUBLESHOOTING CHART

<u>PROBLEM</u>	<u>POSSIBLE CAUSE</u>	<u>SOLUTION</u>
No Flow through Brominator	A. Inlet and/or outlet valve closed.	A. Open valves. B. Flush Brominator by opening outlet valve completely for 1-2 minutes, then reset for normal position.
No bromine residual in system	A. Inlet and/or outlet valve closed outlet clogged B. Algae or excessive organic material in system C. Brominator not properly filled with brominating tablets.	A. Open valves B. Flush as above C. Clean system. Follow label directions. D. Fill Brominator
Bromine residual too high	A. Oversized Brominator B. Feed cycle too long	A. Reduce flow rate B. Reduce feed time
Brominating tablets breaking up or channeling	A. Brominating tablets may not have been dropped into empty Brominator.	A. Be sure to half fill Brominator with water before adding brominating tablets.
Excessive consumption of brominating tablets	A. Algae or excessive organic material in system.	A. Clean system. Follow label directions.

BIG BRO BROMINATOR INFORMATION SHEET

PRESSURE

The Big Bro brominator has been tested in our "in house" testing laboratory. Testing was done at various water pressures, up to and including 80 PSI. Multiple tests were done at each pressure with 5 minute intervals in between each one.

Big Bro units are tested periodically and we have found that subsequently all tests have confirmed the original. We have found however, that occasionally a unit will crack or break while using pumps that are rated at less than 100 psi. This can usually be explained.

- Hints:
1. Exit piping from the Big Bro must go directly to atmosphere. Bromine pellets produce gases that can accumulate and, could lead to an explosion. If you should want to stop the water from returning to the unit during cleaning a check valve may be installed in such a way as to allow the water and gases out of the housing but, not back into it.
 2. Bromine pellets are designed for slow release. However, transportation and handling of them can cause some to be crushed or broken into powder. This powder is much more volatile than the pellet itself and, therefore, gases will be released more rapidly. When this happens an explosive accumulation of the gases may occur causing cracking or breaking of the Big Bro housing.

If you are filling the Big Bro from a bag of pellets try to avoid dumping as much of the powdered residue into the housing as possible. Then, after it is full, run the system for 10 minutes so that the fines are flushed into the system. .

3. Fast opening and closing solinoids operated valves can multiply pressure inside of the Big Bro housing momentarily through a what is often termed as a "water hammer". If this kind of valve is used a pressure relief valve should be installed into the system in front of the Big Bro brominator.
4. Water pressure is increased in a system if the source of the water is elevated significantly above the Big Bro brominator. If for instance a water tower is on the roof of a multi story building and the Big Bro is located in the basement pressure in the system may be significantly higher than the pump being

BIG BRO BROMINATOR INSTALLATION DOCUMENTATION

The Big Bro brominator was designed to be used in systems running at a maximum pressure of 100PSI with a maximum temperature of 100 degrees F. When setting up a system, pump pressure is not the sole determiner of system pressure. ***There are several other factors that could be involved in driving pressures up past the safe limit, leading to injury, death or property damage.*** They are listed below.

THINGS TO REMEMBER ABOUT BIOCIDES

The Big Bro is designed to be used only with BCDMH biocide pellets. Other biocides may increase pressures inside of the unit, to excess leading to an explosion.

BCDMH pellets are shipped in bags. During handling and shipping some of the pellets get crushed and ground into powder. This powder is much more active than the pellets and, produces gas at a much higher rate.

When filling the Big Bro run the system full open for 10 to 15 minutes so that the powder has been flushed out of the system.

When filling the Big Bro with biocide for the first time first fill it up to the exit port with water and then dump the pellets in. ***Fill the pellets to a level just below the surface of the water.*** Do not pile the pellets to a higher level than the water, keeping the pellets submerged at all times. Damp pellets produce gas at a faster rate than those totally submerged in Water. .

