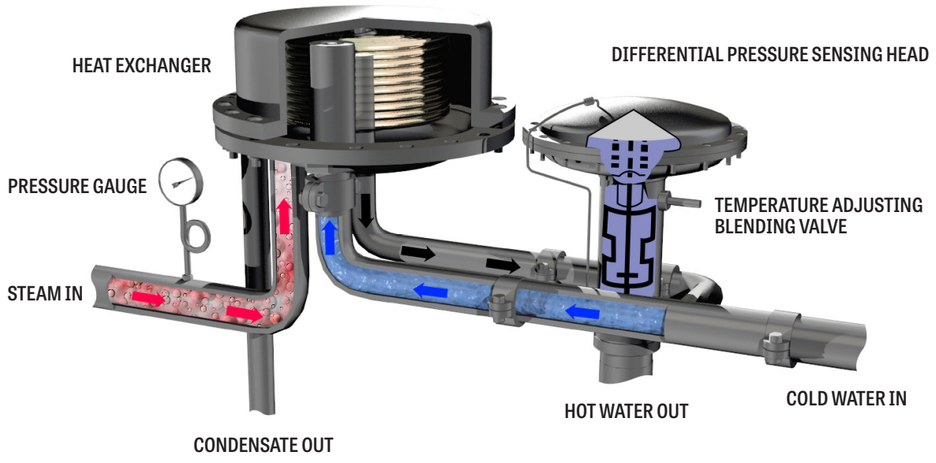
CONSTANTEMP®
SERIES WATER HEATERS

COMPACT HELICAL STEAM/WATER HEATERS
FOR INSTITUTIONAL AND INDUSTRIAL APPLICATIONS

Armstrong®
EXPERIENCE MATTERS™

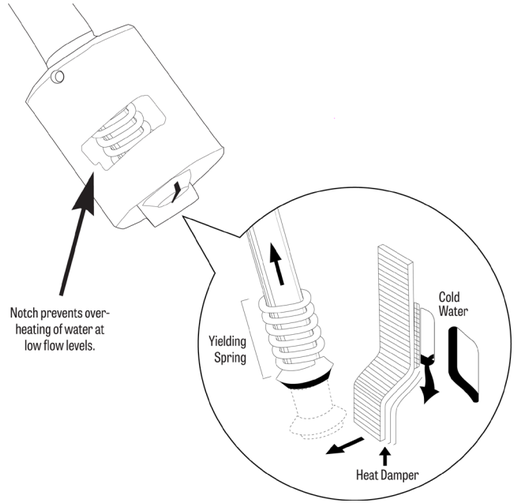
CONSTANTEMP® FEED-FORWARD OPERATION AND COMPACT, PRE-PIPED DESIGN

OFTEN IMITATED, NEVER MATCHED



TWO INNOVATIONS TO ENSURE SAFETY

Should movement of the blending valve be restricted by foreign matter carried in the water, a yielding spring arrangement allows the diaphragm and stem to move up, uncovering a heat damper in the characterized blending valve. This damper allows cold water to enter the blended mix, eliminating the possibility of over-heating or scalding.



CONSTANTEMP OPERATION

FLOW DEMAND

The central component of the Constantemp steam-water heater is the feed forward blending valve activated by a differential pressure sensing head.

An impulse line to the top of the valve's differential sensing head comes from a connection to the cold water supply line. Blended water is sensed under the diaphragm through ports in the blending valve.

The proportioning action of the blending valve occurs as changes in the sensed pressure differential across the diaphragm are created by flow demand.

As demand for blended hot water increases, a drop in blended water pressure is sensed under the diaphragm. This pressure drop causes the stem in the blending valves to move downward, lining up the hot and cold water ports of the valve plug with the ports in the body of the blending valve.

This action automatically proportions the hot and cold water blend ratio to maintain the set temperature for all flow demands. Water is blended instantly and automatically, with virtually no lag in response to demand.

The blending valve plug (a piston or slider-type valve) moves down to open and is rotated during its travel to perform the proportional blending of hot and cold water to the desired temperature. The rotation rate during the valve movement is set by the demand on the system.

Should movement of the blending valve be restricted by foreign matter carried by the water flow, a yielding spring arrangement allows the diaphragm and stem to move up, uncovering a "heat damper" in the characterized blending valve. This damper will allow more cold water to enter the blended mix, reducing the possibility of overheating or scalding.

Temperature settings are easily made by using the adjusting rod located on the stem of the blending valve. A simple movement of the rod in one direction or the other allows outlet water temperature to be preset.

SKID-MOUNTED PACKAGE

The Constantemp® skid-mounted package is a completely pre-piped system with properly sized accessories included.

Models operating with steam pressures above 15 psig are supplied with a steam pressure reducing valve. All features are supplied with traps, strainers, steam pressure gauge and thermometer.

