

Steam/Water Heaters

Steam/water heaters are typically classified as instantaneous, semi-instantaneous and tank-type. Temperature control can be defined as either feed-forward or feedback.

Feedback systems are error-driven and rely upon an outlet or downstream thermostatic temperature-sensing device to detect a temperature change requirement and then modulate the steam to effect the heat exchange in an attempt to recover the heater set-point. Feedback systems are reactive, and a significant concern is their speed of response to system and application temperature control requirements.

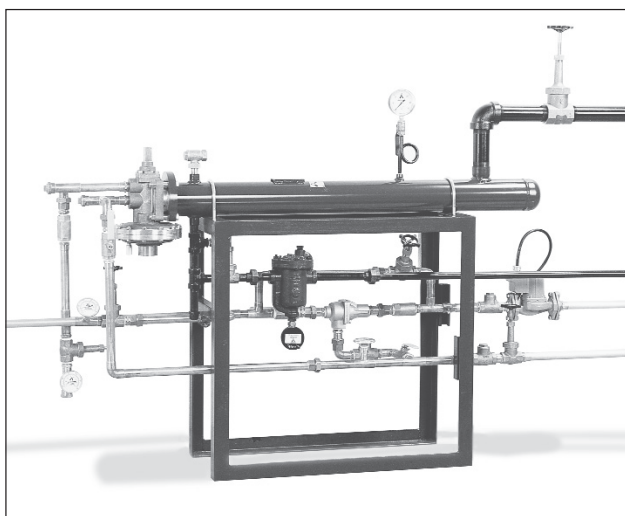
Flo-Rite-Temp™ Instantaneous Steam/Water Heaters (feed-forward)

Flo-Rite-Temp feed-forward instantaneous steam/water heaters offer a simple yet time-proven alternative to traditional feedback instantaneous, semi-instantaneous and tank-type steam-heating methods.

By eliminating the temperature sensing feedback element and relying upon the actual hot water system demand requirement within the system or application, feed-forward systems respond rapidly and are extremely accurate.

Flo-Rite-Temp Feed-Forward Instantaneous Steam/Water Heater is a more attractive option because:

- The constant, non-modulating steam pressure within the shell eliminates cycling wear and tear.
- The system demand or flow feed-forward activation eliminates the requirement for either steam control valve or thermostatic control device.
- Flo-Rite-Temp delivers a consistent outlet temperature (+/-4°F of set-point) with no thermal lag and resulting temperature swing.
- Flo-Rite-Temp is extremely safe because the mixing unit will position to cold water flow upon failure of the primary operating component.



Flo-Rite-Temp instantaneous steam/water heaters can easily do the work of a storage tank unit many times its size—at lower installed cost and with minimum maintenance. Even the largest capacity Flo-Rite-Temp requires only 7 square feet (0.63 m²) of floor space.

The Flo Rite Temp instantaneous Steam/Water heater has a unique feed forward design which features a differential pressure diaphragm actuated mixing unit integral to a shell and tube heat exchanger.

The Flo Rite Temp mixing unit manages the water flow through the heat exchanger based upon downstream hot water demand and eliminates the requirement for a modulating steam control valve.

Operating on constant low pressure (2-15PSI) steam, the Flo Rite Temp mixing unit supplies water to the heat exchanger where it is overheated and then returned to the mixing unit for proportional re-mixing with cold water to a pre-set outlet temperature.

Speed of response

The differential pressure diaphragm within the mixing unit rapidly responds to a change in system demand and significantly reduces the lag times typically associated with feed back/modulating steam control valve systems.

Failure Safe

The Flo Rite Temp mixing units diaphragm actuated design can be described as "failure safe" because in the event of a diaphragm failure the mixing unit will fail with a cold bias and will not allow hot water to exit the heat exchanger.

Temperature Control and User Safety

Capable of controlling outlet temperatures +/- 4F, this principal of operation offers the additional relevant benefit of reducing the waterborne bacterial content of the water during the overheating process. In addition, with no water storage requirement, Flo Rite Temp water heaters are a sensible selection as a component of a broader system design initiative for Legionella risk reduction.

