



Expansion Tanks

Series BT



INSTALLATION, OPERATION and MAINTENANCE MANUAL

www.flofab.com

Manufacturer of Pumps, Tanks, Heat Exchangers & Accessories
for HVAC Market After-Sales Parts and Services

**ASME Pressurized Bladder Type Expansion Tanks -
Series BT Bottom Connection**

Manufacturer of Pumps, Tank, Heat Exchangers & Accessories
for HVAC Market After-Sales Parts and Services

FLO FAB INC
LAKE WORTH,
FLORIDA, USA



IMPORTANT! : READ CAREFULLY THE PRODUCT INSTALLATION, OPERATING AND MAINTENANCE MANUAL. FAILURE TO FOLLOW THE INSTRUCTIONS AND WARNINGS IN THE MANUAL MAY RESULT IN SERIOUS OR FATAL INJURY AND/OR PROPERTY DAMAGE, AND WILL VOID THE PRODUCT WARRANTY. THIS PRODUCT MUST BE INSTALLED BY A QUALIFIED PROFESSIONAL. FOLLOW ALL APPLICABLE LOCAL AND STATE CODES AND REGULATIONS, IN THE ABSENCE OF SUCH CODES, FOLLOW THE CURRENT EDITIONS OF THE NATIONAL PLUMBING CODE AND NATIONAL ELECTRIC CODE, AS APPLICABLE. EXPLOSION OR RUPTURE HAZARD. THE EXPANSION TANK MUST BE OPERATED SO THAT THE PRESSURE DOES NOT EXCEED THE MAXIMUM WORKING PRESSURE.

IMPORTANT! : EXPLOSION OR RUPTURE HAZARD A relief valve must be installed to prevent pressure in excess of local code requirement or maximum working pressure designated in the Product Manual, whichever is less. Do not expose Product to freezing temperatures or temperatures in excess of 240° F. Do not adjust the pre-charge or re-pressure this Product except for any adjustments required at the time of initial installation, especially if Product corroded, damaged or with diminished integrity. Adjustments to pre-charge must be done at ambient temperature only. Failure to properly size the Product or follow these instructions may result in excessive strain on the system lead to Product failure, serious or fatal personal injury, leakage and/or property damage.

IMPORTANT! : CALIFORNIA PROPOSITION 65 WARNING: This product contains a chemical known by the State of California to cause cancer and to cause birth defects or other reproductive harm. (California Installer/Contractor - California law requires that this notice be given to consumer/end user of this product.) For more information: www.flofab.com





IMPORTANT! : Potable Water and Radiant Heating Warning.

This Product must not be used in radiant heating, potable water or open systems of any kind. These systems contain oxygenated water which will cause internal corrosion and premature Product failure. Mount vertically only. Do not install on dead-end pipe.

Note: Inspect for shipping damage and notify freight carrier or store where purchased immediately if damage is present. To avoid risk of personal injury and property damage, if the product appears to be malfunctioning or shows signs of corrosion, call a qualified professional immediately. Current copies of the Product manual can be viewed at www.flofab.com. Use proper safety equipment when installing.

IMPORTANT! : FAILURE TO PROPERLY SEAL VALVE CAP WILL RESULT IN LOSS OF PRECHARGE CAUSING PRODUCT TO FAIL.

IMPORTANT! : GENERAL SAFETY INFORMATION – ADDITIONAL SPECIFIC SAFETY ALERTS APPEAR IN THE FOLLOWING INSTRUCTIONS.

IMPORTANT! : DO NOT LOCATE THIS PRODUCT WHERE LEAKING OR FLOODING COULD CAUSE DAMAGE TO THE SURROUNDING PROPERTY.

The FloFab expansion tank may be placed in any convenient position within the mechanical room (or building). If multiple tanks are installed, they should all be on the same level.

Point of Connection

Unlike a conventional tank, the Flofab tank sealed air cushion does not require replenishment so DO NOT connect to an air separator or other air collection device.

As with any expansion tank, it is recommended that the Flofab tank be connected to the suction side of the pump. This will prevent the pump head from becoming subtractive which may result in entry of air and vapor formation at high points in the system.