CONSTANTEMP® STEAM/WATER HEATER DATA

APPLICATION DATA

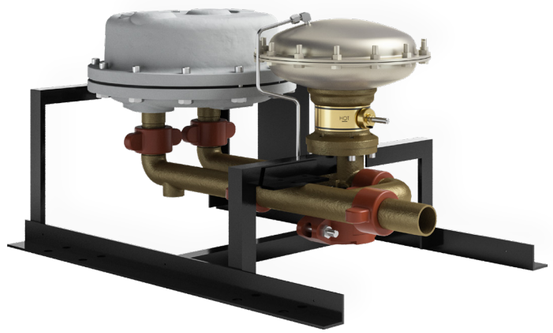
- Hospital and domestic hot water
- University dormitories
- Safety shower systems
- Industrial shower rooms
- Booster heater
- Building heat

FEATURES

- Temperature control within +/-3ºF accuracy
- Feed-forward control
- Flow capacities up to 120 GPM
- Adjustable set temperature range from 105-180ºF
- No storage tank required
- Built-in safety features
- Heats water only on demand
- Fits through a standard doorway
- High turndown

OPTIONS

- Skid=mounted package
- Recirculation Kit
- Insulated Cover



CONSTANTEMP® STEAM/WATER HEATER RATINGS

Adjustable Temperature Range	15-30 GPM: 105-150°F (41-65°C); 60-120 GPM: 105-180°F (41-82°C)
Steam Pressure	2-250 psi (0.1-17.2 bar); >15 psi (1 bar) requires steam reducing valve
Water Pressure	150 psi (10.3 bar) max.; Option for 250 psi (17.2 bar) maximum
Flow Capacities	30, 60, 90, or 120 GPM (113.6, 227.1, 340,7, or 454.2 LPM)

PIPING CONNECTIONS

MODEL	COLD WATER INLET	HOT WATER OUTLET	STEAM INLET	CONDENSATE OUTLET
E300L	1.5" (38 mm)	2" (50 mm)	3" (76 mm)	1.25" (32 mm)
E600L	2" (50 mm)	2" (50 mm)	3" (76 mm)	1.5" (38 mm)
E900L*, E1200L*	2.5" (64 mm)	2.5" (64 mm)	4" (102 mm)	1.5" (38 mm)

