SUPERFREEZE

AMMONIA PRESSURE-RELIEF VALVES

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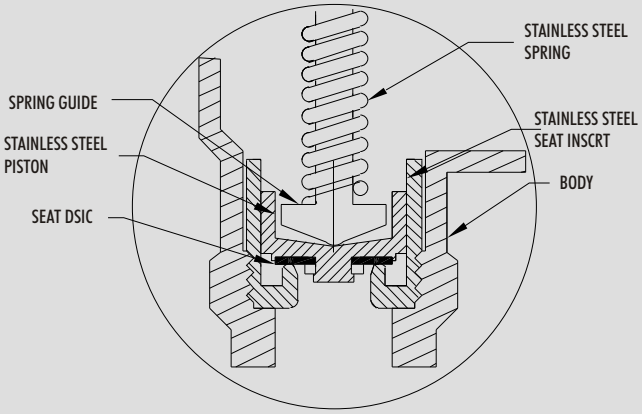
TYPE : SRV

INTRODUCTION

SUPERFREEZE pressure relief valves are designed to provide emergency relief from excessive pressure in refrigerant containing vessels. These tamper-resistant valves are accurately set and sealed by qualified technicians at the factory.

Our safety valve design features the most reliable method of safely relieving pressure. The virgin Teflon seal mated with the stainless steel multiple crown ring, provide an outstanding sealing action. The combination assures a non-stick and accurate pop-off pressure release. The design incorporates a special extra lift, pop-open feature for high relieving capacity.



APPLICATIONS

Pressure relief valves helps meet the requirements of ANSI/ASHRAE 15-1994 safety code for Mechanical Refrigeration as well as other world wide codes. This code requires pressure vessels of all refrigeration systems to be protected by a pressure relief device or other approved means to safely relieve pressure in the event of fire or other abnormal conditions. Once installed, is ready to vent to atmosphere any temporary excessive overpressure inside of a vessel. After discharge, these valves will attempt to reseat to minimize loss of refrigerant. However, once any relief valve has discharged, it must be replaced as soon as possible because debris may have settled on the seat during discharge.

MATERIAL SPECIFICATIONS

Body	:	Nodular iron
Piston	:	Stainless steel AISI-304
Spring	:	Stainless Steel
Seat insert	:	Stainless steel
Seat Discs	:	Premium grade virgin Teflon (PTFE)
Cap	:	Steel, Nickel chrome Plated
Cap O-Ring	:	Neoprene
Maximum Temperature Rating	:	115°C (240F)
Safe Working Pressure	:	365 psig (25 bar)
Setting Range	:	150 to 350 psig (10.4 to 24 bar)

INSTALLATION

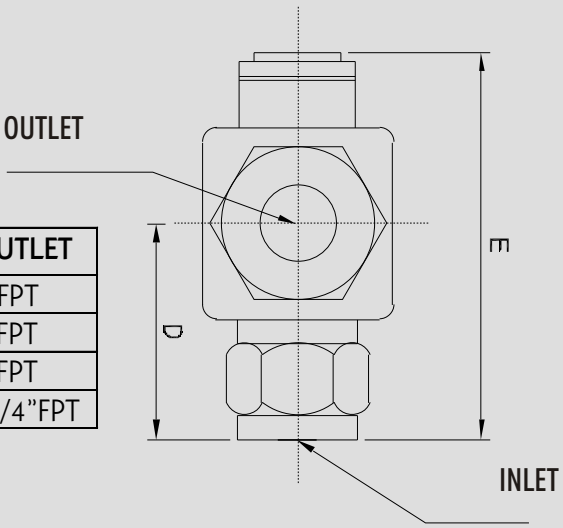
Safety relief valves should not be discharged prior to installation, other than at time of factory setting. If the system is to be pressure tested to pressures at or higher than the relief valve setting, the relief valve should be removed while the system is being tested. Discharging the valve during system pre-test could cause foreign material and contamination to lodge on the valve seat disc. This would cause permanent leak or lower the initial leak pressure. In either event, the valve would have to be replaced.

Do not attempt to change the pressure setting of safety relief valves in the field. Relief valve springs have a limited range of pressure settings and a field adjustment may exceed this range reducing stem lift and discharge capacity. The valve should be returned to manufacturer for re-setting and re-sealing.

