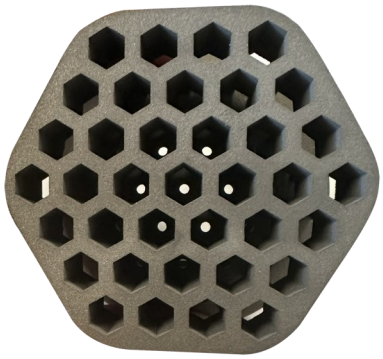
SHIPPENSBURG PUMP CO., INC.
P.O. BOX 279, SHIPPENSBURG, PA 17257
WWW.SHIPCOPUMPS.COM

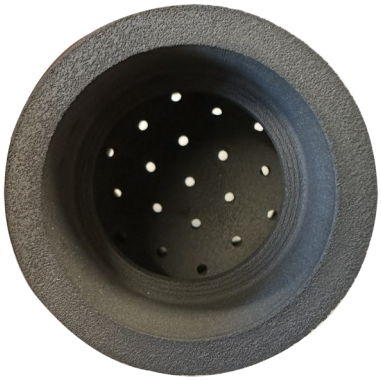
PHONE 717-532-7321
FAX 717-532-7704

SHIPCO® Venturi Injectors

Shipco® *Venturi Injectors* are designed for mixing and heating liquids using steam inside a receiver tank. A venturi injector is submerged below the water where steam is injected through its nozzle. The combination of steam and liquid allows the contents inside the tank to be recirculated. Venturi injectors provide heating without the noise caused by direct application.

Constructed from stainless steel 17-4 PH with socket-weld inlet sizes ranging between 3/8” and 2” NPS. Rated for incoming steam supply pressures up to 125 PSIG.



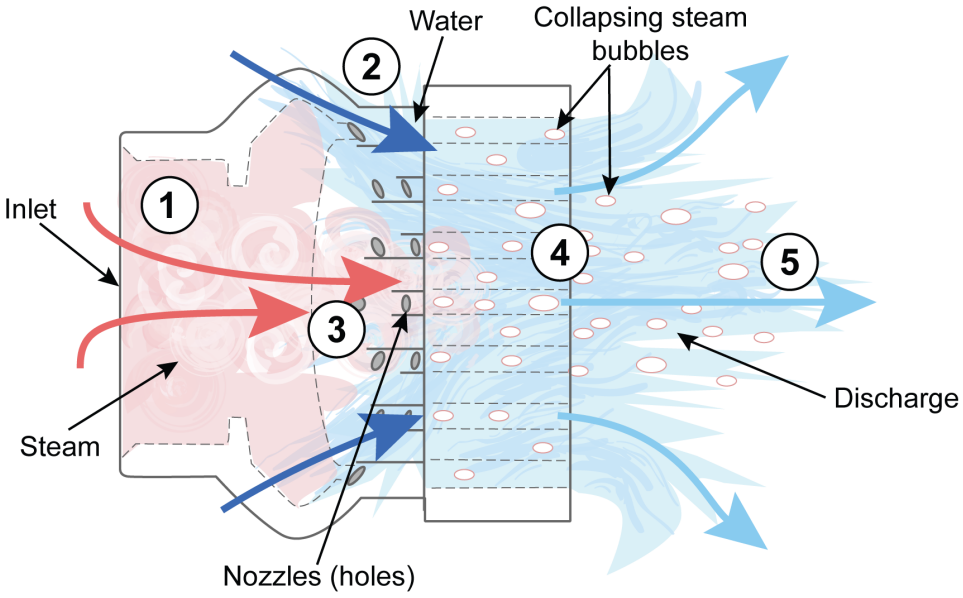


How Venturi Injectors Work

A venturi injector operates on Bernoulli's principle which states that an increase in the speed of a fluid occurs simultaneously with a decrease in pressure or potential energy of a fluid.

The following illustrates the process of steam and water flow occurring inside of the venturi injector.

1. By forcing steam through a small orifice, a vacuum is formed just downstream of the nozzle.
2. The vacuum draws the surrounding water into a mixing zone.
3. In the mixing zone, rapid heat transfer takes place.
4. The turbulence of the mixing process breaks up large steam bubbles reducing vibration and noise.
5. The mixture ejects at reduced pressure protecting the tank from excess wear.