*Steam inlet is flanged

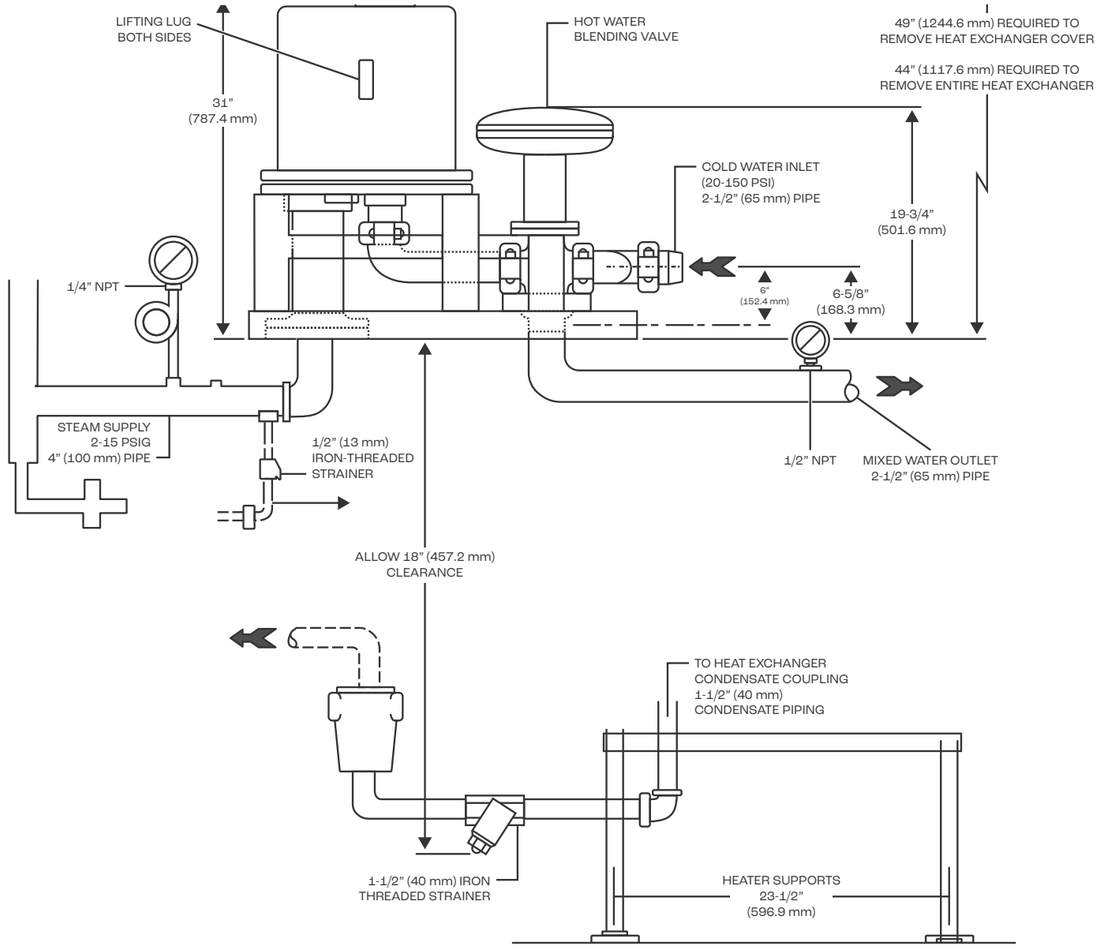
MATERIALS OF CONSTRUCTION

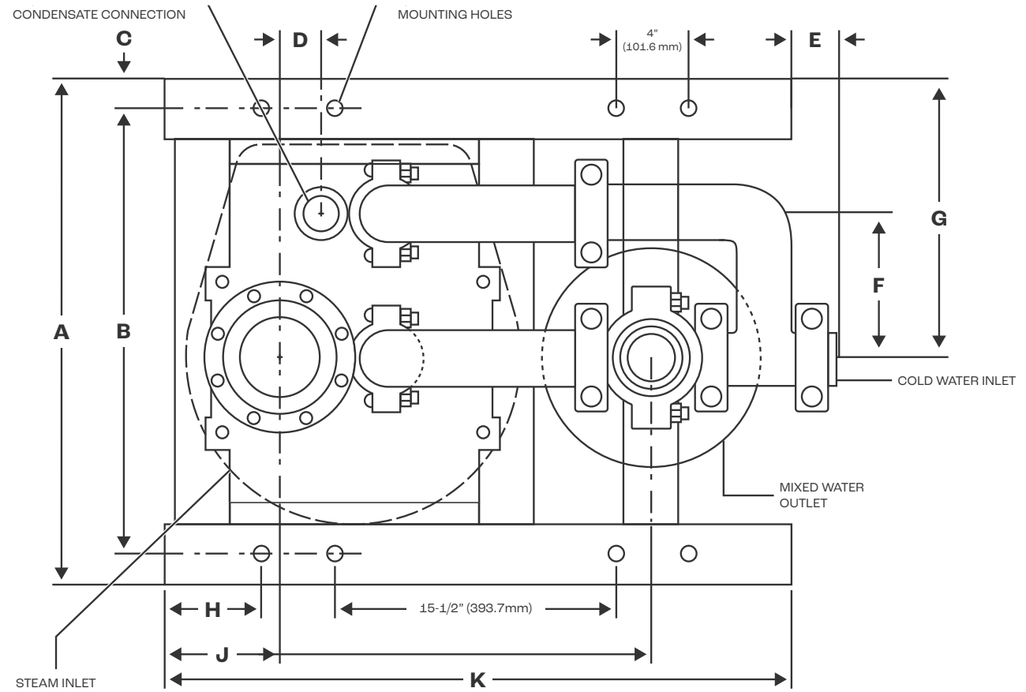
Exchanger Body	Ductile Iron - 75 psi (5.2 bar)
Coil	Standard: Copper; Optional: Admiralty brass or cupro-nickel
Blending Valve	Body: Bronze; Plug: Hastelloy

Safe Water Drinking Act (SWDA) compliant; NSF 61 and NFS/ANSI 61

CONSTANTEMP® DIMENSIONS

MODELS E300L, E600L, E900L AND E1200L





DIMENSIONS - INCHES (MILLIMETERS)

MODEL	A	B	C	D	E	F	G	H	J	K	L
E300L	22-1/2 (571.3)	21 (533.4)	3/4 (19.1)	13/16 (25.4)	1-1/4 (98.4)	6-3/8 (174.6)	1-21/16 (317.5)	4 (101.6)	5-7/16 (138.1)"	15-13/16 (452.4)	31-1/2 (800.1)
E600L	22-1/2 (571.3)	21 (533.4)	3/4 (19.1)	1 (25.4)	3-7/8 (98.4)	67/8 (174.6)	12-1/2 (317.5)	4 (101.6)	5-7/16 (138.1)	17-13/16 (452.4)	31-1/2 (800.1)
E900L	24 (609.6)	21-1/2 (546.1)	1-1/4 (31.8)	1-3/16 (46)"	3-7/8 (98.4)	6-7/8 (174.6)	10-3/4 (273)"	21-5/16 (74.6)	9 (228.6)	13-15/16 (354)	29-7/16 (747.7)
E1200L	27-13/16 (706.4)	24-5/16 (617.5)	1-3/4 (44.5)	2-13/16 (55.6)	2-3/8 (60.3)	8 (203)	15-1/4 (387.4)	5-7/16 (138.1)	77/16 (188.9)	19-31/32 (507.2)	34-3/8 (873.1)

WEIGHT - POUNDS (KILOGRAMS)

APPROXIMATE WEIGHT	E300L	E600L	E900L	E1200L
EXCLUDING STEAM TRAP	260 (117.8)	350 (158.7)	600 (272.2)	720 (326.6)
STEAM TRAP	26 (11.8)	44 (20.0)	71 (32.2)	131 (59.4)

CONSTANTEMP® STEAM/WATER SKID-MOUNTED PACKAGE

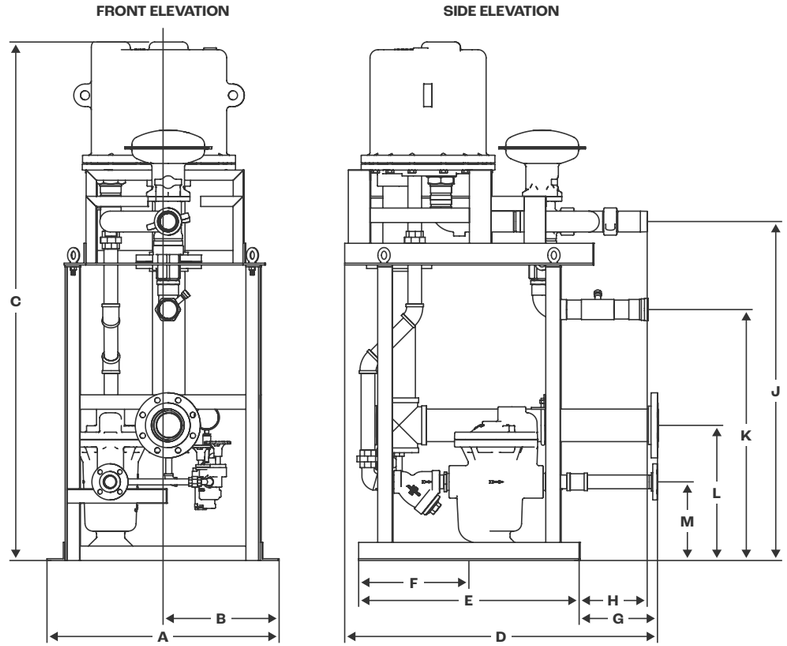
Looking to take the guesswork out of pipe sizing, proper distances, and trap installation? Constantemp® heaters can be mounted onto a pre-piped skid with all traps, strainers, pressure and temperature gauges already installed for an effortless installation that requires only four connections to the steam line, condensate line, cold water inlet, and mixed water outlet.

