



THERM-X-TROL®

Water Heater Expansion Tanks

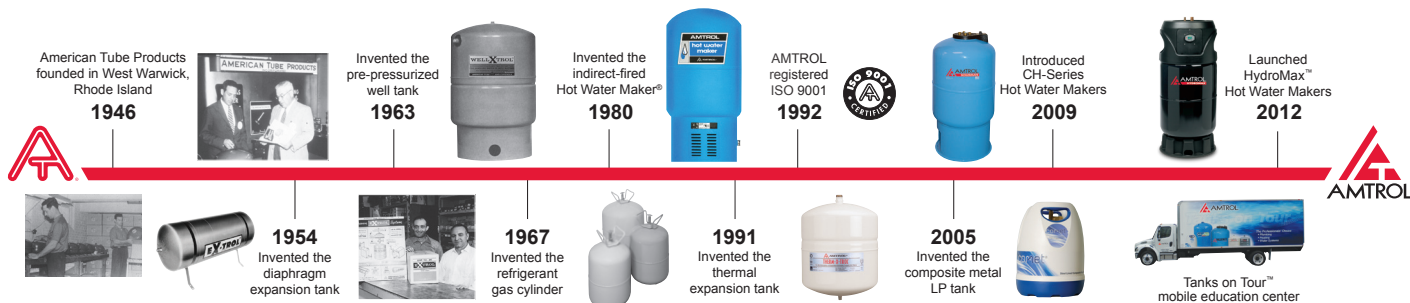


The Best Solution for Controlling Thermal Expansion



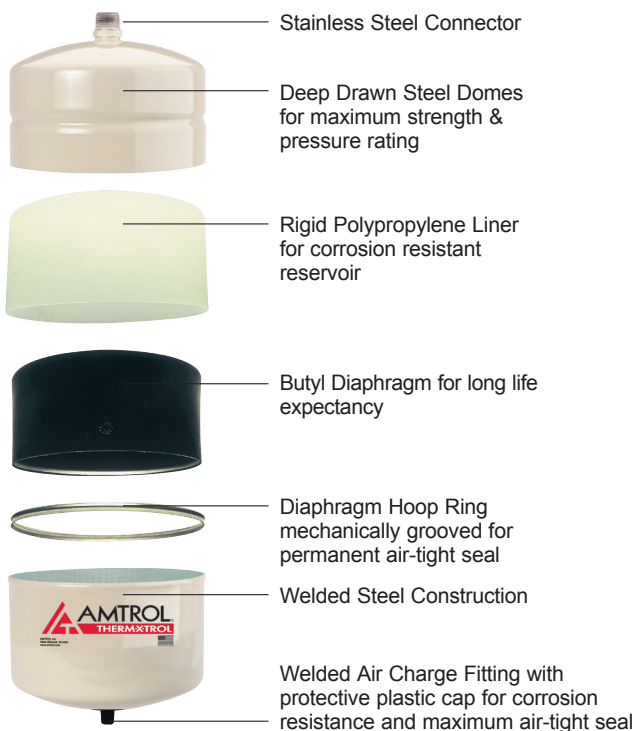
THERM-X-TROL®

Amtrol Inc. invented the thermal expansion tank in 1991 to control pressure build-up in closed, potable water systems. Made in the USA to our exacting specification, Therm-X-Trol is available in diaphragm, partial and full acceptance replaceable bladder designs.

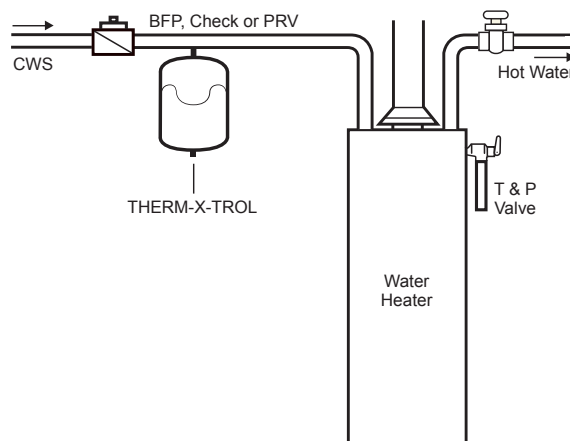


Features

- Accepts expanded water caused by thermal expansion.
- Returns water to the system when hot water is used.
- Protects water heater and fixtures.
- Eliminates wasted energy and water.
- Prevents dangerous pressure buildup.
- Eliminates a potential safety hazard.
- ASME tanks meet all Section VIII, Division I Standards.