By connecting the Flofab tank on the boiler return, displacement of coolest system water into tank is ensured reducing energy waste. Low pressure drop components such as air separators and boilers may be placed between point of connection and pump suction if desired. System design will dictate the feasibility of this.

Natural convection losses and the entry of air into tanks are eliminated by connection to the side or underside of main pipe. The piping should be pitched up and away from Flofab tank to eliminate any potential air traps.

Installation

IMPORTANT!: THIS PRODUCT MUST BE INSTALLED BY A QUALIFIED PROFESSIONAL.

1. Note location of system connection, air charge valve connection on tank.
2. Remove the plug or pipe cap from the system connection.
3. Remove the 1 1/2" NPT plug covering the air charge valve.
4. Before making any connection to the tank, check the tank and air charge (use an accurate pressure gauge). The air pressure must be equal to the minimum system pressure at the tank location.

IMPORTANT: If increasing pre-charge pressure above 55 psig the following steps must be followed:

- a. Tank must be connected to the system with the isolation valve open.
- b. System must be pressurized to 13-14 psig, slightly above factory setting.
- c. Isolation valve needs to be shut.
- d. Pre-charge pressure of tank can now be increased to match system fill pressure.
- e. Open isolation valve and start up system.

Failure to follow these steps could result in damage to the bladder and void all warranties.

5. After making sure the air charge is correct, replace the valve cap and the 1 1/2" plug over the air valve.
6. The tank may now be piped to the system (use the suggested tank piping diagrams on the next page).
7. Using the table below, select appropriate pipe size. Connection to each tank must have a lock shield gate valve and union to allow isolation and removal if required. Make up and fill valves, whether manual or automatic, should be tied into the connecting line. This will ensure that pump operation will not affect valve operation.

Operational Limits

Maximum Operating Pressure: As stamped on nameplate

Maximum Operating Temperature: 240 °F

Minimum Operating Temperature: 36°F (non-glycol application)

If unit is being installed in a glycol system where minimum temperatures fall below 36°F, contact the FloFab technical service department at (450) 621-2995.



Bladder-Type Expansion Tanks Instruction for Bladder change in the field

TOOLS AND SUPPLIES NECESSARY:

- Plumber's tool box
- Compressed air source
- Replacement bladder
- Extension cord (as needed)
- Wood blocks
- GE Silicon II caulk or equivalent, caulking gun and rubbing alcohol
- Wooden stick, at least 2ft. longer than tank height
- Rope or cord (Do not use nylon)
- Work light
- Portable pump (as needed)
- Pressure Gauge
- Soapy water

STEP-BY-STEP INSTRUCTION:

1. Isolate bladder-type expansion tank from system.
2. Drain liquid inside bladder and if required, the liquid between the inside of the tank and the outside of the bladder.
3. Disconnect tank from system and lay tank on its side. Place wooden blocks on each side of the tank to prevent tank from rolling.
4. Remove bolted bottom flange, but prior to removal, mark mating flanges in order to orient them properly when reassembling.
5. Unscrew 2" plug at the top of the tank to reveal cross bar and rope attachment. Untie or cut rope attachment to release bladder.
6. From the bottom flange side, use a slight twisting motion to pull the bladder out of tank.



7. Some bladders incorporate a moulded loop instead of a manufactured steel loop, if yours incorporates a manufactured steel loop, remove manufactured steel loop from the rubber bladder by first unscrewing the nut and then separating and retrieving the components inside and outside of the bladder for reuse. Remove old silicon and clean surfaces with rubbing alcohol.

8. If necessary, hose down the inside walls of the tank and pump all remaining water out of the tank. Allow the inside of the tank to dry out and clean out any remaining dirt or foreign particles. Check the inside tank walls and openings for any sharp edges that may cut the bladder. File down sharp edges if necessary and clean.