Ease of Maintenance

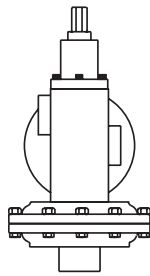
Accessible "non helical" admiralty brass straight tubes inside the carbon steel shell available mechanical cleaning and visual inspection. Non modulating constant steam pressure ensures condensate drainage and removes the potential for water hammer damage and corrosion. There in no steam control valve to maintain and typically no supplemental condensate return equipment required.

Ease of Installation

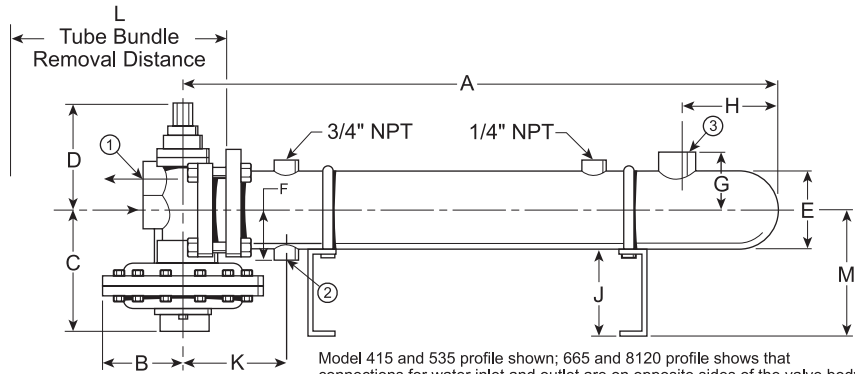
No storage tank, small footprint, access via a standard doorway and pre-piped packaged solutions reduce installation time, space and expenditure.

| How Flo-Rite-Temp Scores on Key Benefits | | | |
|--|----------------------------|-----------------------|---------------------------------|
| | Flo-Rite-Temp Feed-Forward | Storage Tank Feedback | Tankless Instantaneous Feedback |
| Saves space | Yes | No | Yes |
| Saves energy | Yes | No | Yes |
| Eliminates temp. swings | Yes | Yes | No |
| Eliminates thermal lag | Yes | Yes | No |
| Ensures accurate control | Yes | Yes | No |
| Designed with straight tubes for easy cleaning | Yes | No | No |
| Eliminates potential health hazard of standing water | Yes | No | Yes |
| Fails cold for safety | Yes | No | No |
| Eliminates thermostatic control | Yes | No | No |

*last updated 11/15



Model 665 and 8120 Valve



Model 415 and 535 profile shown; 665 and 8120 profile shows that connections for water inlet and outlet are on opposite sides of the valve body.

Dimensions

| Model | A | | B | | C | | D | | E | | F | G | | H | | J | | K | | L | | M | | |
|-------|--------|-------|-------|-----|--------|-----|--------|-----|--------|-----|--------|-----|---------|-----|-------|-----|----|-----|-------|-----|----|-------|--------|-----|
| | in | mm | in | mm | in | mm | in | mm | in | mm | in | mm | in | mm | in | mm | in | mm | in | mm | in | mm | | |
| 415 | 54 | 1,372 | 4-1/2 | 114 | 7-1/2 | 190 | 7 | 178 | 4-1/2 | 114 | 3-5/16 | 84 | 3 | 76 | 7 | 178 | 6 | 152 | 6-1/4 | 159 | 50 | 1,270 | 7-1/2 | 190 |
| 535 | 67-1/2 | 1,715 | 5-1/4 | 133 | 8-5/8 | 219 | 9 | 229 | 5-9/16 | 141 | 4 | 102 | 3-11/16 | 94 | 7-7/8 | 200 | 7 | 178 | 7-1/2 | 191 | 62 | 1,575 | 9 | 229 |
| 665 | 82 | 2,083 | 5-3/4 | 146 | 10-3/8 | 264 | 10-3/8 | 264 | 6-5/8 | 168 | 4-5/8 | 117 | 4-9/16 | 116 | 9-1/4 | 235 | 8 | 203 | 8-3/4 | 222 | 74 | 1,880 | 11 | 280 |
| 8120 | 85 | 2,159 | 5-3/4 | 146 | 11-3/4 | 299 | 12 | 305 | 8-5/8 | 219 | 6 | 152 | 8-7/8 | 225 | 9-1/2 | 241 | 8 | 203 | 9-1/2 | 241 | 74 | 1,880 | 12-3/8 | 314 |