FEATURES

- Quick plug and play installation to save time, manpower, and costs
- Feed-forward control
- Economical option
- Completely assembled - connect to steam line, cold water inlet, hot water outlet, and condensate line and heater is ready to use

OPTIONS

- Recirculation kit
- Insulated cover
- Steam reducing valve



PACKAGE DIMENSIONS - INCHES (MILLIMETERS)

MODEL	A	B	C	D	E	F	G	H	J	K	L	M
E300L	28-1/4 (718)	14-1/8 (359)	55-1/2 (1410)	37-1/2 (953)	30-1/2 (775)	15-1/4 (387)	6-3/8 (162)	4-1/4 (108)	45-15/16 (1167)	34-5/8 (879)	22-1/2 (572)	12 (305)
E600L	28-1/4 (718)	14-1/8 (359)	58-1/4 (1480)	39-5/8 (1006)	30-1/2 (775)	15-1/4 (387)	8-1/2 (216)	4-3/8 (111)	46-7/8 (1188)	35-1/4 (895)	221/4 (565)	13-3/4 (349)
E900L	28-1/4 (718)	14-1/4 (359)	68-1/4 (1734)	42-5/8 (1083)	30-1/2 (775)	15-1/4 (387)	11-1/2 (292	4-3/4 (121)	47-5/8 (1210)	35-1/4 (895)	19 (483)	11 (279)
E1200L	31-1/2 (800)	15-1/4 (387)	68-1/4 (1734)	44 (1118)	30-1/2 (775)	15-1/4 (387)	11-1/2 (292)	9-1/2 (241)	47-5/8 (1210)	35-1/4 (895)	19 (483)	11 (279)

CONNECTION SIZES

CONNECTION	E300L	E600L	E900L	E1200L
COLD WATER INLET (“N”)	2" MNPT	2" MNPT	2-1/2" MNPT	2-1/2" MNPT
HOT WATER OUTLET (“O”)	2" FNPT	2" FNPT	2-1/2" FNPT	2-1/2" FNPT
STEAM INLET (“P”)	3" 150# Fig. RF	3" 150# Fig. RF	4" 150# Fig. RF	4" 150# Fig. RF
CONDENSATE OUTLET (“R”)	1" 150# Fig. RF	1-1/2" 150# Fig. RF	1-1/2" 150# Fig. RF	1-1/2" 150# Fig. RF

CONSTANTCOIL HEAT EXCHANGER

COMPACT, EFFICIENT HEATING

Constantcoil is a compact, highly efficient steam/liquid instantaneous heat exchanger that combines maximum heat exchange surface with minimal space in a compact ductile iron casing.

The basic operating principle of the Constantcoil heat exchanger is similar to traditional shell and tube heat exchangers with steam in the shell and liquid flowing through the tubes.

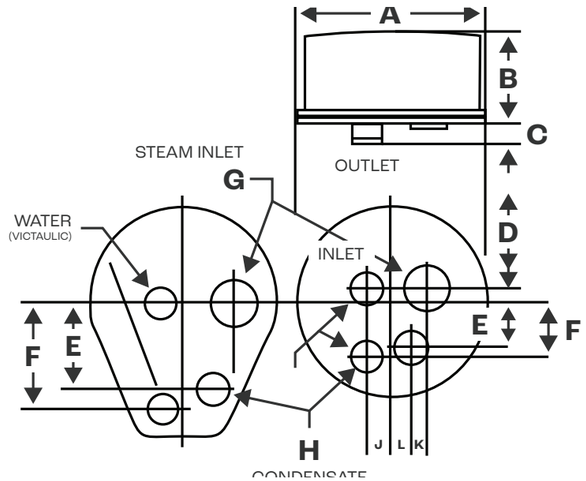
Constantcoil Heat Exchanger - A tightly wound copper coil tucked into a ductile iron casing

FEATURES

- Helical copper coil housed in compact ductile iron casing
- Other coil materials (admiralty brass and cupro-nickel) available
- Victaulic water connections
- Rated for 75 psi
- Sizes: 30, 60, 90 and 120 GPM
- Single source system

APPLICATION DATA

- Process heating sanitation
- Process booster heater
- High-temperature washdown



DIMENSIONS - INCHES (MILLIMETERS) AND WEIGHTS - POUNDS (KILOGRAMS)

