

**PRODUCT APPLICATION BULLETIN PA-1**  
**PARKER BOILER CO., INC.**

**GENERAL BASIC REQUIREMENTS AND RECOMMENDATIONS ON STEAM & RETURN LINES**

**I. MAIN STEAM LINE:**

The main steam line is the piping from the boiler that carries the steam to an area in which multiple steam using units are installed.

1. The steam line should be of proper size and large enough to take care of the reasonable future expansion. The line must be adequate to supply the volume of steam necessary for the distance required at the desired pressure. For proper sizing, refer to steam and return line sizing, Chart G.E. Table 5.
2. Main steam line should be graded downward from the boiler a minimum of 1/8" per linear foot with a steam trap installed at the end of the line and at any low points in the line. This is to provide proper drainage of condensation.
3. All steam lines should be properly secured and installed in accordance with good accepted practice to prevent any hazards such as breakage from vibration. Sufficient room and provisions for expansion and contraction should be allowed.
4. All steam lines should be properly insulated.
5. When steam pressure is critical, it is desirable to install a pressure reducing valve on the main line and operate the boiler at a higher pressure. This will minimize pressure fluctuations. A safety valve equal to the boiler capacity in pounds per hour should be set at a reduced pressure and furnished.

**II. STEAM SUPPLY LINES:**

Steam supply lines are the steam pipes that connect from the main steam line to the steam heated unit.

1. Steam supply lines should be proper size to provide the volume of steam necessary at the desired pressure.
2. Steam supply lines should be connected off of the side or top of the main steam line and never off of the bottom of same.
3. A shutoff valve should be installed on the steam supply line ahead of all other valves and controls in a convenient location for shutting off the equipment when not in use or during repairs.
4. If the desired or approved steam working pressure of the equipment is less than the pressure in the main steam line, a pressure reducing station should be installed in the supply line. A safety valve equal to the boiler capacity in pounds per hour should be set at a reduced pressure and furnished.
5. If a set temperature of the processing equipment is desirable or critical, a steam temperature regulating valve should be installed in the recommended manner.
6. All steam supply piping should be installed in accordance with good engineering practices in compliance with all applicable Codes. All steam supply lines should be properly insulated.

**III. TRAP DISCHARGE LINES:**

The lines which remove the condensate and flash steam from the trap to a return line.

1. The steam trap should be properly sized to efficiently drain the condensation at the volume and pressure necessary. Consult the Trap Manufacturer's Guide Manual for properly selecting and sizing the trap at the required pressure and capacity required.

### **III. TRAP DISCHARGE LINES (continued):**

2. Assuming the trap is properly sized for the job, use a trap discharge line the same size as the trap connection. At very low pressure differentials between trap and condensate return pipe, trap discharge lines can be increased one pipe size to increase pressure differential.
3. Trap(s) must be properly installed in accordance with the Trap Manufacturer's Recommendations to assure proper drainage for the particular application. The trap(s) should be installed at a lower level below the trap outlet of the equipment off of a drip leg with an inlet strainer and discharge check valve. Unions should be provided for easy removal and a stop valve on the discharge side of all other valves as shown in Trap Piping detail. On critical installations, a by-pass may be installed to permit manual operation when the trap is being serviced.
4. The steam discharge line should connect from on the top or up to 45<sup>0</sup> from the side of the main return line to permit free drainage. The discharge lift should not exceed 2-1/4 feet for each pound pressure at the inlet of the trap.

**CAUTION:** Note this lift applies to steam pressure on inlet side of trap. On modulating temperature regulator applications or when pressure drops are experienced through the equipment, this should be taken into consideration.

### **IV. MAIN CONDENSATE RETURN LINE:**

This is the return line that receives the condensate from the many trap discharge lines and carries the condensate back to the boiler return tank.

1. The main condensate return line should be of adequate size and properly graded towards the return tank a minimum of 1/8" per lineal foot so condensate will flow freely back to the tank without resistance. See G.E. Table 5 for proper sizing recommendations.
2. It is considered good practice to select return pipe one or two sizes larger but never less than the capacity of the combined trap discharge lines.

### **V. RELIEF VALVES:**

It is mandatory and important to install safety valves on the connected equipment or on the supply side of all other valves if the connected equipment has an approved working pressure less than that stamped or set on the safety valve of the boiler(s).

Entire installation must comply with all applicable Codes.

## **THIS BULLETIN COURTESY OF PARKER BOILER CO.**

For further assistance or information on Steam Hot Water Boilers and Accessories, please contact your local representative or our Los Angeles Factory.

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