



A-T Controls, Inc.

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Engineer: CMB **No.:** DI00007
Date Created: 12/17/2014
Date Modified: 09/10/2018

Steam Service

Steam is an invisible gas unless condensed in cooler air. Steam has many industrial uses like heating and cooling applications and because of its expanding nature, for generating power. Forms of steam include saturated, superheated, and supercritical. Caution needs to be used when selecting valves for steam service to assure the application temperature and pressure are met with the right valve body and valve trim materials.

Saturated Steam: Steam that exists as both liquid water and water vapor. This form of steam occurs when the steam is at its boiling point at a particular pressure and temperature. The temperature and pressure of the steam determines the amount of each phase of water. A table showing saturated steam properties is shown on the next page.

Superheated Steam: Water heated above its boiling point that exists only as water vapor. This occurs when saturated steam is held at a constant pressure and heated to a temperature above its boiling point. The water bubbles have been removed from the steam system.

Super Critical Steam: Steam that does not solely behave as a liquid or gas. This occurs around 1049 °F at 3200 psig.

Standard Material

Please consult A-T Controls for material selections for your application. These parameters are guidelines, and customers are responsible for materials of construction and lubricants that are compatible with their steam application:

Auxiliary Stem Seal: Graphite

Body: Carbon Steel, 316 SST, others

Seats: PTFE, RTFE, 50/50 STFE, Metal Seats

Trim: 316 SST, 17-4 PH, Stellite

Valve Packages

Power-Seal High Performance Butterfly Valves- Sizes: 2"-24" (larger sizes available upon request), ANSI/ASME Class 150# and 300# Lug and Wafer, Blow out proof stem design.

HPBFV [Web Content](#) and Literature Download:

Series FD9- 150#, 300#, 600# Direct Mount Split Body Flanged Ball Valve, Firesafe, 316SST or WCB, multiple sizes available.

Web Content and Literature Download links:

[FD9 150#](#)

[FD9 300#](#)

[FD9 600#](#)

Series F8R- Sizes ¼"-2-1/2", Full Port and Regular Port 1500/2000 psi WOG (by size), 316 SST or Carbon Steel Body, Threaded, Socket Weld, or Butt Weld.

[Web Content](#) and Literature Download

Series M- Sizes ½"-8", High Performance Metal Seat Ball Valve, Anti-static device, ISO 5211 Mounting Pad, Firesafe API 4th edition.

[Web Content](#) and Literature Download



Manual and Automated Quarter Turn Valves
Complete Valve and Damper Automation





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Temperature (°F)	Pressure (psig)	Specific Volume Sat. Liquid (ft ³ /lb)	Specific Volume Sat. Vapor (ft ³ /lb)	Density Sat. Liquid (lb/ft ³)	Density Sat. Vapor (lb/ft ³)
212	14.70	0.0167	26.7973	59.7968	0.0373
221	17.52	0.0168	22.7367	59.5685	0.0440
230	20.78	0.0169	19.3856	59.3420	0.0516
239	24.52	0.0169	16.6048	59.1173	0.0602
248	28.79	0.0170	14.2869	58.8942	0.0700
257	33.66	0.0171	12.3439	58.6177	0.0810
266	39.17	0.0171	10.7084	58.3438	0.0934
275	45.40	0.0172	9.3260	58.0724	0.1072
284	52.40	0.0173	8.1518	57.8035	0.1227
293	60.25	0.0174	7.1491	57.5372	0.1399
302	69.01	0.0175	6.2921	57.2207	0.1589
311	78.77	0.0176	5.5552	56.9597	0.1800
320	89.60	0.0177	4.9193	56.6496	0.2033
329	101.60	0.0177	4.3682	56.3428	0.2289
338	114.83	0.0178	3.8893	56.0393	0.2571
347	129.37	0.0180	3.4728	55.6894	0.2880
356	145.34	0.0181	3.1084	55.3929	0.3217
365	162.83	0.0182	2.7887	55.0510	0.3586
374	181.94	0.0183	2.5075	54.7133	0.3988
383	202.73	0.0184	2.2594	54.3323	0.4426
392	225.36	0.0185	2.0401	53.9566	0.4902
401	249.90	0.0186	1.8455	53.6322	0.5419



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