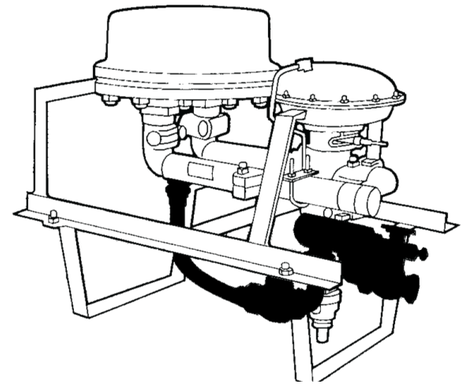
MODEL	A	B	C	D	E	F	G	H	J	K	L	M	WEIGHT
E300L	15-1/2 (394)	7 (178)	2-5/16 (59)	13/16 (21)	3-13/16 (97)	4-9/16 (116)	3 (76)	1-1/4 (32)	1-1/4 (32)	1-5/16 (24)	2-3/4 (70)	1-9/16 (40)	122 (55)
E600L	17-7/8 (454)	10-5/8 (270)	1-13/16 (46)	—	5-1/8 (130)	6-7/8 (175)	3 (76)	2 (51)	2 (51)	1-7/16 (37)	3-3/8 (86)	2-3/8 (60)	198 (90)
E900L	17-7/8 (454)	18-1/8 (460)	11-13/16 (46)	—	5-1/2 (140)	6-7/8 (175)	4 (102)	1-1/2 (38)	2 (51)	1-7/16 (37)	3-3/8 (86)	1-9/16 (40)	325 (147)
E1200L	18-1/2 (470)	18-1/2 (470)	3-1/16 (78)	—	8 (203)	8 (203)	4 (102)	1-1/2 (38)	2-1/2 (64)	11-3/16 (46)	4 (102)	1-13/16 (46)	397 (180)

CONSTANTEMP® RECIRCULATION KIT

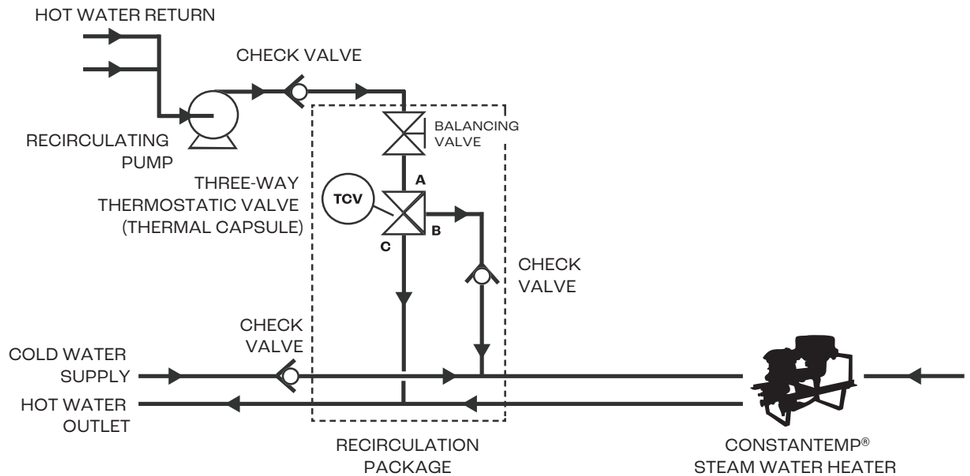
MAXIMIZE YOUR HOT WATER SYSTEM EFFICIENCY

Constantemp® Steam/Water Heater can be supplied with an optional recirculation kit, ideal where applications typically include long piping runs, such as hospitals, universities, military bases, and industrial plants. The recirculation kit features a rugged thermostatic valve that can be pre-piped into the heater assembly so that the recirculation connection on the heater need only be connected to the system return line.

The Constantemp® Recirculation Kit fits entirely within the standard heater envelope and adds no additional space to the footprint.



OPERATION SCHEMATIC



INSULATED COVERS

Reusable insulated covers can be added to any Constantemp® package to improve efficiency and safety by reducing heat loss up to 90% and lowering the risk of burns from accidental contact with the heat exchanger. The rugged cover fits smoothly over the heat exchanger and ties snugly around the bottom, and is easy to remove when maintenance is required.

SIZING - GENERAL

CONSTANTEMP® HEATER SIZING

1. Determine inlet temperature, set point, required flow, and steam pressure. If flow in GPM is unknown, use ASHRAE fixture count method to determine flow in GPM.
2. If steam pressure is greater than 15 PSI, use the pressure-reducing valve selection chart.
3. To determine heater size, enter the left hand side of the chart at the inlet temperature and corresponding outlet temperature (set-point).
4. Read across your steam pressure and down to the first flow that is greater than or equal to the system requirement. Read across to the right to the corresponding heater model.

HEATER SIZING

$$\#/HR = \frac{(GPH)(T2-T1)}{100}$$

CONDENSATE FLOW

$$\#/HR = \frac{GPM}{500} \text{ CONDENSATE}$$

CONSTANTEMP® HEATER CODE SELECTION CHART

	FLOW	HEX	COIL	DESIGN	TUBE	RECIRC		SPECIAL	
E	09	0	1	L	00	R120	00000	0	00
1	2-3	4	5	6	7-8	9-12	13-17	18	19-20

POSITION 1 - MODEL
- E - Single Wall

POSITION 2-3 - FLOW RATE (GPM)
- 03 - 30 GPM
- 06 - 60 GPM
- 09 - 90 GPM
- 12 - 120 GPM

POSITION 4 - HEAT EXCHANGER MATERIAL
- 0 - Ductile Iron (75 psi)

POSITION 5 - COIL MATERIAL
- 0 - Copper (Standard)
- 1 - Admiralty
- 2 - Cupro-Nickel

POSITION 6 - DESIGN PRESSURE
- L - Low Pressure

POSITION 7-8 - TUBE PRESSURE
- 00 - Standard (150 psi)

