



## SRV461S and SRV463S

### Stainless Steel

## Direct Acting Pressure Reducing Valves

### Description

Types SRV461S and SRV463S are direct acting pressure reducing valves with all wetted parts in AISI 316L/1.4404, 1.4408 and 1.4462 stainless steel. For steam, liquid or gas applications.

Typical applications include: Clean steam, gas and liquid supplies to centrifuges, freeze dryers, sterilisers, autoclaves, process tanks, humidifiers and culinary equipment.

### Sizes and pipe connections

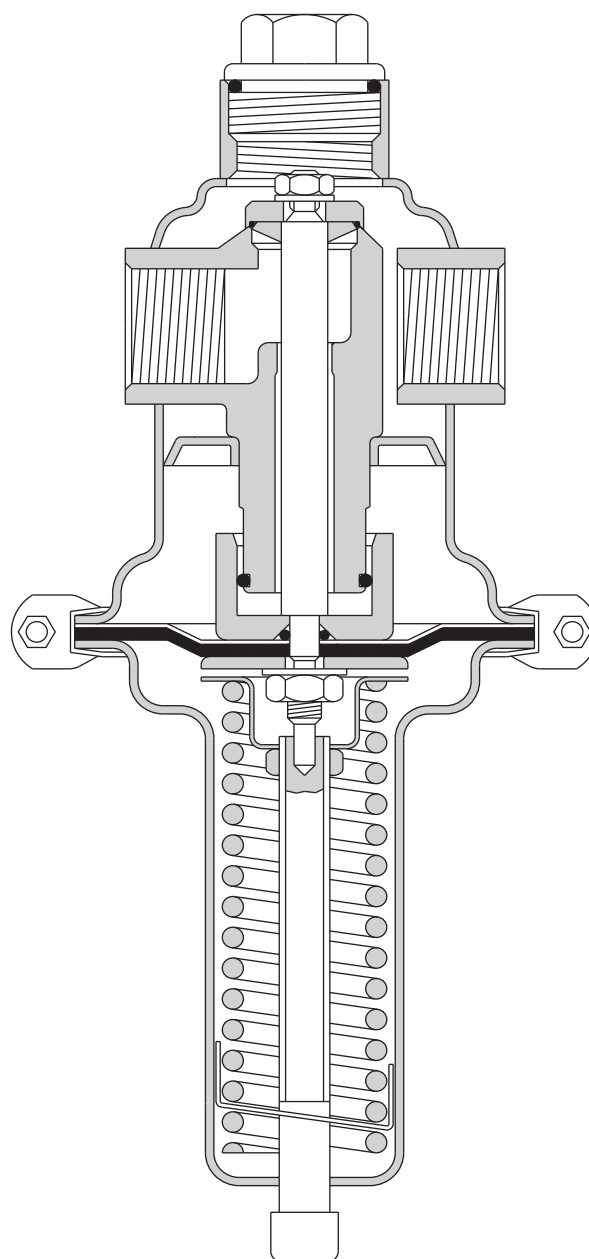
<b>SRV461S</b>	1/2", 3/4", 1", 1 1/4", 1 1/2" and 2" Screwed NPT, BSP
<b>SRV463S</b>	DN15, DN20, DN25, DN32, DN40 and DN50 Flanged ASME (ANSI) 150, EN 1092 PN16

### Pressure ranges

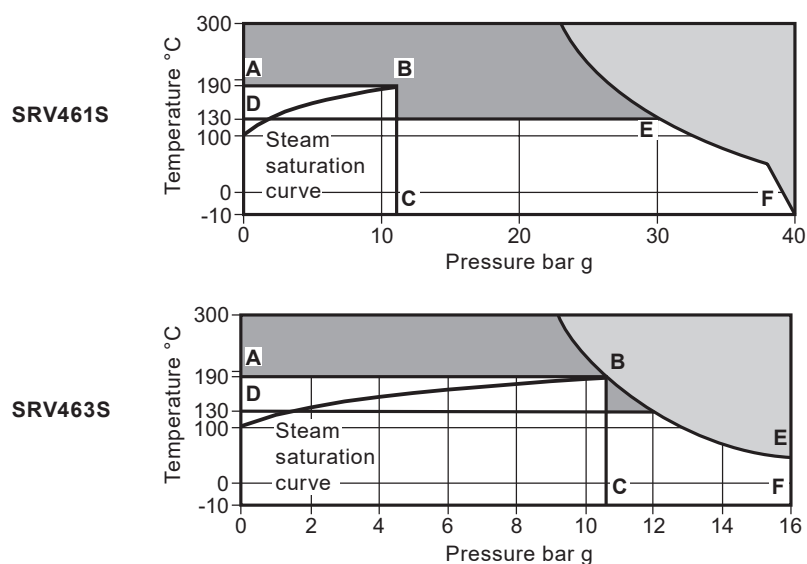
The SRV461S and SRV463S are available for use within the downstream pressure ranges shown.

