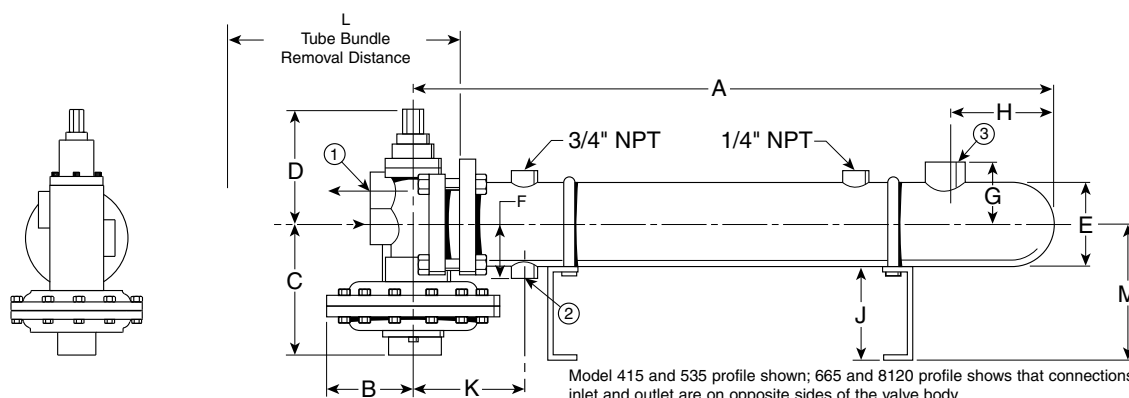


Models 415, 535, 665 and 8120

Model 665 and 8120 Valve



Note: Double wall units available, see page WH-305.

Table WH-299-1. Dimensions

Model	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	J mm	K mm	L mm	M mm
415	1 372	114	190	178	114	89	89	178	127	159	1 270	190
535	1 715	133	219	229	141	102	114	200	152	191	1 575	229
665	2 083	146	264	264	168	121	140	235	190	222	1 880	280
8120	2 159	146	299	305	219	156	225	241	203	241	1 880	314

Shade indicates products that are CE Marked according to the PED (97/23/EC). All the other models comply with the Article 3.3 of the same directive.

Table WH-299-2. Connections and Weights

Model	Connections			Weights Kg
	1	2	3	
415	1" NPT	3/4" NPT	2" NPT	60
535	1 1/2" NPT	1" NPT	2 1/2" NPT	107
665	2" NPT*	1 1/4" NPT	3" NPT	162
8120	3" NPT*	2" NPT	4" 150#ANSI	265

Table WH-299-3. Specifications

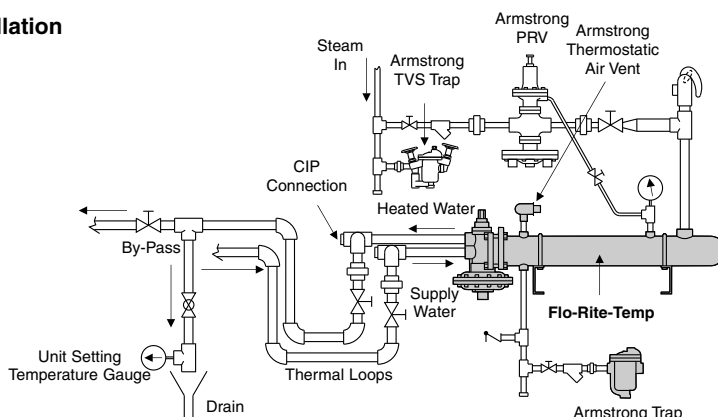
Application	Steam Supply Pressure	Water Supply Pressure	Maximum Water Pressure Drop
Steam to Water	0,14 - 1 bar	1,4 - 8,5 bar	0,7 bar

* 665 and 8120 connections for water inlet and outlet are on opposite sides of the valve body

Table WH-299-4. Materials

Body	Valve	Valve Seats	Diaphragm	Heat Exchanger Shell	Heat Exchanger Tubes	Tube Sheets	Tube Bundle End Cap
Bronze	415 303 Stainless Steel w/Teflon Inserts	415/535 303 Stainless Steel	Viton® GF	Carbon Steel ASME "U" Stamped	5/8" 16 BWG Admiralty Brass	Brass	Brass
	535/665/8120 Brass	665/8120 Brass	Reinforced w/Nomex® Fiber				

Heater Installation



Notes: Flo-Rite-Temp is provided with one Armstrong Steam Trap and Thermostatic Air Vent (shaded). All other items shown not included. Removable/reusable insulation covers for the heat exchangers are available. Contact Armstrong or your local representative for more information.

