

Self-operated Pressure Regulators



Pressure Build-up Regulator Type 2357-3



Fig. 1 · Type 2357-3 with non-return unit at port C

Mounting and Operating Instructions

EB 2559 EN

Edition February 2008



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General safety instructions

- ▶ *The regulators must be installed, started up and serviced by fully trained and qualified personnel only, observing the accepted industry codes and practices. Make sure employees or third persons are not exposed to any danger.*

All safety instructions and warnings in these instructions, particularly those concerning installation, start-up, and maintenance, must be observed.
- ▶ *For appropriate operation, make sure that the regulator is only used in applications where the operating pressure and temperatures do not exceed the operating values based on the sizing data submitted in the order.*
- ▶ *Note that the manufacturer does not assume any responsibility for damage caused by external forces or any other external factors.*

Any hazards which could be caused in the regulator by the process medium or operating pressure are to be prevented by means of appropriate measures.
- ▶ *Proper shipping and appropriate storage are assumed.*

1 Design and principle of operation

The pressure regulator is especially designed for the use in cryogenic service to keep the pressure constant to the adjusted set point.

The pressure regulator consists of a valve with three ports A, B and C, a spring-loaded operating bellows with set point adjuster and a tubular plug.

The pressure regulator operates as a **pressure build-up regulator with safety function** when the direction of flow is from port A to port B.

The valve is open when no pressure is applied. The pressure downstream of the valve is transmitted to the operating bellows (4). The positioning force produced by this pressure moves the pressure build-up plug (1), which is firmly attached to the plug sleeve, depending on the spring force adjustable at the set point adjuster (6). The valve closes when the pressure downstream of the valve has assumed the adjusted set point.

Functioning as a **pressure build-up regulator**, the regulator also operates as a safety valve for the pressure chamber upstream of port A. When the pressure rises above the set point by approx. 5 bar, the positioning force overcomes the force of the closing spring (8), causing the pressure build-up plug (1) to open and the pressure is relieved to ports B and C.

Functioning as a **pressure relief valve**, the medium flows from port B to C. The tubular plug seals off the operating bellows when there is no pressure drop across port B and C. The pressure at port B acts on the operating bellows (4). The positioning force produced by this pressure opposes the adjustable

spring force of the set point spring (5) and opens the tubular plug (2) when the pressure rises above the set point by approx. 0.5 bar. The pressures are equalized and the medium escapes through the inside of the tubular plug over port C.

As a pressure relief valve, the regulator can be optionally equipped with a non-return unit (10). It prevents the medium from flowing back to port C and allows maintenance work to be performed on the regulator without having to empty the container first.

