BackStop®

"Preferred by Professionals"

Thermal Expansion Explained

How BackStop® protects you

Choosing BackStop®

Installing BackStop®

6 YEAR LIMITED WARRANTY on manufacturing defects

IAPMO Certified

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Safety Information

BackStop® takes pride in offering only the best quality products at an exceptional value. We engineer each tank to provide a lifetime of safe operation in both residential and commercial applications.

BackStop® Thermal Expansion Tanks must be installed by a qualified professional. Follow all local and national plumbing and electrical codes. Read and understand fully the instructions included here and those on the manufacturer's website which are updated on a regular basis.

BackStop® recommends annual inspections of the expansion tank and system by a qualified professional. Visually examine the tank and the system connection for signs of water leaks or corrosion on the tank exterior and connection.

BackStop® Tank performance and life span can be significantly and adversely impacted by aggressive water conditions. A water test should be done at regular intervals looking for corrosive water, acids, and other contaminates which must be treated immediately if present.

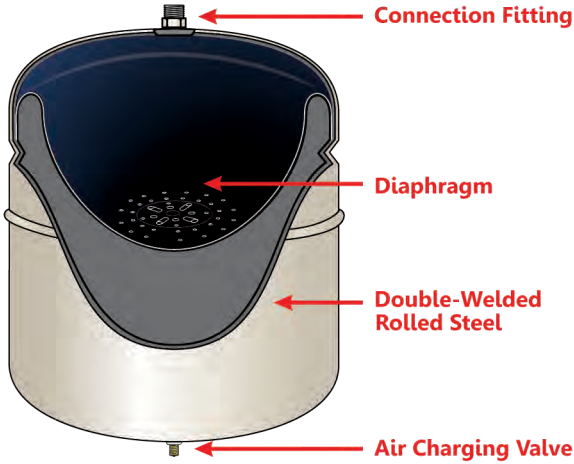
Inside Backstop® Tanks

BackStop® Thermal Expansion Tanks safely maintain optimum water pressure levels in closed loop domestic water heating systems. **BackStop® Tanks** work along with a previously installed back flow preventer or check valve.

Thermal expansion tanks feature a diaphragm that seals in the air cushion and separates air from the hot water. The tank liner protects potable water coming into direct contact with steel and potential contamination for corrosion.

Backstop® Specifications

Tank	**16 Gauge Rolled Steel**
Finish	**Appliance Grade Paint**
Diaphragm	**Heavy Duty Butyl Rubber**
Liner	**Polypropylene Liner**
Connection	**304 Stainless Steel**
Air Valve	**Brass With O-Ring Seal**
Warranty	**6 Years**
Maximum Pressure	**150 psig**
Maximum Temperature	**200°F**
Factory Pre-charge	**35 psi**
Maximum Pre-Charge	**80 psi**



More Info

For more information, please contact your local **BackStop®** representative. Visit us online at **www.backstopinc.com** or call **1-800-242-7769**.

Before Installing BackStop®

Inspect the tank for damage that may have occurred while shipping before installing. If any portion of the tank is dented, bent, or scratched, return the product to the original point of purchase for a replacement. Failure to do so can result in serious personal injury or property damage and will void the product warranty. Do not attempt to adjust the tank air pressure if there are signs of damage on the tank.

Pre-charge Adjustment

BackStop® Thermal Expansion Tanks ship with a factory pre-charge of 35 psi. Pre-charge pressure adjustments must be done prior to initial tank installation or with 0 psi pressure in the system.

Never adjust the tank pre-charge after installed on the system and under the system pressure. The expansion tank should be pre-charged to the incoming system water pressure but must not exceed 80 psi. Failure to properly adjust the pre-charge prior to installation will shorten the life of the product.

STEP 1 — Remove Cap

Remove the protective cap from the air valve located on the bottom of the tank.

STEP 2 — Check Pressure

Check the tank pre-charge using a standard tire pressure gauge.

STEP 3 — Add Air As Needed

Add air to the tank using a manual bicycle tire pump until the proper pre-charge pressure is reached.

STEP 4 — Replace Cap

Replace the protective cap on the air valve.

What Is Thermal Expansion?

Thermal expansion is the term used to describe the expansion of water volume as it is heated.