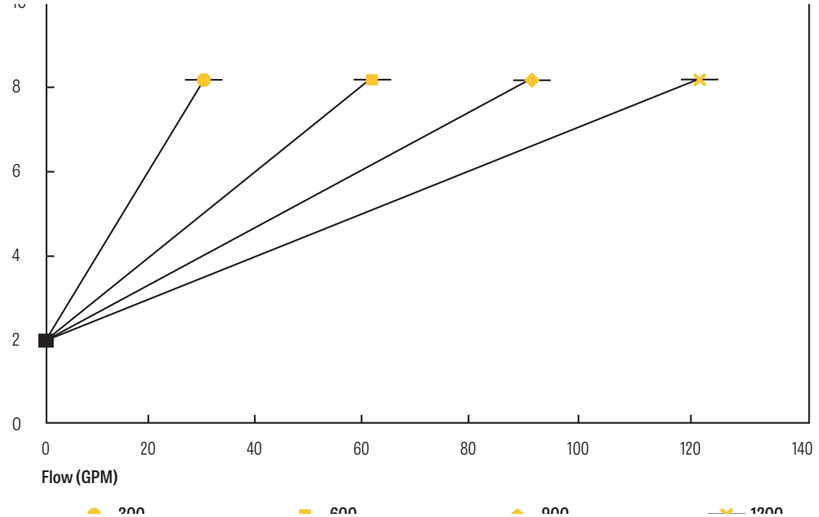
POSITION 9-12 - RECIRCULATION
- 0000 - No recirculation kit required
- R095 - 95°F set temperature
- R110 - 110°F set temperature
- R120 - 120°F set temperature
- R130 - 130°F set temperature
- R140 - 140°F set temperature
- R150 - 150°F set temperature
- R160 - 160°F set temperature
- R170 - 170°F set temperature
- R180 - 180°F set temperature

POSITION 18 - SPECIAL
- 0 - Standard
- T - Tandem
- S - Stacked
- X - Special

PRESSURE DROP VS. FLOW

Capacity tables for Constantemp® Steam/Water Heaters show various capacities for each model number, depending on the temperature rise and inlet steam pressure.

The curves in the chart below provide water pressure drop vs. flow rate in GPM for Constantemp® heaters. Calculating pressure drop for your application using the curves below ensures that the pressure drop from the Constantemp® heater does not exceed customer requirements.



DETERMINING CONSTANTEMP® STEAM/WATER HEATER LOAD REQUIREMENTS

When sizing the Constantemp® Stem/Water Heater, it is necessary to determine the maximum instantaneous system demand in gallons per minute (GPM). If system demand in GPM is not known, it is necessary to perform a count of all fixtures that will receive hot water from the Constantemp® heater.

Use the Table 1 and charts in this section to determine GPM by totaling the number of fixture units compared to the curve for the type of building. Hot water for fixtures and outlets that have constant flows should be added to demand.

Unusual hot water requirements in a building should be analyzed to determine if additional capacity is required - for example, a dormitory at a military school where all showers and lavatories may be used simultaneously when students return from a parade. In such a case, the heater should be sized for the full flow of the system.

To make preliminary estimates of hot water demand when fixture count is not known, utilize Table 2 against the curves in this section. Results will typically exceed the demand determined by actual fixture count - as such, actual heater size should be determined from Table 1.

DETERMINING CONSTANTEMP® STEAM/WATER HEATER LOAD REQUIREMENTS

Example: A 600-student elementary school requires a preliminary estimate. The school has 6 showers. Use Table 2 to find estimated flow - per student, estimate 0.30 fixture units, and per shower, estimate 1.5 fixture units. The preliminary calculation estimates a total flow of 23 GPM.

(600 students x 0.3 fixture units) + (6 showers x 1.5 fixture units) = 189 fixture units

60	Public lavatories	x 1 fixture units	=	60 fixture units
6	Service sinks	x 2.5 fixture units	=	15 fixture units
4	Kitchen sinks	x 0.75 fixture units	=	3 fixture units
6	Showers	x 1.5 fixture units	=	9 fixture units
	Subtotal			**87 fixture units**

The fixture count for the school includes 60 public lavatories, 6 slop sinks, 4 kitchen sinks, 6 showers, and 1 dishwasher at 8 GPM. The calculation is as follows:

At 87 fixture units, Curve D in Figure 2 shows a system demand of 16 GPM. With the dishwasher requirement (8 GPM) factored in, the total system demand is 24 GPM. The flow based on actual fixture count (24 GPM) is slightly higher than the flow determined by the preliminary estimate (23 GPM). In some applications, it is possible for the preliminary estimate to be twice as high as the actual fixture count. To prevent oversizing equipment, it is imperative to determine actual fixture count when sizing the Constantemp® heater.

TABLE 1 - ACTUAL HOT WATER DEMAND IN FIXTURE UNITS (140°F/60°C WATER)

	Apartment Building	Hotels Gyms	Industrial Hospitals	Dorms	Plants	Offices	Building	School	YMCA
Basins, private lavatory	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Basins, public lavatory	--	1	1	1	1	1	1	1	1
Bathtubs	1.5	1.5	--	1.5	1.5	--	--	--	--
Dishwashers									
Therapeutic bath	--	--	5	--	--	--	--	--	--
Kitchen sink	0.75	1.5	--	3	1.5	3	--	0.75	3
Pantry/prep sink	--	2.5	--	2.5	2.5	--	--	2.5	2.5
Service sink	1.5	2.5	--	2.5	2.5	2.5	2.5	2.5	2.5
Showers	1.5	1.5	1.5	1.5	1.5	3.5	--	1.5	1.5
Circular wash fountain	--	2.5	2.5	2.5	--	4	--	2.5	2.5
Semi-circular wash fountain	--	1.5	1.5	1.5	--	3	--	1.5	1.5

