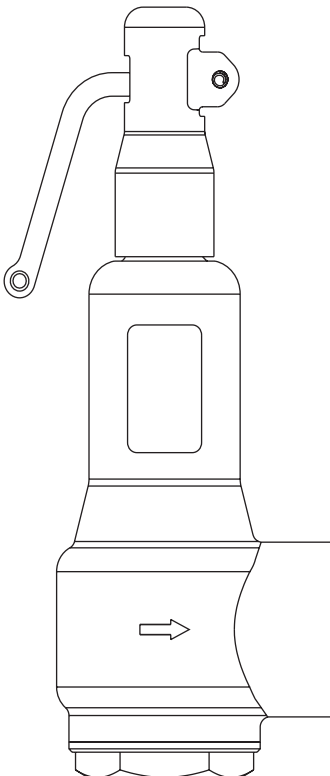


**SV615****Safety Valve****Installation and Maintenance Instructions**

1. *Safety information*
2. *Product information*
3. *Supply*
4. *Handling*
5. *Before fitting the valve*
6. *Installation*
7. *Damage prevention*
8. *Commissioning*
9. *Testing during use*
10. *Guidelines for setting*
11. *Maintenance*

---

# 1. Safety information

---

Safe operation of the unit can only be guaranteed if it is properly installed, commissioned and maintained by a qualified person (see Section 1.11) in compliance with the operating instructions. General installation and safety instructions for pipeline and plant construction, as well as the proper use of tools and safety equipment must also be complied with.

## 1.1 Intended use

Referring to these Installation and Maintenance Instructions, Name-plate and Technical Information Sheet, check that the product is suitable for the intended use/application. The requirements of the European Pressure Equipment Directive 97/23/EC have been satisfied and, if applicable, the product accordingly bears the CE mark:

- i) The product has been specifically designed for use on the fluids specified in the Technical Information Sheets. (These fluids are in Group 2 of the above mentioned Pressure Equipment Directive). The product's use on other fluids may be possible but, if this is contemplated, Spirax Sarco should be contacted to confirm the suitability of the product for the application being considered.
- ii) Check material suitability, pressure and temperature and their maximum and minimum values. If the maximum operating limits of the product are lower than those of the system in which it is being fitted, or if malfunction of the product could result in a dangerous overpressure or overtemperature occurrence, ensure a safety device is included in the system to prevent such over-limit situations.
- iii) Determine the correct installation situation and direction of fluid flow.
- iv) Spirax Sarco products are not intended to withstand external stresses that may be induced by any system to which they are fitted. It is the responsibility of the installer to consider these stresses and take adequate precautions to minimise them.
- v) Remove protective covers from all connections before installation.

## 1.2 Access

Ensure safe access and if necessary a safe working platform (suitably guarded) before attempting to work on the product. Arrange suitable lifting gear if required.

## 1.3 Lighting

Ensure adequate lighting, particularly where detailed or intricate work is required.

## 1.4 Hazardous liquids or gases in the pipeline

Consider what is in the pipeline or what may have been in the pipeline at some previous time. Consider; flammable materials, substances hazardous to health, extremes of temperature.

## 1.5 Hazardous environment around the product

Consider; explosion risk areas, lack of oxygen (e.g. tanks, pits), dangerous gases, extremes of temperature, hot surfaces, fire hazard (e.g. during welding), excessive noise, moving machinery.

## 1.6 The system

Consider the effect on the complete system of the work proposed. Will any proposed action (e.g. closing isolation valves, electrical isolation) put any other part of the system or any personnel at risk?

Dangers might include isolation of vents or protective devices or the rendering ineffective of controls or alarms. Ensure isolation valves are turned on and off in a gradual way to avoid system shocks.

---

## 1.7 Pressure systems

Ensure that any pressure is isolated and safely vented to atmospheric pressure. Consider double isolation (double block and bleed) and the locking or labelling of closed valves. Do not assume that the system has depressurised even when the pressure gauge indicates zero.

## 1.8 Temperature

Allow time for temperature to normalise after isolation to avoid danger of burns.

## 1.9 Tools and consumables

Before starting work ensure that you have suitable tools and/or consumables available. Use only genuine Spirax Sarco replacement parts.