Connections and Weights

| Model | Connections | | | Weight | |
|-------|----------------|----------------|-------------------|--------|-----|
| | 1 | 2 | 3 | | |
| | in (mm) | in (mm) | ib (mm) | lb | kg |
| 415 | 1 (25) NPT | 3/4 (20) NPT | 2 (50) NPT | 133 | 60 |
| 535 | 1-1/2 (40) NPT | 1 (25) NPT | 2-1/2 (65) NPT | 235 | 107 |
| 665 | 2 (50) NPT* | 1-1/4 (32) NPT | 3 (80) NPT | 358 | 162 |
| 8120 | 3 (80) NPT* | 2 (50) NPT | 4 (100) 150# ANSI | 585 | 265 |

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

Specifications

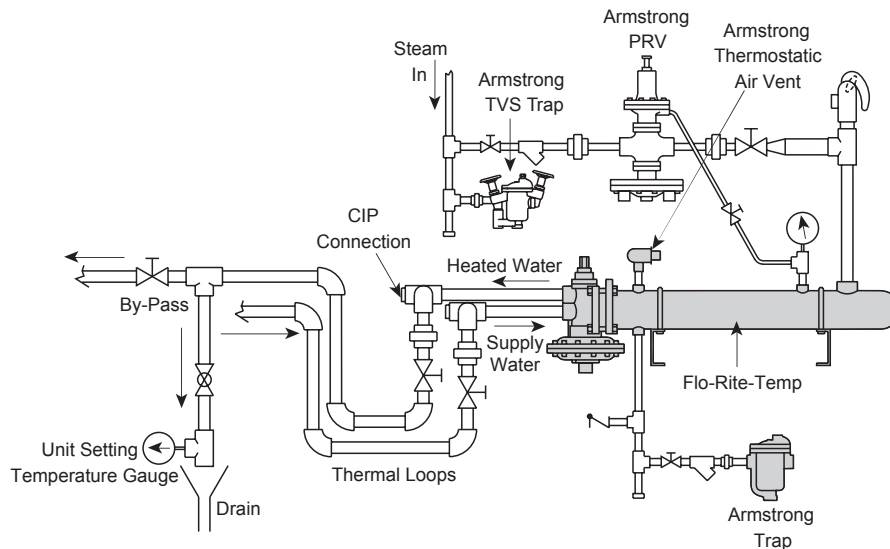
| Application | Steam Supply Pressure | Water Supply Pressure | Maximum Water Pressure Drop |
|----------------|---------------------------------|--------------------------------|-----------------------------|
| Steam to Water | 2 - 15 psig (0.14 - 1.0 bar) | 20-150 psig (1.4 - 1.0 bar) | 10 psig (0.7 bar) |

NOTE: Reusable insulation wraps available.

Materials

| Body | Valve | Valve Seats | Diaphragm | Heat Exchanger Shell | Heat Exchanger Tubes | Tube Sheets | Tube Bundle End Cap |
|--------|-------------------------|---------------------|----------------|----------------------|----------------------|-------------|---------------------|
| Bronze | (415) 303 Stainless | (415/535) | Viton®GF | Carbon Steel | 5/8" 16 BWG | Brass | Brass |
| | Steel w/ Teflon Inserts | 303 Stainless Steel | Reinforced | ASTM SA 106-B | Admiralty Brass | | |
| | (535/665/8120) Brass | (665/8120) Brass | w/Nomex® Fiber | ASME "U" Stamped | | | |

NOTE: Units are NSF-61 certified.



Water Heater Installation Detail

The Flo-Rite-Temp® models identified in the submittal table below are provided, as standard, with an Armstrong steam trap and thermostatic air vent (shaded). All other items indicated, are shown for water heater installation detail only.

For pre-piped packaged Flo-Rite-Temp® water heater assemblies, refer to pages 14-26.

*last updated 11/15