

PUMP TANKS

PUMP MATE PRE-PRESSURIZED

Drawn Steel Construction
Diaphragm Operation
Corrosion Resistant Base
Lighweight
Maximum Working Pressure 100 PSI
5-Year Limited Warranty

NEPTUNE GLASSLINED

Rolled Steel Construction
Fused Glasslining
Maximum Working Pressure 100 PSIG
3-Year Limited Warranty

NEPTUNE GALVANIZED

100% Galvanized
1-Year Limited Warranty



NSF International
Listed Standard 61

D022652

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Ashland City, Tennessee 37015
www.statewaterheaters.com

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PUMP MATE™

PRE-PRESSURIZED DIAPHRAGM OPERATION

5-YEAR LIMITED WARRANTY

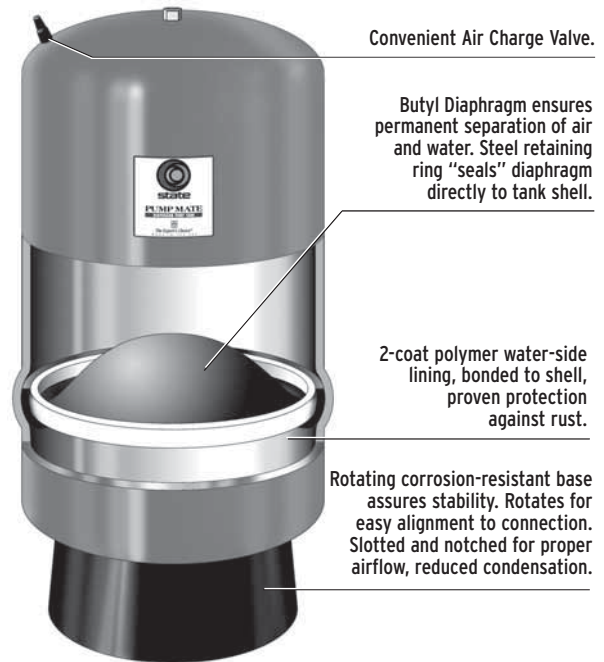
State Industries Pump Mate tanks are designed for installation flexibility and years of trouble-free service. Smooth, dependable diaphragm design and operation provides precise control of system operation cycles. Free-standing and in-line vertical tanks are available, as well as horizontal tanks with universal pump mounting bracket. Every State Pump Mate tank is made in the U.S.A.

Higher Drawdown Than Competition!

The industry's most popular "standard" tank sizes are 32-gallon and 44-gallon. Pump Mate offers 36-gallon and 52-gallon tanks in the same price range. So, a 36-gallon Pump Mate delivers 12% higher drawdown than the industry standard. A 52-gallon Pump Mate delivers 18% higher drawdown than standard!

In-Line Tanks

SPMDI Series tanks, available in 2, 4.6, 7.3 and 14-gallon sizes, are designed to be supported by system piping (See Typical Installations, page 4).



Convenient Air Charge Valve.

Butyl Diaphragm ensures permanent separation of air and water. Steel retaining ring "seals" diaphragm directly to tank shell.

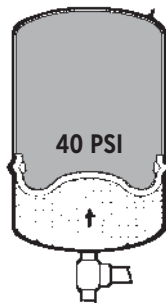
2-coat polymer water-side lining, bonded to shell, proven protection against rust.

Rotating corrosion-resistant base assures stability. Rotates for easy alignment to connection. Slotted and notched for proper airflow, reduced condensation.

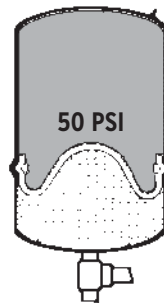
PRE-PRESSURIZED PUMP TANK OPERATION CYCLES



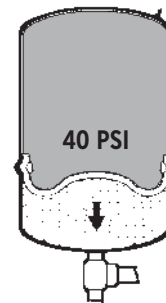
Start-up Cycle*
Diaphragm is pressed against the bottom of the chamber.



Fill Cycle*
Water is pumped into the reservoir, which forces the diaphragm upward into the air chamber.



Hold Cycle*
Pump-cutoff pressure is attained. Diaphragm reaches its uppermost position. Reservoir is now filled to its rated capacity.



Delivery Cycle*
Pump remains shut off while air pressure in top chamber forces diaphragm downward, delivering water to system.

