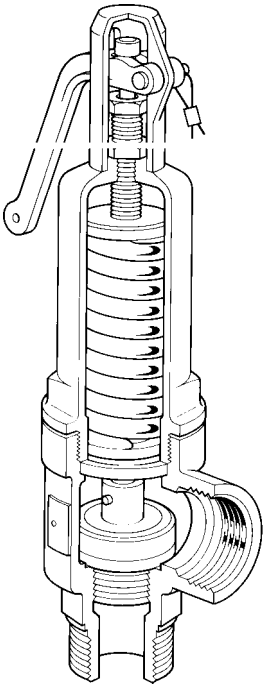
spirax sarco

SV 3 Safety Valve
Installation and Maintenance Instructions



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1. General specification

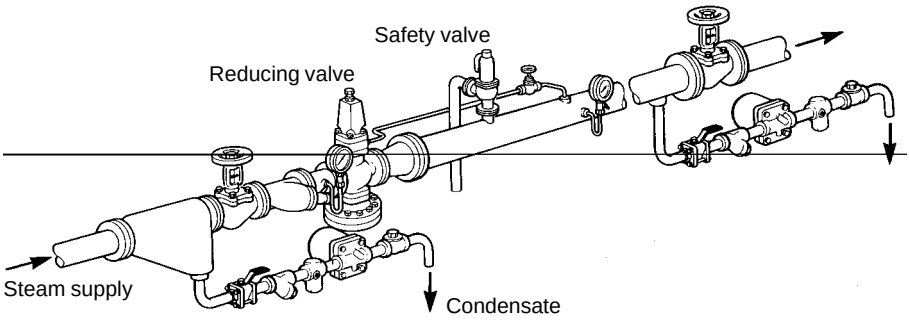


Fig 1. Typical installation of safety valve, downstream of pressure reducing valve station

Description

The SV3 is a high lift, Pop Type Safety Valve approved to BS6759 parts 1 and 2 for use on compressed air and steam.

Available types

Gunmetal body, screwed DN 15 to 50
Steel body screwed DN 65 and 80
Steel body Flanged DN 50 to 100

Each of the above are available with 3 optional soft seal inserts: Nitrile, EPDM or Viton.

Sizes and pipe connections

DN 15, 20, 32, 40, 50, 65 and 80

Inlet Screwed BSP (BS 21 Taper) male.

Outlet Screwed BSP (BS 21 Parallel) female.

API available. Subject to special quotation.

DN 50, 65, 80 and 100

Inlet flange:- BS 4504 PN 16 or BS 10 table F.

Outlet Screwed (DN 50, 65 and 80) BSP (BS21 parallel) female.
Flanged (DN 100) BS 4504 PN 16 or BS 10 table F.

Limiting conditions

Steel body valves

Max. upstream conditions	13 bar at 245°C
Max. body design conditions	16 bar at 350°C
	20 bar at 250°C
	25 bar at 120°C

Cold hydraulic test 38 bar

Gunmetal body valves

Maximum upstream conditions
(DN15—20) 21 bar at 240°C
(DN25—40) 17 bar at 224°C
(DN50) 13 bar at 245°C

Max. body design conditions (DN15 and 20)
17 bar at 260°C
24 bar at 230°C
40 bar at 120°C
Cold hydraulic test 60 bar

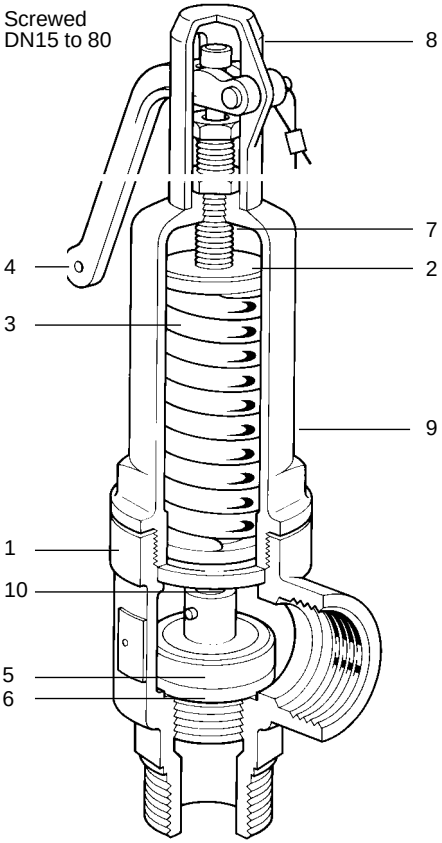
Max. body design conditions (DN25 to 50)
10.5 bar at 260°C
16 bar at 230°C
25 bar at 120°C
Cold hydraulic test 38 bar