All dimensions and weights are approximate. Use certified print for exact dimensions. Design and materials are subject to change without notice.



Selecting the Proper Flo-Rite-Temp™ Model

Table WH-300-1. Water and Steam Capacities (Note: Capacities for Single-Wall and Double Wall Units are identical)

Inlet Temperature °C	Set Temperature °C	Hot Water Capacities* Steam Pressure (barg)				Steam Capacities Steam Pressure (barg)				Model
		0,14	0,35	0,7	1	0,14	0,35	0,7	1	
		m³/h				kg/h				
4	49	3,8	4,1	4,5	4,5	323	347	379	407	415
		8,4	9,1	9,8	10,2	697	749	820	880	535
		15,7	16,8	18,2	18,2	1 290	1 386	1 517	1 628	665
		32,2	32,9	32,9	32,9	2 576	2 794	3 066	3 248	8120
	54	3,4	3,6	3,8	4,1	308	332	365	392	415
		7,3	7,7	8,4	8,8	665	717	788	848	535
		13,2	14,3	15,4	16,6	1 230	1 327	1 458	1 569	665
		25,4	27,7	30,9	32,9	2 286	2 490	2 776	3 041	8120
	60	2,7	3,0	3,4	3,6	292	316	349	377	415
		6,1	6,6	7,3	7,7	631	684	755	815	535
		11,3	12,2	13,3	14,3	1 168	1 265	1 397	1 509	665
		20,0	22,0	24,7	27,2	1 996	2 200	2 472	2 722	8120
	71	2,0	2,3	2,5	2,7	259	283	317	346	415
		4,5	5,0	5,5	5,9	558	612	686	747	535
		8,4	9,1	10,2	10,9	1 033	1 134	1 268	1 382	665
		15,6	18,8	20,2	21,6	1 878	2 259	2 422	2 585	8120
	82	1,1	1,1	1,4	1,6	156	175	200	221	415
		2,7	3,0	3,4	3,6	390	438	501	553	535
		5,2	5,9	6,6	7,3	754	846	968	1 068	665
		9,7	10,7	11,8	13,4	1 365	1 492	1 651	1 873	8120
10	49	4,3	4,5	4,5	4,5	313	337	369	396	415
		9,3	10,0	10,0	10,2	676	727	797	857	535
		17,3	18,2	18,2	18,2	1 251	1 346	1 475	1 586	665
		32,2	32,2	32,2	32,2	2 603	2 762	2 985	3 191	8120
	54	3,6	3,8	4,3	4,5	298	322	355	382	415
		7,7	8,4	9,1	9,8	644	696	766	826	535
		14,5	15,4	17,0	18,2	1 192	1 287	1 418	1 528	665
		28,8	31,3	32,2	32,2	2 304	2 504	2 776	3 066	8120
	60	2,9	3,2	3,6	3,8	283	307	340	367	415
		6,6	7,0	7,7	8,4	611	663	734	794	535
		12,2	13,2	14,5	15,4	1 131	1 227	1 358	1 474	665
		22,5	24,5	27,5	30,4	2 021	2 204	2 470	2 735	8120
	71	2,3	2,5	2,7	3,0	250	275	308	336	415
		4,7	5,2	5,7	6,4	540	593	665	726	535
		8,9	9,5	10,7	11,6	999	1 098	1 232	1 344	665
		17,2	20,4	21,6	23,1	1 896	2 245	2 370	2 545	8120
	82	1,1	1,4	1,4	1,6	151	169	194	214	415
		2,7	3,2	3,6	3,9	377	424	486	537	535
		5,4	6,1	6,8	7,5	728	819	938	1 037	665
		11,1	12,5	14,3	16,3	1 445	1 622	1 857	2 123	8120
16	54	4,1	4,3	4,5	4,5	288	312	344	372	415
		8,7	9,3	10,2	10,2	623	674	744	803	535
		15,9	17,3	18,2	18,2	1 152	1 247	1 377	1 486	665
		32,2	32,2	32,2	32,2	2 318	2 524	2 762	2 953	8120
	60	3,4	3,6	3,8	4,3	273	297	330	357	415
		7,3	7,7	8,6	9,1	591	642	712	772	535
		13,2	14,3	15,7	17,0	1 093	1 188	1 318	1 428	665
		25,2	27,9	31,1	32,2	2 014	2 232	2 486	2 758	8120
	71	2,3	2,5	2,9	3,2	241	266	299	327	415
		5,0	5,5	6,1	6,8	521	574	645	706	535
		9,3	10,2	11,3	12,5	964	1 062	1 194	1 306	665
		19,3	22,5	23,6	26,1	1 928	2245	2 359	2 758	8120
	82	1,1	1,4	1,6	1,6	145	163	188	208	415
		3,0	3,2	3,6	4,1	363	409	470	522	535
		5,7	6,4	6,4	7,9	701	791	909	1 007	665
		13,4	15,2	18,1	20,4	1 606	1 823	2 177	2 449	8120

