

Self-operated Pressure Regulators Series 2357

for special applications



Pressure Build-up Regulator Types 2357-1/6 · Valve opens when the upstream pressure drops or the valve closes when the downstream pressure rises

Excess Pressure Valve Types 2357-2/7 · Valve opens when upstream pressure rises

Application

Pressure regulators for cryogenic gases and liquids as well as other liquids, gases and vapors · Operating pressures up to **50 bar** · Set point range **0.2 bar** to **40 bar** · Temperature range **-200 °C** to **+200 °C** · Free of oil and grease



Industrial gases, such as argon, nitrogen and oxygen, are stored in liquified condition at extremely low temperatures and at a constant pressure in thermally insulated containers. Suitable pipelines transport the medium to the consumer. The extreme operating conditions (pressures up to 50 bar and temperatures down to -200 °C) require the use of special valves.

The Types 2357-... Pressure Regulators are especially designed for the use in cryogenic service, but are also suitable for handling gases, liquids and vapors under different operating conditions.

Special features

- Low-maintenance proportional regulators, requiring no auxiliary energy
- Wide set point range and easy set point adjustment
- Rugged design and small overall height
- Suitable for oxygen service

Versions

The pressure regulators mainly consist of a valve body with two ports (marked A and B), internal operating diaphragm and a set point adjuster.

Pressure build-up regulator with safety function · The upstream pressure is transmitted to the operating diaphragm. The valve opens when the upstream pressure drops. Direction of flow from port B to port A.

Safety function: The plug in the pressure build-up regulator operates as a safety valve and relieves the pressure chamber. The pressure acts on the plug from below. The valve opens to relieve the pressure.

Types 2357-1/6 Pressure Reducing Valves · Pressure regulators with globe valve · Maintains the downstream pressure at the adjusted set point. The valve closes when the downstream pressure rises. Direction of flow from port A to port B.

Types 2357-2/7 Excess Pressure Valves · Pressure regulators with angle valve · Maintains the upstream pressure at the adjusted set point. When the upstream pressure rises, the valve opens until the pressure has assumed the adjusted set point.

Type 2357-2 can additionally be equipped with a non-return unit. In thermally insulated containers, the excess pressure is relieved by feeding the gas into the consumer pipeline.



Fig. 1 · Type 2357-1 Pressure Regulator (pressure build-up regulator or pressure reducing valve)



Fig. 2 · Type 2357-2 Pressure Regulator (excess pressure valve)



Fig. 3 · Type 2357-6 Pressure Regulator (pressure build-up regulator)

Special versions - Details on request -

Types 2357-6/7 Pressure Regulators

- All wetted parts are electropolished
- Additionally available in nominal size DN 40 with $K_{VS} = 10$
- Version for liquid hydrogen

Accessories

Types 2357-1/2: Mounting parts: Soldering nipple with ball-type bushing (for connection to pipes with 16 mm or 15 mm Ø); filter with 270 µm or 50 µm mesh

Type 2357-2: Non-return unit

Other accessories listed in TV-SK 17010.

Principle of operation

The process medium flows from port A to port B when the Types 2357-1/6 Pressure Regulators are used as **pressure reducing valves**.

The valve is open when relieved of pressure. The pressure downstream of the port B is transmitted to the operating diaphragm (3). The positioning force produced by this pressure moves the valve plug (2) depending on the spring force adjustable at the set point adjuster (10). The valve closes when the pressure downstream of the port B increases.

Functioning as **build-up pressure regulators** with the process medium flowing from port B to port A, the pressure upstream of the port B is transmitted to the operating diaphragm. The valve closes when the upstream pressure rises or opens when the upstream pressure drops.

The pressure build-up regulator acts as a safety valve and relieves the pressure in the pressure chamber when the set point is exceeded by 5 bar. The valve opens when the pressure exceeds the force of the springs located on top.

In the Types 2357-2/7 **Excess Pressure Valves**, the medium always flows from port A to port B. The valve is closed when relieved of pressure. The upstream pressure produced at port A is internally transmitted to the operating diaphragm (3). The positioning force produced by this pressure opposes the adjustable spring force. When the pressure increases, the valve opens until the pressure has assumed the set point.

To discharge small quantities of gas, the Type 2357-2 Excess Pressure Valve can be used with special accessories. The safety valve does not react when just the gas volume must be discharged due to heat leak.

The excess pressure valve can additionally be equipped with a non-return unit, which prevents the medium from flowing back through the valve.

Installation

- Any desired mounting positions
- Build-up pressure regulator with safety function: direction of flow from port B to port A,
- Pressure reducing valve: direction of flow from port A to port B
- Type 2357-2 Excess Pressure Valve with non-return unit: the center axis of the regulator must be vertical and port B must point upward.

EC type examination

An EC type examination according to the Pressure Equipment Directive 97/23/EC, Module B has been performed on the regulators.