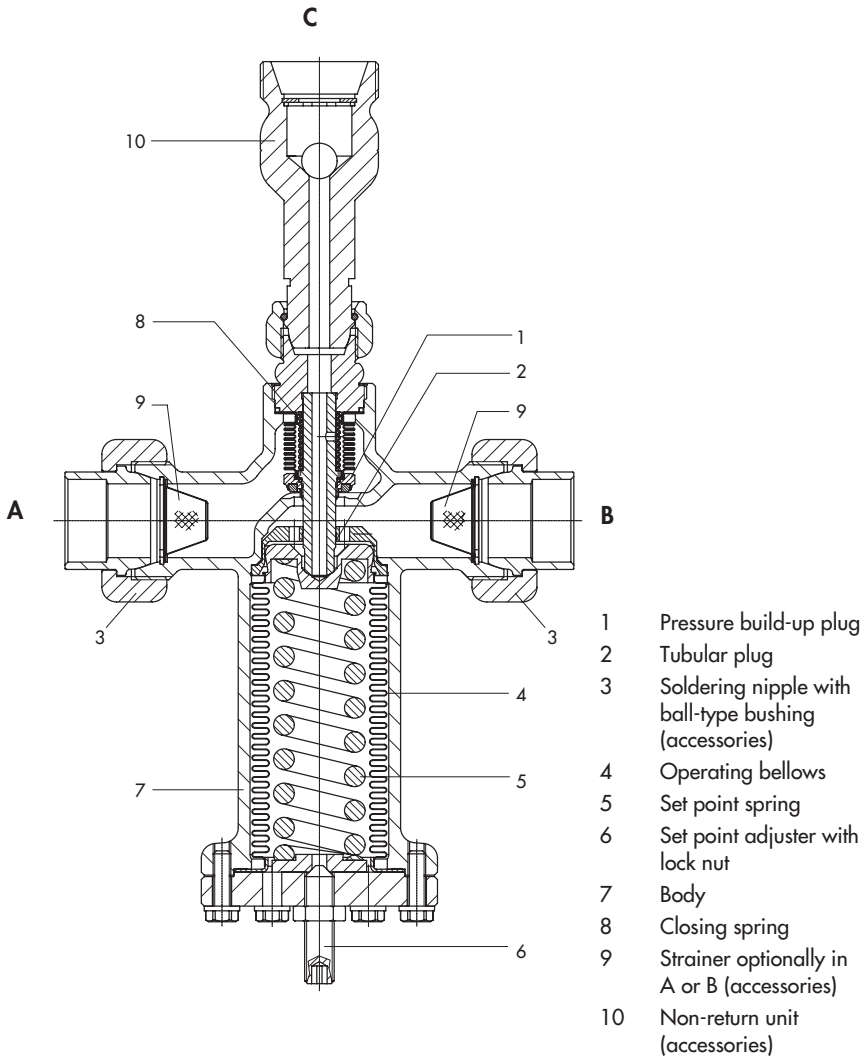


Fig. 2 · Sectional drawings

2 Installation

2.1 Mounting position

The pressure regulator must be installed with the actuator housing pointing downward (port C facing upward).

The ports A and B are marked on the body.

The required accessories are listed in Table 2 on page 9.



Installation as build-up pressure regulator with safety function:

- Direction of flow from port **A** to port **B**

Installation as pressure relief valve:

- Direction of flow from port **B** to port **C**

NOTICE

Make sure that any impurities carried along by the process medium in the connected pipelines do not impair the proper functioning and especially the tight shut-off of the regulator.

2.2 Shut-off valve

We recommend installing a hand-operated shut-off valve both upstream of the strainer and downstream of the regulator to be able to shut down the plant for cleaning.

Install a pressure gauge both upstream and downstream of the regulator to monitor the pressures prevailing in the plant.

3 Operation

3.1 Set point adjustment

The pressure regulator is adjusted at the factory to the set points listed in the table. However, you can change them by turning the set point adjuster (6).

When pressure gauges are installed in the connected pipelines, you can adjust the desired set point directly while monitoring the corresponding pressure gauge.

When no pressure gauge is installed, use the adjustment diagram to adjust the set point.

1. Undo the lock nut to allow the set point adjuster to move freely.
2. Determine the difference between the fixed set point (Table 1) and the required set point. Turn the set point adjuster the required amount of turns as specified in Fig. 3.
Any subsequent change in set point can be also be made by determining the required number of turns using the specifications listed in the Set point change per turn row.
3. Secure the setting with the lock nut.

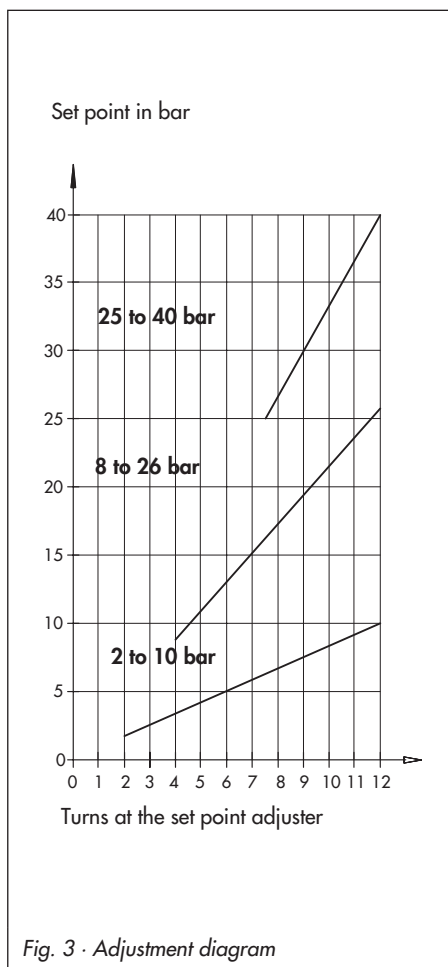


Fig. 3 · Adjustment diagram

Table 1 · Set point adjustment

Set point range	2 to 10 bar	8 to 26 bar	25 to 40 bar
Adjusted to approx.	10 bar	10 bar	25 bar
Set point change per turn	0.8 bar	1.5 bar	3.2 bar