INSTALLATION DIMENSIONS

SAFETY VLAVE

Cat No.	SIZE	D	E	INLET	OUTLET
SRV 1520	15mm X 20mm	66	125	½"FPT	¾"FPT
SRV 1525	15mm X 20mm	66	125	½"FPT	1" FPT
SRV 2025	20mm X 25mm	66	125	¾"FPT	1" FPT
SRV 2532	25mm X32mm	75	140	1" FPT	1-1/4"FPT



CONNECTIONS

Relief valves are connected as nearly as practicable directly to the pressure vessel above the liquid refrigerant level. The opening to which the relief valve is connected shall have at least the area of the relief valve Inlet. There should not be a stop valve between the vessel and the relief valve or between the relief valve and the point of discharge.

For relief valves used on pressure vessels having 10 cubic feet of internal gross volume or more, a relief device system consisting of a three-way valve and two relief valves in parallel is required. This arrangement for any size system containing a substantial charge of refrigerant provides a convenient method for relief valve maintenance

LOCATION

Valves relieving to atmosphere may be installed on systems operating as low as -100°C provided location is in ambient temperatures that are normally above 0°C.

REQUIRED VALVE CAPACITY FOR PRESSURE VESSELS

The ANSI/ASHRE 15-1994 safety code gives the following formula for determining the necessary relief valve capacity for a given pressure vessel. The minimum required discharge capacity of the safety relief valve shall be:

$$C = 13.1(f)(D)(L)$$

Where

C = Minimum required discharge capacity of the relief valve in SCFM of air

13.1 = Constant to convert air, lb/min to scfm

f = Factor dependent upon kind of refrigerant

Ammonia (Refrigerant 717)	f = 0.5
Refrigerant F-12, F-22	f = 1.6

D = Outside diameter of vessel in ft.

L = Length of vessel in ft.

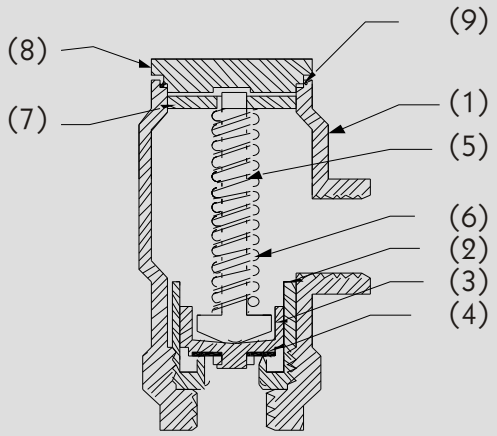
PRESSURE-RELIEF VALVE CAPACITY RATINGS

Cat. No.	Air Capacity	Standard Pressure Settings (psig)								
		150	175	200	225	250	275	300	325	350
SRV1520 SRV1525 SRV2025	lb/min	35.2	41.8	46	52	57.2	62.2	69	74.8	79.6
	scfm	475	549	624	690	765	841	915	985	1057
SRV2532	lb/min	53.0	61.8	69.6	77.3	85	92.5	100	109	117
	scfm	702	815	920	1027	1136	1245	1351	1460	1567

Important note: these are atmospheric relief valves. Setting equal pressure above atmosphere when outlet is connected via proper schedule 40 piping to the atmosphere (out side). (scfm = Standard Cubic Feet per Minute}

PART LIST

ITEM	DESCRIPTION	QTY	PART NO
1	BODY	1	75010100
2	INSERT	1	75012000
3	PISTON	1	75011700
4	SEAT RING	1	75010500
5	SPINDLE	1	75010300
6	SPRING	1	75011900
7	TIGHTENING NUT	1	75012300
8	COVER PLATE	1	75011600
9	"O" RING	1	75010800



ORDERING INFORMATION PRESSURE-RELIEF VALVES

Cat. No.	Threaded Connection	
	Bottom Inlet	Side Outlet
SRV1520	1/2" FPT	3/4" FPT
SRV1525	1/2" FPT	1" FPT
SRV2025	3/4" FPT	1" FPT
SRV2532	1" FPT	1-1/4" FPT

To Order: Please specify catalog number, inlet / outlet connection size, and pressure setting
Standard pressure setting: 150*, 175, 200, 225, 250*, 275, 300*, 325, 350 psig. (*stock pressure setting.)

