

# Self-operated Pressure Regulators Series 2371



## Pressure Reducing Valve for food processing and pharmaceutical industries

### Type 2371-11

#### Application

Pressure reducing valve for set point ranges **0.3 to 6 bar** (5 to 90 psi) ·  $K_{VS}$  **2 to 5.2** ( $C_V$  2.5 to 6) · **DN 15 to DN 50** (NPS ½ to 2) · For liquids and gases from **-10 to +160 °C** (14 to 320 °F) · Max. operating pressure (inlet pressure) **10 bar** (150 psi)

The valve closes as the outlet pressure **rises**



#### Special features

- Proportional regulator for use in the food processing and pharmaceutical industries
- Wetted inside surfaces with a smooth or polished finish
- Stainless steel 1.4404 (316L)
- FDA-approved materials
- Angle-style valve body
- Body free of cavities
- Diaphragm leakage monitoring over a leak-off port

#### Version

Pressure reducing valve with a diaphragm for controlling the outlet pressure to the set point adjustable over a spring.

Angle valve · Version in bar stock body · DN 15 to DN 50 (NPS ½ to 2)

Standard version with plug with metal sealing or optionally special plug with soft sealing.

Maximum pressure 10 bar (150 psi) · Clamp to attach actuator housing

The regulator can be fitted with a stem locking facility to keep the plug open during CIP (Cleaning in Place) or SIP (Sterilization in Place).

#### Connections

Standard connections:

- Clamp connections according to ISO 2852
- Threaded connections according to DIN 11887

Special connections:

- Flanges according to DIN EN 1092-1, ASME B16.5
- Threaded connections according to SMS 1146, ISO 2853 (IDF)
- Clamp connections according to DIN 32676, BS 4825

#### Special versions

- Body made of 1.4435 · Other materials on request
- Body with DN 65 connections
- Body with two outlet ports
- Leak-off port for leakage monitoring with connection sleeve to connect it to a leakage line



Fig. 1 · Type 2371-11 Pressure Reducing Valve

### Principle of operation (see Fig. 2)

The process medium flows through the valve body (1) in the direction indicated by the arrow. The position of the valve plug (3) determines the flow rate across the cross-sectional area released between the plug and the valve seat (2).

To control the pressure, the operating diaphragm (4) is pretensioned by the positioning springs (7) and the set point screw (6). The valve opens when the downstream pressure  $p_2$  falls below the adjusted set point. The resulting output pressure  $p_2$  depends on the flow rate.

The set point is adjusted by an Allen key (SW 8), which is inserted through the adjustment opening (6.1) on top of the housing to adjust the set point screw (6). The blanking plug must first be removed.

Turning the set point screw clockwise causes the spring plate (7.1) to move upwards and increases the spring force and the set point. Turning the set point screw counterclockwise relieves the spring tension, reducing the set point.

If necessary, the set point screw (6) can be secured by locking screw (12) in the upper plug section (5) to prevent the set point screw from loosening due to vibrations which would change the set point.

Any medium escaping from the leak-off port (11) in the housing indicates that the operating diaphragm (4) may be leaking or the diaphragm has ruptured.

### Stem locking (Fig. 3)

The version with stem locking is designed to keep the plug in the open position. This allows safe and effective cleaning (CIP or SIP) while the valve is open.

To lock the valve stem, turn the pin (13) in place of the blanking plug (6.1) to the open position. The end of the pin is located on the head of the set point screw (6). As the pin is screwed into the valve, it pushes the plug into the opening position over the set point screw (6) and upper plug section plug (5). A mechanical stop (15) prevents it from being screwed in any further, protecting the diaphragm from overstretching or rupturing. The position is secured by the lock nut (14).

When the groove of the pin is completely covered, the stem locking is active, whereas a visible groove means it is disengaged.

### Installation

The regulator has an angle-style valve body. Install the valve into the pipeline, observing the following points:

- The valve must be installed with actuator housing facing upwards and the outlet port in the horizontal position.
- The medium must flow through the valve in the direction indicated by the arrow on the valve body (inlet at the bottom and outlet at the side).

