



SURGE-TROL[®]

ASME Fire Sprinkler System Surge Suppressors



For the Absorption of Pump Surges



SURGE-TROL®

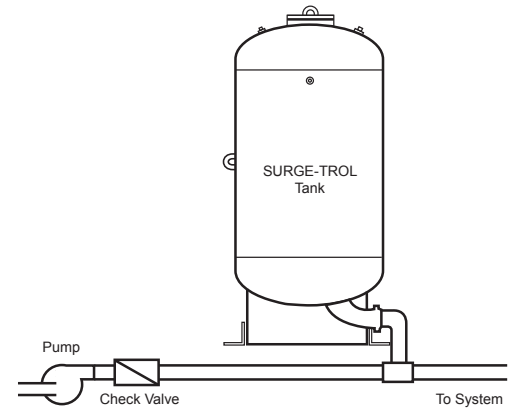
Amtrol Commercial Surge-Trol tanks are designed to absorb pump startup and shut-down surges in fire protection sprinkler systems. Available from 10 to 528 gallon sizes, Surge-Trol tanks are made in the USA in our ISO 9001:2015 certified facilities. These tanks meet all ASME Section VIII, Division 1 Standards.



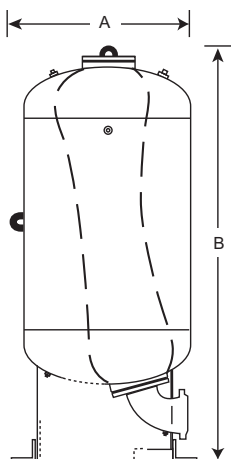
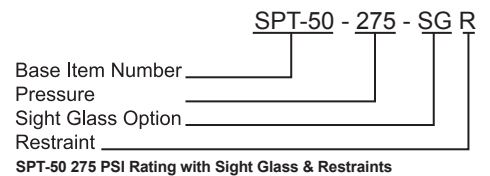
SURGE-TROL SPT SERIES

- Replaceable, heavy duty bladder.
- Compatible with water, glycerin and glycol systems.
- UL listed (SPT-7 through SPT-70).
- FM approved.
- ASME Section VIII, Division 1 certified.
- Seismic Restraints (R) come standard; Sight Glass (SG) option available.
- Factory pre-charge: 25 psig.
- Maximum operating temperature: 240° F.
- Maximum working pressure: 275 PSI.

Typical Installation



How to Order: Specify Model & Options



SPT Series Specifications

Model Number	Tank Volume (Gallons)	Max. Accept. Volume (Gallons)	A Diameter (Inches)	B Height (Inches)	System Conn. ¹ (Inches)	Shipping Weight (lbs.)
SPT-1	10	10	16	31	2	200
SPT-3	25	25	16	49	3	273
SPT-7	53	53	24	49	4	390
SPT-11	80	80	24	63	4	505
SPT-14	106	106	24	77	4	618
SPT-18	132	132	24	91	4	731
SPT-21	158	158	30	75	4	950
SPT-28	211	211	30	93	4	1,125
SPT-35	264	264	36	85	6	1,520
SPT-42	317	317	36	97	6	1,720
SPT-50	370	370	36	110	6	1,900
SPT-56	422	422	48	86	8	2,300
SPT-70	528	528	48	100	8	2,700

¹Malleable Iron 300# Flange.

Sizing Guides

Formula for Water Hammer Protection (Start-Up)

$$\text{Tank Volume (gallons)} = \frac{\left(\frac{\text{SG} \times 2 \times \text{Qs} \times \text{L}}{449 \times \text{a}} \right) \left(\frac{\text{P}_2 + 14.7}{\text{P}_1 + 14.7} \right)^{1/n}}{\left(\frac{\text{P}_2 + 14.7}{\text{P}_1 + 14.7} \right)^{1/n} - 1} \times 7.481$$

Example*

$$\text{Tank Volume (gallons)} = \frac{\left(\frac{1 \times 2 \times 400 \times 2500}{449 \times 4500} \right) \left(\frac{150 + 14.7}{85 + 14.7} \right)^{1/1.2}}{\left(\frac{150 + 14.7}{85 + 14.7} \right)^{1/1.2} - 1} \times 7.481$$

Tank Volume = 21.6 gallons (Select tank equal to or greater.)
Recommended Model: SPT-7