4 Dimensions in mm

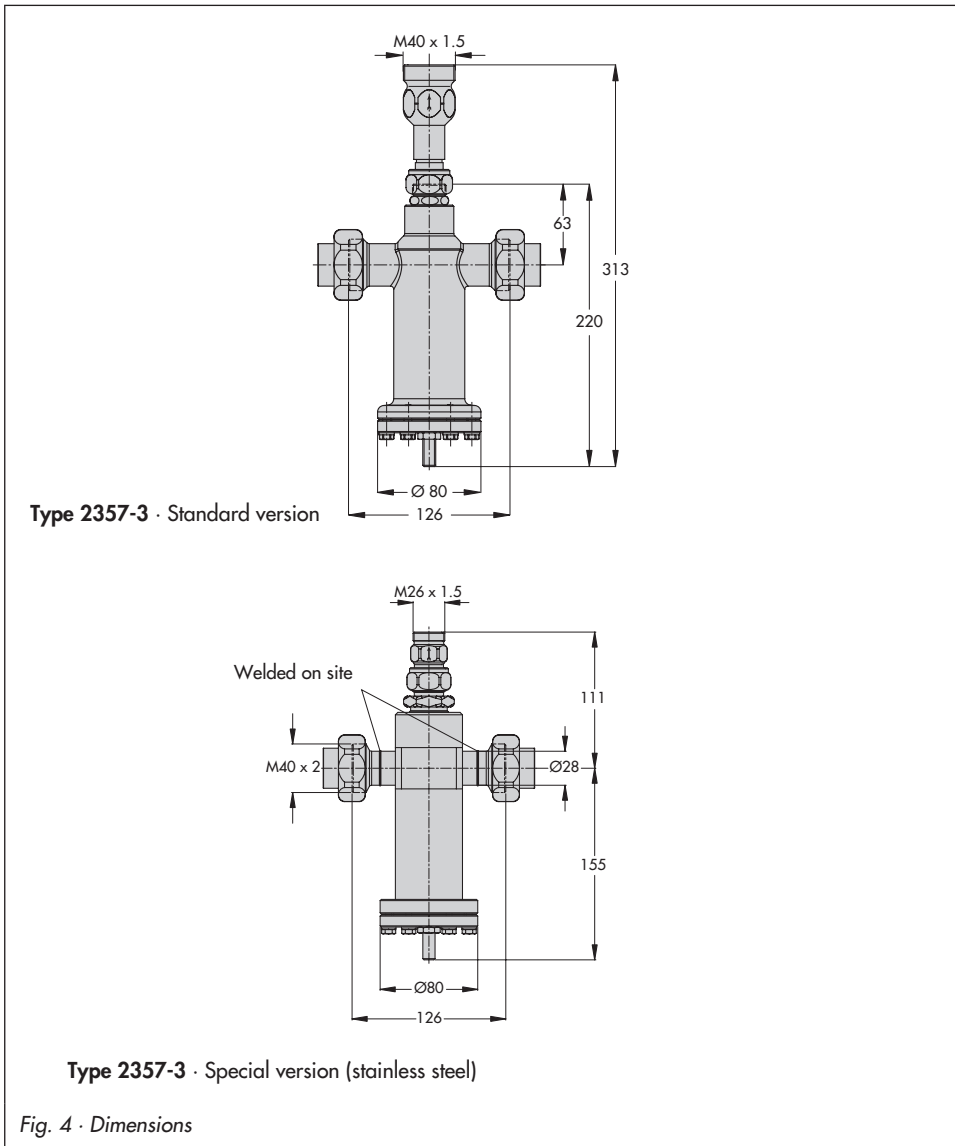


Fig. 4 · Dimensions

4.1 Accessories

Table 2 · Accessories

Accessories	Order number
Non-return unit for port C, connection for ball-type bushing M40x2	1400-7092
2 soldering nipples for 28 mm pipe, PN 40 For port A and B	1400-7090
1 soldering nipple for 28 mm pipe, PN 40 For port C with non-return unit	1400-7300
1 soldering nipple for 18 mm pipe, PN 40 For port C without non-return unit	1400-7091
Sealing cap for port C	1400-7297
Sealing cap for port A	1400-9527
3 welding ends for 18 x 1.6 mm pipe (1.4404) with (brass) coupling nut For port A, B and C with non-return unit	1400-9742

Other accessories are listed in TV-SK 17010 EN.



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S/Z 2011-03