



# HOT WATER BOILER SYSTEMS

## Medium & High Temperature

Temperatures to 400°F. Pressures to 300 PSI

### HISTORY

Since the days of the Roman Empire, hot water and hot gases have been circulated as a heating media. About 1920 a new concept in industrial and process heating was first successfully tested in Europe. In 1927 the first technical journals were written in the United States concerning high temperature Liquid & Hot Water Systems. Newer, stronger materials were developed, pressures and temperatures were increased, and by 1930, many 400°F circulating systems were in operation in England. Parker Boiler began to furnish Hot Water Boilers in this growing field in the post-World War II days. In 1953 the first Medium/High Temperature Water Systems were installed by Parker Boiler. These systems have operated extremely well and the owners attest to their satisfaction. Numerous systems have followed, proving that High Temperature Hot Fluid for process heating is successful.

### HOT WATER SYSTEM DEFINITIONS

**LT/LP** Low Temperature below 250°F and Low Pressure less than 160 PSIG.

**MT/MP** Medium Temperature 250° to 350°F with less than 150 PSIG.

**HT/HP** High temperature above 350°F and High Pressure less than 300 PSIG.

**Closed System** One in which the fluid is continuously circulated with no water make-up or lost fluid. Parker Direct Fired Hot Water Boilers are well suited for this type of system.

**PARKER BOILER CO.**  
5930 Bandini Boulevard  
Los Angeles, CA 90040  
Tel (323) 727-9800  
Fax (323) 722-2848  
www.parkerboiler.com  
BROCHURE 201-HTHWB 111



The Parker bent steel tube, all welded construction is the ideal boiler for high temperature applications. Pictured is the Boiler Room at HMT Technology Corp. in Eugene, Oregon. Here, two T-4600's provide the heat source for a metal plating line (350°F), and three T-6800's serve the building heating needs of the facility.

### Open System

One in which the fluid is heated and then used, so make-up is required. The Parker Indirect Heater is the unit of choice for this type of system.

### Examples:

A Domestic Hot Water System with heater, pump and storage tank constitute LT/LP open system, because water would normally be in the 140°F range with a pressure of 100 PSI or less.

The closed water system on plating tanks, where the circulating water is less than 350°F, and approximately 115°F PSI, would be a MT/MP system.

A 400°F circulating Thermal Liquid Heater or Hot Water Boiler operating on a jacketed kettle, platen, calendar rolls, etc., would be an example of a HT/HP system. A broad classification embodying MT/MP and HT/HP systems are used in our nomenclature at Parker Boiler Company as High Temperature High Pressure Systems.

### APPLICATIONS

- Metal Plating and Anodizing Tanks
- Laminating Presses
- Chemical Plants
- Building Heat
- Greenhouses
- Food Processing
- Wine Processing
- Meat Processing
- Plastics Manufacturers
- Kiln Dryers
- Parts Washing Systems

### ADVANTAGES

#### Lower Initial Equipment Cost

The comparative cost of the High Temperature Hot Water Heating Equipment is considerably less than the same capacity in steam. Frequently a savings of as much as 25% can be obtained in original equipment cost.

#### Lower Operating Cost

Maintenance and operating costs will result in a large cost saving. This saving results from: (1) Lower fuel expense, due to higher operating efficiency and less system radiation losses; (2) Lack of steam trap discharge losses; (3) Virtually no feed water make-up; (4) Dras-

tically reduced costs, from labor savings by the elimination of water softening, blowdowns, and boiler water treatment; (5) Boiler attendants are normally not required and the system can remain in operation without supervision and can be started with a time clock.

#### Long Equipment Life

Since little or no water is induced into the closed system, corrosion or scale problems are held at a minimum. These systems typically run for long periods of time with little maintenance.

#### Applicable To Variable Elevation Installations

Since the circulating system depends on a pump for circulation, it is not important that the pipe be graded in order for condensate to reach a low point. The distribution piping system is easy to install with fewer complications than steam systems.

