Summer 2021 Newsletter

How a Pre-Heat Feed Water System Works

By Jr Keown

Did you know that water entering your boiler at a lower-than-recommended temperature can lead to serious damage? It can cause cracking, high levels of gasses, and thermal shock. However, you can easily prevent these damages by raising the temperature of the water before it enters the boiler with a pre-heat feed water system.

In this article, we'll explain the importance of this pre-heating system and how it works instead. You can learn more in our recent Boiling Point video, How a Pre-Heat Feed Water System Works.

What is the Purpose of the Feed Water Tank?
If you have a boiler without a deaerator, you likely have a typical feed water tank. This atmospheric (vented) tank is important because it holds water returning from the system and allows you to adjust the water temperature before it enters the boiler. The system is also crucial for boilers that stop and start often because it allows you to prevent dramatic changes in temperature.

Why is Pre-Heating So Important?
The greater the difference between the feed water temperature and the temperature of the boiler, the more thermal stress you will have. So, filling your boiler with cold water can cause incredible damage to the metal, such as thermal shock, which causes the metal to become brittle and crack as it becomes fatigued. In addition, a low water temperature can affect the quality of the water, allowing for higher levels of oxygen and carbon dioxide that can corrode the metal.

To prevent possible damage to your boiler, you can use a pre-heat feed water system to inject steam and raise the temperature of the water slowly. The ultimate goal for a pre-heat feed water system is to ensure that the water entering the system is as close to the temperature of the water already inside—typically 180 to 185 degrees Fahrenheit. Please note that just as the water temperature should not be too low, it should not be too high either. You never want the water in your tank to reach near its boiling point.

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How Does a Forced Circulation Boiler Work?

By John Wizor

You might be familiar with a forced circulation boiler, also known as a "Vapor Power" boiler, but what exactly makes it different from a natural circulation boiler, and what are the advantages? VAPOR POWER INTERNATIONAL

At WARE, we provide combustion services including installation, boiler repair, combustion tuning, and control upgrades, along with boiler service and maintenance. We take great pride in educating our customers with the knowledge they need to choose the right boiler for their business.

In this article, we will discuss what a forced circulation boiler is and how it differs from a natural circulation boiler. You can learn more in our recent Boiling Point video, How Does a Forced Circulation Boiler Work?

Forced Circulation Boilers—A Key Difference

As we begin to look at how a forced circulation boiler works, you will notice some key differences in the parts of a natural circulation boiler; for example, forced circulation boilers include a feed pump that you won't find on other boilers. This pump serves to force water, at superheated temperatures, into the coils, rather than simply waiting on the differential of density to result in generating steam. As a result, a forced circulation boiler generates steam at a much more rapid rate than a natural circulation boiler.

Keep in mind that just like other boilers, a forced circulation boiler also has a steam drum which is the main pressure vessel where the steam will be generated; the difference is the manner and the speed at which this steam is generated.

The Process of Forced Circulation

Now that we've explained the main structural difference of a forced circulation boiler, let's go through the inner workings!

First, water is collected in the steam drum, which maintains the water level, and steam is generated for use. The steam drum draws water from the high pressure and high temperature forced water pump. It then forces the water into the first coil exchanges; water enters the primary chamber coil and is forced into circulation.

The water exits the first tube coil into a manifold then splits into two sections to the exchange. Next, the water flows into the convection coil, exits, and heads to the steam separator. At this point, it's important to note that though the water is superheated, it has not yet flashed to steam. Quickly (thanks to the pressure generated from the feed pump!), the water is released into the vapor drum, flashing it to steam.

Benefits of a Forced Circulation Boiler

As with every decision surrounding combustion equipment, we recommend that you spend time evaluating your business needs with a trusted boiler service company in order to choose the best equipment for your needs.

With that being said, one of the main benefits of a forced circulation boiler is the speed at which it generates steam. Rather than waiting on the change in density of the heated water to generate steam like traditional boilers, the high temperature and high-pressure feed pump forces the water into circulation, creating steam. Depending on the specific needs of your business, a forced circulation boiler may be right for you!

Want to Learn More?

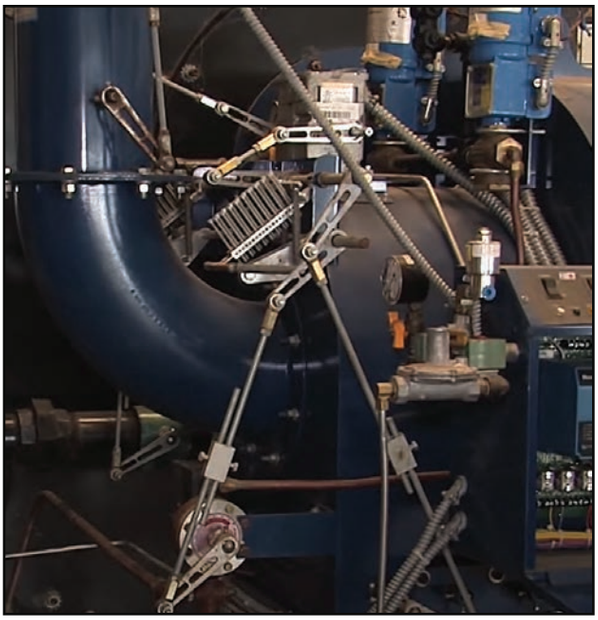
Contact WARE today, to learn more about forced circulation boilers and how they might be a good option for your business.