## 1.10 Protective clothing

Consider whether any protective clothing is required by yourself and/or others in the vicinity to protect against the hazards of, for example, chemicals, high/low temperature, noise, falling objects, and dangers to eyes and face.

## 1.11 Permits to work

All work must be carried out or be supervised by a suitably competent person. Installation and operating personnel should be trained in the correct use of the product according to these instructions.

Where a formal 'permit to work' system is in force it must be complied with. Where there is no such system, it is recommended that a responsible person should know what work is going on and, where necessary, arrange to have an assistant whose primary responsibility is safety.

Post 'warning notices' if necessary.

## 1.12 Handling

Where the weight of the product exceeds 20 kg (44 lb) it is recommended that suitable lifting equipment is used to prevent personal injury.

## 1.13 Residual hazards

In normal use the external surface of the product may be very hot. If used at the maximum permitted operating conditions the surface temperature of some products may reach temperatures in excess of 200°C (392°F).

Many products are not self-draining. Take due care when dismantling or removing the product from an installation (refer to Section 11, 'Maintenance').

## 1.14 Freezing

Provision must be made to protect products which are not self-draining against frost damage if they are inoperative in environments where they may be exposed to temperatures below freezing point.

## 1.15 Safety information - Product specific

This product should not be dismantled without first releasing the compression on the control spring.

This valve contains a Viton component. If the valve has been subjected to a temperature approaching 315°C (599°F), the Viton material may have decomposed and formed hydrofluoric acid. Avoid skin contact and inhalation of any dust or fumes as this acid causes deep burns and damage to the respiratory system.

---

## 1.16 Disposal

Unless otherwise stated in the Installation and Maintenance Instructions, this product is recyclable and no ecological hazard is anticipated with its disposal providing due care is taken. However, if the valve is fitted with Viton or PTFE seat, special care must be taken to avoid potential health hazards associated with decomposition/burning of these seats.

### Viton:

- Can be landfilled, when in compliance with National and Local regulations.
- Can be incinerated, but a scrubber must be used to remove Hydrogen Fluoride, which is evolved from the product and with compliance to National and Local regulations.
- Is insoluble in aquatic media.

## 1.17 Returning products

Customers and stockists are reminded that under UK and EC Health, Safety and Environment Law, when returning products to Spirax Sarco they must provide information on any hazards and the precautions to be taken due to contamination residues or mechanical damage which may present a health, safety or environmental risk. This information must be provided in writing including Health and safety data sheets relating to any substances identified as hazardous.

## 2. Product information

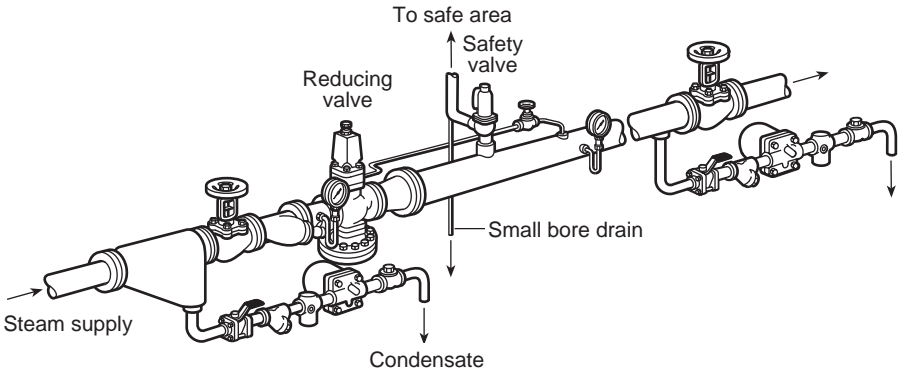


Fig. 1 Typical installation of safety valve, downstream of pressure reducing valve station

### 2.1 Description

The SV615 full lift, full nozzle safety valve is suitable for steam, air, inert industrial gas and non-hazardous liquid service.

#### Available types

Valves are available in sizes from DN15 to DN50 and have a bronze body with female screwed connections and a stainless steel nozzle. There is also the option of a sanitary clamp inlet connection on the smaller sizes. All valves have a closed bonnet with either a lifting lever or closed cap (gas tight cap option). An optional soft seal is available in Nitrile (for air up to 120°C), EPDM (for water) or Viton (for air up to 200°C).