Installing a properly sized **(see Page 9 for guide)** and charged **(see Pages 5-6 for instructions)** thermal expansion tank in a water heating system is the recommended way to eliminate the problems associated with increased volume and pressure in a closed or restricted plumbing system.

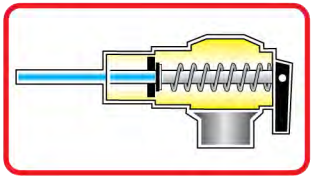
What Is A Thermal Expansion Tank?

A Thermal Expansion tank is a safety device used to prevent dripping valves and extend the overall life of the heating system. Once attached to the cold water inlet of the water heater, a reservoir for the expanded water is maintained inside the tank.

A closed loop domestic water system may also include a back-flow preventer, water meter with a check valve, or any other "no return" valve. Heated water expands causing unsafe operating pressures and continual operation of the water heater pressure relief valve **(see below)**. **BackStop® Thermal Expansion Tanks** prevent this from occurring by allowing water to enter the tank and safely releasing it back into the system on demand.

Pressure Relief Valves

The pressure relief valve on the water heater relieves heated water pressure and lowers the volume inside a water heater. The valve activates in emergency situations and is not made for daily use. When the valve only opens once a day, the valve wears out fast. Worn out valves activate unexpectedly, releasing hot water constantly. Once this happens, the efficiency of the system is reduced while wasting energy and water.



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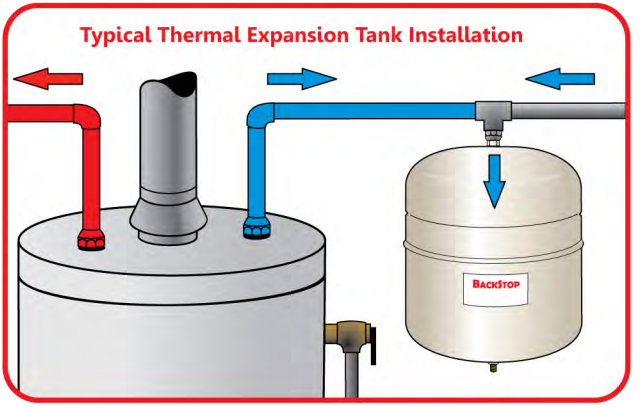
BackStop® Thermal Expansion Tank



STEP 1 Turn Off Electrical

Before installing, disconnect or turn off the electrical power source to the water heater, turn off the water supply to the system, and remove all water pressure from the system. Failure to turn off the electrical and water supply and releasing the water pressure could result in serious injury or death and or property damage.

STEP 2 Choose Proper Location

Choose an installation location where leakage will not cause property damage and water draining is ideal. Over an extended period of time, the expansion tank or the pipes could leak. **BackStop®** is not responsible for water damage that may occur in association with the expansion tank installation.

Installation Procedures

STEP 3 — Use Piping Support

Install the tank in the vertical position **18"** from the water heater. Even though the tank is designed to be supported by the system pipe work, prior to installing insure that the system piping is supported. Use more strapping, brackets or pipe hangers to the system piping as needed.

STEP 4 — Install Expansion Tank

Install the expansion tank in the incoming water line to the water heater between the water heater and the backflow preventer or check valve.
Proper thread sealant must be used to ensure a leak free installation.

STEP 5 — Check For Leaks

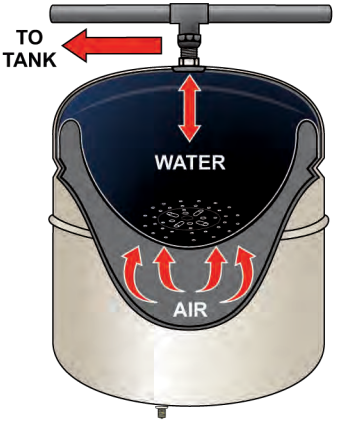
Open a hot water faucet prior to turning on the water supply to system to remove air from the system piping. Failure to do so might cause damage to the water heater. After turning on the water, inspect for leaks. Pay close attention to the connection between the expansion tank and piping. Follow the water heater instructions for proper start-up of the heater and the system.