9. If required, prepare manufactured steel loop with silicon and attach to the new bladder as per the following photos:

10. Cut a 30" length of cord/rope and attach to the manufactured steel loop or moulded loop as per the following photos and then temporarily attach other end of rope/cord to a wooden stick or similar tool. Wooden stick should be 2ft longer than the height of the tank to assist in guiding and pulling the bladder through the tank opening. **Extreme care must be taken to ensure that the wooden stick does not puncture the bladder.**

11. Carefully roll up the replacement bladder lengthwise, with both sides rolled toward the middle like a scroll. This insures the bladder will expand without twisting when filled. Secure at intervals with rope or cord in order to keep it rolled.



12. Insert wooden stick through the bottom flange bottom side until it is accessible through the half coupling opening at the top of the tank. Insert the replacement bladder, removing the rope or cord as it nears the tank opening.
13. Untie the rope/cord from the wooden stick and tie it to the tank cross bar. Allow approximately 12" to 18" of slack between the bladder and the cross bar. This is to ensure that the bladder will remain properly aligned and expand properly.
14. Ensure all components are aligned properly. Check the marking on the bottom flange and insert into the bladder opening.
15. Tighten bolts evenly, using the conventional star pattern.
16. Clean threads on 2" half-coupling and plug. Seal plug into half-coupling with Tite-seal No.55 or equivalent. **This connection must be air-tight.**
17. Using a compressed air source and pressure gauge, charge tank to system operating pressure minus 2 PSI. Using soapy water, check the drain, thread fittings, air valve, and flange joints for air leakage.
18. Reconnect to system, open the fill-valve and check operation of the tank. **Always pre-charge tank before completing this step.**





Operating Instructions

1. Check the expansion tank pre-charge before the system is filled with water. The charge is 12 psig unless noted otherwise on the tank label. Check to make sure this is the correct pre-charge pressure specified for the system.
2. If the tank pre-charge pressure needs to be changed on a dry system follow the following procedure:
 - a. Check the expansion tank air pressures at the pre-charge connection with an accurate tire type pressure gauge. The precharge connection is the same kind of connection found on automobile tires.
 - b. If the pressure is low, charge the tank with nitrogen gas or with oil free compressed air. Check the pressure frequently during this process as you would when filling a tire with air.

DANGER: Excessive pressure can cause tank to explode. Exercise care when filling a tank with air so the pressure does not exceed that required or does not exceed the working pressure of the tank as stamped on the nameplate. Failure to follow these instructions will result in serious personal injury or death and property damage.

3. If, after the system has been filled with water and operating, it is found that the expansion tank pre-charge must be changed use the following procedure:
 - a. Turn off the heat source and allow the system water to cool to ambient temperature.

IMPORTANT: Expansion tank cannot be properly air charged other than at ambient temperature.

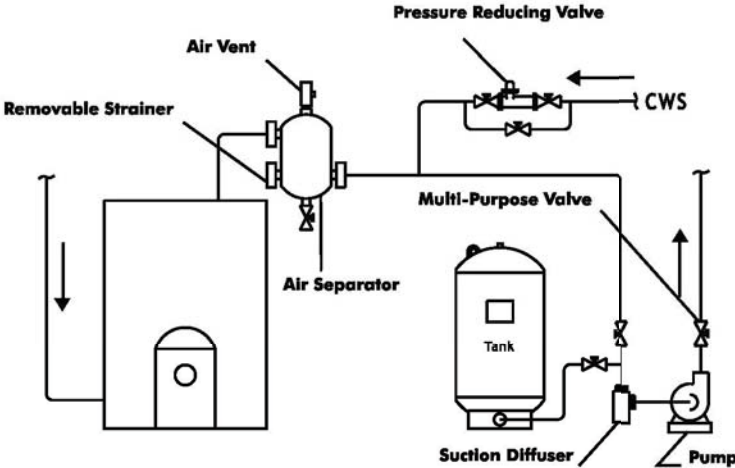
- b. Close the lock-shield valve in the tank-to-system piping.
- c. Open the drain valve to empty the water from the tank.
- d. Check the tank air pressure at the pre-charge connection with an accurate tire type air gauge.
- e. Refer to 2b above.
- f. Close the drain valve, open the lock-shield valve and turn on the heat source.
- g. Relock the lock-shield valve.