* Based on 30-50 PSI operating system.



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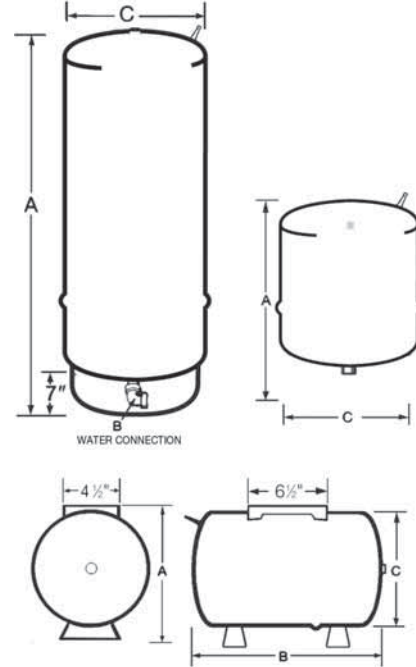
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PUMP MATE™

PRE-PRESSURIZED DIMENSIONS AND WEIGHTS

	Model Number	Volume (Gallons)	Dimensions in Inches			Weight (Lbs.)
			"A" Overall Height	"B" To Center of Water Inlet	"C" Diameter	
SPMD Series Free Standing	SPMD-14	14.0	24 3/4	2 1/4	15 3/8	25
	SPMD-20	20.0	32 3/4	2 1/4	15 3/8	30
	SPMD-31	31.0	45 1/2	2 1/4	15 3/8	40
	SPMD-36S	36.0	32 5/8	2 1/4	20	45
	SPMD-52	52.0	38 5/8	2 1/4	23 3/8	77
	SPMD-86	86	59	2 1/4	23 3/8	105
	SPMD-96	96.0	63 3/8	2 1/4	23 3/8	111
SPMDI Series In-Line	SPMDI-2	2.0	12 9/16	-	8 3/8	4 1/2
	SPMDI-5	4.6	14 11/16	-	11 3/8	7 1/2
	SPMDI-7	7.3	21 1/8	-	11 3/8	10 1/2
SPMDH Series Horizontal	SPMDH-7	7.3	12 5/8	21 1/8	11 3/8	16
	SPMDH-14	14.0	17 3/8	21 3/4	15 3/8	25 1/2
	SPMDH-20	20.0	17 3/8	27 1/8	15 3/8	30

SPMD-14, SPMD-20, SPMD-36S connection 1" Female.
 SPMD-52, SPMD-86, SPMD-96, SPMD-119 connection 1-1/4" Female.
 SPMDI connection 3/4" Male. • SPMDI-14 1" male.
 SPMDH-7 connection 3/4" Male. * SPMDH-14, SPMDH-20 connection 1" Male.



PUMP TANK SIZING

Free-Standing Selection Charts

The charts below allow you to easily select the right free-standing tank for standard size pumps between 2-1/2 and 30 gallons in capacity and for 20-40 PSI, 30-50 PSI and 40-60 PSI pressure ranges. Minimum run times shown (from start-up) are 1 minute, 1-1/2 minutes and 2 minutes. For example, for a system that delivers 10 gpm at 30-50 PSI, with a minimum run time of 1 minute, Chart 1 indicates that the proper tank is the SPMD-36S.

If proper tank selection cannot be made using Chart 1, follow this procedure.

First find the “drawdown multiplier” by matching the pump start-up and shut-off pressures on Chart 2. For example, the multiplier for a 30-50 PSI pressure range is .31. Next, insert the pump GPM capacity and desired minimum run time into this formula:

$$\frac{\text{PUMP GPM} \times \text{Min. Run Time}}{\text{Multiplier}} = \text{Minimum Tank Volume Required}$$

To assume dependable Drawdown Volumes, and in keeping with present industry practice, Drawdowns are based on Boyles Law.

For example, using a 10 GPM pump, a one-minute minimum run time, and a 30-50 PSI pressure range, the formula is as follows:

$$\frac{10 \times 1}{.31} = 32.25 \text{ Minimum Tank Volume}$$

Then, using Chart 3, select the tank that has a minimum volume that meets or exceeds your minimum volume requirement, and supplies adequate drawdown at the required pressure range. Minimum drawdown equals Pump GPM x Minimum Run Time. Therefore, in the above example, select the SPMD-36S 36-gallon tank. It provides adequate drawdown at 30-50 PSI.