How Backstop Tanks Work

BackStop® Thermal Expansion Tanks are installed on the cold water line of the water heater to protect the system from the damaging effects of thermal expansion and increased pressure. The tank controls excessive pressure generated inside the water heater using a sealed compressible air cushion space to store and hold the additional expanded water volume.

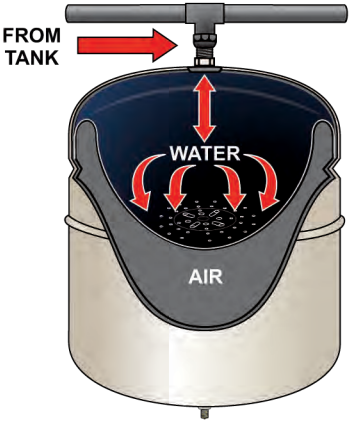
Air Cushion

As temperature and pressure increases, the diaphragm flexes against an air cushion below controlling the excess volume of the heated water.

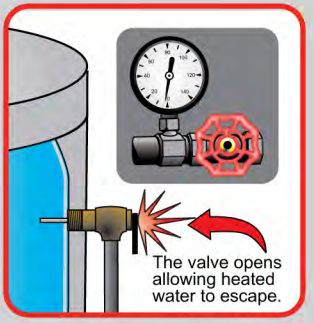


Water Section

As hot water is drawn from the tank or as it cools down, a reservoir inside the tank protects water heater.



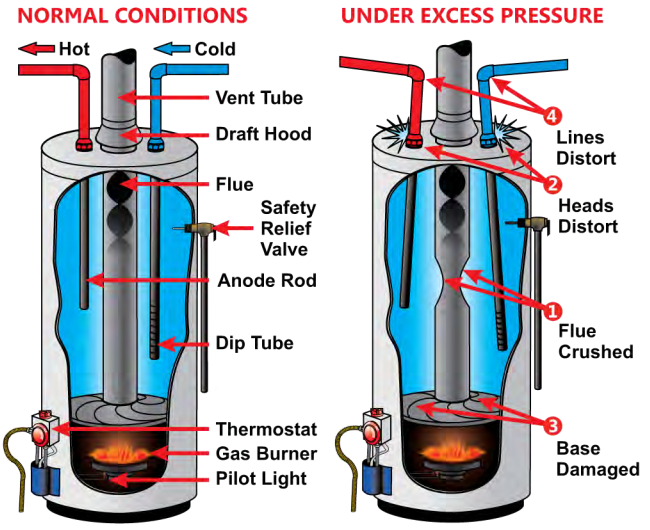
Understanding Water Systems Under Pressure



All water heaters, regardless of heat source (gas, oil, electric, solar or indirect), can suffer the effects of thermal expansion. In every tank-type water heater, cold water is heated as it enters the water heater. This increases the overall water volume and pressure inside the tank. For safety, the increase in volume and pressure must be relieved in some way.

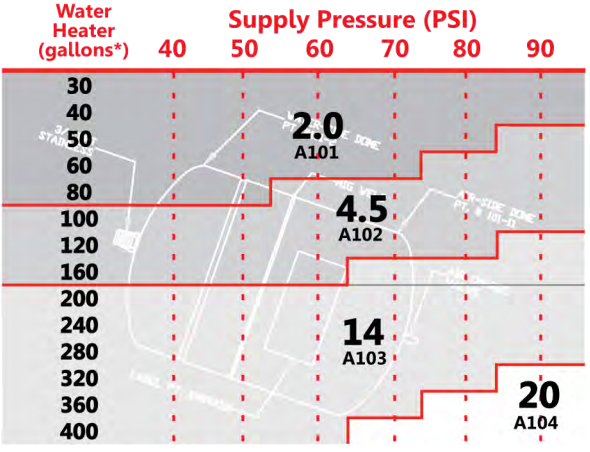
Damage often occurs before the safety relief valve is able to relieve the excess pressure inside a water heater. The flue inside gas and some oil-powered heaters allows combustion gases (fumes) to escape. Under constant excess pressure, ❶ the flue collapses and restricts the flow of fumes. As a result unsafe carbon monoxide levels can occur. Excess pressure also ❷ distorts the tank head, ❸ the tank base, and ❹ the hot and cold water line (see graphic below).

Inside A Water Heater



Quick-Sizing Guide

Based on: Temperature rise of 90°F (50°F to 140°F) with **BackStop®** charged to supply line pressure.