* Units may be piped in parallel when desired capacities exceed that of a single unit.

Notes: Minimum water temperature increase is 33°C. Consult factory if less than 33°C increase is required or a set temperature of below 49°C is required. See pages PTC-267 and PTC-272 for proper pressure reducing valve selection.

Flo-Rite-Temp™ Instantaneous Water Heater Sizing Instructions



Chart WH-301-1

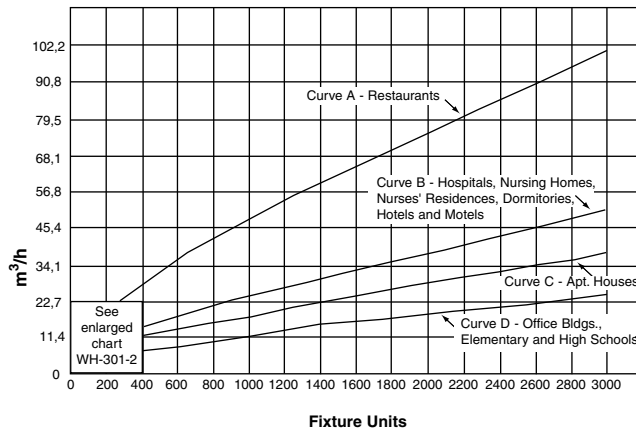
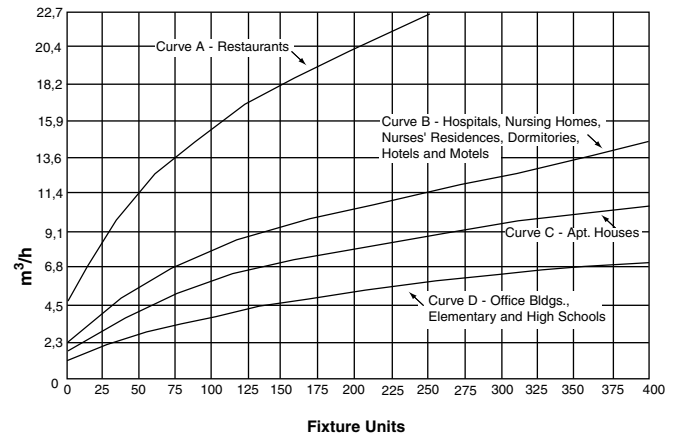


Chart WH-301-2. Enlarged Section



Reprinted from the 1987 ASHRAE Handbook – HVAC with permission from the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. Hunter curves should be used for intermittent, insignificant fixtures only.

Step 1

Determine the total fixture unit load for all the fixtures serviced by your water heater application using the Fixture Units Table on page WH-302. See example below.

Step 2

Using the total fixture units for your application, enter the Hunter Curves (Chart WH-301-1) from the bottom on the total fixture units line for your application. Read up to the curve that best fits the application. Then read to the left for the corresponding m³/h requirement.

Step 3

Select the proper Armstrong Flo-Rite-Temp Instantaneous Water Heater from Pages WH-300 through WH-307.

Table WH-301-1. Example: College Dormitory			
No. Fixtures	Type of Fixture	Fix. unit	Demand Fix. Unit
150	Private Lavatory	0,75	113
120	Private Shower	1,5	180
20	Slop Basin	2,5	50
8	Clothes Washer	2,0	16
Total Fixture Units			359

Refer to the modified Hunter Curves in Chart WH-301-2. Curve B represents dormitories. Enter the graph from the bottom at 359 fixture units and go up to curve B. Then move to the left horizontally to read approximately 13,6 m³/h of hot water capacity required.