YouTube Watch WAREboilers channel

Video On
How Does a Forced Circulation Boiler Work?

Linkage vs. Parallel Positioning

By Jude Wolf



Have you noticed that modern boiler technology is moving toward parallel positioning and away from linkage systems? There are several great reasons for this shift, and at WARE, we are committed to helping you stay ahead of technology trends to increase the efficiency and safety of your boiler room. In this article, we'll explain why many boiler experts are moving to this modern practice.

What is the Difference between Linkage and Parallel Positioning?

Unlike parallel positioning, traditional burners use a standard flame safe-guard system, which limits the combustion tuner's control over control valves for combustion air, fuel, and flue gas recirculation. This less-modern (single point) system is literally linked together, and is typically referred to as a "linkage" system. Parallel positioning, on the other hand, provides the operator with individual control over each element, allowing them the flexibility and precision to make their boiler run more efficiently.

Parallel Positioning has a Better Return on Investment

Though traditional linkage systems may be less expensive than parallel positioning systems on the initial investment, you might be surprised to know that, over time, the parallel positioning system will save you more. Linkage systems will not pay for themselves, as they typically cost 7 to 10% more in fuel cost and require constant maintenance, meaning that you will spend more resources than you would with newer technology like parallel positioning.

Parallel Positioning Requires Less Oversight

With a parallel positioning system and a micro-modulating controller, you make your boiler more efficient and less work intensive. The controller allows you to accomplish the same flame-guard controls as the linkage system, but it also does PID (Proportional Integral Derivative) control. You are able to configure each element based on particular parameters to ensure that each element is told what to do, what position to do it in, and they're not tied or constrained by the other connected elements. Parallel positioning provides you with independent control of each element, allowing for better fine tuning—unlike in a linkage system that is more limited.

To learn more, you can visit our recent Boiling Point video, Linkage vs. Parallel Positioning.

Video On
Linkage vs. Parallel Positioning

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Unit	HP/PPH	Year	Manf.	Fuel	Type	PSI	Ctrl.
796	82,500	2016	Victory Energy Faber	(Low NOx) G/#2	Steam	350	IRI
797	82,500	2016	Victory Energy Faber	(Low NOx) G/#2	Steam	350	IRI
767	75,000	2011	Victory Energy	(Low NOx) G/#2	Steam/SH	750/750	IRI
747	75,000	2000	B&W	(Low NOx) G/#2	Steam/SH	750/750	IRI
791	75,000	2016	Victory Energy	(Low NOx) G/#2	Steam/SH	750/750	IRI
750	70,000	1996	Nebraska	(Low NOx) G/#2	Steam/SH	750/750	IRI
709	60,000	1979	Zurn	(Low NOx) G/#2	Steam	500	IRI
741	60,000	1979	Zurn	G/#2	Steam	550	IRI
795	40,000	1986	Cleaver Brooks	Gas	Steam	260	IRI
634	800	1972	York-Shipley	G/#2	Steam	150	IRI
620	800	1975	York-Shipley	G/#2	Steam	250	IRI
SSB-55	800 XID	2021	Victory Energy	(Low NOx) G#2	Steam	250	UL/CSD-1
SSB-57	600 XID	2021	Victory Energy	(Low NOx) G/#2	Steam	250	UL/CSD-1
SB-139	500	2001	Cleaver Brooks	G/#2	Steam	150	
SB-243	400	2018	Victory Energy	(Low NOx) G/#2	Steam	150	UL/CSD1
SB-138	350	1994	Cleaver Brooks	G/#2	Steam	150	
SSB-39	300 XID	2016	Victory Energy	(Low NOx) G/#2	Steam	150	UL/CSD-1
SSB-51	250	2020	Victory Energy	(Low NOx) G/#2	Steam	150	UL/CSD-1
415	250	1980	Eclipse	#2 Oil	HT/HW	954	IRI
SB-148	200	1995	Kewanee	Gas	Steam	325	IRI
SB-146	200	1995	Kewanee	Gas	Steam	325	IRI

