

Piping Relief Valves Back Into the System

Refrigeration systems containing large ammonia charges (>10,000 pounds) can benefit by piping relief valves back into the system. Safety pressure relief valves are subject to "inspection and testing" periodically under the Mechanical Integrity provisions of OSHA Professional Safety management and EPA Risk Management Programs. Relief valves that are piped back into the system can be expected to perform over much longer periods between inspections than relief valves exposed to contaminants and corrosion from exposure to the atmosphere. Another benefit of discharging back into the system is the avoidance of liquid spills from oil pots, liquid coolers, and other liquid filled components.

When piping relief valves back into the system, the total of the set points of relief valves in series should not exceed the allowed working pressure of upstream components. Following are a few examples of suitable application of piping relief valves back into the system:

- 400 psi Oil Coolers on screw compress:
Use 75 psi or 100 psi set point liquid relief valves discharging into 300 psi oil separator.
- 250 psi Surge drums on evaporators:
Use 75 psi or 100 psi set point valves discharging to suction line downstream of the suction stop valve, using 150 psi set point valves on the main house accumulator.
- 250 psi Evaporative condensers:
A relief valve is not required on evaporative condenser coils, however, when desired, use 75 psi or 100 psi set point valve discharging to the condenser drain downstream of the condenser outlet stop valve.
- 250 psi Oil drain drum:
Use 75 psi or 100 psi set point valve discharging to 150 psi accumulator.
- 250 psi Shell and tube or boudelot plate evaporator.
Use 75 psi or 100 psi set point valve discharging to 150 psi suction downstream of evaporator outlet stop valve.
- 300 psi Screw compressor:
Use 250 psi set point valve discharging to suction line upstream of suction stop valve. This valve is primarily to protect motor from overload in case screw is started with a closed discharge valve.

The effect of the potential from discharges of upstream relief valves should be considered in sizing downstream atmospheric safety relief valves

To Maintain Tight Seating Relief Valves

Manufacturers of Safety Relief valves cannot guarantee that your valves will reseal, because of the potential for particulate matter within the system that may become embedded on the seat ring during a release.

To prevent operational releases, high pressure cut-out switches should be calibrated annually.

To insure tight closing Safety Relief Valves, the high pressure cut-out switch should stop the compressors at 80% of the set point of the Safety Relief Valve.

In the event of an accidental higher pressure excursion, it is comforting to know that your Shank Safety Relief Valves have the best chance of reseating after a release. However, industry practices, as reflected in trade association recommendations such as IAR Bulletin 110, suggest that Relief Valves which have discharged in service due to temporary excessive over pressure should be replaced at the first opportunity even though they may be, temporarily, maintaining a pressure-tight seal.