#### Standards and approvals

The SV615 complies with the requirements of EN ISO 4126:2004 and carries the **CE** mark indicating full compliance with the requirements of the European Pressure Equipment Directive 97/23/EC. Approval Authority and Notified Body is SAFed TAS. Seat tightness complies with ANSI/API STD 527-1992.

#### Certification

A certificate of conformity to EN 10204 2.2 is provided as standard for each valve including valve set and hydraulic test pressure. Also available on request is material certification in accordance with EN 10204 3.1.

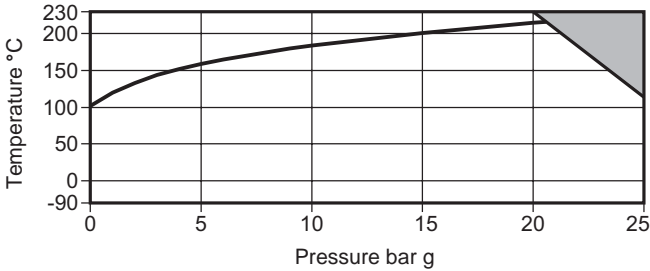
### 2.2 Sizes and end connections


DN15, DN20, DN25, DN32, DN40 and DN50.

	Screwed BSP (BS 21 parallel) or NPT
<b>Inlet connections</b>	Sanitary clamp compatible (DN15, DN20 and DN25 sizes only) BS 4825 / ISO 2852 / DIN 32676
<b>Outlet connections</b>	Screwed BSP (BS 21 parallel) or NPT

### 2.3 Pressure/temperature limits

Please contact Spirax Sarco, when so required, for relevant details regarding the maximum allowable limits that the shell can withstand.



 The product **must not** be used in this region.

**Note:** For hygienic/sanitary clamp ends the maximum pressure/temperature may be restricted by the gasket or sanitary clamp used. Please consult Spirax Sarco.

Body design conditions			PN25
Set pressure range	Maximum	1/2" to 1 1/4"	18 bar g
		1 1/2" and 2"	14 bar g
	Minimum		0.3 bar g
Temperature	Metal seat	Minimum	-90°C
		Maximum	+230°C
	Nitrile seat	Minimum	-30°C
		Maximum	+120°C
	EPDM seat	Minimum	-50°C
		Maximum	+150°C
Viton seat	Minimum	-20°C	
	Maximum	+200°C	
Performance data	Overpressure	Steam, gas	10%
		Liquid	10 to 25%
	Blowdown limits	Steam, gas	10%
		Liquids	2.5 to 20%
Derated coefficient of discharge values	Steam, gas	0.71	
	Liquid	0.52	
Maximum permitted backpressure			10% of set pressure
Designed for a maximum inlet cold hydraulic test pressure of:			37.5 bar g

## 2.4 Dimensions/weights (approximate) in mm and kg

	Size	Connection		Lift	A	B	C	Flow Ø	
		Inlet	Outlet					D	Weight
Screwed	DN15	½"	¾"	3.00	40	40	194	12	1.3
	DN20	¾"	1¼"	5.00	55	44	229	20	2.4
	DN25	1"	1½"	6.00	60	48	242	24	2.9
	DN32	1¼"	2"	7.25	70	58	279	29	4.2
	DN40	1½"	2½"	9.25	81	67	365	37	8.8
	DN50	2"	3"	11.50	96	80	420	46	13.0
Sanitary clamp	DN15	½"	¾"	3.00	40	55	209	12	1.4
	DN20	1"	1¼"	5.00	55	60	245	20	2.6
	DN25	1"	1½"	6.00	60	64	258	24	3.1