When refilling the Big Bro brominator, fill it when the level of biocide in the unit is about halfway empty. Once again, make sure that the water is at a level just below the exit port and fill to a level just below the surface of the water and ***then, run the system full out for 10 to 15 minutes to flush out the pellet fines.***

Never isolate the Big Bro brominator by closing off valves on both the fill and exit ports at the same time. It is best to run directly from unit to the cooling tower with no valves at all in between. However, if it is necessary to put in a valve between the unit and the cooling tower it should be a “check valve” allowing the water to flow out but, not back into it.

THINGS TO REMEMBER ABOUT WATER

Never use a Big Bro brominator unless you know what the pressure or the temperature of the water is.

Water temperature can fluctuate in a system. *The higher the temperature of the water the more active the biocide becomes, producing gases at a higher rate and building pressures within the Big Bro that can exceed the maximum design pressure which could lead to an explosion.* (Another way to think of this is. Water temperature of 110 degrees F lowers the maximum pressure rating of the unit to 90 PSI. 120 degrees F lowers it to 70 PSI.) **Knowing what the temperature of the water is at all times is critical to setting up a successful system.. A system may work beautifully for months until a seasonal change in the weather causes the water temperature to rise, excellerating the performance of the biocide.**

Water hammer is caused by the rapid closing of a valve in a liquid system. Water literally travels at the speed of sound through the pipes until it slams onto something in the system and then it reverses and slams back into the valve. *This “slamming” effect has destroyed valves and is capable of breaking pipes, flow meters and even the Big Bro brominator.*

Systems are often set up using fast acting automatic opening and closing valves. They, sometimes, use a solenoid to accomplish this. **We highly recommend the use of automatic valves that open and close slowly to avoid water hammers..**

Municipal water pressure is generated by pumping water up and into an elevated water tower. This principle is also in effect when the water source for a system is elevated high above the location of the Big Bro brominator. The higher the source the higher the water pressure will be. *A water tower located on the roof of a high rise building combined with the locating of a Big Bro in the basement of the building could result in pressures exceeding the capability of it. Combining this with a fast acting valve generating a water hammer will amost certainly lead to breakage.*

As you can see, it is absolutely critical that when installing a system using the Big Bro brominator, or any other brominator for that matter, you must know exactly what the total pressure and temperature of the system is going to be working at, at all times. If you are involved with the total design of it you should be able to avoid any problems. **If the system is already set up it would be a good practice to replace the valves with slower acting types. You might want to add a pressure relief valve and a surge tank, with a pressurized bladder inside to handle water hammers.**

PLEASE READ THIS IMPORTANT INFORMATION

System Water Pressure

Even though our tests prove that the Big Bro brominator can withstand pressures of 100 psi we have had a few situations, over the years, in which, for various reasons, a unit cracks or appears to explode while being used in a system that seems to have had a working pressure of less than that. There are several reasons why this could have happened that are related to the system that it has been installed in.

First consideration: It is of primary importance that you know exactly what the ambient water pressure is in the system that you are working with.

When working with water, **it should be remembered that the pump is not the only source of water pressure in the system**. A water tower creates the water pressure in most municipalities. It does this by creating a vertical column of water. The higher the tower, the greater the pressure it creates. Most municipalities erect towers high enough to produce 40 to 60 psi pressure. **Remarkably the pressure has no relationship to the total mass of water involved. A column of water inside of a vertical ¾” pipe 100 feet high will produce the same amount of pressure as a 100 foot high water tower will. This is especially important to you when designing a system using our Big Bro brominator if that system is installed in a high rise building where the water source is on the roof and, the Big Bro is located in the basement. This being the case it is very possible for the water pressure in that system to show itself at the brominator higher than it was designed to withstand.**

A system with ambient water pressure exceeding 60 psi should be moderated back to less than 60 psi by a “pressure reducing valve”. This will not only help to protect the Big Bro, it will also extend the life of every part of your system.

Second consideration: “Water Hammer” is capable of damaging and destroying the Big Bro.