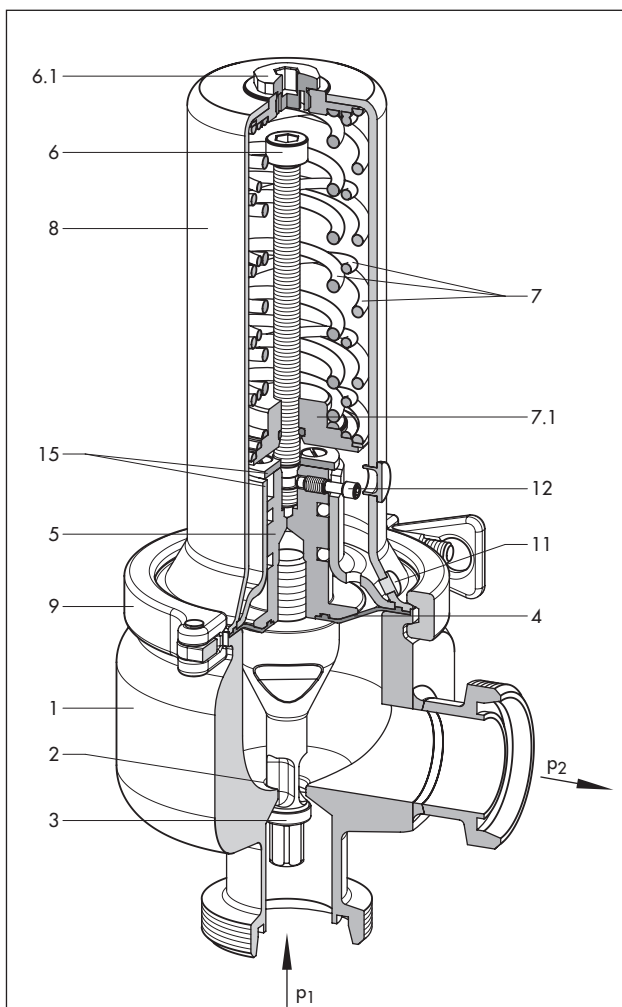


Fig. 2 · Sectional drawing for Type 2371-11

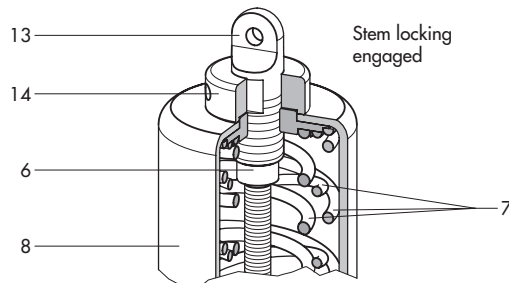


Fig. 3 · Sectional drawing of the stem locking

- |     |                                       |    |                      |
|-----|---------------------------------------|----|----------------------|
| 1   | Valve body                            | 8  | Actuator housing     |
| 2   | Seat                                  | 9  | Clamp fitting        |
| 3   | Plug                                  | 11 | Leak-off port        |
| 4   | Operating diaphragm                   |    | (leakage monitoring) |
| 5   | Upper plug section                    | 12 | Locking screw        |
| 6   | Set point screw                       | 13 | Pin                  |
| 6.1 | Adjustment opening with blanking plug | 14 | Lock nut             |
| 7   | Positioning springs                   | 15 | Mechanical stop      |
| 7.1 | Spring plate                          |    |                      |

**Table 1 · Technical data** · All pressures specified as gauge pressures

Type 2371-11 Pressure Reducing Valve		DN					NPS					
Nominal size		15	20	25	32	40	50	½	¾	1	1½	2
K <sub>V5</sub> <sup>1)</sup> m <sup>3</sup> /h		2	3	3.5	4	4.5	5.2	-				
C <sub>V</sub> <sup>1)</sup> US gal/min		-					2.5	3.5	4	5.3	6	
Set point ranges		0.3 to 1.2 bar · 1 to 3 bar · 2.5 to 4.5 bar 4 to 6 bar					5 to 18 psi · 15 to 45 psi · 35 to 65 psi 60 to 90 psi					
Maximum pressure		10 bar					150 psi					
Max. permissible temperatures	Operating temp. range	-10 to +160 °C					14 °F to 320 °F					
	Sterilizing temperature	180 °C up to 30 minutes					356 °F up to 30 minutes					
Leakage rate	Metal sealing	≤ 0.05 % of K <sub>V5</sub> or C <sub>V</sub>										
	Soft sealing	≤ 0.02 % of K <sub>V5</sub> or C <sub>V</sub>										
Peak-to-valley height and surface treatment	External	R <sub>a</sub> ≤ 1.6 μm, glass bead blasted <sup>2)</sup> · R <sub>a</sub> ≤ 0.6 μm, polished										
	Internal	R <sub>a</sub> ≤ 0.8 μm, smooth finish <sup>2)</sup> · R <sub>a</sub> ≤ 0.6 μm, polished · R <sub>a</sub> ≤ 0.4 μm, satin finish R <sub>a</sub> ≤ 0.4 μm, mirror finish										

<sup>1)</sup> Other K<sub>V5</sub>/C<sub>V</sub> on request · <sup>2)</sup> Standard version