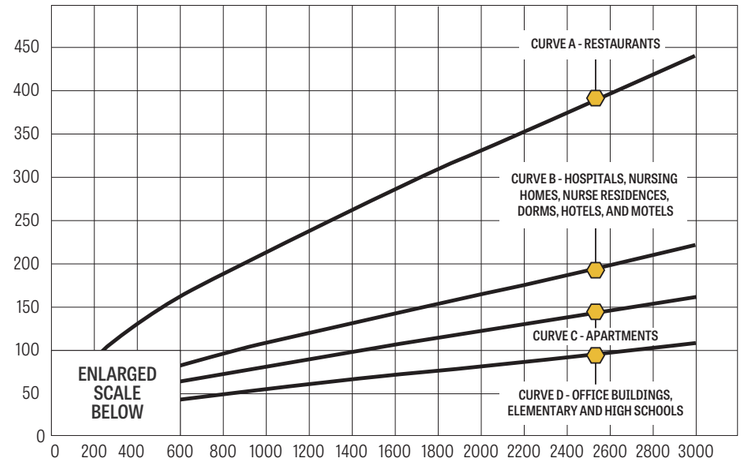
TABLE 2 - PRELIMINARY HOT WATER DEMAND ESTIMATE

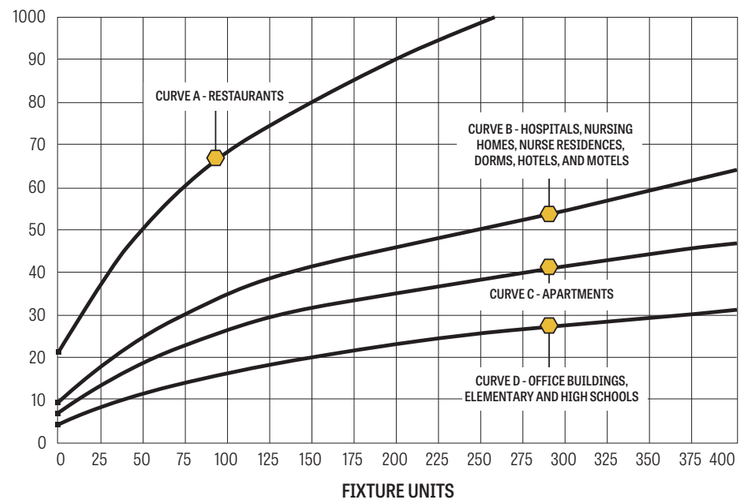
Type of Building	Unit	Fixture Units per Unit
Hospital or nursing home	Bed	2.5
Hotel or motel	Room	2.5
Office building	Person	0.15

Type of Building	Unit	Fixture Units per Unit
Elementary school	Student	0.30[a]
Junior high or high school	Student	0.30[a]
Apartment building	Apartment	3

[a] Add shower load.

MODIFIED HUNTER CURVE FOR HOT WATER FLOW RATE - CORRECTED FOR TYPE OF BUILDING USAGE





CONSTANTEMP® SERIES SIZING CHART (IMPERIAL -GALLONS PER MINUTE)

Inlet Temp (°F)	Set Temp. (°F)	Steam Pressure - PSIG				Model
		2	5	10	15	
40	105 - 110	29	30	30	30	300L
		58	60	60	60	600L
		87	90	90	90	900L
		116	120	120	120	1200L
	120	27	30	30	30	300L
		54	60	60	60	600L
		81	90	90	90	900L
		108	120	120	120	1200L
	140	20	22	24	27	300L
		46	54	58	60	600L
		69	81	87	90	900L
		92	108	116	120	1200L
	150	17	19	21	23	300L
		40	49	53	54	600L
		60	73	79	81	900L
		80	98	106	108	1200L
	160	—	—	—	—	300L
		34	41	44	46	600L
		51	61	66	69	900L
		68	82	88	92	1200L
	180	—	—	—	—	300L
		21	23	25	28	600L
		31	34	37	42	900L
		42	46	50	56	1200L

Inlet Temp (°F)	Set Temp. (°F)	Steam Pressure - PSIG				Model
		2	5	10	15	
60	105 - 110	30	30	30	30	300L
		60	60	60	60	600L
		90	90	90	90	900L
		120	120	120	120	1200L
	120	30	30	30	30	300L
		60	60	60	60	600L
		90	90	90	90	900L
		120	120	120	120	1200L
	140	23	25	27	30	300L
		57	59	60	60	600L
		85	88	90	90	900L
		114	118	120	120	1200L
	150	20	22	24	27	300L
		49	54	57	60	600L
		73	81	85	90	900L
		98	108	114	120	1200L
	160	—	—	—	—	300L
		42	49	51	56	600L
		63	73	76	84	900L
		84	98	102	112	1200L
	180	—	—	—	—	300L
		29	33	39	44	600L
		43	49	58	66	900L
		58	66	78	88	1200L

To calculate capacity for alternative coil materials (copper is standard), multiply the capacities listed in the table by 0.95 for Admiralty coils, or by 0.81 for Cupro-Nickel coils.