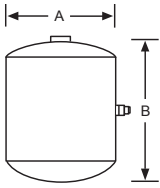


Typical Installation

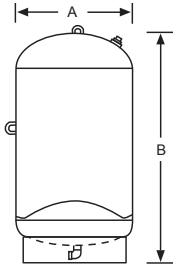


Always adjust the THERM-X-TROL pre-charge to equal water supply pressure.

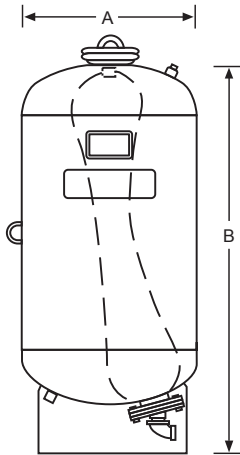
ASME Thermal Expansion Tanks®



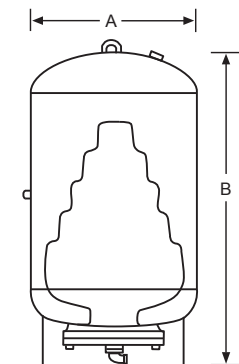
ST-5C, ST-12C



ST-20VC through ST-210VC



ST-447C through ST-457C



ST-35CL through ST-600CL

ST-5C through ST-210VC Specifications

Model Number	Tank Volume (Gallons)	Max. Accept Volume (Gallons)	A Diameter (Inches)	B Height (Inches)	System Conn. NPT (Inches)	Shipping Weight (lbs.) Max. Working Pressure			
						150 PSI	175 PSI	250 PSI	300 PSI
ST-5C	2.1	0.9	10	10	3/4	20	21	22	23
ST-12C	6.4	3.2	12	12	3/4	34	36	37	39
ST-20VC	8.0	3.2	12	19	3/4	41	43	45	47
ST-30VC	14.0	9	16	19	3/4	59	62	65	78
ST-42VC	18.0	11	16	24	3/4	71	75	78	82
ST-60VC	25.0	11	16	34	3/4	85	89	94	98
ST-70VC	34.0	11	16	45	3/4	99	104	109	115
ST-80VC	53.0	35	24	37	1 1/4	224	235	247	259
ST-120VC	68.0	35	24	44	1 1/4	266	279	293	308
ST-180VC	77.0	35	24	49	1 1/4	285	299	314	330
ST-210VC	90.0	35	24	57	1 1/4	319	335	352	369

Maximum Allowable Working Temperature: 200°F. Standard Factory Precharge: 55 PSIG.

ST-447C through ST-457C Specifications

Model Number	Tank Volume (Gallons)	Max. Accept Volume (Gallons)	A Diameter (Inches)	B Height (Inches)	System Conn. NPT (Inches)	Shipping Weight (lbs.) Max. Working Pressure				
						150 PSI	175 PSI	250 PSI	300 PSI	300 PSI
ST-447C	53	34	24	45	2	274	288	302	317	333
ST-448C	80	52	24	59	2	286	300	315	331	348
ST-449C	106	69	24	73	2	320	336	353	370	389
ST-450C	132	86	24	87	2	354	372	390	410	430
ST-451C	159	103	30	73	2	494	519	545	572	600
ST-452C	211	137	30	91	2	593	623	654	686	721
ST-453C	264	172	36	86	3	667	700	735	772	811
ST-454C	317	206	36	98	3	762	800	840	882	26
ST-455C	370	241	36	110	3	842	884	928	75	1,023
ST-456C	422	274	48	82	3	1,151	1,209	1,269	1,332	1,399
ST-457C	528	343	48	97	3	1,925	2,021	2,122	2,228	2,340

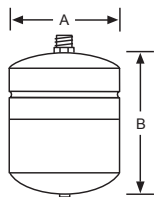
Maximum Allowable Working Temperature: 240°F. Standard Factory Precharge: 55 PSIG.

