



Top Ten Reasons Why Relief Valves Discharge

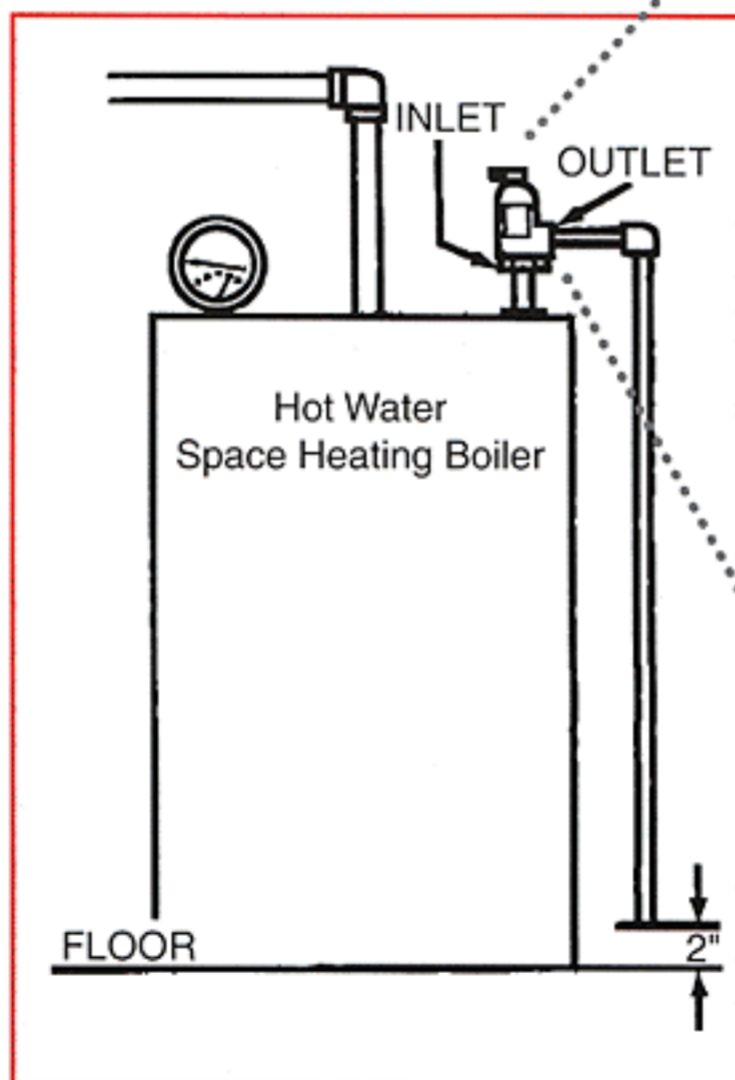
1 Waterlogged Steel Compression Tank. There are some heating systems that still use the older steel compression tanks to absorb the water that expands when heated. If for some reason the tank loses its volume of air, it will be replaced with an equal amount of water. Unfortunately, water isn't compressible so when the boiler fires up, the expanding water tries to enter the tank and causes an immediate increase in pressure which causes the relief valve to discharge this excessive pressure build up.

2 Pressure Reducing Valve is Left Opened or Fails Open. Most systems today use a pressure-reducing valve to fill and pressurize the system. If scale or minerals build up on its seat, it may fail in the open position. Also, most of these valves have a manual bypass feature to fast-fill a system. If the bypass valve is accidentally left open it will expose the system to street pressure, which normally exceeds the boiler's pressure relief valve rating.

3 Diaphragm Tank Loses Its Air Charge. The air cushion in this type of tank is separated from the system by a membrane. Unfortunately, the membrane is permeable which allows a small portion of the air to enter the system where it is vented out. As this occurs, the PRV notices a drop in system pressure and rightfully adds water to maintain the appropriate system pressure. Of course the diaphragm tank is slowly losing its cushion of air and finally one day, when the boiler heats up the water, the relief valve discharges onto the floor.

4 Undersized Expansion Tank. These tanks, whether the "old" steel or the diaphragm style, have to be sized correctly to do their job. If someone installs an undersized tank, the volume of the water in the system will be too great for the tank to handle. This will cause an immediate rise in pressure and the relief valve will open.

5 Undercharged Diaphragm Tank. It is very important to size the tank correctly and be sure that the pre-charge of air in the tank matches the system's fill pressure. If the air charge doesn't, then cold water will be allowed to enter the tank before the boiler even heats the water. This will have the same effect as an undersized tank.



Protection of Hot Water Space Heating Boilers

and aggressive water. Once this happens, the boiler and its relief valve are exposed to the pressure of the cold water line. Normally this pressure exceeds the valve's rating and the relief valve opens.

7 Faulty Aquastat. A faulty aquastat will allow the boiler water to reach excessive temperatures. This causes the water to expand beyond the recommended range of tank sizing guides and the result is a rise in pressure beyond the relief valve's capacity, causing it to open.

8 The System's Static Fill Pressure Requirements Approach the Boilers Relief Valve Setting. With this condition, every time the boiler fires, the relief valve will open. It is very important that when selecting a boiler for applications in tall buildings the maximum pressure allowed by the boiler manufacturer must be greater than that required by the system's fill pressure.

9 Improper Location of the Expansion Tank and System Pump. If the expansion tank and high head system pump are installed on the return, the pump's pressure differential will be added to the system's fill pressure. These two pressures, when added together, may exceed the relief valve's setting.

10 Systems that Incorporate High Head Pumps and Pressure Differential Valves. In the Spring and Fall, when most of

the zone valves in the system are closed, the pressure differential valve opens to prevent the circulator from building up excessive head pressure. Unfortunately this pump head is now directed toward the boiler and relief valve. If this head pressure combined with the system's static pressure exceeds the relief valve's pressure, it will open.

These are some of the more common (and not so common) situations that can cause a relief valve to discharge. For expert help with questions or problems you may have with any hydronic system, contact your local Bell & Gossett representative.



6 Tankless Coil. A tankless coil located inside the boiler produces domestic hot water. Eventually these coils can develop leaks from corrosion