Firing Rate of Boiler MBTU/H	Length of Pipe Connecting Tank to System:		
	Below 11'	11' – 30'	31'-100'
2,000	½"	¾"	1"
4,000	¾"	1"	1 ¼"
8,000	1"	1 ¼"	1 ½"
12,000	1 ¼"	1 ½"	2"
16,000	1 ¼"	2"	2 ½"
20,000	1 ½"	2"	2 ½"

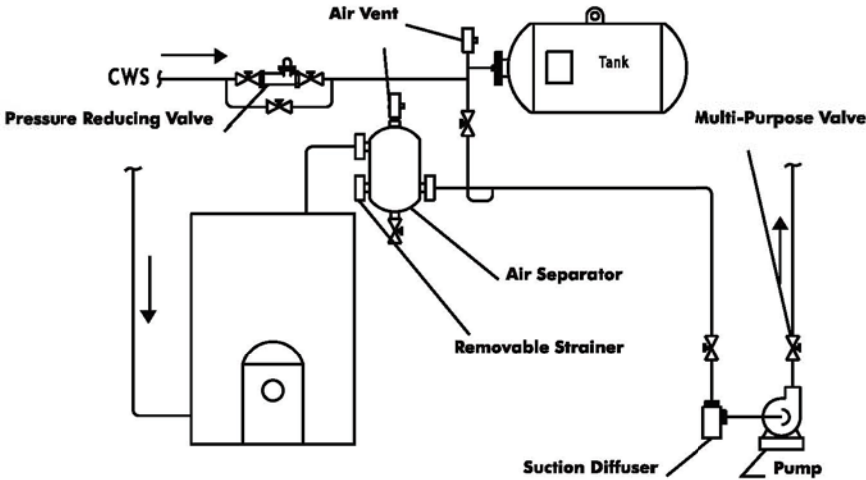


Installation Details

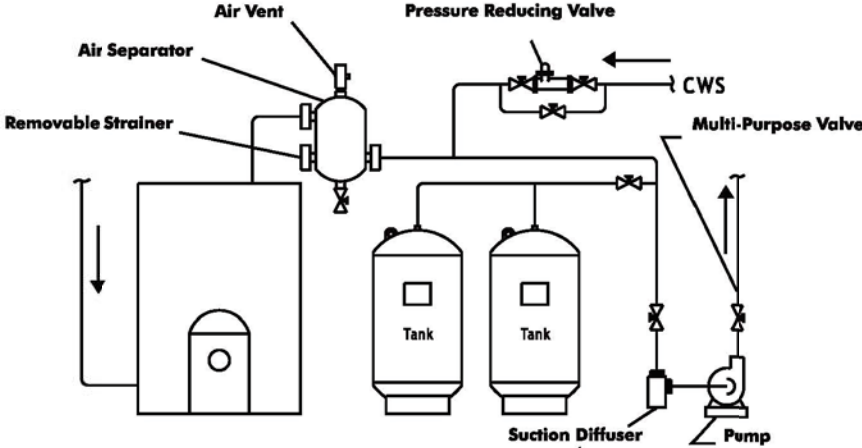
SIMPLE INSTALLATION



HORIZONTAL INSTALLATION (OPTIONAL)