ST-35CL through ST-600CL Specifications

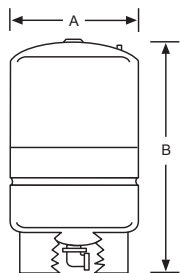
Model Number	Tank Volume (Gallons)	Max. Accept Volume (Gallons)	A Diameter (Inches)	B Height (Inches)	System Conn. NPT (Inches)	Shipping Weight (lbs.) 150 PSI
ST-35CL	10	10	10	37	1	76
ST-50CL	13	11	12	37	1	78
ST-85CL	22	11	16	35	1	95
ST-100CL	26	11	16	39	1	102
ST-130CL	34	27	20	35	1	134
ST-165CL	44	27	20	40	1	153
ST-200CL	53	27	24	41	1	205
ST-300CL	80	27	24	56	1	254
ST-400CL	106	53	24	69	1	308
ST-500CL	132	53	24	83	1	352
ST-600CL	158	53	30	67	1	442

Maximum Allowable Working Temperature: 240°F. Standard Factory Precharge: 55 PSIG.

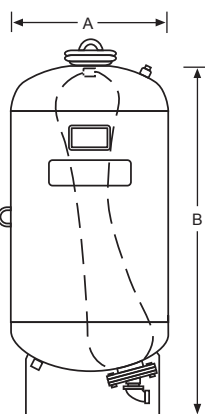
Non-ASME Thermal Expansion Tanks®



ST-5, ST-8, ST-12



ST-25V through ST-210V



ST-451 through ST-457

ST-5 through ST-457 Specifications

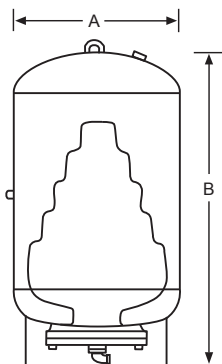
Model Number	Tank Volume (Gallons)	Max. Accept Volume (Gallons)	A Diameter (Inches)	B Height (Inches)	System Conn. NPT (Inches)	Shipping Weight (lbs.) 150 PSI
ST-5	2.0	.45	8	13	3/4	5
ST-8	3.2	.59	9	15	3/4	7
ST-12	4.4	.73	11	15	3/4	9
ST-25V	10.3	1.00	15	19	3/4	23
ST-30V	14.0	.81	15	24	3/4	25
ST-42V	20.0	.57	15	32	3/4	33
ST-60V	34.0	1.00	22	30	1 1/4	61
ST-80V	44.0	.77	22	36	1 1/4	69
ST-180V	62.0	.55	22	47	1 1/4	92
ST-200V	81.0	.41	22	56	1 1/4	103
ST-210V	86.0	.54	26	47	1 1/4	123
ST-451	158.0	.65	30	73	2	508
ST-452	211.0	.65	30	91	2	760
ST-453	264.0	.65	36	86	3	810
ST-454	317.0	.65	36	98	3	914
ST-455	370.0	.65	36	110	3	1,018
ST-456	422.0	.65	48	82	3	1,655
ST-457	528.0	.65	48	97	3	1,925

Maximum Allowable Working Temperature: ST-5 through ST-210V: 200°F; ST-451 through ST-457: 240°F.
Standard Factory Precharge: ST-5 through ST-210V: 40 PSIG; ST-451 through ST-457: 55 PSIG.

ST-35L through ST-600L Specifications

Model Number	Tank Volume (Gallons)	Max. Accept Volume (Gallons)	A Diameter (Inches)	B Height (Inches)	System Conn. NPT (Inches)	Shipping Weight (lbs.) 150 PSI
ST-35L	10	10	10	37	1	76
ST-50L	13	11	12	37	1	78
ST-85L	22	11	16	35	1	95
ST-100L	26	11	16	39	1	102
ST-130L	34	27	20	35	1	134
ST-165L	44	27	20	40	1	153
ST-200L	53	27	24	41	1	205
ST-300L	80	27	24	56	1	254
ST-400L	106	53	24	69	1	308
ST-500L	132	53	24	83	1	352
ST-600L	158	53	30	67	1	442

Maximum Allowable Working Temperature: 240 °F. Standard Factory Precharge: 55 PSIG



ST-35L through ST-600L

Sizing Guides

Precise Sizing Guide

Things You Must Know:

1. Total Water Heater Volume _____ gallons
2. Maximum System Temperature _____ °F
3. Minimum System Temperature _____ °F
4. Maximum Operating Pressure at Expansion Tank . _____ PSIG
5. Line Pressure at Expansion Tank _____ PSIG

