



# SRV461S and SRV463S, SRV461S Food+ and SRV463S Food+ 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, 1.4462 and 1.4571 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.

SRV461S and SRV463S can be provided for Food+ applications. Please advise when ordering the product.

## Sizes and pipe connections

<b>SRV461S</b>	½", ¾", 1", 1¼", 1½" and 2" Screwed NPT, BSP
<b>SRV463S</b>	DN15, DN20, DN25, DN32, DN40 and DN50 Flanged EN1759-1 Class 150, Class 300 and EN 1092-1 PN40

## Pressure ranges

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

<b>Note:</b> 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

## Certification (Food+ Variants)

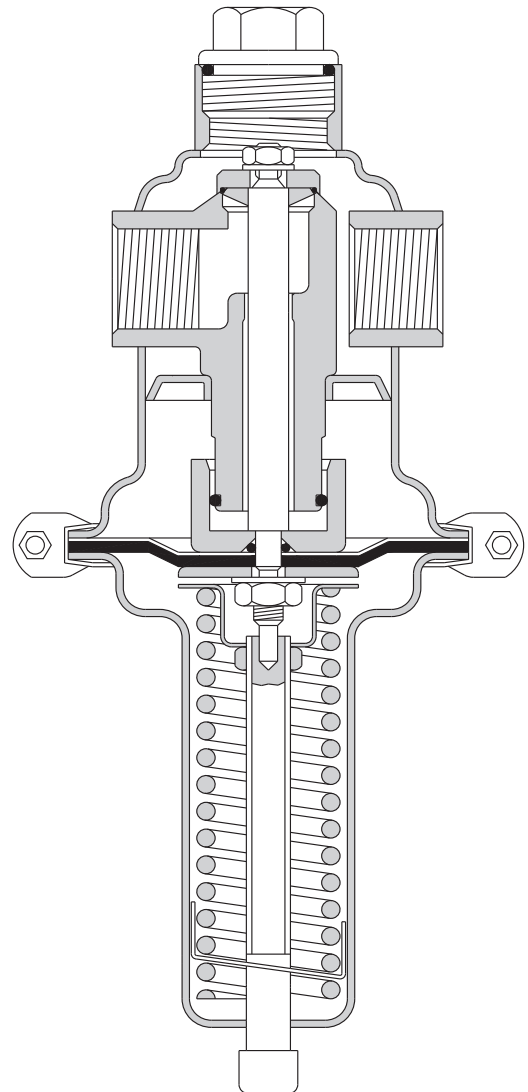
Designed, manufactured and approved for Steam and Condensate applications, the Direct Acting Pressure Reducing Valve for Food+ complies with:

- (EC)1935:2004 Materials and Articles Intended to come into Contact with Food
- (EC)2023:2006 Good Manufacturing Practice for Materials and Articles Intended to come into Contact with Food
- (EU)10/2011 Plastic Materials and Articles Intended to come into Contact with Food
- FDA Code of Federal Regulations - title 21 - Food and Drugs

This product is intended to be connected into a system that can operate a food contact compliant process.

A list of the materials that could come directly or indirectly into contact with foodstuffs can be found in the Declaration of Compliance available for this product.

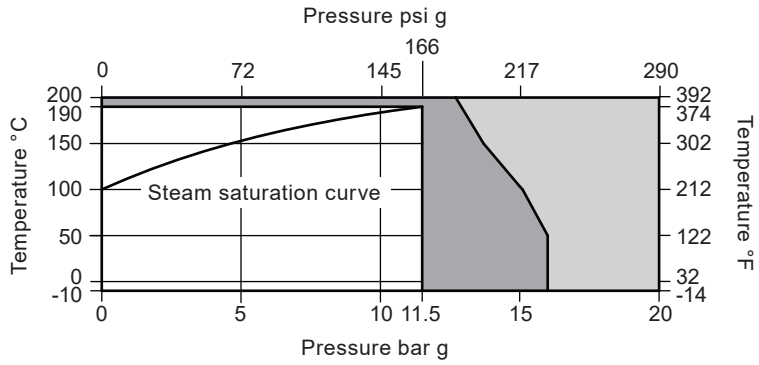
**Note:** All certification/inspection requirements must be stated at the time of order placement.