Chart 1- PMD Series Free-Standing Tank Selection Chart

Pump GPM	System Pressure Ranges-PSI								
	20-40			30-50			40-60		
	Minimum Run Times (Minutes)								
	1	1-1/2	2	1	1-1/2	2	1	1-1/2	2
2.5	SPMD-14	SPMD-14	SPMD-14	SPMD-14	SPMD-14	SPMD-20	SPMD-14	SPMD-20	SPMD-20
5	SPMD-14	SPMD-20	SPMD-36S	SPMD-20	SPMD-36S	SPMD-36S	SPMD-20	SPMD-36S	SPMD-52
7	SPMD-20	SPMD-36S	SPMD-52	SPMD-36S	SPMD-36S	SPMD-52	SPMD-36S	SPMD-52	SPMD-86
10	SPMD-36S	SPMD-52	SPMD-86	SPMD-36S	SPMD-52	SPMD-86	SPMD-52	SPMD-86	SPMD-86
12	SPMD-36S	SPMD-52	SPMD-86	SPMD-52	SPMD-86	SPMD-86	SPMD-52	SPMD-86	SPMD-96
15	SPMD-52	SPMD-86	SPMD-86	SPMD-52	SPMD-86	SPMD-119	SPMD-86	SPMD-96	SPMD-119
20	SPMD-86	SPMD-86	SPMD-119	SPMD-86	SPMD-119	[2]SPMD-86	SPMD-86	SPMD-119	[2]SPMD-86
25	SPMD-86	SPMD-119	[2]SPMD-86	SPMD-86	[2]SPMD-86	[2]SPMD-86	SPMD-96	[2]SPMD-86	[2]SPMD-96
30	SPMD-86	[2]SPMD-86	[2]SPMD-86	SPMD-119	[2]SPMD-86	[2]SPMD-119	SPMD-119	[2]SPMD-96	[2]SPMD-119

Chart 2- Drawdown Volume Multiplier (Approximate)

Pump Shut-Off Pressure Psi	Pump Start-Up Pressure-PSI							
	10	20	30	40	50	60	70	80
20	0.26							
30	0.41	0.22						
40		0.37	0.18					
50		0.46	0.31	0.15				
60			0.40	0.27	0.13			
70			0.47	0.35	0.24	0.12		
80				0.42	0.32	0.21	0.11	
90				0.48	0.38	0.29	0.19	0.10
100					0.44	0.35	0.26	0.17

Chart 3- Drawdown in Gallons

Model No.	Vol. in Gallons	20-40	30-50	40-60
SPMDI-2	2.0	0.7	0.6	–
SPMDI-5	4.6	1.7	1.4	–
SPMDI-7	7.3	2.7	2.3	–
SPMD-14	14.0	5.2	4.3	3.8
SPMD-20	20.0	7.4	6.2	5.4
SPMD-31	31	11.4	9.6	8.4
SPMD-36S	36.0	13.3	11.2	9.7
SPMD-52	52.0	19.2	16.1	14.0
SPMD-86	86.0	31.8	26.7	23.2
SPMD-96	96.0	35.5	29.8	25.9
SPMD-119	119.5	44.2	37.0	32.3

Rule of Thumb System Sizing

The following water requirements figures are based on averages accepted by the industry. They represent typical household and farm animal water requirements. Generally speaking, a reliable daily average water requirement is 100 gallons per day per person.

Average daily farm animal requirements

Gallons/Day	
Horse, Mule, Steer	12
Cow-Dry	15
Cow-Milking	35
Hog	4
Sheep	2
Chicken/100	6
Turkey/100	20

Average home water requirements based on industry-accepted 7-minute peak demand cycle

Unit	Flow Rate GPM	Requirement Gallons
Kitchen sink	5	3
Toilet	4	5
Lavatory	4	2
Tub or Shower	5	35
Auto Wash Machine	5	35
Dishwasher	2	14
Garden Hose (1/2")	3	} Depends upon cycle time
Lawn Sprinkler	3-7	
Water Softener	7	

Average household water requirements (GPM) using industry-accepted 7-minute peak demand cycle