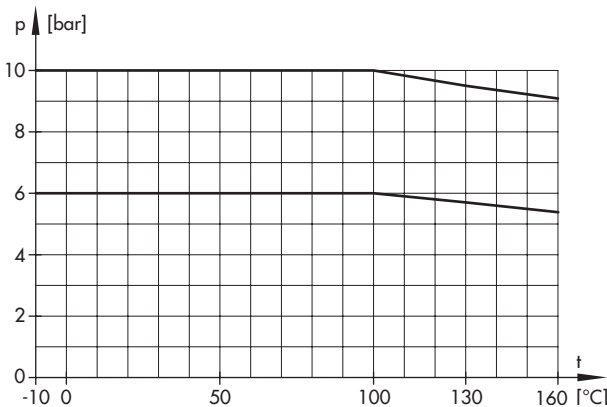
**Table 2 · Materials** · Material number acc. to DIN EN

Version		DIN	ANSI
Body		1.4404	316L
Plug	With metal sealing	1.4404	316L
	Seat ring for soft sealing	PEEK	
Diaphragm		EPDM and PTFE	
Cap		1.4404	316L
Springs		1.4310	301

**Table 3 · Connections, max. operating pressure (inlet press.) and temperature ranges** · See pressure-temperature diagram **1** **2**

Connections	Standard	Nominal size mm · inch	Pressure-temperature values	
			Max. inlet pressure	Medium temperature range
Threaded connections	DIN 11887 Type A	DN 15 to 50	10 bar	-10 to 100 °C <b>1</b>
	SMS 1146	DN 25 to 50	6 bar	-10 to 100 °C <b>1</b>
	ISO 2853 (IDF)	NPS 1 to 2	150 psi	14 to 212 °F <b>2</b>
Clamp connections	DIN 32676	DN 15 to 50	10 bar	-10 to 100 °C <b>1</b>
	ISO 2852	DN 25 to 50	10 bar	-10 to 100 °C <b>1</b>
	BS 4825	NPS 1, 1½, 2	150 psi	14 to 212 °F <b>2</b>
Flanges with smooth raised face R <sub>a</sub> ≤ 0.8 μm	DIN EN 1092-1 Form B2 PN 10	DN 15 to 50	10 bar	-10 to 100 °C <b>1</b>
	PN 6	DN 15 to 50	6 bar	-10 to 100 °C <b>1</b>
	ASME B 16.5 Form RF (CL 150)	NPS ½ to 2	150 psi	14 to 212 °F <b>2</b>