Selection of Expansion Tank:

6. Find and enter "Water Expansion Factor" _____ (see Table 1)
7. Max. Acceptance Volume = Line (1) x Line (6) _____ gallons
8. Find and enter "Design Pressure Factor" _____ (see Table 2)
9. Minimum Tank Volume = Line (7) x Line (8) _____ gallons
10. Select an ASME or non-ASME THERM-X-TROL Expansion Tank that is at least equal to Line (9) for Tank Volume (gallons) and Line (7) for Max. Acceptance Volume (gallons). Multiple tanks may be required.

**Table 1:
Water Expansion Factor**

Maximum System Temp.	Minimum System Temperature						
	40° F	50° F	60° F	70° F	80° F	90° F	100° F
60° F	.0005	.0049	—	—	—	—	—
70° F	.0015	.0014	.0009	—	—	—	—
80° F	.0026	.0025	.0020	.0011	—	—	—
90° F	.0041	.0040	.0035	.0026	.0015	—	—
100° F	.0058	.0057	.0052	.0043	.0031	.0017	—
110° F	.0077	.0077	.0072	.0062	.0051	.0037	.0019
120° F	.0100	.0099	.0095	.0086	.0074	.0060	.0043
130° F	.0124	.0123	.0118	.0109	.0098	.0083	.0066
140° F	.0150	.0149	.0145	.0135	.0124	.0110	.0093
150° F	.0179	.0178	.0173	.0164	.0153	.0133	.0121
160° F	.0209	.0208	.0204	.0194	.0181	.0165	.0148
170° F	.0242	.0241	.0236	.0227	.0216	.0201	.0184
180° F	.0276	.0275	.0271	.0261	.0250	.0236	.0219
190° F	.0313	.0312	.0307	.0298	.0287	.0272	.0255
200° F	.0351	.0350	.0346	.0336	.0325	.0311	.0294
210° F	.0391	.0390	.0386	.0376	.0365	.0351	.0334
220° F	.0434	.0433	.0428	.0419	.0408	.0393	.0376
230° F	.0476	.0475	.0471	.0461	.0450	.0436	.0419
240° F	.0522	.0521	.0517	.0507	.0496	.0482	.0465

For fluid applications other than water, consult AMTROL technical services.

Maximum Temperature Setting 140°F

Water Heater Size (gals.)	Static Supply Pressure (PSI)		
	40	60	80
40	ST-5	ST-5	ST-5
50	ST-5	ST-5	ST-5
60	ST-5	ST-5	ST-8
80	ST-8	ST-8	ST-12
120	ST-12	ST-12	ST-25V

Maximum Temperature Setting 150°F

Water Heater Size (gals.)	Static Supply Pressure (PSI)		
	40	60	80
40	ST-5	ST-5	ST-5
50	ST-5	ST-5	ST-8
60	ST-5	ST-5	ST-8
80	ST-8	ST-8	ST-12
120	ST-12	ST-12	ST-25V

Maximum Temperature Setting 180°F

Water Heater Size (gals.)	Static Supply Pressure (PSI)		
	40	60	80
40	ST-8	ST-8	ST-8
50	ST-8	ST-8	ST-12
60	ST-8	ST-12	ST-25V
80	ST-12	ST-25V	ST-25V
120	ST-25V	ST-25V	ST-25V

Quick-Sizing Charts

- Sizing charts are based on 40°F incoming water temperature and a 150 PSI T&P safety relief valve.
- For multiple heaters, use the total volume of the water heaters plus any storage tanks.
- THERM-X-TROL precharge must be set to the static supply pressure prior to installation.

**Table 2:
Design Pressure Factor (DPF)**

Maximum Allowable Pressure	Line Pressure (PSI)	Design Pressure Factor (DPF)
100	40	1.9
	50	2.3
	60	2.9
	70	3.8
125	80	5.7
	40	1.6
	50	1.9
	60	2.1
150	70	2.5
	80	3.1
	40	1.5
	50	1.6
	60	1.8
	70	2.1
	80	2.4

For conditions not shown in table, use equation:

$$DPF = \frac{\text{Max. Allow. Pressure} + 14.7}{\text{Max. Allow. Pressure} - \text{Line Pressure}}$$



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