Formula for Cavitation Protection (Shut-Down)

$$\text{Tc} = \frac{2 \times \text{L}}{\text{a}}$$

$$\text{Vv} = \text{Qss} \times \text{Tc} \times 7.481$$

$$\text{AF} = 1 - \left(\frac{\text{P}_1 + 14.7}{\text{P}_2 + 14.7} \right)^{1/n}$$

$$\text{Tank Volume (gallons)} = \frac{\text{Vv}}{\text{AF}}$$

Example*

$$\text{Tc} = \frac{2 \times 2500}{4500} = 1.11$$

$$\text{Vv} = 10.08 \times 1.11 \times 7.481 = 83.70$$

$$\text{AF} = 1 - \left(\frac{50 + 14.7}{150 + 14.7} \right)^{1/1.2} = .541$$

$$\text{Tank Volume} = \frac{83.04}{.541}$$

Tank Volume = 153.5 gallons (Select tank equal to or greater.)
Recommended Model: SPT-21

Glossary of Terms

Abbreviation	Definition	Example
A	Pipe Size	
a	Speed of Pressure Wave (ft./sec.)	Steel, Cast Iron & Ductile Iron Pipe = 4,500 ft/sec PVC Pipe = 1,250 ft/sec
AF	Acceptance Factor	
L	Length of Pipe (feet)	
n	Gas Constant (pre-charge gas)	Dry Air = 1.2 Nitrogen = 1.4
P ₁	Tank Pre-Charge Pressure	Start-up: 15% below static pressure Shut-down: 50% below static pressure
P ₂	Maximum Allowable Pressure	
Qs	Fire Pump Flow Rate (gal./min.)	
Qss	Fire Pump Flow Rate (ft./sec.)	See Chart
SG	Specific Gravity	Ammonia = 0.7 Ethylene Glycol = 1.1 Glycerin = 1.3 Propylene Glycol = 1.1 Water = 1
Tc	Critical Time (seconds)	
V	Velocity of Water (ft./sec.)	
Vv	Vacuum Volume	

Qss Fire Pump Flow Rate (feet per second)

GPM	Pipe Size			GPM	Pipe Size			GPM	Pipe Size			
	2"	3"	4"		5"	6"	8"		10"	12"	14"	16"
90	8.60	-	-	500	8.02	-	-	2000	8.14	-	-	-
100	9.56	-	-	550	8.82	-	-	2500	10.17	-	-	-
125	11.97	-	-	600	9.63	-	-	3000	12.20	8.60	-	-
150	14.36	-	-	650	10.43	-	-	3500	14.24	10.30	8.30	-
175	16.75	-	-	700	11.23	-	-	4000	16.27	11.47	9.48	-
200	19.14	8.68	-	750	12.03	8.33	-	4500	18.31	12.90	10.67	8.17
225	-	9.77	-	800	12.83	8.88	-	5000	-	14.33	11.85	9.08
250	-	10.85	-	850	13.64	9.44	-					
275	-	11.94	-	900	14.44	9.99	-					
300	-	13.00	-	950	15.24	10.55	-					
325	-	14.12	8.19	1000	16.04	11.10	-					
350	-	-	8.82	1100	17.65	12.22	-					
375	-	-	9.45	1200	-	13.33	-					
400	-	-	10.08	1300	-	14.43	8.33					
425	-	-	10.71	1400	-	15.55	8.98					
450	-	-	11.34	1500	-	16.66	9.62					
475	-	-	11.97	1600	-	17.77	10.26					
500	-	-	12.60	1800	-	19.99	11.54					
550	-	-	13.85	2000	-	-	12.82					
600	-	-	15.12	2500	-	-	16.03					
-	-	-	-	3000	-	-	19.24					

*System Information Used for Formula Examples

Fluid: Water
Pump: 400 GPM
Pipe Size: 4" Steel
Pipe Length: 2500 ft.
Static Pressure: 100 PSI
Max. Pressure: 150 PSI
Pre-charge Gas: Dry Air



Made in the USA

From modest beginnings in 1946, 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 available on amtrol.com.



1400 Division Road, West Warwick, RI USA 02893
T: 800.426.8765 www.amtrol.com



SPT-7 through
SPT-70



APPROVED