**Note:** The pressure range required needs to be specified at the time of order placement:

0.02 - 0.12 bar g
0.10 - 0.50 bar g
0.30 - 1.10 bar g
0.80 - 2.50 bar g
2.00 - 5.00 bar g
4.00 - 8.00 bar g
6.00 - 12.00 bar g



## Pressure/temperature limits



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

The product should not be used in this region or beyond its operating range as damage to the internals may occur.

**A-B-C** Maximum operating conditions for steam

**D-E-F** Maximum operating conditions for liquids and gases

Body design conditions	<b>SRV461S</b>	PN40
	<b>SRV463S</b>	PN16
Maximum design pressure	<b>SRV461S</b>	38 bar g @ 38 °C
	<b>SRV463S</b>	15.2 bar g @ 50 °C
Maximum design temperature	<b>SRV461S</b>	300 °C @ 23.2 bar g
	<b>SRV463S</b>	300 °C @ 9 bar g
Minimum design temperature		-10 °C
Maximum operating temperature	Steam	190 °C @ 10.9 bar g
	Liquid and gases	130 °C @ 12 bar g
Minimum operating temperature		-10 °C
<b>Note:</b> for lower operating temperatures consult Spirax Sarco		

### Permissible reduction ratio (maximum $P_1/P_2$ )

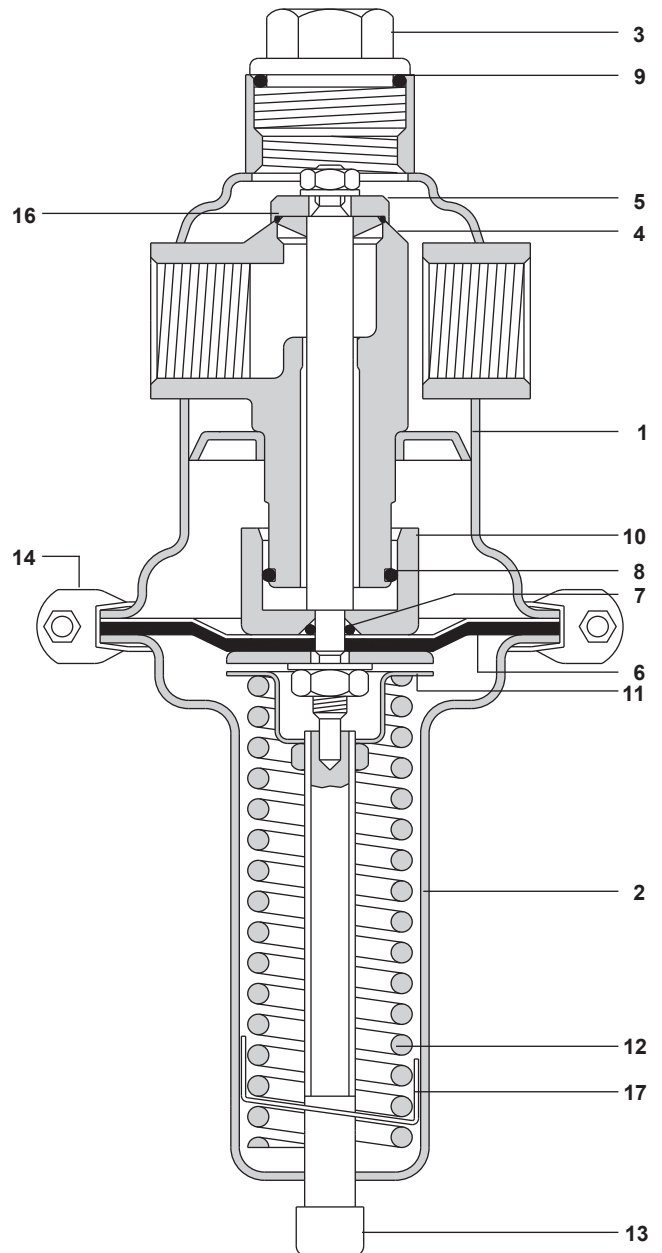
	Setting range (bar g)	Nominal diameter	
		G1½" - 1" DN15 - DN25	G1¼" - 2" DN32 - DN50
Maximum differential pressure	0.02 - 0.12	80:1	50:1
	0.10 - 0.50	40:1	25:1
	0.30 - 1.10	30:1	18:1
	0.80 - 12.00	20:1	12:1
Designed for a maximum cold hydraulic test pressure of:	<b>SRV461S</b>	60 bar g	
	<b>SRV463S</b>	24 bar g	