MULTI INSTALLATION





Terms and Conditions

LIMITED WARRANTY: We warrant to our immediate customer and to the ultimate consumer that products of our manufacture will be free of defects in material and workmanship under normal use and service for the following time periods, when installed and maintained in accordance with our instructions. Pumps Products: One (1) year from date of invoicing. As used herein, "the ultimate consumer" is defined as the purchaser who first uses the product after its initial installation or, in the case of product designed for non permanent installation, the first owner who used the product. It is the purchaser's or any sub-vendee's obligation to make know to the ultimate consumer the terms and conditions of this warranty. This warranty gives you specific legal rights, and there may also be other rights which vary from province to province. In the event the product is covered by the Consumer Product Warranty (1) the duration of any implied warranty associated with the product by virtue of said law is limited to the same duration as stated herein, (2) this warranty is a LIMITED WARRANTY, and (3) no claims of any nature whatsoever shall be made against us, until the ultimate consumer, his successor, or assigns, notifies us in writing of the defect, and delivers the product and/or defective part(s) freight prepaid to our factory or nearest authorized service station. THE SOLE AND EXCLUSIVE REMEDY FOR BREACH OF ANY AND ALL WARRANTIES WITH RESPECT TO ANY PRODUCT SHALL BE TO REPLACE OR REPAIR AT OUR ELECTION, F.O.B. POINT OF MANUFACTURE OR AUTHORIZED REPAIR STATION, SUCH PRODUCTS AND/OR PARTS REPAIR STATION, SUCH PRODUCTS AND/OR PARTS AS PROVEN DEFECTIVE. THERE SHALL BE NO FURTHER LIABILITY, WHETHER BASED ON WARRANTY, NEGLIGENCE OR OTHERWISE. Unless expressly stated otherwise guarantees in the nature of performance specifications furnished in addition to the foregoing material and workmanship warranties on a product manufactured by us, if any, are subject to laboratory tests corrected for field performance. Any additional guarantees, in the nature of performance specifications must be in writing and such writing must be signed by our authorized representative. Due to inaccuracies in field testing if a conflict arises between the results of field testing conducted by or for user, and laboratory test corrected for field performance, the latter shall control. Components or accessories supplied by us but manufactured by others are warranted only to the extent of and by the terms and conditions of the original manufacturer's warranty. RECOMMENDATIONS FOR SPECIAL APPLICATIONS OR THOSE RESULTING FROM SYSTEMS ANALYSES AND EVALUATIONS WE CONDUCT WILL BE BASED ON OUR BEST AVAILABLE EXPERIENCE AND PUBLISHED INDUSTRY INFORMATION. SUCH RECOMMENDATIONS DO NOT CONSTITUTE A WARRANTY OF SATISFACTORY PERFORMANCE AND NO SUCH WARRANTY IS GIVEN. This warranty shall not apply when damage is caused by (A) improper installation, (B) improper voltage (C) lightning (D) sand or other abrasive material (E) scale or corrosion build-up due to excessive chemical content. Any modification of the original equipment will also void the warranty. We will not be responsible for loss, damage or labour cost due to interruption of service caused by defective parts. Neither will we accept charges incurred by others without our prior written approval. This warranty is void if our inspection reveals the product was in a manner inconsistent with normal industry practice and/or our specific recommendations.

The purchaser is responsible for communication of all necessary information regarding the application and use of the product. UNDER NO CIRCUMSTANCES WILL BE RESPONSIBLE FOR ANY OTHER DIRECT OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO LOST PROFITS, LOST INCOME, LABOUR CHARGES, DELAYS IN PRODUCTION, IDLE PRODUCTION, WHICH DAMAGES ARE CAUSED BY ANY DEFECTS IN MATERIAL AND/OR WORKMANSHIP AND/OR DAMAGE OR DELAYS IN SHIPMENT. THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY OTHER EXPRESS OR IMPLIED WARRANTY, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. No rights extended under this warranty shall be assigned to any other person, whether by operation of law or otherwise, without our prior written approval. If any litigation is commenced between the parties hereto for the enforcement of any rights hereunder, the successful party in subject litigation shall be entitled to receive from the unsuccessful party all costs incurred in connection therewith, including a reasonable amount of attorney's fees. YOUR ACCEPTANCE OF ANY GOODS SUPPLIED BY US, OR ON OUR BEHALF, SHALL, WITHOUT LIMITATION CONSTITUTE ACCEPTANCE OF ALL TERMS AND CONDITIONS STATED ABOVE.

PROJECT: _____
CONTRACTOR: _____
ENGINEER: _____
DATE: _____





Terms and Conditions

Our acceptance of your order is expressly conditioned on the general terms and conditions set forth below and all terms stated on the face of this form. The contract shall not include any deviating or additional terms unless expressly agreed to in writing and signed by an officer of our company.