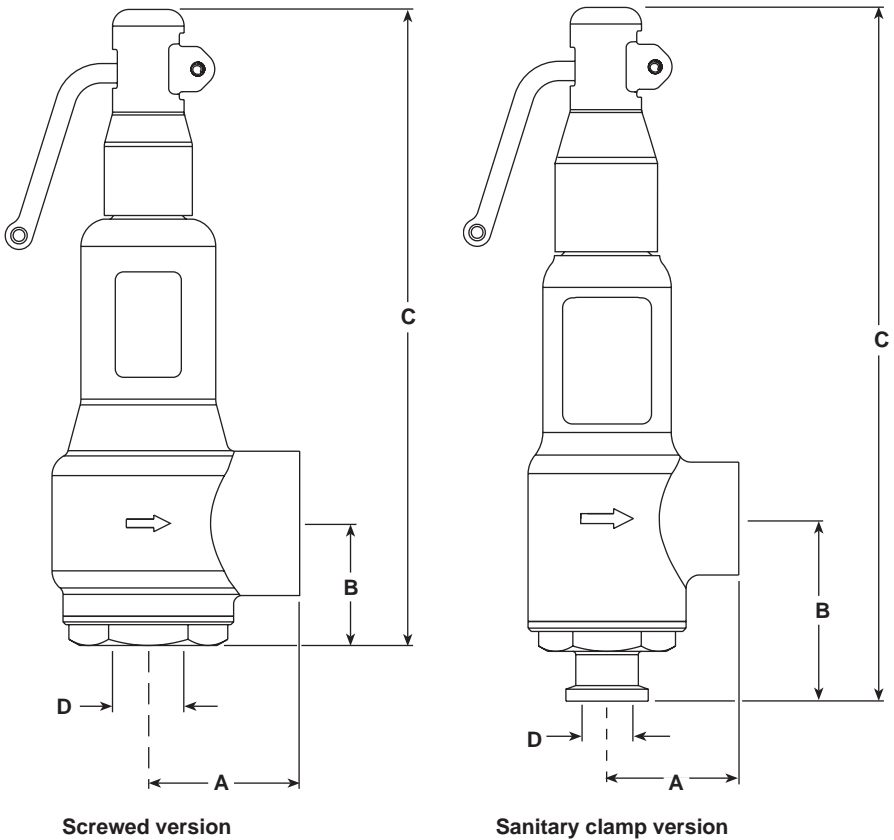


Fig. 2

## 2.5 Materials

No.	Part	Material	
1	Body	Bronze	BS EN 1982 CC491K
2	Nozzle	Stainless steel ASTM A276 316L (for valve with hygenic connection)	BS 3146 Pt2 Gr. ANC2
3	Disc	Stainless steel ASTM A276 316L (for valve with hygenic connection)	BS 970 431 S29
4	Lever housing	Bronze	BS EN 1982 CC491K
5	Spring	Chrome-vanadium alloy steel	BS 2803 735 A50 HS
6	Stem guide	Brass	BS 2872 CZ 121
7	Spring end plate	Brass	BS 2872 CZ 121
8	Stem	Stainless steel	BS 970 431 S29
9	Adjustment screw	Brass	BS 2874 CZ 121
10	Lever	Zinc plated SG iron	
11	Pivot pin	Stainless steel	AISI 304
12	Circlip	Stainless steel	BS 2056 316 S42
13	Adjuster lock-nut	Brass	BS 2872 CZ 121
14	Soft seal disc	Stainless steel/nitrile	ASTM A276 316
		Stainless steel/EPDM	ASTM A276 316
		Stainless steel/Viton	ASTM A276 316
15	Sealed cap	Bronze	BS EN 1982 CC491K
16	Cap seal	Nitrile	BS 2874 CZ 121
17	Skirt	Brass	BS 2874 CZ 121
18	Grub screw	Steel	

## 2.6 How to select SV615 safety valve selection guide:

<b>Model type</b>	SV615	<b>SV615</b>
<b>Configuration</b>	A = Closed bonnet/easing lever B = Closed bonnet/sealed cap	<b>A</b>
<b>Seal material</b>	S = Stainless steel N = Nitrile E = EPDM V = Viton	<b>N</b>
<b>Finish</b>	ENP = Electroless nickel plated (optional extra)	
<b>Size</b>	DN15, DN20, DN25, DN32, DN40 and DN50	<b>DN15</b>
<b>Connection</b>	BSP, NPT or sanitary clamp	<b>BSP</b>

### Selection example

<b>SV615</b>	<b>A</b>	<b>N</b>	<b>DN15</b>	<b>BSP</b>
--------------	----------	----------	-------------	------------

If ENP finish is required, add 'ENP'.

### How to order example:

1 off Spirax Sarco SV615AN safety valve having a DN15 screwed BSP connection, set at 6 bar g.