Soft seal insert (not suitable for use on steam)

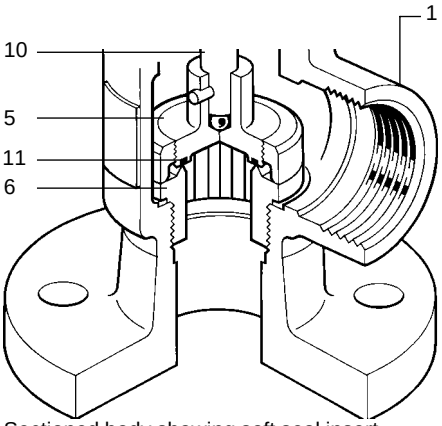
Nitrile	-10	to	+ 90°C
EPDM	-20	to	+125°C
Viton	-20	to	+200°C

Materials

No	Part		Material	
1	Body	Screwed DN 15 to 50	Gunmetal	BS 1400 LG2
		Screwed DN65 and 80, Flanged DN 50 to 100	Steel	DIN 17245 GS C25
2	Spring Plate		Brass	BS 2872 CZ 121
3	Spring		Steel	BS 970 Pt 5 735 A 50
4	Easing Lever		SG Iron	DIN 1693 GGG 40
5	Disc		Stainless Steel	BS 3146 Pt2 Gr ANC2
6	Seat		Stainless Steel	BS 3146 Pt2 Gr ANC2
7	Adjustment Screw		Brass	BS 2874 CZ 121
8	Lever Housing	(DN15 to 50 Gunmetal Body)	Gunmetal	BS 1400 LG2
		(DN50 to 100 Steel Body)	Cast Iron	DIN 1691 GG 20
9	Spring Housing	(DN15 to 50 Gunmetal Body)	Gunmetal	BS 1400 LG2
		(DN50 to 100 Steel Body)	Cast Iron	DIN 1691 GG 20
10	Stem	(DN15 to 50 Gunmetal Body)	Brass	BS 2874 CZ 121
		(DN50 to 100 Steel Body)	Stainless Steel	BS 970 431 S29
11	'O' Ring		According to service	



Flanged DN50 to 100
(Note: DN100 has flanged outlet)



Sectioned body showing soft seal insert

Dimensions (approximate) in mm

Screwed				
DN	A	B	C	Weight
15	151	50	38	1.1 kg
20	160	54	46	1.6 kg
25	199	65	56	2.7 kg
32	224	74	65	4.1 kg
40	263	86	73	6.1 kg
50	301	92	80	8.2 kg
65	385	110	100	15.9 kg
80	419	120	110	22.3 kg

Flanged					
		PN 16	BS 10 F		
DN	A	B	B	C	Weight
50	301	95	91	80	10 kg
65	385	104	102	100	18.2 kg
80	419	117	113	110	26.3 kg
100	604	174	173	175	51.8 kg

Spring ranges

The spring ranges are colour coded according to their pressure range and are listed below.

Gold	DN 15 to 40	0.3 — 0.7 bar
Pink		0.7 — 1.0 bar
Green		1.0 — 1.7 bar
Brown		1.7 — 3.1 bar
Red		3.1 — 5.2 bar
White		5.2 — 7.9 bar
Black	DN 15 to 80	7.9 — 11.4 bar
	DN 100	7.9 — 10.3 bar
Blue	DN 15 to 40	11.4 — 15.5 bar
Blue	DN 50 to 80	11.4 — 13.0 bar
Blue	DN 100	10.3 — 13.0 bar
Light Grey	DN 25 to 40	15.5 — 17.2 bar
Dark Grey	DN 15 & 20	15.5 — 20.7 bar

Standards and approvals

The SV3 safety valve is approved by A.O.T.C. to the requirements of B.S.6759 part 1 and 2 1984 for use on steam and comressed air.

