



THERM-X-TROL®

Commercial Thermal Expansion Tanks



For Closed Thermal Water Systems



THERM-X-TROL®

Amtrol thermal expansion tanks are engineered to control pressure build-up in closed, potable water systems. Available in diaphragm, full acceptance and partial acceptance bladder designs, all Therm-X-Trol expansion tanks are made in the USA at our ISO 9001 : 2008 registered facilities. ASME tanks meet Section VIII, Division 1 Standards.

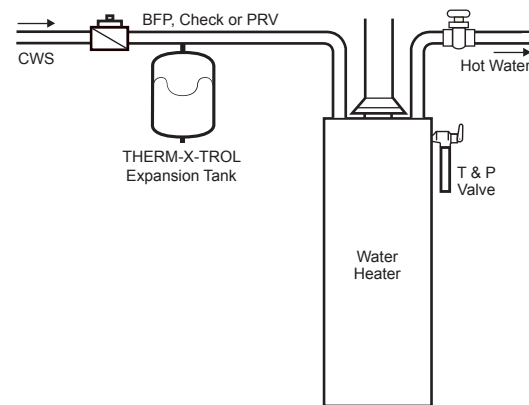


Features

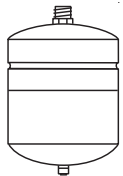
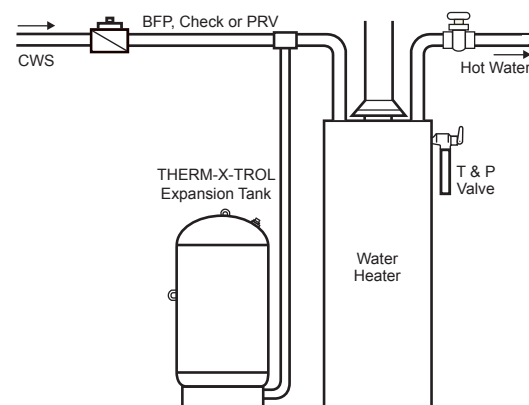
- Accepts expanded water caused by thermal expansion.
- Returns water to the system when hot water is used.
- Protects water heater and fixtures.
- Eliminates wasted energy and water.
- Prevents dangerous pressure build-up.
- Eliminates a potential safety hazard.

Typical Installations

In-Line Models

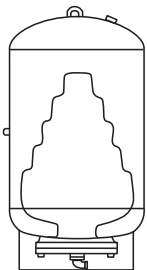


Stand Models



Diaphragm Models

- Heavy duty butyl diaphragm; industry's thickest.
- Fixed diaphragm construction for leak-free performance.



Bladder Models

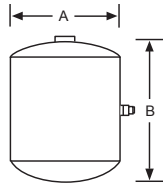
- Heavy duty butyl bladder; industry's thickest.
- Replaceable full and partial acceptance designs.

How to Order: Specify Item & Options

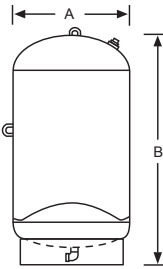
Base Item Number _____
 Pressure _____
 Sight Glass Option _____
 Restraint Option _____
 ST-80VC 150 PSI Rating with Sight Glass & Restraints

ST-80VC -150 SGR

ASME Thermal Expansion Tanks



ST-5C, ST-12C



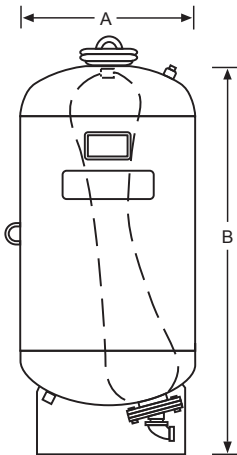
ST-20VC through ST-210VC

ASME Diaphragm Series Specifications

Model Number	Tank Volume (Gallons)	Max. Accept. Volume (Gallons)	A Diameter (Inches)	B Height (Inches)	System Conn. ¹ NPTF (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	23	25	30
ST-12C	6.4	3.2	12	12	3/4	34	37	42	50
ST-20VC	8.0	3.2	12	19	3/4	41	43	50	62
ST-30VC	14.0	9.0	16	19	3/4	59	64	96	108
ST-42VC	18.0	11.0	16	24	3/4	71	75	101	112
ST-60VC	25.0	11.0	16	32	3/4	85	113	125	139
ST-70VC	34.0	11.0	16	45	3/4	99	122	136	151
ST-80VC	53.0	35.0	24	37	1 1/4	224	296	305	340
ST-120VC	68.0	35.0	24	44	1 1/4	266	340	375	400
ST-180VC	77.0	35.0	24	49	1 1/4	285	360	380	420
ST-210VC	90.0	35.0	24	57	1 1/4	319	380	405	440

¹Stainless Steel System Connection.

Maximum Operating Temperature: 200°F. Factory Pre-charge: 55 PSIG.