Note: Remember to add any constant flow capacities, as determined under “Important Note” below, to this 13,6 m³/h.

Important Note

Special consideration should be given to applications involving periodic use of gang showers, process equipment, laundry machines, etc., as may occur in field houses, gymnasiums, factories, hospitals, etc. Because these applications could have all equipment on at the same time, their total hot water capacity should be determined and then added to the maximum hot water demand as read from the modified Hunter Curves. Use the following formula to determine total hot water capacity needed for these applications when final water temperatures are lower than that of the water heater.

$$\frac{(B - C)}{(H - C)} \times \left(\text{Total water flow from all gang shower heads in m}^3/\text{h} \right) = \text{Hot water needed (m}^3/\text{h)}$$

Where:

B = Blended water temperature out of the fixture

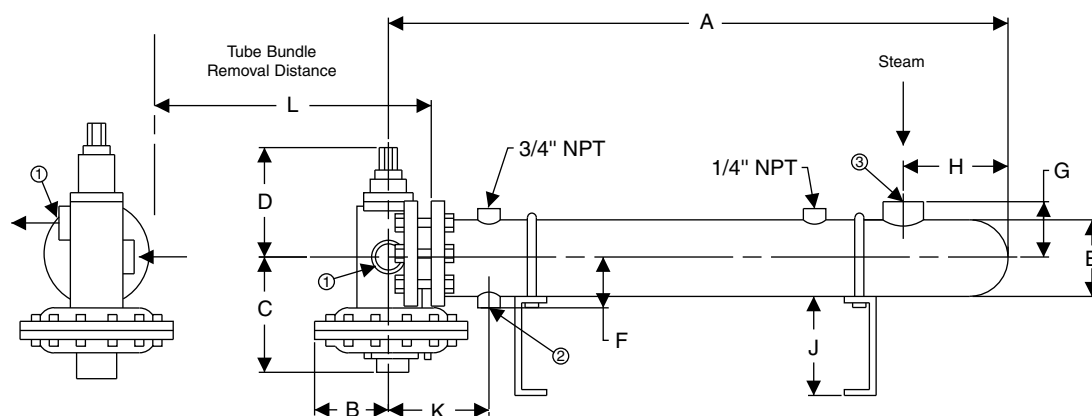
H = Hot water temperature to the fixture

C = Cold water temperature to the fixture



Flo-Rite-Temp™ SS 316 Stainless Steel Steam Instantaneous Water Heater

Model 665 SS and 8120 SS Valve



The Flo-Rite-Temp SS is a compact, steam to water, instantaneous water heater with all wetted metal parts of type 316 stainless steel. Because of its construction materials, this heater is well-suited for heating most corrosive liquids, such as demineralized, deionized or reverse osmosis water commonly used by manufacturers of electronic equipment, pharmaceuticals and food.

Features

- Feed forward control provides accurate temperature control on demand even when demand fluctuates abruptly.
- Feed forward operation assures that the heater will fail safely in the closed (cold) position to prevent overheating.
- Straight, non-U-bend tube bundle with removable end cover provides for easy tube cleaning along with the capability to visually inspect all tubes.
- Constant steam pressure on heat exchanger at all times means positive condensate evacuation, avoiding damage to the exchanger due to water hammer.
- Heavy duty 5/8" tubes of 16 gauge 316L stainless steel ensure long life and maintainability backed up by a 10-year tube bundle warranty against workmanship and material defects.
- Control valve is mounted integral to the heat exchanger, thus eliminating intermediate piping leaks.

All dimensions and weights are approximate. Use certified print for exact dimensions. Design and materials are subject to change without notice.