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NEW AND USED LIST continued

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Unit	HP/PPH	Year	Manf.	Fuel	Type	PSI	Ctrl.
SWVB4	2500	2021	Victory Energy	(Low Nox) G/#2	Steam	250	UL/CSD-1
SWVB3	1500	2021	Victory Energy	(Low Nox) G/#2	Steam	250	UL/CSD-1
SSB-56	1200	2021	Victory Energy	(Low NOx) G/#2	Steam	250	UL/CSD-1
SB-251	250	2019	Victory Energy	G/#2	Steam	150	UL/CSD-1
SB-255	250	2012	Cleaver Brook	G/#2	Steam	150	UL/CSD-1
SB-249	175 XID	2019	Victory Energy	G/#2	Steam	150	UL/CSD-1
SB-248	175 XID	2019	Victory Energy	G/#2	Steam	150	UL/CSD-1
SSB-53	175 XID	2020	Victory Energy	(Low NOx) G/#2	Steam	150	UL/CSD-1
SSB-52	150	2021	Victory Energy	(Low NOx) G/#2	Steam	150	UL/CSD-1
SB-257	150	2021	Victory Energy	G/#2	Steam	150	UL/CSD1
SB-256	150	2019	Victory Energy	G/#2	Steam	150	UL/CSD1
769	150	1998	Precision	Electric	Steam	150	UL
SB-260	100	2010	Johnston	Gas	Steam	150	UL
SB-254	100	2020	Victory Energy	G/#2	Steam	150	UL/CSD-1
SB-259	100	2021	Victory Energy	G/#2	Steam	150	UL/CSD-1
SB-262	100	2021	Victory Energy	G/#2	Steam	150	UL/CSD-1
SSB-54	100	2020	Victory Energy	(Low NOx) G/#2	Steam	150	UL/CSD-1
SB-241	100	2008	York-Shipley	Gas	Steam	150	UL
SB-237	70	2016	Victory Energy	G/#2	Steam	150	UL/CSD-1
SB-238	70	2016	Victory Energy	G/#2	Steam	150	UL/CSD-1
SSB-35	70	2016	Victory Energy	(Low NOx) G/#2	Steam	150	UL/CSD-1
SB-247	50	2019	Victory Energy	G/#2	Steam	150	UL/CSD-1
SB-261	50	2016	Victory Energy	G/#2	Steam	150	UL/CSD-1
SSB-45	50	2019	Victory Energy	G/#2	Steam	150	UL/CSD-1

Continued from Pg 1 - How a Pre-Heat Feed Water System Works

Components of a Boiler's Pre-Heat System

There are three primary components of a pre-heat feed water system:

1. Temperature Control: This control maintains the proper temperature.

2. Integrated Valving: This valve will integrate with the temperature control (e.g., a capillary control valve).

3. Steam Supply for Heat: This is the source that supplies the steam and pre-heats the tank.

Adjusting the Temperature

The three elements mentioned above work together to allow you to increase the steam and control the water temperature. One common method of pre-heating is called sparging, where you inject steam into the water below the surface to bring up the temperature.

Extend the Life of Your Boiler

By regulating your water temperature with a pre-heat feed water system, you can prevent unnecessary damage to your boiler and extend the life of the equipment. Want to learn more? At Boiler University, you can learn from industry experts with decades of experience and firsthand knowledge. Read about our state-of-the-art training facility and our course selection here on our website.

Watch Video On What is a Sparge Tube?
WAREboilers channel

A STRONG ADDITION

WARE is pleased to announce a new product line that we're stocking in our parts department: Armstrong Steam Traps. We carry a full line of Armstrong Inverted Bucket Traps, and Armstrong Float and Thermostatic Traps. These tough, reliable condensate traps help preserve performance and system integrity by separating out the water in your steam circuit, preventing it from impeding heat transfer and damaging process components.

INVERTED BUCKET TRAPS

The Armstrong Inverted Bucket Trap looks like it sounds. Inside, an inverted, one-ended cylinder is suspended in place inside a larger cylinder that is partially filled with condensate. Steam flows upwards from the bottom of the trap, filling the bucket and keeping it buoyant. As long as there's enough steam pressure to keep it in the air, the lever connected to the bucket will keep the drain valve sealed to prevent any pressure loss. Once enough condensate forms to displace the steam keeping the bucket afloat, the bucket begins to sink. As it does, it pulls the lever connected to the drain valve to allow the condensate to escape.

THE B THAT GETS AN A+

The other steam trap we've added to our product line is the Armstrong Float and Thermostatic Steam Trap, Type B. As its name suggests, it uses a combination of thermodynamics and static pressure to remove condensate from your system without losing steam pressure. Armstrong Float and Thermostatic Steam Traps are excellent at providing two critical functions in your steam circuit. First, they allow condensate to drain. Second, they provide continuous, high-volume venting of air.

DRAINED

Inside the Armstrong Float and Thermostatic Steam Trap, the condensate drain valve is connected to a ball float. As the level of condensate rises, the ball float starts to float upwards. As it does so, it acts on a lever connected to the drain valve, opening it and allowing condensate to escape. However, because the condensate drain valve remains underwater, it doesn't allow air or other non-condensables to escape. That's where the thermodynamic part of the trap comes into play.

JUST HAVE TO VENT

Air and other non-condensables don't have the same thermodynamic properties as pure steam. Because of that, they introduce temperature differences whenever they're present in a steam trap valve. When air and other non-condensables cause the temperature inside the steam trap to drop a few degrees below the saturation point, a venting valve opens and the unwanted gases flow out. Because they're fully mechanical and powered by pressure and temperature, Armstrong Float and Thermostatic Steam Traps are simple, reliable, durable, and dependable.

If you need an Armstrong Steam Trap installed, or if you need any kind of parts or service for your boiler, WARE is here to help. Contact us today.

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