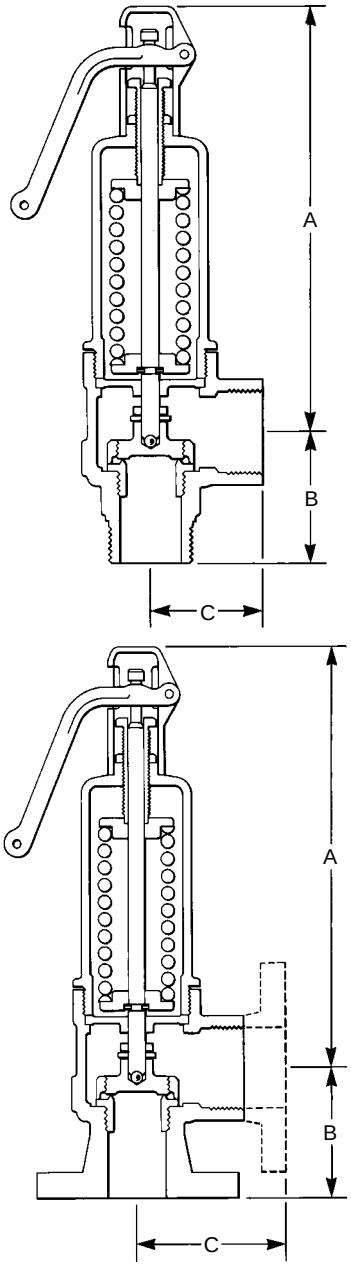
Seat tightness

Tested to the general standard laid down in API 527.

How to specify

1 — DN 40 Spirax Sarco SV 3 ☐ seat

N=Nitrile
E=EPDM
V=Viton



Pop Type Safety valve set at 1.0 bar g. Having a gunmetal body with screwed BSP connections and incorporating an easing lever and locking device.

2 Supply

Normally, the valve will be supplied set at the required pressure and sealed.
B.S. 6759 and local regulations requires that the setting of the valve should only be carried outby an authorised/competent person.
Spirax Sarco accepts no responsibility for valves which have been reset by unauthorised persons.

3 Setting the valve

3.1 Ensure that the installation is correct (Fig. 1).
3.2 Blow through pipework to ensure that it is free of any foreign matter that may otherwise pass to the valve seat and cause damage. Blowdown should be carried out via a suitable pipeline strainer and not by opening the safety valve.
3.3 Ensure that valve is set to the correct pressure, see section 8.

4 Installation

4.1 The valve should always be mounted vertically upwards with its main axis vertical.
4.2 The valve should be fitted to the pipework or vessel by means of the shortest possible length of pipe or fitting.
4.3 There should be no intervening valve or fitting i.e. it should not be possible to isolate safety valve. (Fig. 2)
4.4 The inlet pipe connection should not be smaller than the valve.
4.5 The outlet pipe should be equal to or larger than the valve outlet to keep back pressure below 12% of set pressure.
4.6 Direct the outlet pipework to a safe point of discharge where there is no risk of injury to persons or damage to property in the event of the valve operating.
4.7 The outlet pipework should be adequately supported such that it does not place undue stress on the safety valve.
4.8 Where the outlet pipework is directed upwards a small bore drain should be provided at the lowest point. (Fig. 3) This drain should be taken to a place where any discharge will not create a hazard or inconvenience.
4.9 Each safety valve should have its own unrestricted discharge pipe.
4.10 Safety valve should not be lagged.
4.11 Safety valves can operate very suddenly and will be too hot to touch without protection when installed on steam systems.

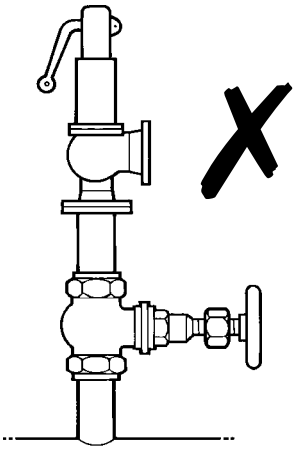


Fig 2

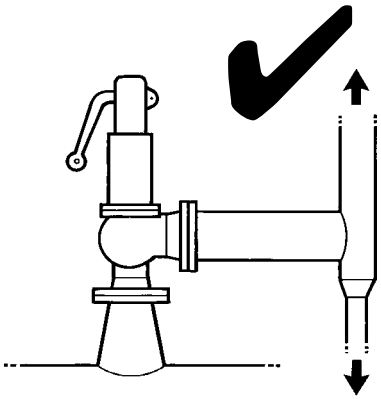


Fig 3

5 Prevention of seat damage

Excessive pressure loss at the inlet of a safety valve when it operates will cause extremely rapid opening and closing of the valve, observed as chattering or hammering.
This may result in reduced capacity as well as damage to seating faces and the other parts of the valve.
When normal pressure is restored it is possible that the valve will leak.

Solution
B.S.6759 makes the following recommendations to prevent these problems. Valve should be fitted 8-10 pipe diameters downstream of Converging or Diverging Fittings or Bends. (Fig. 4). Inlet branches should be as Fig. 5 or Fig. 6.