Table 1 · Types 2357-... Valve versions and end connections

Type	Design Body style	End connections	
		Inlet	Outlet
2357-1	Pressure reducing valve Globe valve	G ¾ A Conical joint	
2357-2	Excess pressure valve Angle valve	G ¾ A Conical joint	G ¾ A Female thread
2357-6	Pressure reducing valve Globe valve	Welding ends Ø18 x 1.5	
2357-7	Excess pressure valve Angle valve		

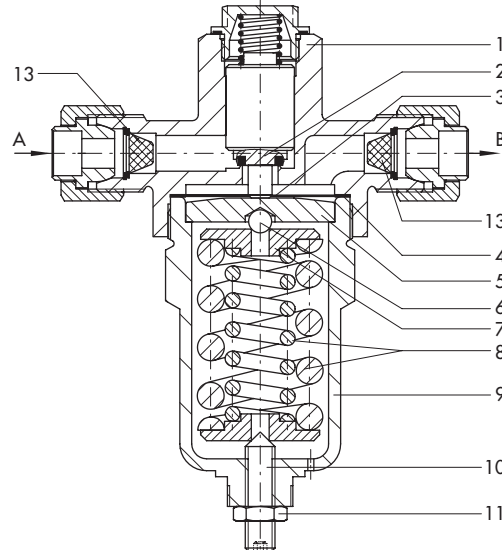


Fig. 4 · Type 2357-1/6 Pressure Reducing Valve or Pressure Build-up Regulator

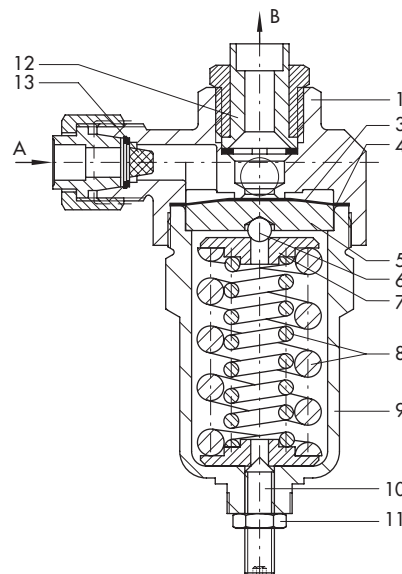


Fig. 5 · Type 2357-2 Excess Pressure Valve

- | | |
|-----------------------|-----------------------|
| 1 Valve body | 8 Springs |
| 2 Plug | 9 Lower part of body |
| 3 Operating diaphragm | 10 Set point adjuster |
| 4 Sealing ring | 11 Lock nut |
| 5 Diaphragm plate | 12 Non-return unit |
| 6 Ball | 13 Filter |
| 7 Spring plate | |