# Pressure/temperature limits

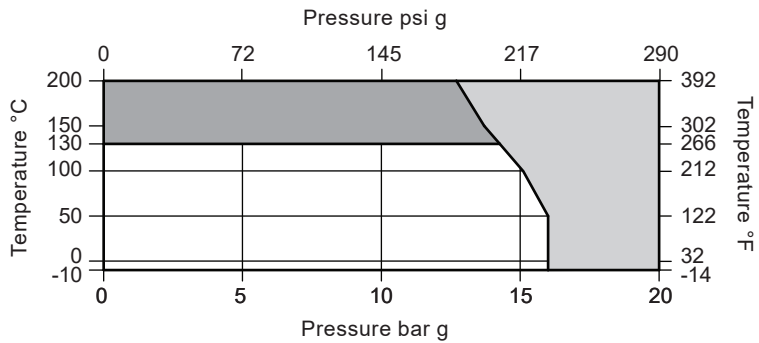
## Class 150 flanges

For use on steam



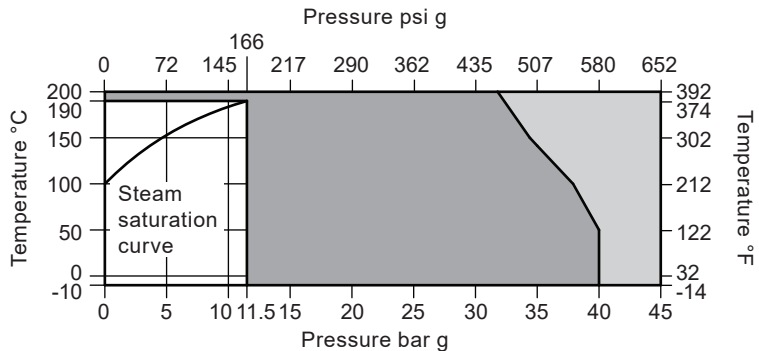
## Class 150 flanges

For use on liquids and gases



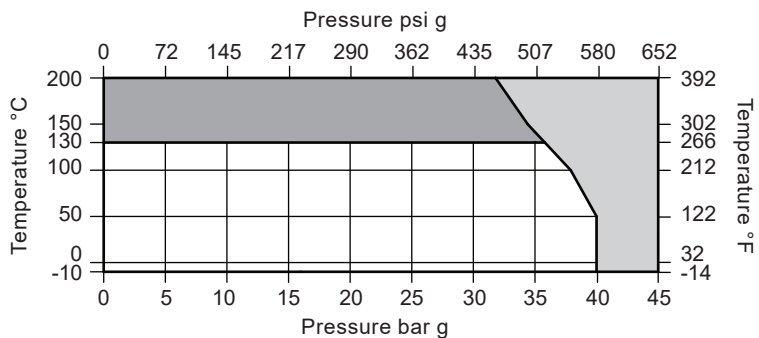
## Screwed connections PN40 flanges Class 300 flanges

For use on steam



## Screwed connections PN40 flanges Class 300 flanges

For use on liquids and gases



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.