Water is for all practical purposes not compressible. This means that any energy applied to it is instantly transmitted through it. This energy becomes dynamic in nature when a

force, such as quick closing valve or pump applies velocity to it. **Unrestricted, this velocity can literally increase to a speed close to the speed of sound (4000ft. per second) as it races through piping and in the process increases pressures inside of the system two to three times. (Some people say five times). This energy transmission is known as “Water Hammer” .**

Water Hammer is often caused by abruptly closing a valve or starting up of a pump in a system. When this happens it sends a wave through the pipes that eventually has to hit something. If it is the Big Bro brominator that it hits it can momentarily drive the pressure inside to close to three times what the ambient pressure was. Therefore, if the ambient pressure in the system was 60 psi , within a split second a wave can hit the unit driving it up to 180 psi. *And, the further that the wave travels before it hits something the more damaging it can be.* **This is far beyond the pressure that the Big Bro was designed to withstand and, because the force will be violent, it will most probably result in a catastrophic failure of the unit.**

A water system which includes various pieces of fragile equipment can eliminate “Water Hammer” damage caused by the rapid closing of a valve by using slow operating valves rather than solenoid operated types. A valve that closes in 1.5 seconds or more eliminates that threat and the accompanying pressure spike.

Another “rule of thumb” is that it is better to install the slow acting control valve as close to the damageable equipment as possible, eliminating the long runs for the wave to travel.

“Water Hammer” damage is extremely hard to identify, after the damage is done. The energy is transmitted so quickly through the pipes that most gauges can not register the fact that it has existed.

Biocide

Third Consideration: Hints about using Biocide pellets.

Use only BCDMH biocide pellets in the Big Bro brominator..

Biocides pellets are shipped and stored in paper bags. **During handling, some of the pellets are usually crushed and ground into powder. This powder will be much more active, releasing gas at a much higher rate when exposed to moisture. To avoid the accumulation of this gas the system should be run for 10 to 15 minutes full open to flush the powder out of the system.**

When filling the Big Bro with biocide, fill it up only as far the bottom of the exit port, **Pellets must be kept below the surface of the water at all times. Damp pellets produce gas at a faster rate than submerged pellets.**

Never isolate the Big Bro brominator by closing off valves on both the intake and exit ports at the same time. It is best to run directly from the unit to the cooling tower with no valves in between. However, if it is necessary to put in a valve between the unit and the cooling tower it should be a “check valve” allowing the water to flow out but, not back into it.

Fourth Consideration: Ambient temperature of the water in the system

It is very important to know exactly what the ambient water temperature in the system is. The higher the temperature of the water the more active your biocide will be, producing gases at a higher rate which, can build pressures within the Big Bro. This increased pressure can cause the Big Bro to crack or even explode . (*For instance: Water temperature of 110 degrees F effectively lowers the maximum pressure rating of the unit to 90 psi. If the temperature is raised to just 120 degrees F it lowers it to just 70 psi.*). Knowing what the temperature of the system is at all times is obviously, critical to setting up a successful system. (*A system may work beautifully for several months until a seasonal change in the weather causes the water temperature to rise, excellerating the performance of the biocide*)

Summary

It is therefore, incumbent upon the person installing the Big Bro brominator, or, for that matter, as it is with almost any piece of equipment in a water system, that they become familiar with the system in which it is being installed. It is important that ambient pressure and temperature are within common sense parameters. The correct biocide must be used correctly, that the unit is not isolated at any time and, it is also important that the equipment used throughout is suited to the proper functioning of the system. (*Carlton meter company will actually extend their normal one year warrantee to seven years if slow acting valves are employed rather than fast acting.*). It is best to have valves placed as close to the Big Bro as possible to avoid long runs in which the water can gain supersonic force before slamming into it.

We hope you can see from what we have given you above that there is more to installing equipment in a water system than just plumbing it in and forgetting it. The Big Bro has been tested to 100 psi but, as you can see it is possible to damage it, meters and even pipes and elbows in systems where a pump appears to be generating pressure of much less than that. The probabilities of damage are significantly less however, if thought is given to the entire system before installation and precautions are taken.