## Materials

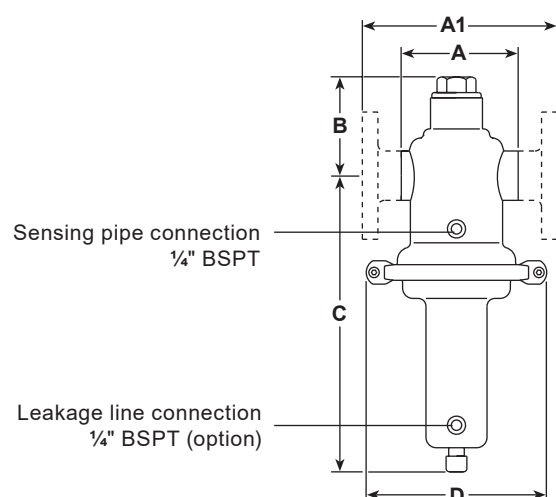
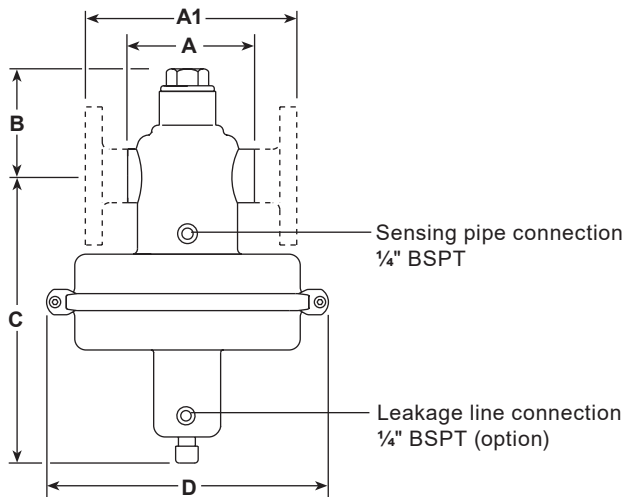
No.	Part	Material	Werkstoff No.	AISI Equivalent
1	Body	Stainless steel	1.4404	316L
2	Spring housing	Stainless steel	1.4404	316L
3	Cap	Stainless steel	1.4571	316Ti
4	Valve seat	Stainless steel	1.4404	316L
5	Valve	Stainless steel	1.4404	316L
6	Diaphragm	EPDM/PTFE		
7	'O' ring	EPDM		
8	'O' ring	EPDM		
9	'O' ring	EPDM		
10	Piston	Stainless steel	1.4571	316Ti
11	Top spring plate	Stainless steel	1.4571	316Ti
12	Spring	Stainless steel	1.4310	301*
13	Adjustment screw	Stainless steel	1.4404	316L
14	V band clamp	Stainless steel	AISI 300 series	
15	Flange (not shown)	Stainless steel	1.4404	316L
16	Soft seal	Fluoraz (FEPM) †		
17	Spring clip	Stainless steel	1.4301	304

\* Not a direct equivalent, nearest AISI specification is given.

† For hydrocarbon applications an optional soft seal is available in FPM (Viton) - please consult Spirax Sarco.