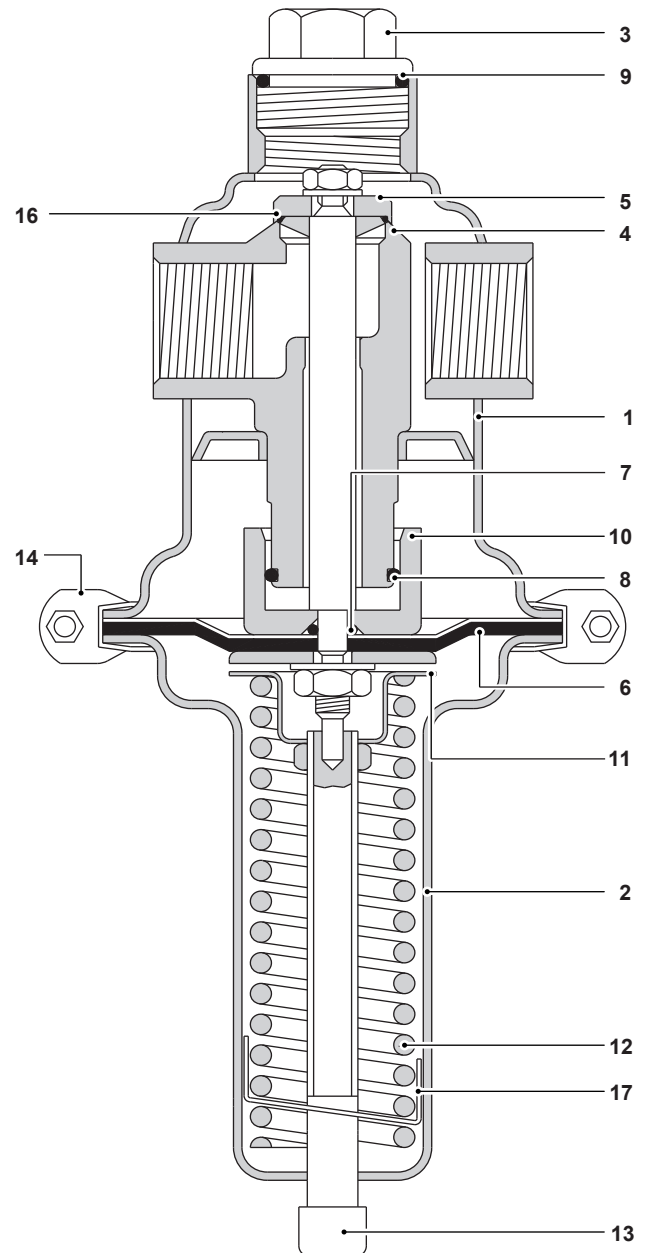
Body design conditions	Screwed, Flanged PN40 and Class 300	PN40	
	Flanged Class 150	PN16	
Maximum allowable pressure	Screwed, Flanged PN40 and Class 300	40 bar g @ 50 °C (580 psi g @ 122 °F)	
	Flanged Class 150	16 bar g @ 50 °C (232 psi g @ 122 °F)	
Maximum allowable temperature	Screwed, Flanged PN40 and Class 300	200 °C @ 31.8 bar g (392 °F @ 461 psi g)	
	Flanged Class 150	200 °C @ 12.7 bar g (392 °F @ 184 psi g)	
Minimum allowable temperature		-10 °C (14 °F)	
Maximum operating temperature	Screwed, Flanged PN40 and Class 300	Steam (Saturated)	190 °C @ 11.5 bar g (374 °F @ 167 psi g)
		Other Liquids & Gases	50 °C @ 40 bar g (122 °F @ 580 psi g)
	Flanged Class 150	Steam (Saturated)	190 °C @ 11.5 bar g (374 °F @ 167 psi g)
		Other Liquids & Gases	50 °C @ 16 bar g (122 °F @ 232 psi g)
Maximum operating pressure	Screwed, Flanged PN40 and Class 300	Steam (Saturated)	11.5 bar g @ 190 °C (167 psi g @ 374 °F)
		Other Liquids and Gases	40 bar g @ 50 °C (580 psi g @ 122 °F)
	Flanged Class 150	Steam (Saturated)	11.5 bar g @ 190 °C (167 psi g @ 374 °F)
		Other Liquids and Gases	16 bar g @ 50 °C (232 psi g @ 122 °F)
Minimum operating temperature		-10 °C (14 °F)	

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

	Setting range (bar g)	Nominal diameter	
		½" - 1" DN15 - DN25	1¼" - 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:	Screwed, Flanged PN40 and Class 300	60 bar g	
	Flanged Class 150	24 bar g	