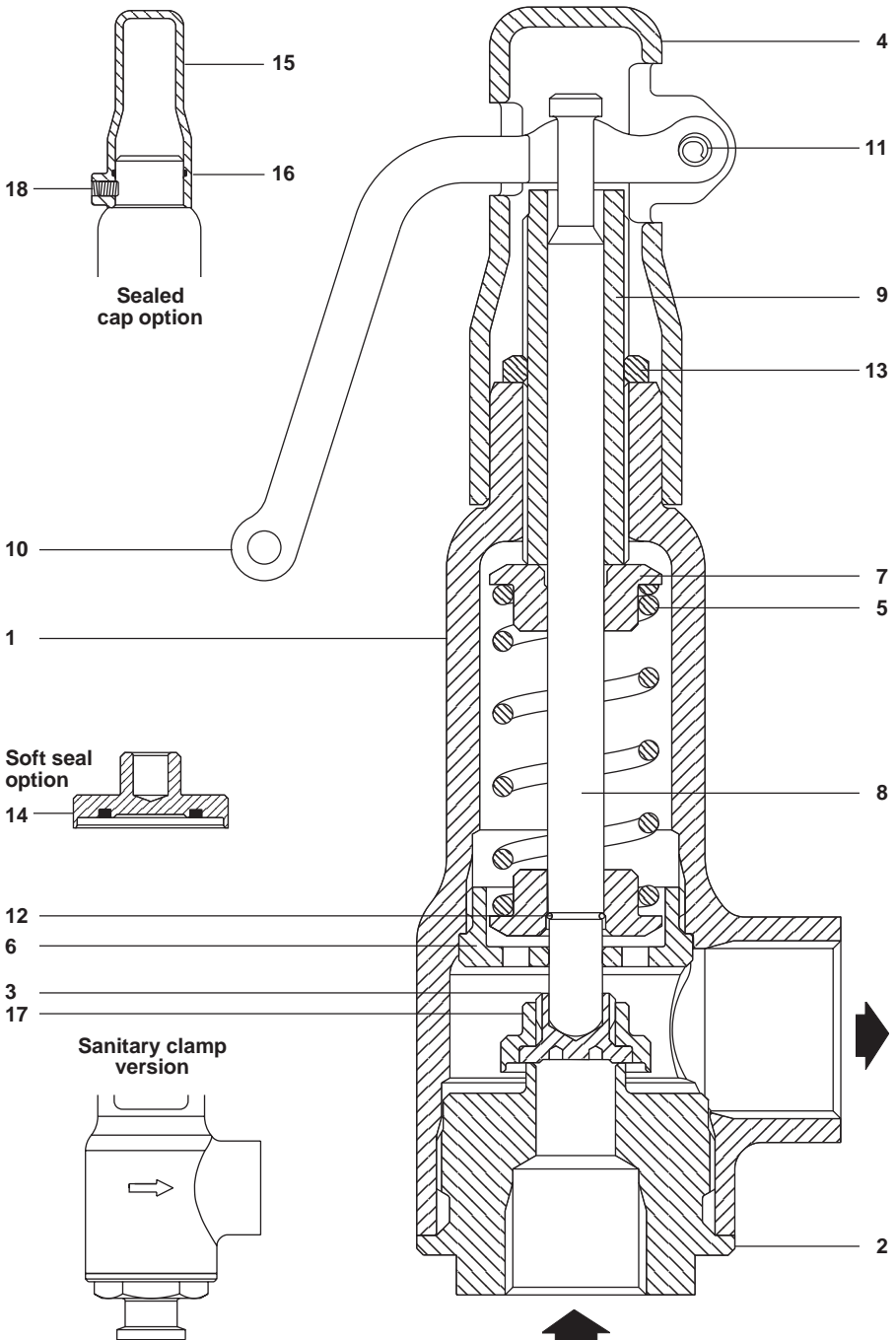


Fig. 3

---

## 3. *Supply*

---

Normally, the valve will be supplied set at the required pressure and sealed. BS 6759, DIN 3320 and local regulations requires that the setting of the valve should only be carried out by an authorised/competent person. Spirax Sarco accepts no responsibility for valves which have been reset by unauthorised persons.