Sizing Steam Capacity

Steam capacity is sized using the following formula:

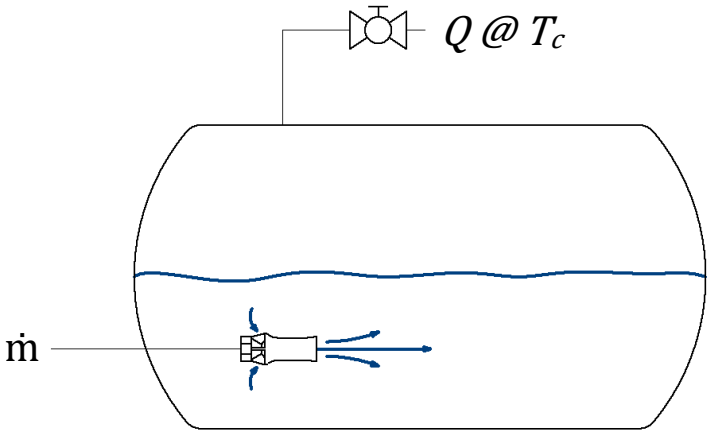
$$\dot{m} = \frac{Q \times (T_h - T_c)}{2}$$

$\dot{m}$ = Amount of steam required (lb/hr)

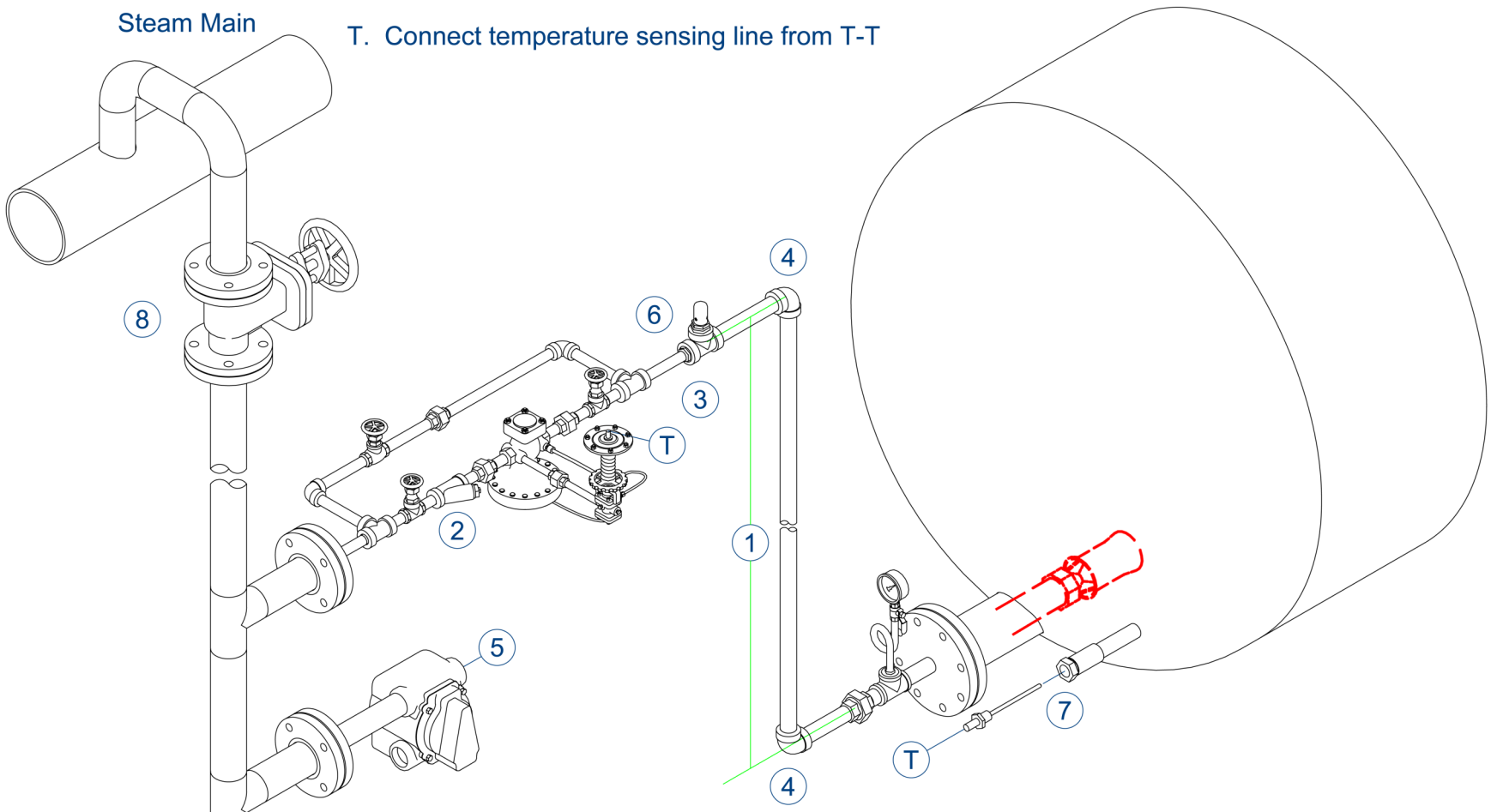
Q = Incoming cold water flow rate (gal/min)