## Dimensions (approximate) in millimetres



Size	All pressure ranges			Pressure range (bar)				Pressure range (bar)					
				0.02 - 0.12		0.1 - 0.5		0.3 - 1.1		0.8 - 2.5 and 2 - 5		4 - 8 and 8 - 12	
	A	A1	B	C	ØD	C	ØD	C	ØD	C	ØD	C	ØD
DN15 ½"	85	130	76	300	360	300	264	300	200	235	138	235	138
DN20 ¾"	91	150	76	300	360	300	264	300	200	235	138	235	138
DN25 1"	85	160	76	300	360	300	264	300	200	235	138	235	138
DN32 1¼"	130	180	80	300	360	300	264	300	200	235	138	235	138
DN40 1½"	145	200	80	300	360	300	264	300	200	235	138	235	138
DN50 2"	185	230	80	300	360	300	264	300	200	235	138	235	138

## Weights (approximate) in kg

½" - 1"	Screwed	13.5	7.1	6.1	3.1	3.1
DN15 - DN25	Flanged	15.3	8.9	7.9	4.9	4.9
1¼" - 2"	Screwed	14.4	8.0	7.0	4.0	4.0
DN32 - DN50	Flanged	18.4	12.0	11.0	8.0	8.0

## K<sub>v</sub> values

Valve size	½" DN15	¾" DN20	1" DN25	1¼" DN32	1½" DN40	2" DN50
K <sub>v</sub> at 20% offset	4.0	5.6	6.4	17.6	17.6	17.6
Maximum K <sub>v</sub>	5.0	7.0	8.0	22.0	22.0	22.0

To maximise the control accuracy (especially for large load variations) use the K<sub>v</sub> values given at 20% offset. For safety valve sizing use the maximum K<sub>v</sub> values. Leakage rate ≤ 0.05% of the maximum K<sub>v</sub> value.

## Sizing and selection

The required  $K_v$  can be calculated from the following formulae.

**Where:**

$\dot{m}_s$  = Steam mass flow (kg/h)

$\dot{V}$  = Liquid volume flow (m<sup>3</sup>/h)

$\dot{V}_g$  = Gas flow at standard conditions: 0 °C @ 1.013 bar a (m<sup>3</sup>/h)

$P_1$  = Upstream pressure (bar absolute)

$P_2$  = Downstream pressure (bar absolute)

$\chi$  =  $\frac{P_1 - P_2}{P_1}$  (pressure drop factor)

$S$  = Specific gravity

$T$  = Absolute average gas temperature (Kelvin = °C + 273)

### Selecting valve type and nominal diameter

Using the required maximum flowrate and smallest differential pressure  $P_1 - P_2$ , calculate the required  $K_v$  from one of the adjacent formulae. Select a valve whose  $K_v$  value is 30% greater than the calculated  $K_v$ . The optimum working range of the selected valve should ideally be within the range of 10 to 70% of its  $K_v$ .

You should also note the reduction ratio (inlet pressure  $P_1$  divided by outlet pressure  $P_2$ ). If this exceeds the quoted pressure reduction ratio for the valve being considered the valve will not close.

---

**Critical pressure drop:**  $P_2 \leq 0.58 P_1$

$$K_v = \frac{\dot{m}_s}{12 P_1}$$

### Steam

---

**Non-critical pressure drop:**  $P_2 \geq 0.58 P_1$

$$K_v = \frac{\dot{m}_s}{12 P_1 \sqrt{1 - 5.67 (0.42 - \chi)^2}}$$

### Gas

$$K_v = \frac{\dot{V}_g}{287} \sqrt{\frac{ST}{(P_1 - P_2)(P_1 + P_2)}}$$

### Liquid

$$K_v = \dot{V} \sqrt{\frac{S}{P_1 - P_2}}$$

---

	<b>Steam</b>	<b>Saturated</b>	10 to 40 m/s	<b>Superheated</b>	15 to 60 m/s
<b>Recommended fluid velocities</b>	<b>Gas</b>	<b>up to 2 bar g</b>	2 to 10 m/s	<b>above 2 bar g</b>	5 to 40 m/s
	<b>Liquids</b>				1 to 5 m/s

---

## Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P186-02) supplied with the product.

### Installation note:

Note that for use on steam, the spring housing must be below the pipework. A downstream pressure sensing pipe is also required.

## How to order

**Example:** 1 off Spirax Sarco ½" NPT SRV461S direct acting pressure reducing valve having a pressure range of 0.8 to 2.5 bar g.

## Spare parts

The spare parts available are detailed below. No other parts are supplied as spares.

### Available spares

Diaphragm and 'O' ring kit

6, 7, 8, 9, 16

### How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size, model and pressure range.

**Example:** 1 - Diaphragm and 'O' ring kit for a Spirax Sarco DN15 SRV463S direct acting pressure reducing valve with FEPM seat seal and having a pressure range of 0.8 to 2.5 bar g.