ASME Full Acceptance Bladder Series Specifications

Model Number	Tank Volume (Gallons)	Max. Accept. Volume (Gallons)	A Diameter (Inches)	B Height (Inches)	System Conn. ¹ NPTF (Inches)	Shipping Weight (lbs.) Max. Working Pressure				
						125 PSI	150 PSI	175 PSI	250 PSI	300 PSI
ST-447C	53	53	24	45	2	236	262	290	370	425
ST-448C	80	80	24	59	2	274	340	430	492	540
ST-449C	106	106	24	73	2	320	360	450	510	560
ST-450C	132	132	24	87	2	354	400	460	570	632
ST-451C	159	159	30	73	2	494	587	680	815	895
ST-452C	211	211	30	91	2	593	625	699	1,005	1,107
ST-453C	264	264	36	86	3	667	760	845	1,100	1,205
ST-454C	317	317	36	98	3	762	850	960	1,265	1,400
ST-455C	370	370	36	110	3	842	935	1,065	1,350	1,490
ST-456C	422	422	48	82	3	1,151	1,423	1,650	1,660	1,830
ST-457C	528	528	48	97	3	1,335	1,505	1,875	2,230	2,455

¹Bronze System Connection.

Maximum Operating Temperature: 240°F. Factory Pre-charge: 55 PSIG.

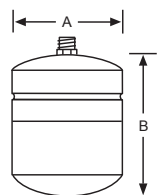
ASME Partial Acceptance Bladder Series Specifications

Model Number	Tank Volume (Gallons)	Max. Accept. Volume (Gallons)	A Diameter (Inches)	B Height (Inches)	System Conn. ¹ NPTF (Inches)	Shipping Weight (lbs.) Max. Working Pressure
						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

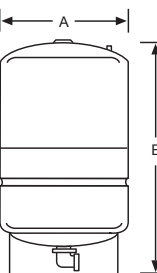
¹Stainless Steel System Connection.

Maximum Operating Temperature: 240°F. Factory Pre-charge: 55 PSIG.

Non-ASME Thermal Expansion Tanks



ST-5, ST-8, ST-12



ST-25V through ST-210V

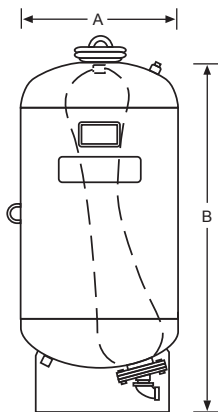
Non-ASME Diaphragm Series Specifications

Model Number	Tank Volume (Gallons)	Max. Accept. Volume (Gallons)	A Diameter (Inches)	B Height (Inches)	System Conn. ¹ (Inches)	Shipping Weight (lbs.) Max. Working Pressure
						150 PSI
ST-5	2.0	0.9	8	13	3/4	5
ST-8	3.2	1.9	9	15	3/4	7
ST-12	4.4	3.2	11	15	3/4	9
ST-25V	10.3	10.3	15	19	3/4	23
ST-30V	14.0	11.3	15	24	3/4	25
ST-42V	20.0	11.4	15	32	3/4	33
ST-60V	34.0	34.0	22	30	1 1/4	61
ST-80V	44.0	33.9	22	36	1 1/4	69
ST-180V	62.0	34.1	22	47	1 1/4	92
ST-200V	81.0	33.2	22	56	1 1/4	103
ST-210V	86.0	46.4	26	47	1 1/4	123

¹ST-5 through ST-12: Stainless Steel NPTM System Connection.

ST-25V through ST-210V: Stainless Steel NPTF System Connection.

Maximum Operating Temperature: 200°F. Factory Pre-charge: 40 PSIG.



ST-451 through ST-457

Non-ASME Full Acceptance Bladder Series Specifications

Model Number	Tank Volume (Gallons)	Max. Accept. Volume (Gallons)	A Diameter (Inches)	B Height (Inches)	System Conn. ¹ (Inches)	Shipping Weight (lbs.) Max. Working Pressure
						150 PSI
ST-451	159	159	30	73	2	550
ST-452	211	211	30	91	2	600
ST-453	264	264	36	86	3	740
ST-454	317	317	36	98	3	825
ST-455	370	370	36	110	3	900
ST-456	422	422	48	82	3	1,390
ST-457	528	528	48	97	3	1,495

¹ST-451 through ST-457: Bronze NPTF System Connection.

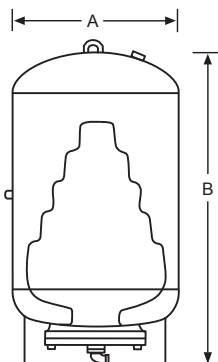
Maximum Operating Temperature: 240°F. Factory Pre-charge: 55 PSIG.

Non-ASME Parial Acceptance Bladder Series Specifications

Model Number	Tank Volume (Gallons)	Max. Accept. Volume (Gallons)	A Diameter (Inches)	B Height (Inches)	System Conn. ¹ NPTF (Inches)	Shipping Weight (lbs.) Max. Working Pressure
						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

¹Stainless Steel System Connection.

Maximum Operating Temperature: 240°F. Factory Pre-charge: 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 (DPF)" . . . _____ (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.

Quick-Sizing Charts

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-8	ST-8	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

- 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 (PSI)	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:

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



Made in the USA

From modest beginnings in founder Chet Kirk's garage to our current, state-of-the-art facilities, Amtrol is still proudly manufacturing products in the USA. Our talented, dedicated associates are committed to providing you with the highest quality, most reliable and best performing products on the market.



Associates at our West Warwick, Rhode Island manufacturing facility.

Additional support materials include:

- Commercial and Industrial Products Catalog (MC 4401)
- Data Submittal Sheets (MC 4400)
- Engineering Handbook (MC 4402P)
- Product Sizing programs on www.amtrol.com
- Revit Files (MC 10205)
- AutoCAD Files (MC 10029)



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