CONSTANTEMP® SERIES SIZING CHART (METRIC - LITERS PER MINUTE)

Inlet Temp (°C)	Set Temp. (°C)	Steam Pressure - BARG				Model
		0.1	0.4	0.7	1	
4	40 - 43	109.8	113.6	113.6	113.6	300L
		219.5	227.1	227.1	227.1	600L
		329.3	340.7	340.7	340.7	900L
		439.1	454.2	454.2	454.2	1200L
	49	102.2	113.6	113.6	113.6	300L
		204.4	227.1	227.1	227.1	600L
		306.6	340.7	340.7	340.7	900L
		408.8	454.2	454.2	454.2	1200L
	60	75.7	83.3	90.8	102.2	300L
		174.1	204.4	219.5	227.1	600L
		261.2	306.6	329.3	340.7	900L
		348.2	408.8	439.1	454.2	1200L
	66	64.3	71.9	79.5	87.1	300L
		151.4	185.5	200.6	204.4	600L
		227.1	276.3	299.0	306.6	900L
		302.8	370.9	401.2	408.8	1200L
	71	—	—	—	—	300L
		128.7	155.2	166.5	174.1	600L
		193.0	230.9	249.8	261.2	900L
		257.4	310.4	333.1	348.2	1200L
	82	—	—	—	—	300L
		79.5	87.1	94.6	106.0	600L
		117.3	128.7	140.0	159.0	900L
		159.0	174.1	189.3	212.0	1200L

Inlet Temp (°F)	Set Temp. (°F)	Steam Pressure - BARG				Model
		0.1	0.4	0.7	1	
16	40 - 43	113.6	113.6	113.6	113.6	300L
		227.1	227.1	227.1	227.1	600L
		340.7	340.7	340.7	340.7	900L
		454.2	454.2	454.2	454.2	1200L
	49	113.6	113.6	113.6	113.6	300L
		227.1	227.1	227.1	227.1	600L
		340.7	340.7	340.7	340.7	900L
		454.2	454.2	454.2	454.2	1200L
	60	87.1	94.6	102.2	113.6	300L
		215.7	223.3	227.1	227.1	600L
		321.7	333.1	340.7	340.7	900L
		431.5	446.6	454.2	454.2	1200L
	66	75.7	83.3	90.8	102.2	300L
		185.5	204.4	215.7	227.1	600L
		276.3	306.6	321.7	340.7	900L
		370.9	408.8	431.5	454.2	1200L
	71	—	—	—	—	300L
		159.0	185.5	193.0	212.0	600L
		238.5	276.3	287.7	317.9	900L
		317.9	370.9	386.1	423.9	1200L
	82	—	—	—	—	300L
		109.8	124.9	147.6	166.5	600L
		162.8	185.5	219.5	249.8	900L
		219.5	249.8	295.2	333.1	1200L

To calculate capacity for alternative coil materials (copper is standard), multiply the capacities listed in the table by 0.95 for Admiralty coils, or by 0.81 for Cupro-Nickel coils.

PRESSURE REDUCING VALVE - RECOMMENDED SELECTIONS

For applications where inlet steam pressure to the Constantemp® heat exchanger will exceed 15 psig (1 bar), a steam pressure reducing valve is required. See chart below for sizing information.

MODEL	END CONNECTION	INLET PRESSURE	OUTLET PRESSURE	LBS/HR STEAM	SUGGESTED GP-2000 SIZE
E300L	3/4"	125	15	1,800	GP-2000 1"NPT
E600L	1-1/4"	125	15	3,600	GP-2000 1-1/2" NPT
E900L	1-1/2"	125	15	5,400	GP-2000 2" NPT
E1200L	2"	125	15	7,200	GP-2000 3" 150# FLG

WARRANTY

Armstrong International, Inc. or the Armstrong division that sold the product ("Armstrong") warrants to the original user of those products supplied by it and used in the service and in the manner for which they are intended, that such products shall be free from defects in material and workmanship for a period of one (1) year from the date of installation, but not longer than 15 months from the date of shipment from the factory, [unless a Special Warranty Period applies, as listed below]. This warranty does not extend to any product that has been subject to misuse, neglect or alteration after shipment from the Armstrong factory. Except as may be expressly provided in a written agreement between Armstrong and the user, which is signed by both parties, Armstrong **DOES NOT MAKE ANY OTHER REPRESENTATIONS OR WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.**

The sole and exclusive remedy with respect to the above limited warranty or with respect to any other claim relating to the products or to defects or any condition or use of the products supplied by Armstrong, however caused, and whether such claim is based upon warranty, contract, negligence, strict liability, or any other basis or theory, is limited to Armstrong's repair or replacement of the part or product, excluding any labor or any other cost to remove or install said part or product, or at Armstrong's option, to repayment of the purchase price. As a condition of enforcing any rights or remedies relating to Armstrong products, notice of any warranty or other claim relating to the products must be given in writing to Armstrong: (i) within 30 days of last day of the applicable warranty period, or (ii) within 30 days of the date of the manifestation of the condition or occurrence giving rise to the claim, whichever is earlier. **IN NO EVENT SHALL ARMSTRONG BE LIABLE FOR SPECIAL, DIRECT, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING, BUT NOT LIMITED TO, LOSS OF USE OR PROFITS OR INTERRUPTION OF BUSINESS**. The Limited Warranty and Remedy terms herein apply notwithstanding any contrary terms in any purchase order or form submitted or issued by any user, purchaser, or third party and all such contrary terms shall be deemed rejected by Armstrong.

Special Warranty Periods are as follows:

Constantemp Heat Exchanger shall carry an extended warranty in addition to the manufacturer's warranty as follows:

Constantemp® Steam Water Heater Coil: The coil shall have a 10-year guarantee against failure caused by materials or workmanship provided by Armstrong but not against gasket failure or damage caused by corrosion, water hammer or lack of proper maintenance.

Constantemp® Steam/Water Heater: Two (2) years from the date of installation, but not longer than 27 months from the date of shipment.

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