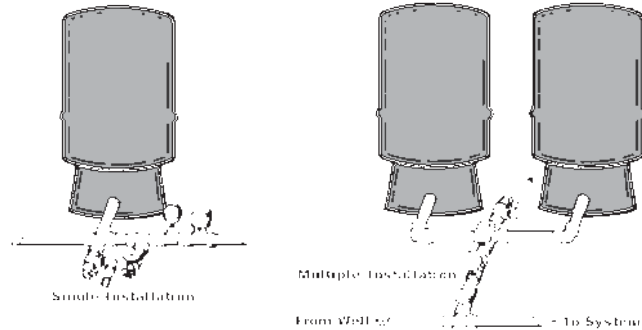
No. of Bathrooms	Type of Water Using Fixtures Installed	GPM Required
1	Sink, Toilet, Lavatory Tub/Shower	7
1 1/2	Same as Above but with Automatic Washer	10
2-2 1/2	Same as Above but with Automatic Dishwasher	14
3-4	Same as Above	17

TYPICAL INSTALLATIONS

For multiple installations, manifold size is critical. If you have questions about sizes call our Technical Engineering Services Department at 1-800-365-0024.

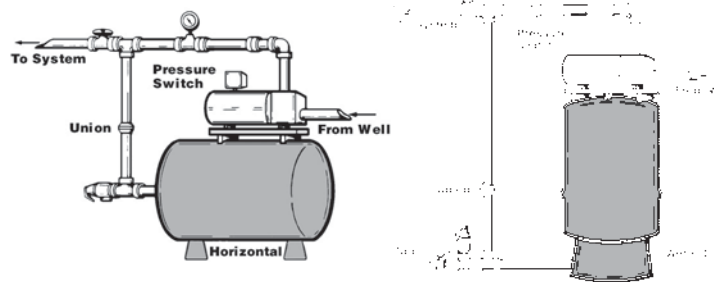
Free-Standing Series*

The standard installation, utilizing front entry, with gauge, relief valve and pressure switch installed in *front* of tank.



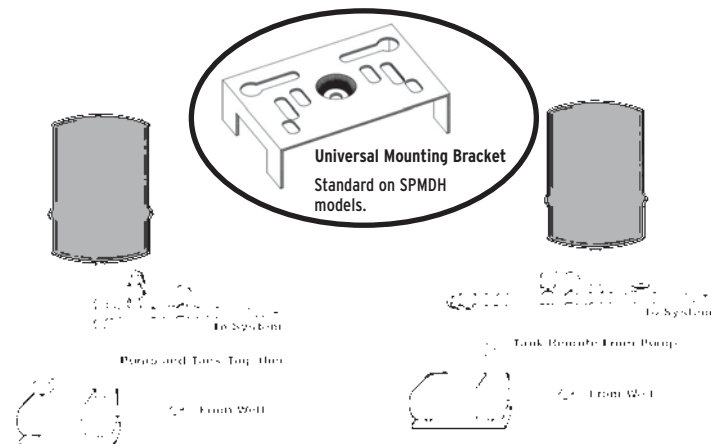
Free-Standing Series With Pump Mounted On Tank*

The pump can be mounted on tank using a universal mounting base. The pump and base can be strapped to the tank in the horizontal position, or mounted to the tank in a vertical position.



In-Line Series*

The In-Line Series is designed to be supported by system piping, either directly above the pump, or in a convenient place in the piping system as close to the pump as possible.



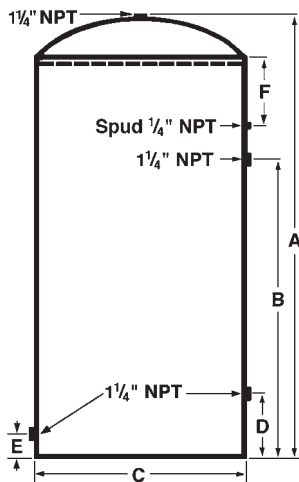
* When pump and tank are in different locations, the pressure switch should be at the tank location. Or compensating adjustment must be made for pressure loss due to head of water, i.e., one PSI for every two feet of elevation.

NEPTUNE™ GLASSLINED

Rolled Steel Construction
Fused Glasslining
Maximum working pressure 100 PSIG
3-Year limited warranty

“Glasslining,” a porcelain protective coating to a steel tank interior, is the plumbing industry’s most time-tested system for protection against tanks. State Neptune Glasslined Pump Tanks feature rolled-steel construction. State Water Heaters is one of the world’s largest producers of glasslined tanks, and every Neptune Tank is made in the U.S.A.