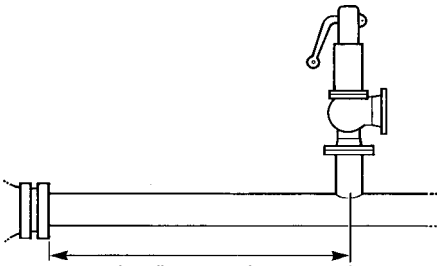


Fig 4

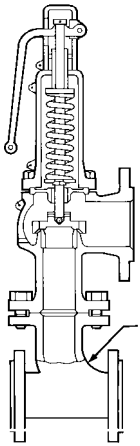


Fig 5

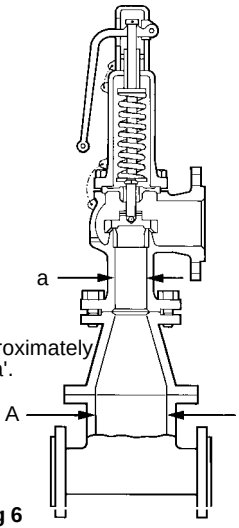


Fig 6

6 Commissioning

6.1 Once the valve has been fitted check that there are no leaks from either the inlet or the outlet connections.
6.2 Test the valve by raising the system pressure. Check that the valve operates at the correct pressure and that the overpressure is limited to 10% of the safety valve setting.
6.3 Reduce the system pressure to the normal operating pressure and check that the safety valve reseats.

7 Testing during use

It is recommended that the safety valve be tested for correct operation once every six months, as outlined in Section 6, or by manual lifting when the operating pressure is no more than 85% of the safety valve set pressure.

8 Guidelines for setting a SV3 safety valve (By Authorised Persons Only)

8.1 Choice of Set Pressure
A decision must be made regarding the pressure at which the safety valve should be set.
The maximum set pressure, in accordance with B.S.5500, is the safe working pressure of the plant it protects and the valve must achieve its rated capacity with an overpressure of no more than 10%.
If the valve is set too close to the operating pressure of the system the valve may operate prematurely. It will also fail to close satisfactorily when normal operating pressure is restored.
Fig. 7 outlines the way a safety valve operates under abnormal pressure conditions.

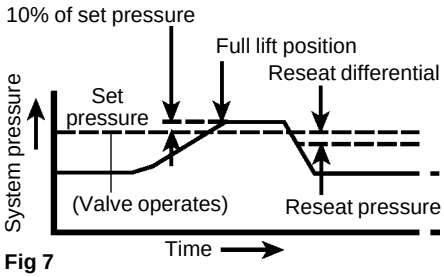


Fig 7

It can be seen that the safety valve does not re-seat when the pressure falls to the safety valve set pressure.
There must be adequate differential between the maximum system operating pressure and the safety valve set pressure if the valve is to re-seat.
The maximum system operating pressure will occur during no-load conditions.
Fig. 8 shows the range within which the valve must be set.

Note: The operating pressure of a system will vary and it is important that the safety valve is set high enough to accommodate such fluctuations.

8.2 Setting the Valve
British Standard 6759 requires that a safety valve should only be set by an Authorised Person. Spirax Sarco cannot be held responsible for unauthorised alteration of the set pressure.

Maintenance

All safety valves should receive planned maintenance.
It is recommended that the Spirax Sarco SV3 safety valves are returned to Spirax Sarco for a thorough overhaul periodically.
The valve will be returned having been overhauled, tested re-set and sealed in accordance with B.S.6759.

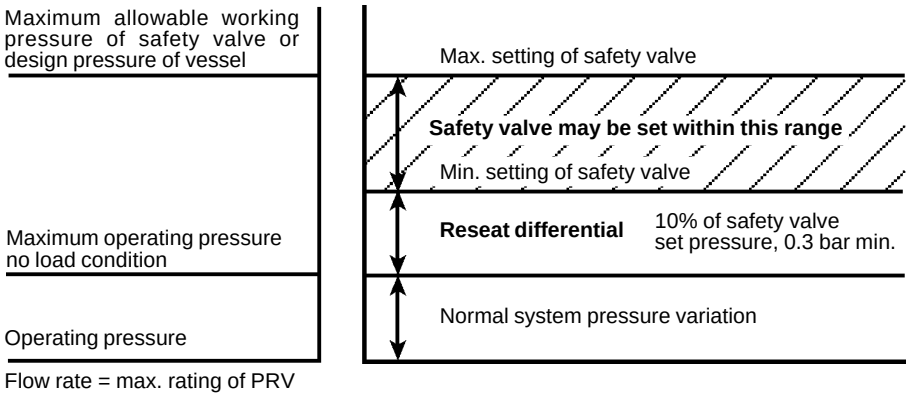


Fig 8