**"Never a Compromise for Quality or Safety"**



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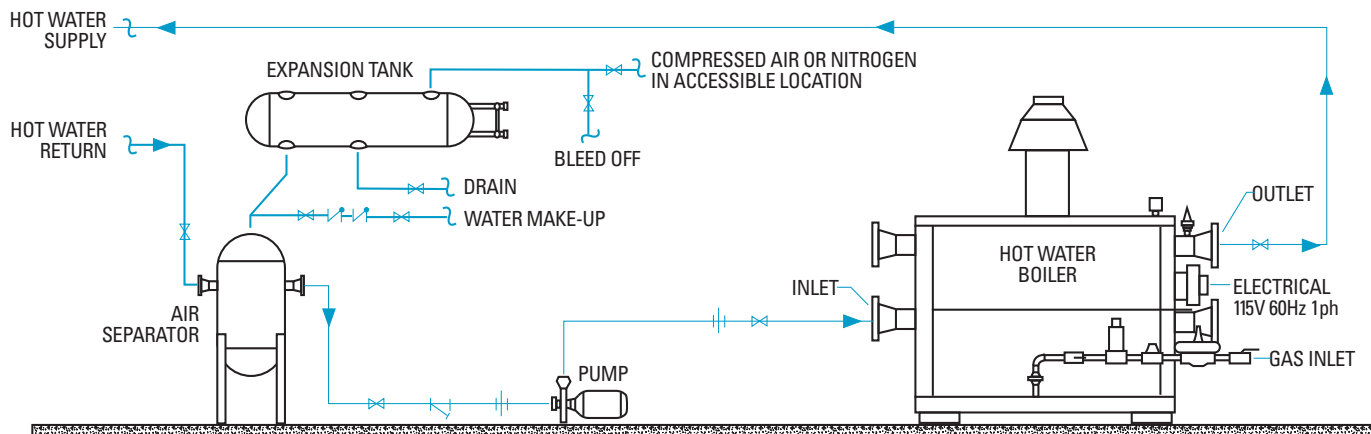
## Medium & High Temperature

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### 201 Med & High Temp Hot Water Boilers

#### TYPICAL DIRECT FIRED, CLOSED SYSTEM PIPING SCHEMATIC



#### SYSTEM COMPONENTS

##### Boiler

Parker Direct Fired Hot Water Boilers are ideally suited for all phases of medium or high temperature circulating work. Of the utmost importance is our high degree of ability to withstand thermal shock due to flexible bent tube all welded construction. This enables us to provide a 25 year Thermal Shock Warranty. Another prime consideration is the proper circulation of the heating medium through the boiler tubes, our boiler is ideally designed to obtain the exact required circulation. Internal header baffles can be installed in the headers of the entire line of hot water boilers to adequately baffle the flow rate through the boiler to the required design system flow rate. Our 6-10 pass staggered tube design allows for maximum heat absorption of the products of combustion. Glycol and water blend solutions are also used successfully on Parker Boilers.

##### Expansion/Compression Tank

Some suitable means must be supplied to accommodate the expansion of water volume within the system when the system is heated to normal operating temperature. Specially designed ASME Code tanks are necessary for this application and should be rated to withstand system pressure and temperature. A wide range of tanks are available. The importance of purchasing the correct size and design of expansion/compression tank cannot be minimized. In some instances, little design consideration is given to the expansion tank. This can result in pump problems or discharging of the boiler relief valve, thus losing treated water. In some instances compressed air or nitrogen can be used to control system pressure and expansion. Water glass fixtures are standard on Expansion/Compression tanks and tank mounted low water cut-offs are available at extra cost.

Parker tanks are rated for temperatures up to 450°F, and can be built for pressures up to 250 psi.

##### High Temperature Circulating Pumps

Of utmost importance to the entire satisfactory operating system is the circulating pump. Each job demands a specific pumping capacity in GPM, and a specific maximum head capacity. When an inadequate size pump is furnished, the boiler tubing may become starved for water. Parker can select and supply air or water cooled pumps to insure adequate system flow. Economical air cooled pumps can be provided for system operation to 275°F. More expensive air cooled pumps are available for temperatures to 325°F and pumps with water cooling jackets are available to up to 400°F.

##### Air Separator

A suitable air separator should be provided and able to withstand system pressure and temperatures.

##### Heat Exchanger

A suitable means of transferring the heat must be provided and designed for use with circulating fluid. If the exchanger is not properly sized, the heat cannot be transferred successfully to the product and the system will not work efficiently.

*Parker Boiler's Engineering/Sales Staff will be happy to assist you with your High Temperature Heating System needs. Our list of satisfied Customers attests to the operational ability of our equipment and our knowledge in the field.*



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