---

## 4. *Handling*

---

- 4.1 Valves should be transported in the upright position.
- 4.2 **Do not drop** and avoid sudden shocks or heavy impacts.
- 4.3 Always store in the suppliers packaging until required.
- 4.4 **Never** carry a safety valve by the lifting lever.

---

## 5. *Before fitting the valve*

---

- 5.1 Ensure that the installation is correct (Figure 1, page 5).
- 5.2 Blow through the pipework to ensure that it is completely free of any foreign matter that may otherwise pass to the valve seat and cause damage, leading to seat leakage. Blowdown must be carried out before installing the safety valve.
- 5.3 Ensure that valve is set to the correct pressure, see 'Testing during use', Section 9.

## 6. Installation

**Note:** Before actioning any installation observe the 'Safety information', Section 1.

- 6.1** The valve should always be mounted vertically upwards with its main axis vertical.
- 6.2** The valve should be fitted to the pipework or vessel by means of the shortest possible length of pipe or fitting.
- 6.3** There should be no intervening valve or fitting i.e. it should not be possible to isolate the safety valve (Figure 4).
- 6.4** The inlet pipe connection should not be smaller than the valve (see Figures 7 and 8).
- 6.5** The outlet pipe size should be equal or larger than the valve outlet to keep backpressure below 12% of the set pressure. **Use long radius bends and fittings.**
- 6.6** 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.
- 6.7** The outlet pipework should be adequately supported such that it does not place undue stress on the safety valve.
- 6.8** Where the outlet pipework is directed upwards a small bore drain should be provided at the lowest point (Figure 5). This drain should be taken to a place where any discharge will not create a hazard or inconvenience.
- 6.9** Each safety valve should have its own unrestricted discharge pipe.
- 6.10** Safety valves should not be lagged.
- 6.11** Safety valves can operate very suddenly and will be too hot to touch without protection when installed on steam systems.
- 6.12** Always use a wrench on the hexagon to secure the valve to the inlet pipe. Do not use pipe grips on the body. Do not use excessive leverage or force.

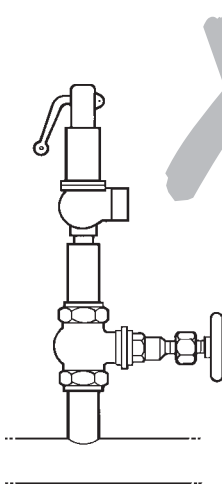


Fig. 4

Not drawn  
to scale

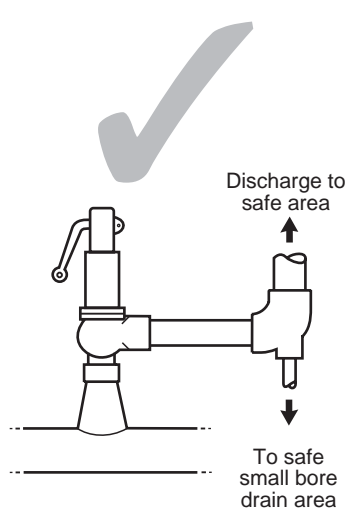


Fig. 5

# 7. Damage prevention

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.

## 7.1 Solution

BS 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 (Figure 6). Inlet branches should be as Figure 7 or 8.