*For multiple heaters, use the total volume of the heaters plus any storage tanks.

BackStop® Product Line

For more than a decade, **BackStop®** has offered a complete line of tanks, directly involved with the engineering process with an exclusive manufacturer.
Below and on the following page is a general overview of the types of tanks **BackStop®** carries.
With most **BackStop®** tanks being IAPMO certified, each tank is engineered to provide a lifetime of safe operation, and come backed by an industry-leading 6 year

IAPMO Certified

6 YEAR LIMITED WARRANTY

Dual Port Thermal Expansion

Optimized for Use With Tankless Water Systems

Model	Vol.	Ht.	Dia.	Con.	Wt.
A 201	2	12-1/2"	8"	3/4"	5
A 202	4.5	15"	11"	3/4"	9

continued on next page

BackStop® Product Line (continued)

Product mix improvements are made on a regularly. Please also see our current catalog online at **www.backstopinc.com**, or call **1-800-242-7769**.

Thermal

Model	Vol.	Ht.	Dia.	Con.	Wt.
A 100	0.5	8-3/4"	5-1/2"	3/4"	5
A 101	2.1	8"	12-1/2"	3/4"	5
A 102	4.5	11"	15"	3/4"	9
A 103	14	19-7/8"	15-1/2"	1"	19
A 104	20	27"	15-1/2"	1"	27
A 103M	14	19-7/8"	15-1/2"	1"	19
A 104M	20	27"	15-1/2"	1"	27
A 105M	32	46-1/2"	15-1/2"	1-1/4"	43
A 106M	44	22"	35-1/2"	1-1/4"	52

"M" Denotes Stand Models

Hydronic

Model	Vol.	Ht.	Dia.	Con.	Wt.
H 15	2.1	12-1/2"	8"	1/2"	4.5
H 30	4.8	15"	11"	1/2"	8
H 60	6	16-5/8"	15-1/2"	1/2"	9.5
H 90	14	19-7/8"	15-1/2"	1"	19
HX 30	14	24-7/8"	15-1/2"	1"	22
HX 40	20	27"	15-1/2"	1"	27
HX 60	32	27-1/2"	22"	1"	46
HX 90	40	36-1/2"	22"	1"	60

Solar

Model	Vol.	Ht.	Dia.	Con.	Wt.
S 15	2.1	12-1/2"	8"	3/4"	4.5
S 30	4.8	15"	11"	3/4"	8
S 60	6	16-5/8"	15-1/2"	3/4"	9.5
S 90	14	19-7/8"	15-1/2"	3/4"	19

Well / Storage

Model	Vol.	Ht.	Dia.	Con.	Wt.
AW 100	1/2	8-3/4"	5-1/2"	3/4"	2.5
AW 101	2	12-1/2"	8"	3/4"	5
AW 102	4.5	15"	11"	3/4"	9
AW 103M	14	19-7/8"	15-1/2"	1"	19
AW 104M	20	27"	15-1/2"	1"	27
AW 105M	32	46-1/2"	15-1/2"	1-1/4"	43
AW 106M	44	35-1/2"	22"	1-1/4"	52

ASME

Model	Vol.	Ht.	Dia.	Con.	Wt.
AC 5	3.5	14"	10"	3/4"	22
AC 12	5	14"	12"	3/4"	28
AC 20	8	20"	12"	3/4"	34
AC 30	15	23"	16"	3/4"	64
AC 60	25	34"	16"	1"	93
AC 80	35	45"	16"	1"	109
AC 100	45	38"	20"	1"	146
AC 160	70	46"	24"	1"	259
AC 180	80	49"	24"	1"	268
AC 210	90	52"	24"	1"	283

BACKSTOP®

"Preferred by Professionals"

Quality is what the pros expect and that is what you get with **BackStop®**. This is why we build each tank to meet or exceed exacting **IAPMO** and **NSF** standards. Our complete line of **ASME** diaphragm type expansion tanks are the best choice for all your plumbing, heating, solar and hydro-pneumatic residential and commercial applications.

To locate your nearest **BackStop®** dealer, please call **1-800-242-7769** or you may visit us online at **www.backstopinc.com**

To meet your local BackStop Representative and find out more about our thermal expansion tank line.