Other Neptune features include a 1-1/4" NPT spud on top for motor mount or retention tank connections, a 1/4" switch or gauge tapping on the air side of the tank, and full-size 1-1/4" connections at all needed locations.

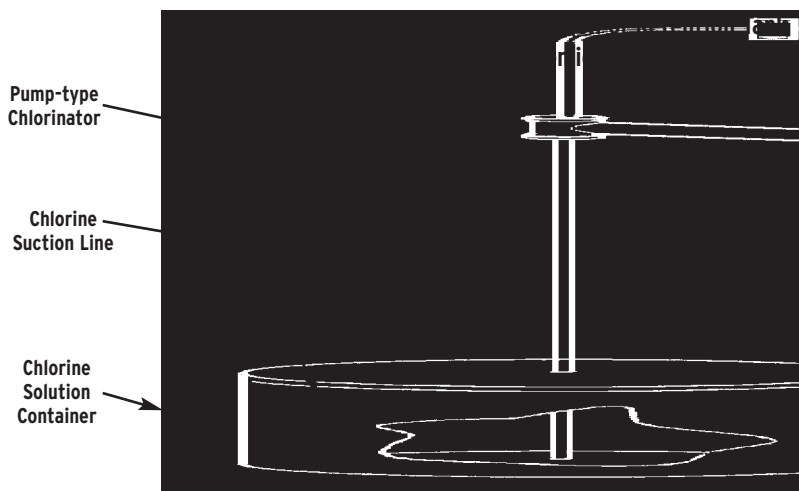


G Series Glasslined Pump Tanks

Model Number	Volume (Gallons)	Dimensions in Inches						Weight (Pounds)
		A	B	C	D	E	F	
G-42-T	42	49	26	16-1/2	12	3	6	77
G-42-S	42	35-7/8	17	20	8	3	6	79
G-82	82	62-1/4	33	20	12	3	6	120
G-120	120	63	33	24	12	3	6	160

1-1/4" NPT Spud in head for alternate motor mount or retention tank connection.
 All tapping 1-1/4" Water Connections.
 1/4 " pressure switch tapping on all models.

A STANDARD RETENTION SYSTEM

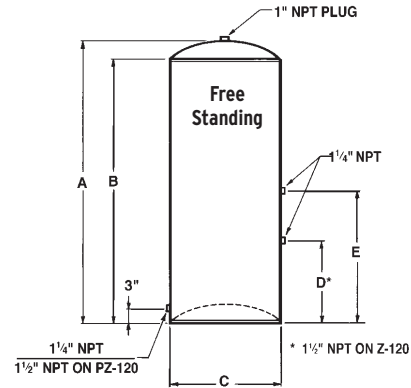


NEPTUNE™ GALVANIZED

Horizontal or Vertical Tanks
Maximum working pressure 75 PSIG
NSF Certified
1-Year limited warranty

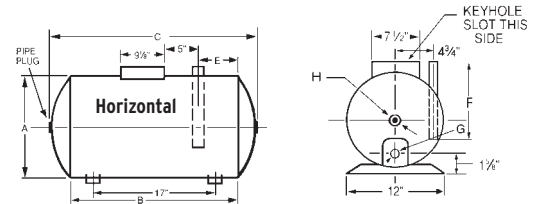
Sizes 12 to 120 Gallons - Free Standing

Model Number	Volume (Gallons)	Dimensions in Inches					Weight (Pounds)
		A	B	C	D	E	
Z-12	12	26-1/2	24	12	5	13	27
Z-21	21	27	24	16	5	13	45
Z-32	32	38 3/4	36	16	8	17	52
ZT-42	42	51	48	16	12	26	71
ZS-42	42	33 3/4	30	20	8	17	71
Z-82	82	63	60	20	12	33	114
Z-120	120	64 1/2	60	24	12	33	154



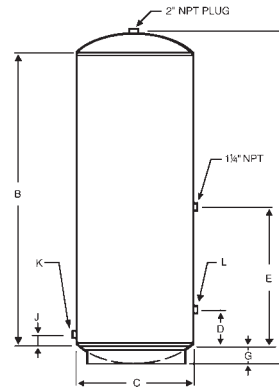
30-Gallon - Horizontal

Model Number	Volume (Gallons)	Dimensions in Inches							Weight (Pounds)
		A	B	C	E	F	G	H	
Z-30H	30	16	29-1/2	34-1/2	5-1/4	14	1	3/8	65