T_h = Desired tank temperature (°F)

T_c = Incoming water temperature (°F)



Typical Piping Diagram

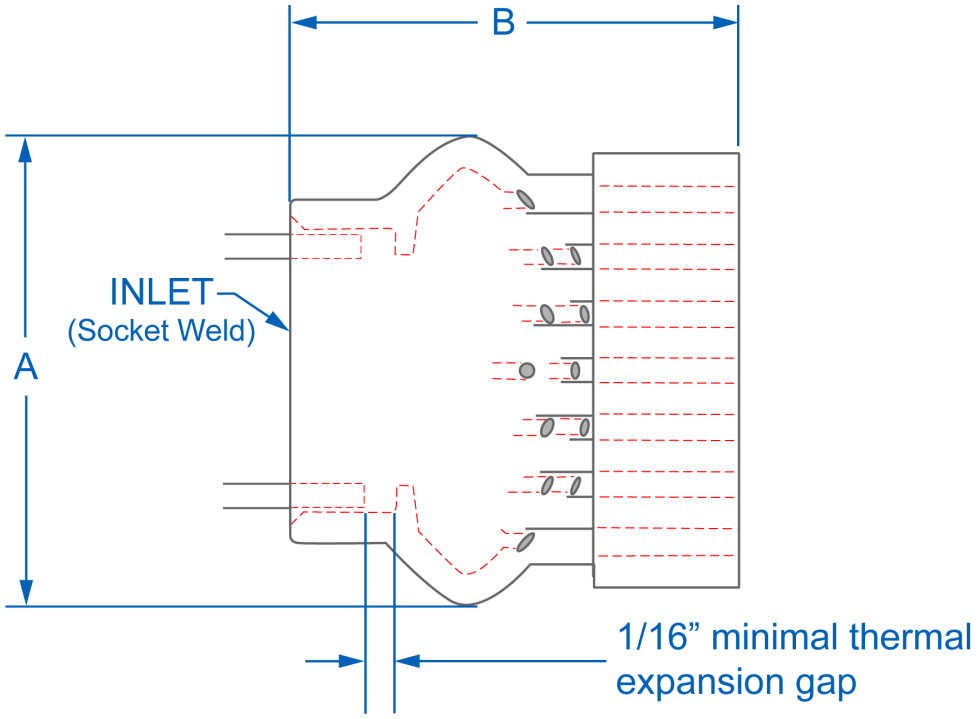


1. Pipe regulators 6" min above tank
2. Install strainers horizontal to prevent waterhammer
3. Increase min full size tank connection
4. Use long radius elbows to limit vibration
5. Pipe traps to drain, condensate recovery, or high psi diffuser
6. Vacuum breaker prevents backflow on submerged injectors
7. Pack well with thermal grease
8. Max supply velocity 12000 fpm

Direct contact steam heating will induce some vibration. Housekeeping pads and grouted bases will dampen vibration. Installation above ground floor will increase vibration and may require additional structural considerations.

Sizing Chart

Inlet (NPS)	A (in)	B (in)	Part Number	Capacity in lb/hr at given supply psi											
				10	20	30	40	50	60	70	80	90	100	110	120
3/8	1.07	1.25	SDPN00874-038	26	47	63	78	92	105	119	133	147	160	174	188
1/2	1.24	1.375	SDPN00874-050	41	73	98	122	144	164	186	207	229	251	272	294
3/4	1.57	1.5	SDPN00874-075	78	139	186	230	272	310	351	392	433	474	515	556
1	2.20	2.15	SDPN00873-100	126	224	302	372	440	502	568	635	701	768	834	901
1 1/4	2.75	2.44	SDPN00873-125	208	371	499	615	728	830	940	1049	1159	1269	1379	1490
1 1/2	3.25	2.80	SDPN00873-150	311	554	745	919	1087	1240	1404	1567	1731	1896	2060	2225
2	3.65	2.81	SDPN00873-175	401	716	962	1187	1404	1601	1812	2024	2235	2448	2660	2873
2	3.89	3.15	SDPN00873-200	503	898	1206	1489	1761	2008	2273	2539	2804	3071	3337	3604



SHIPPENSBURG PUMP COMPANY, INC., P.O. BOX 279, SHIPPENSBURG, PA 17257 • PHONE 717-532-7321 • FAX 717-532-7704 • WWW.SHIPCOPUMPS.COM

PRINTED IN THE U.S.A. • BEIDEL PRINTING HOUSE, INC. 717-532-5063