

# SURGE-TROL

ASME Fire Sprinkler System  
Surge Suppressors



For the Absorption of Pump Surges

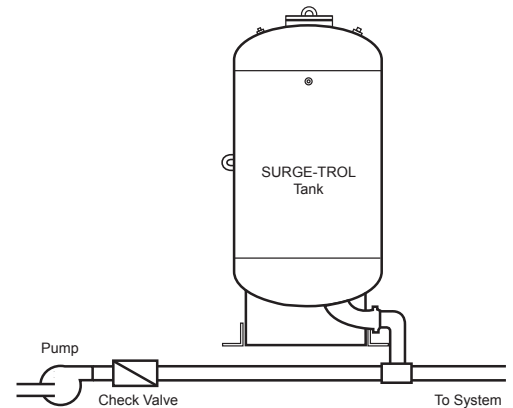
Surge-Trol tanks are designed to absorb pump startup and shut-down surges in fire protection sprinkler systems. Available from 10 to 528 gallon sizes, Surge-Trol tanks are made in the USA in our ISO 9001:2015 certified facilities. These tanks meet all ASME Section VIII, Division 1 Standards.



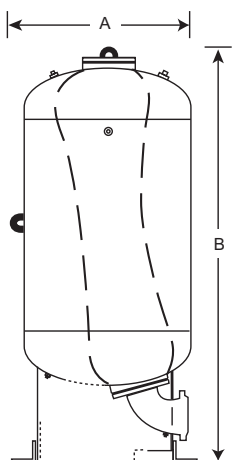
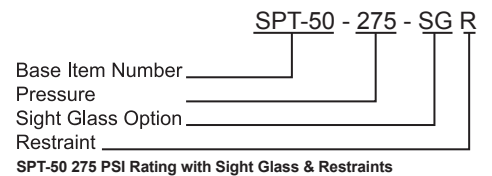
## SURGE-TROL SPT SERIES

- 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



Model Number	Tank Volume (Gallons)	Max. Accept. Volume (Gallons)	A Diameter (Inches)	B Height (Inches)	System Conn. <sup>1</sup> (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

<sup>1</sup>Malleable Iron 300# Flange.

# Sizing Guides

$$\text{Tank Volume (gallons)} = \left[ \frac{\left( \frac{SG \times 2 \times Q_s \times L}{449 \times a} \right) \left( \frac{P_2 + 14.7}{P_1 + 14.7} \right)^{1/n}}{\left( \frac{P_2 + 14.7}{P_1 + 14.7} \right)^{1/n} - 1} \right] \times 7.481$$

**Example\***

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

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

$$T_c = \frac{2 \times L}{a}$$

$$V_v = Q_{ss} \times T_c \times 7.481$$

$$AF = 1 - \left( \frac{P_1 + 14.7}{P_2 + 14.7} \right)^{1/n}$$

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

**Example\***

$$T_c = \frac{2 \times 2500}{4500} = 1.11$$

$$V_v = 10.08 \times 1.11 \times 7.481 = 83.70$$

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

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

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

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 <sub>1</sub>	Tank Pre-Charge Pressure	Start-up: 15% below static pressure Shut-down: 50% below static pressure
P <sub>2</sub>	Maximum Allowable Pressure	
Q <sub>s</sub>	Fire Pump Flow Rate (gal./min.)	
Q <sub>ss</sub>	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
T <sub>c</sub>	Critical Time (seconds)	
V	Velocity of Water (ft./sec.)	
V <sub>v</sub>	Vacuum Volume	

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