PRICES: All prices are subject to change without notice and all shipments will be invoiced at the price in effect at the time of shipment, except when otherwise agreed to in writing by our authorized representative. Published prices are for products of our standard design and construction and any item not covered by the most recent published price list must be referred to us for special pricing. Prices do not include freight. Weights shown in price lists are approximate shipping weights. The amount of any applicable present or future tax or other government charge upon the production, sale, shipment or use of goods ordered or sold is not in the price and will be added to billing unless you provide us with an appropriate exemption certificate.

QUOTATION: Prices quoted by us are valid for 30 days from date of quotation unless we have otherwise specified in writing. Clerical errors on quotations are subject to our correction and such errors will not be binding.

CANCELLATION & REVISIONS: No purchase orders accepted and acknowledged by us may be cancelled or revised by you except with our prior written consent and upon payment of reasonable cancellation charges compensating us for all costs incurred in work done and material purchased. We reserve the right to determine what constitutes reasonable cancellation charges.

RETURN OF EQUIPMENT: No equipment shall be returned to us without first obtaining a written Returned Goods Authorization and shipping instruction from us. The returner must prepay the charges in full for transportation to our factory. Credit allowed for new, undamaged equipment of current standard design will be 80% of the invoiced price or current billing price, whichever is less. Equipment which has been used, however slight, will not be accepted. Authorization will not be given for return of equipment, (1) which would, in our opinion, result in an excess in the amount of stock we normally carry, (2) not invoiced within the last 3 months, or (3) which is non-standard and manufactured specifically to a buyer's specifications. For non-standard equipment not of our manufacture, the only credit allowed will be such credit as may be allowed by the manufacturer of such equipment. Equipment must be returned within 30 days of the issuance of the Returned Goods Authorization. No item with a net value of less than \$50.00 will be authorized for return. Unauthorized returns may be refused and/or returned freight collect.

CREDIT & PAYMENT: Payment is due as noted on our invoice. Overdue accounts are subject to a service charge. All orders are subject to approval of our credit department and we may require full or partial payment in advance. Pro rata payments shall become due as shipments are made. If the shipments are delayed by you for any cause, payments shall become due from date on which we are prepared to make shipment and storage shall be at your risk and expense. If manufacture is delayed by you for any

cause, a partial payment based upon the proportion of the order completed shall become due from the date on which we are notified of the delay.

SECURITY INTEREST: We shall have a lien on all goods sold as security for payment on the invoice price, and upon request you shall provide and execute a financing statement showing such lien.

DELIVERY: We will reasonable effort to meet your delivery requirement provided you provide us, on a timely basis, all approvals, technical data, instructions and credit approval requirements needed for release of the shipment. However, all delivery and/or shipment dates are estimates only unless we have expressly guaranteed delivery of such dates in writing at your specific request. In no event shall we have any liability if delivery is delayed by strikes, labour disturbances, material shortages, plant calamities or disaster, acts of God, government actions, civil disturbance, the failure of any pre-supposed condition of the contract, withholding shipments due to credit clearance, or other interferences beyond our reasonable control, and the date of delivery shall be extended for a period of time equal to the time lost because of any such reason.

SHIPPING: Unless you specify in writing and we acknowledge in writing, (A) goods will be boxed or crated as we may deem proper for protection against normal handling and for domestic shipment, (B) routing and manner of shipment will be at our discretion, and may be insured at your expense. An extra charge will be made for special handling. All shipments are F.O.B. point of manufacture. Delivery of goods to the initial carrier will constitute delivery to you and all goods will be shipped at your risk. A claim for loss or damage in transit must be entered with the carrier and prosecuted by you. Acceptance of material from a common carrier constitutes a waiver of any claims against us for delay, damage or loss.

GOVERNING LAW: It is understood and agreed that these Terms and Condition of Sale shall be interpreted under and pursuant to the laws of the Province of Quebec; you agree that any action at law which is related to any contract of sale brought against the company shall be filed in the appropriate court located in the Province of Quebec.

PROJECT: _____
CONTRACTOR: _____
ENGINEER: _____
DATE: _____





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