**1** Pressure-temperature diagram for materials according to DIN EN · Temperature range extended  
Material: 1.4404



**2** Pressure-temperature diagram for ANSI materials  
Temperature range extended  
Material: 316L

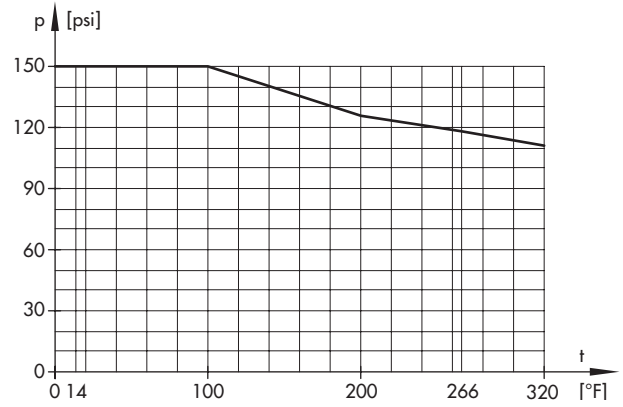


Fig. 4 · Pressure-temperature diagrams

## Dimensions

### Dimensions in mm and weights in kg

Valve	DN NPS	15 ½	20 ¾	25 1	32 –	40 1½	50 2	
Clamp connections acc. to DIN 32676	L1	55	55	60	60	65	70	
	L2	90	90	90	90	90	90	
	Ød1	16	20	26	32	38	50	
	ØC3	34	34	50.5	50.5	50.5	64	
Clamp connections acc. to BS 4825	L1	–		60	–		65 70	
	L2	–		90	–		90 90	
	Ød1	–		22.2	–		34.9 47.6	
	ØC3	–		50.5	–		50.5 64	
Clamp connections acc. to ISO 2852	L1	–		60	60	65	70	
	L2	–		90	90	90	90	
	Ød1	–		22.6	31.3	35.6	48.6	
	ØC3	–		50.5	50.5	50.5	64	
Threaded connections acc. to DIN 11887	L1	55	55	60	60	65	70	
	L2	90	90	90	90	90	90	
	Ød1	16	20	26	32	38	50	
	ØC1	34x 1/8"	44x 1/6"	52x 1/6"	58x 1/6"	65x 1/6"	78x 1/6"	
Threaded connections ...  acc. to SMS 1146  acc. to IDF	L1	–		60	60	65	70	
	L2	–		90	90	90	90	
	Ød1	–		22.6	29.6 <sup>1)</sup>	35.6	48.6	
	ØC2	–		40x 1/6"	48x 1/6"	60x 1/6"	70x 1/6"	
Flanges ... acc. to DIN EN 1092-1	L1	90	95	100	105	115	125	
	L2	90	95	100	105	115	125	
ASME B16.5	Ød1	16	20	26	32	38	50	
Common dimensions	A	95	95	95	95	95	95	
	H1	255	255	255	280	280	280	
	H3	≥ 200						
	H4	50						
Weight with clamp connections	Approx. 7 kg			Approx. 10 kg				

<sup>1)</sup> Acc. to ISO 2853 (IDF): 31.3 mm

Fig. 5 · Dimensions

### Ordering text

#### Pressure Reducing Valve Type 2371-11

DN (NPS) ...

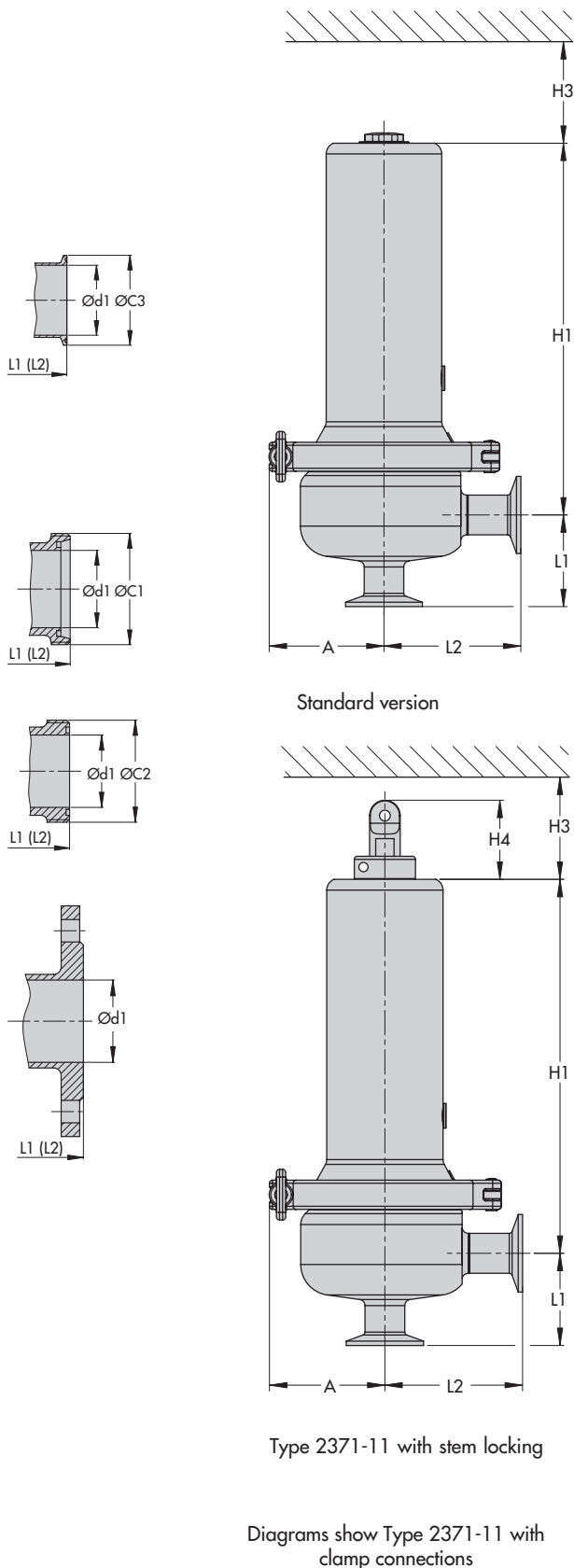
Set point range: 0.3 to 1.2 bar (5 to 18 psi)/1.0 to 3.0 bar (15 to 45 psi)/2.5 to 4.5 bar (35 to 65 psi)/4.0 to 6.0 bar (60 to 90 psi)

Type of connections: Threaded connection acc. to .../clamp connection acc. to .../flange connection acc. to ...

Plug with metal sealing/soft sealing

Surface roughness internal ..., external ...

Stem locking: Without/with



Specifications subject to change without notice.



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