Armstrong International SA • Parc Industriel des Hauts-Sarts (2^e Avenue) • 4040 Herstal • Belgium

Tel.: +32 (0)4 240 90 90 • Fax: +32 (0)4 240 40 33

www.armstronginternational.eu • info@armstronginternational.eu

Flo-Rite-Temp™ SS

316 Stainless Steel Steam Instantaneous Water Heater



Table WH-307-1. Specifications			
Application	Steam Supply Pressure	Water Supply pressure	Maximum Water Pressure Drop
Steam to Water	0,14 - 1 bar	1,4 - 8,5 bar	0,7 bar

Table WH-307-2. Materials						
Body	Valve	Seats	Diaphragm	Heat Exchanger Shell	Heat Exchanger Tubes	Heat Exchanger tube Sheets
T-316 Stainless Steel			Viton® GF Reinforced with Nomex® Fiber	Carbon Steel (Standard) T-316 Stainless Steel (Optional)	T-316 Stainless Steel	T-316 Stainless Steel

Table WH-307-3. Dimensions and Weights															
Model	Dimensions (mm)											Connections			Weight (kg)
	A	B	C	D	E	F	G	H	J	K	L	1	2	3	
665 SS	2 102	146	264	264	168	121	140	235	191	222	1 880	2" NPT	1 1/4" NPT	3" NPT	152
8120 SS	2 286	146	264	264	219	156	225	241	203	368	1 880	2" NPT	2" NPT	4" 150 RF	298

Shade indicates products that are CE Marked according to the PED (97/23/EC). All the other models comply with the Article 3.3 of the same directive.

Table WH-307-4. Capacities and Steam Loads										
Water Temperature		Hot Water Capacities* Steam Pressure (barg)				Steam Capacities Steam Pressure (barg)				Model
		0,14	0,35	0,7	1,0	0,14	0,35	0,7	1,0	
Inlet °C	Outlet °C	m³/h				kg/h				
4	49	9,3	10,0	10,7	11,6	769	826	904	970	665 SS
		19,1	20,2	22,0	23,4	1 520	1 687	1 860	1 981	8120 SS
	54	7,9	8,4	9,3	9,8	733	791	869	935	665 SS
		15,0	16,4	18,2	19,5	1 349	1 469	1 638	1 794	8120 SS
	60	6,8	7,3	7,9	8,4	696	754	833	899	665 SS
		11,8	12,9	14,5	16,1	1 178	1 298	1 459	1 606	8120 SS
	71	3,9	4,1	4,3	4,8	459	503	563	614	665 SS
		10,0	10,9	12,0	12,9	1 237	1 356	1 518	1 654	8120 SS
	82	2,7	3,0	3,4	3,9	390	437	500	552	665 SS
		7,3	7,9	9,1	10,0	1 051	1 178	1 348	1 488	8120 SS
10	49	10,2	10,9	12,0	12,7	745	802	879	945	665 SS
		20,7	22,0	23,8	25,7	1 497	1 610	1 765	1 897	8120 SS
	54	8,6	9,3	10,0	10,7	710	767	845	910	665 SS
		17,0	18,4	20,2	21,6	1 359	1 447	1 696	1 828	8120 SS
	60	7,3	7,7	8,6	9,3	674	731	809	875	665 SS
		13,2	14,5	16,1	17,9	1 192	1 300	1 457	1 614	8120 SS
	71	3,9	4,3	4,8	5,2	444	488	547	597	665 SS
		10,4	11,6	12,7	13,9	1 195	1 314	1 474	1 608	8120 SS
	82	2,7	3,2	3,6	4,1	376	423	485	537	665 SS
		7,5	8,4	9,5	10,7	1 014	1 140	1 307	1 446	8120 SS
16	49	11,6	12,5	13,6	14,5	721	777	854	919	665 SS
		16,1	23,6	27,7	29,5	1 473	1 588	1 745	1 877	8120 SS
	54	9,5	10,2	11,1	12,0	687	743	820	885	665 SS
		19,5	20,9	22,7	24,5	1 403	1 518	1 676	1 809	8120 SS
	60	7,9	8,4	9,3	10,0	651	708	786	851	665 SS
		15,0	16,6	18,4	19,8	1 188	1 317	1 466	1 680	8120 SS
	71	4,1	4,5	5,0	5,5	428	472	531	580	665 SS
		11,1	12,3	13,6	14,8	1 154	1 271	1 429	1 563	8120 SS
	82	3,0	3,2	3,9	4,3	362	409	469	521	665 SS
		7,9	8,9	10,0	11,1	976	1 101	1 266	1 403	8120 SS

* Units may be piped in parallel when desired capacities exceed that of a single unit.

Notes: Minimum water temperature increase is 33°C. Consult factory if less than 33°C increase is required or a set temperature of below 49°C is required.

All dimensions and weights are approximate. Use certified print for exact dimensions. Design and materials are subject to change without notice.