GENERAL PRECAUTIONS

- Never expose face or body to a connected relief valve exit or piping connected thereto.
- Make sure valve setting and capacity (see Nameplate information Section) meet requirements per system design in accordance with local and national regulations.
- Install pressure-relief valve connected directly to the pressure vessel with no shut-off valves and at a location above the liquid refrigerant level.
- Never attempt to reset or change valve setting.
- Do not discharge valves prior to installation or when pressure testing.
- Do not install shut-off valves in line with pressure relief valves.
- Install valves in locations where they will not be damaged by moving equipment such as lift trucks, etc.
- Install valves in a manner that enables them to be replaced.
- Avoid trapped ice build-up between valves and other equipment.
- Do not install valves in a refrigerated space unless precautions are taken to prevent moisture migration into the valve body or the relief vent line.
- Be sure to isolate the valve and related piping from the refrigeration system and pump out pressure to zero before attempting to install or replace any pressure-relief valve and be sure to avoid residual refrigerant when doing so.
- Apply a modest amount of thread sealing compound to external pipe threads only in order to avoid getting compound inside valve.
- Vent relief valve exit to a safe outdoor location in an approved manner away from people and building openings.
- Pressure test all valves and related piping for leaks. When testing a dual pressure relief system, the three-way valve stem should be in the mid-position, ensuring that all valves are properly leak tested.
- When a dual pressure relief system is being put into service, the three-way valve stem should be positioned so that only one valve is activated. While the valve can be either front-seated (front port is closed) or back-seated (back port is closed), the back-seated position is recommended because it takes pressure off the packing and reduces the possibility of packing leaks.
- Use brackets or hangers to support pipe and prevent valve from being overly stressed.
- Do not put undue stress on valve by using it to stretch or align pipe.

ALWAYS REPLACE PRESSURE-RELIEF VALVES ONCE THEY HAVE DISCHARGED.

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 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. Here are a few examples of suitable application of piping relief valves back into the system.

- **400 psi Oil Coolers on screw compressor** :
  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 relief valves on the main house accumulator.

- **250 psi Evaporative condensers** :
  A relief valve is not required on evaporative condenser coil however, when desired, use 75 psi or 100 psi set point valve discharging to the condenser drain downstream of the condenser outlet stop valve.

- **250psi Oil Drain drum** :
  Use 75 psi or 100 psi set point valve discgarging to 150 psi suction accumulator.

- **250 psi Shell and tube or baudelot 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.

WHEN AMMONIA RELIEF VALVES DISCHARGE INTO WATER

Corrosion: There is a concern about corrosion in relief valves when the discharge is piped into a tank of water. This corrosion is due to exposure to water vapor and air in the piping. ***SUPERFREEZE*** safety relief valves use ductile iron bodies, and stainless steel and Teflon from internal parts. Since these materials resist corrosion, the accepted industries practice of inspecting or replacing safety relief valves every five years should provide adequate protection from corrosion in the valves.

Back Pressure: Another concern is the reduction of relief valve capacity caused by the head of water over the discharge pipe outlet when it is submerged. The various codes do not provide methods to address this subject except to require due allowance for pressure drop in the downstream section.

Vacuum Service

1 When safety relief valves are connected to systems that operate below atmospheric pressure, a reasonable precaution is to install a check valve in the discharge line before it enters the water tank. This will prevent a vacuum from sucking water into the system should a relief valve leak or not reseat after a release. The check valve may also prevent the migration of water vapor so as to reduce the potential for corrosion in the relief valve.

2 An alternative is to use a check valve mounted in a "tee" in the run of the discharge piping. This will not affect the pressure drop in the discharge, but will act as a "vacuum breaker". Either of the two methods suggested above will protect against diluting the ammonia with water should the relief valve leak after operating.

Where Water Tanks are Required: The requirement for discharge into a tank of water appears in the Uniform Mechanical Code, published by ICBO, Section 1119 for ammonia systems. The international Mechanical Code, does require that refrigerating systems comply with the ASHRAE-15 Safety Code, and that ammonia refrigerating systems in a industrial occupancy conform to IIAR-2 Equipment, Design and Installation of Ammonia Mechanical Refrigerating Systems. ASHRAE-15 offer three methods for ammonia discharge: i.e. , into the atmosphere, into a tank of water, or into other approved treatment systems. Appendix B provides guidelines for emergency discharge of refrigerants when required by local codes. In IIAR-2, the preferred discharge of discharge into a tank of water. When local mechanical codes require the use of a water tank for absorbing the discharge from ammonia relief valves, refer to ASHRAE 15-1994 paragraph 9.7.8.2(b) for details. Note : IIAR-2 in the process of revision to conform to the specifications now in ASHRAE -15.

ICBO - International Conference Building Officials Located in California.

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