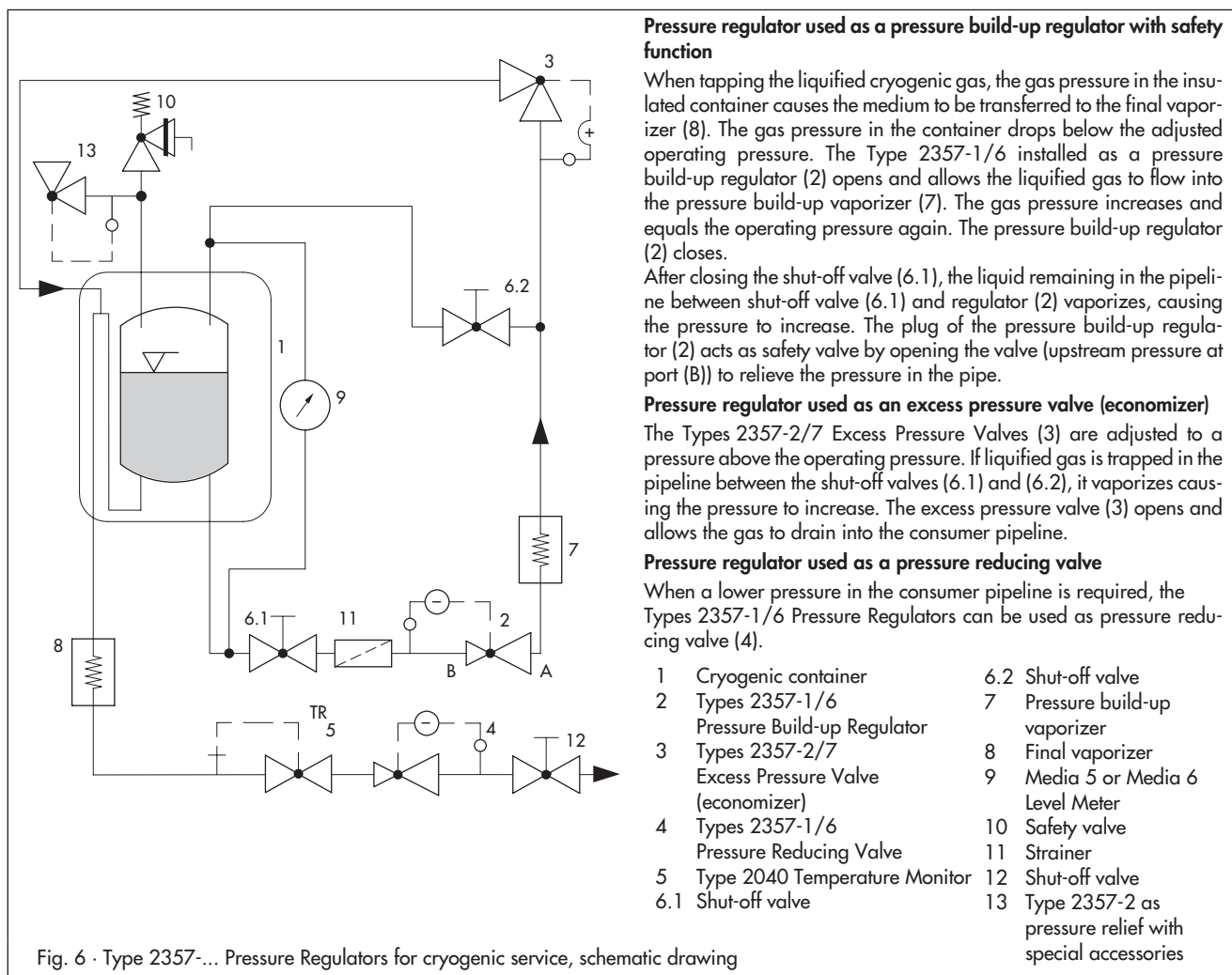


Table 2 · Technical data · All pressures in bar (gauge)

Type	2357-1		2357-2		2357-6	2357-7
K_{VS} coefficient	0.25	0.8	1.25	0.4	0.8	1.25
Set point ranges ¹⁾ in bar	1 to 25 10 to 36	1 to 8 5 to 25 8 to 40	1 to 25 10 to 36	1 to 8 5 to 25 8 to 40		
Safety function for Types 2357-1/6	5 bar above the set point					
Perm. operating pressure	PN 40	PN 50	PN 40	PN 50		
Max. permissible differential pressure Δp	Types 2357-1/6 Pressure Reducing Valve: Gases 30 bar · Liquids 6 bar Types 2357-2/7 Excess Pressure Valve: 3 bar · Special accessories are required above 3 bar					
Temperature range	-196 °C to +200 °C				-200 °C to +200 °C	

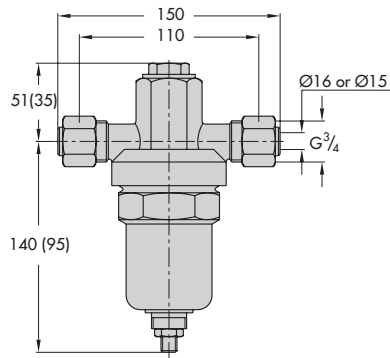
¹⁾ Additional set point ranges on request

Table 3 · Materials · Material no. according to DIN EN

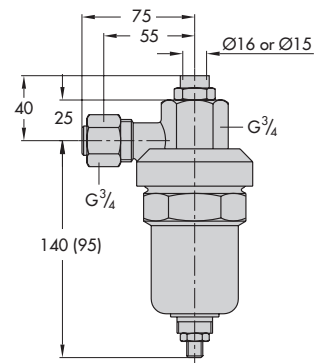
Type	2357-1	2357-2	2357-6	2357-7
Body	CC754S-GM (brass) ¹⁾		1.4404 or 1.4301	
Bonnet	CC754S-GM (brass) ¹⁾			
Plug	CW602N (brass) with PTFE soft sealing	-	1.4301	-
Operating diaphragm	CuBe		1.4301	
Set point springs	Stainless steel (1.4310)			
Body gasket	PTFE			

¹⁾ PN 40: CW617N (brass)

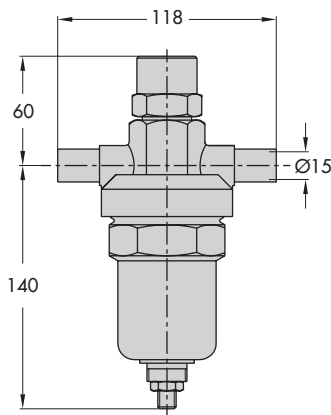
Dimensions and weights



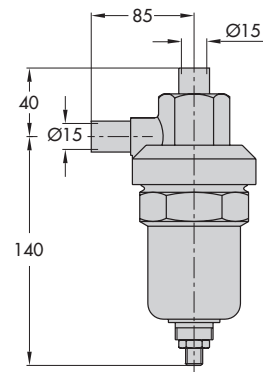
Type 2357-1 Pressure Regulator
Weight: 2.0 (0.9) kg



Type 2357-2 Pressure Regulator
Weight: 1.7 (0.6) kg



Type 2357-6 Pressure Regulator
Weight: 3.0 kg



Type 2357-7 Pressure Regulator
Weight: 2.5 kg

Specifications in parentheses () apply for regulators in PN 40

Fig. 7 · Dimensions in mm and weights

Ordering text

Type 2357-1/2/6/7 Pressure Regulator

Set point range ... bar

Optionally, accessories ...

Special version ...

Specifications subject to change without notice.



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