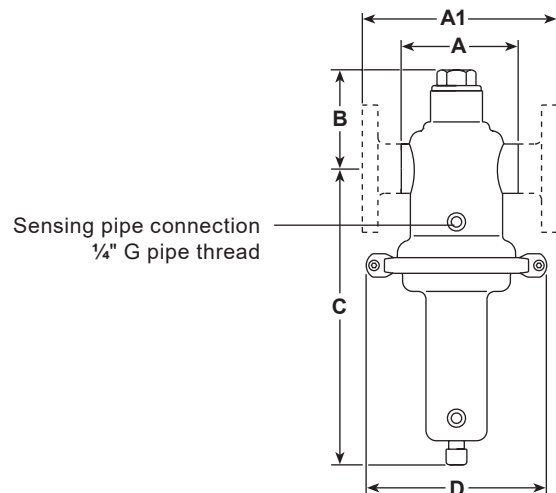
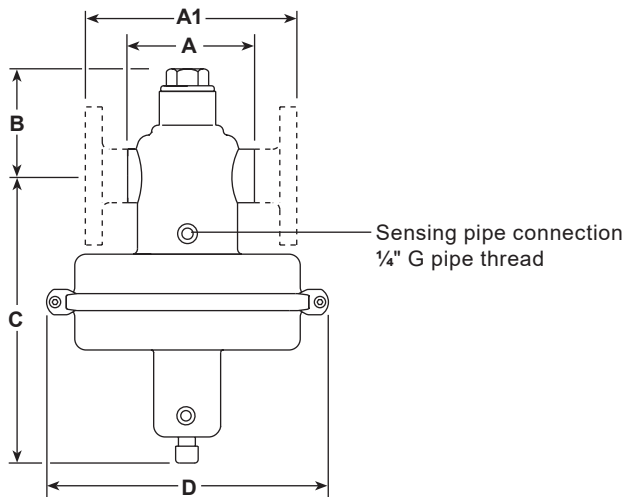
## Materials

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	FEPM		
8	'O' ring	FEPM		
9	'O' ring	FEPM		
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.

## Dimensions (approximate) in millimetres



Size	All pressure ranges			Pressure range (bar)		Pressure range (bar)		Pressure range (bar)		Pressure range (bar)		Pressure range (bar)	
	A	A1	B	C	ØD	C	ØD	C	ØD	C	ØD	C	ØD
DN15 1/2"	85	130	76	300	360	300	264	300	200	235	138	235	138
DN20 3/4"	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 1 1/4"	130	180	80	300	360	300	264	300	200	235	138	235	138
DN40 1 1/2"	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

Set Pressure Range (bar)	0.02 - 0.12	0.1 - 0.5	0.3 - 1.1	0.8 - 12
1/2" - 1" <b>Screwed</b>	13.5	7.1	6.1	3.1
DN15 - DN25 <b>Flanged</b>	15.3	8.9	7.9	4.9
1 1/4" - 2" <b>Screwed</b>	14.4	8.0	7.0	4.0
DN32 - DN50 <b>Flanged</b>	18.4	12.0	11.0	8.0

## Kv values

Valve size	1/2" DN15	3/4" DN20	1" DN25	1 1/4" DN32	1 1/2" DN40	2" DN50
<b>Kv at 20% offset</b>	4.0	5.6	6.4	17.6	17.6	17.6
<b>Maximum Kv</b>	5.0	7.0	8.0	22.0	22.0	22.0

To maximise the control accuracy (especially for large load variations) use the Kv values given at 20% offset. For safety valve sizing use the maximum Kv values. Leakage rate ≤ 0.05% of the maximum Kv 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>Recommended fluid velocities</b>	<b>Steam</b>	<b>Saturated</b>	10 to 40 m/s	<b>Superheated</b>	15 to 60 m/s
	<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, pressure range and indicate whether it is a standard or Food+ variant.

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