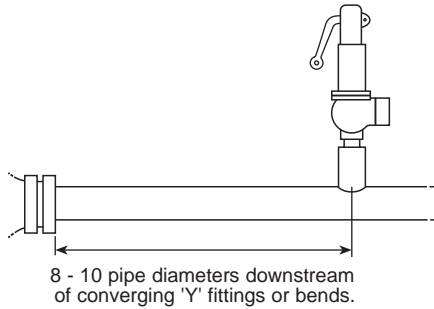


Fig. 6

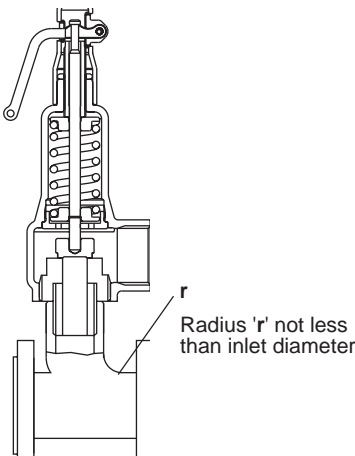


Fig. 7

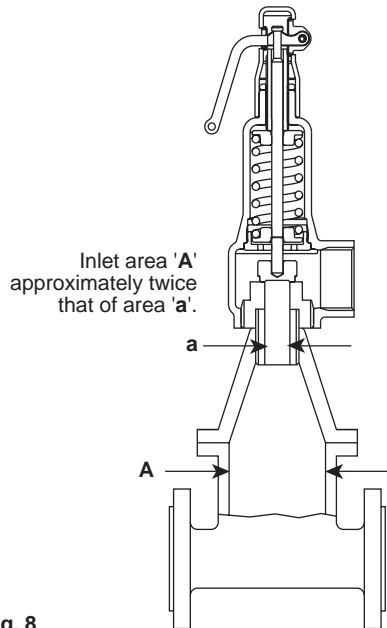


Fig. 8

---

## 8. Commissioning

---

- 8.1 Once the valve has been fitted check that there are no leaks from either the inlet or the outlet connections.
- 8.2 Test the valve by raising the system pressure. Check that the valve operates at the correct set pressure.
- 8.3 Reduce the system pressure to the normal operating pressure and check that the safety valve reseats.

---

## 9. Testing during use

---

It is recommended that the safety valve be tested for correct operation at least once every six months\*, as outlined in 'Commissioning', Section 8, or by manual lifting when the operating pressure is no more than 85% of the safety valve set pressure.

\* **Note:** Use suitable protection against excess heat and noise when testing safety valves, period between safety valve tests to be agreed by responsible person or insurance company. (Check local requirements for frequency of testing).

---

## 10. Guidelines for setting

---

*(By authorised persons only)*

### 10.1 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 BS 5500, is the safe working pressure of the plant it protects and the valve must achieve its rated capacity with an over pressure of no more than 10%.

The SV615 achieves its rated capacity at 5% over pressure on steam, 10% on air. 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. Figure 9 outlines the way a safety valve operates.

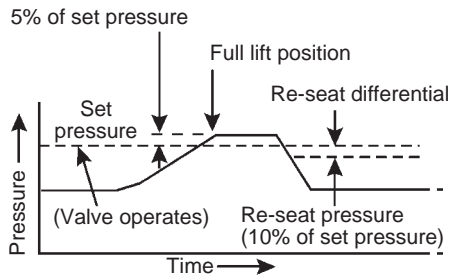


Fig. 9

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 is most likely to occur during no-load conditions. Figure 10 shows the range within which the valve must be set.

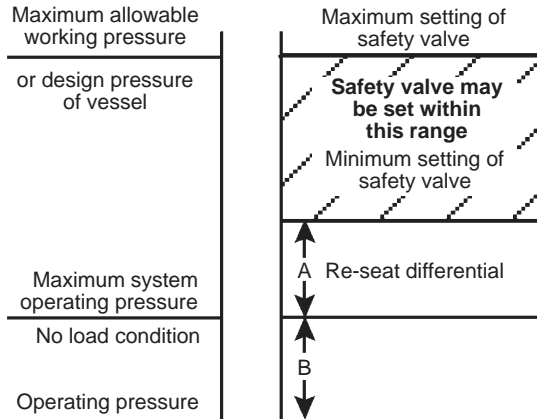


Fig. 10

Flowrate = Maximum rating of pressure reducing valve

A = 10% of safety valve set pressure, 0.3 bar minimum

B = Normal system pressure variation

**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.

## 10.2 Setting the valve

British Standard BS 6759 and DIN 3320 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.

## 10.3 Valves supplied unset

Valves supplied unset to approved agents will include a set pressure tag to be stamped with the appropriate set pressure in bar after setting.

The tag should be permanently attached to the valve when using the locking wire and lead seal.

The back of the blue instruction label affixed to each unset valve will indicate the pressure range of the spring fitted.

---

# *11. Maintenance*

---

**All safety valves should receive planned maintenance.**

**Note: Before actioning any maintenance work please read 'Safety information', Section 1.**

It is recommended that Spirax Sarco safety valves are returned to Spirax Sarco, or an approved Spirax Sarco agent, for a thorough overhaul periodically, please read 'Returning products', Section 1.17.

The valve will be returned having been overhauled, tested re-set and sealed in accordance with BS 6759.