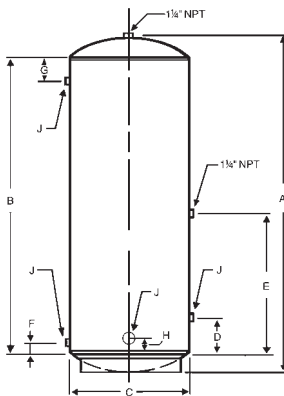


Sizes 220 to 900 Gallons - Galvanized

Model Number	Volume (Gallons)	Dimensions in Inches									Weight (Pounds)
		A	B	C	D	E	G	J	K	L	
Z-220	220	78	66	30	6	32	6	2-1/2	2	2	303
Z-315	315	79-1/2	66	36	6	32	7	2-1/2	2	2	416
Z-480	480	87	72	42	6	32	7-1/2	2-1/2	2	3	640



Models: Z-220, Z-315, Z-480



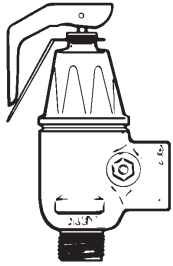
Models: ZU-525, ZU-900

Model Number	Volume (Gallons)	Dimensions in Inches									Weight (Pounds)
		A	B	C	D	E	F	G	H	J	
ZU-525	525	128	114	36	6	56	2-1/2	2-1/2	4	2" NPT	685
ZU-900	900	159	144	42	14	77	4	4	9	3" NPT	1040

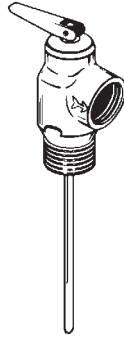
1" NPT Spud in head for alternate motor mount or retention tank connection.
All tapping 1-1/4" Water Connections.
1/4" pressure switch tapping on all models.

PRESSURE RELIEF VALVE

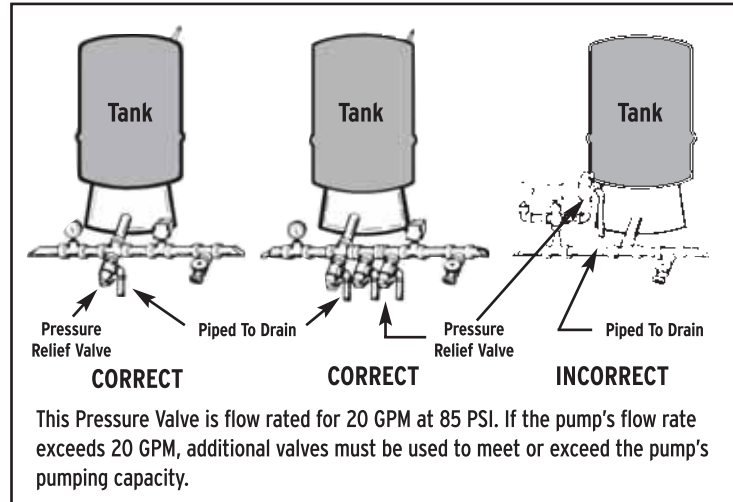
Only for Installation on Pump Tank or Expansion Tank Systems



- 75 pound setting
- 20 GPM at 85 PSI
- 3/4" male inlet size
- 3/4" female outlet size



- 100 pound setting
- 20 GPM at 85 PSI
- 3/4" male inlet size
- 3/4" female outlet size



This Pressure Valve is flow rated for 20 GPM at 85 PSI. If the pump's flow rate exceeds 20 GPM, additional valves must be used to meet or exceed the pump's pumping capacity.

All tanks described in this brochure are covered by a limited warranty.

- SPMD Series 5-Year Limited Warranty
- G Series - 3-Year Limited Warranty
- Z Series - 1-Year Limited Warranty

Details of these warranties are available from the State Water Heaters sales office at 1-800-365-8170.

In keeping with our policy of continuous product improvements, we reserve the right to make minor changes without prior notice.



All State expansion tanks are
manufactured in the
United States of America.

Specifications are subject to change without prior notice.