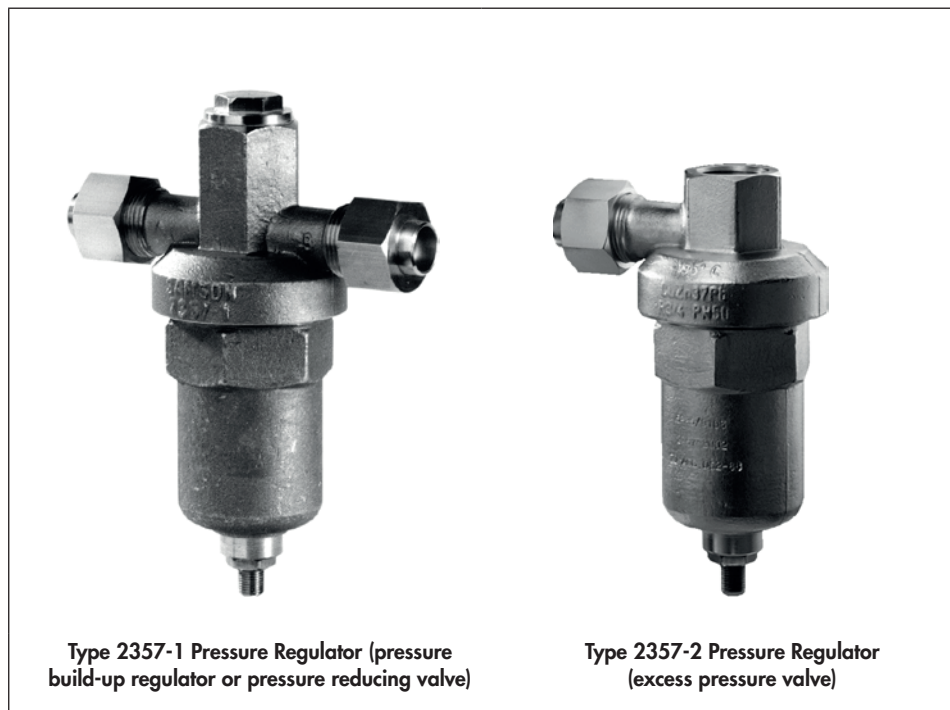


# MOUNTING AND OPERATING INSTRUCTIONS



## EB 2557 EN

Translation of original instructions



**Type 2357-1 Pressure Regulator (pressure  
build-up regulator or pressure reducing valve)**

**Type 2357-2 Pressure Regulator  
(excess pressure valve)**

## **Type 2357-1 Pressure Regulator · Type 2357-2 Excess Pressure Valve**

Self-operated Pressure Regulators for special applications

Edition December 2022



## Note on these mounting and operating instructions

These mounting and operating instructions assist you in mounting and operating the device safely. The instructions are binding for handling SAMSON devices. The images shown in these instructions are for illustration purposes only. The actual product may vary.

- For the safe and proper use of these instructions, read them carefully and keep them for later reference.
- If you have any questions about these instructions, contact SAMSON's After-sales Service (aftersaleservice@samsongroup.com).



The mounting and operating instructions for the devices are included in the scope of delivery. The latest documentation is available on our website at [www.samsongroup.com](http://www.samsongroup.com) > **Service & Support** > **Downloads** > **Documentation**.

## Definition of signal words

### **DANGER**

*Hazardous situations which, if not avoided, will result in death or serious injury*

### **WARNING**

*Hazardous situations which, if not avoided, could result in death or serious injury*

### **NOTICE**

*Property damage message or malfunction*

### **Note**

*Additional information*

### **Tip**

*Recommended action*

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# 1 Safety instructions and measures

## Intended use

The SAMSON Type 2357-1 and Type 2357-2 Regulators are pressure regulators.

The self-operated regulators are used as a pressure reducing valve/pressure build-up regulator (Type 2357-1) or as an excess pressure valve (Type 2357-2). Cryogenic gases and liquids as well as other liquids, gases and vapors in industrial plants can be controlled by the regulators.

The regulators are designed to operate under exactly defined conditions (e.g. operating pressure, process medium, temperature). Therefore, operators must ensure that the regulators are only used in operating conditions that meet the specifications used for sizing the devices at the ordering stage. In case operators intend to use the controllers in applications or conditions other than those specified, contact SAMSON.

SAMSON does not assume any liability for damage resulting from the failure to use the device for its intended purpose or for damage caused by external forces or any other external factors.

➔ Refer to the technical data and nameplate for limits and fields of application as well as possible uses.

## Reasonably foreseeable misuse

The regulators are not suitable for the following applications:

- Use outside the limits defined during sizing and by the technical data
- Use outside the limits defined by the additional fittings mounted on the regulator

Furthermore, the following activities do not comply with the intended use:

- Use of non-original spare parts
- Performing service and repair work not described

## Personal protective equipment

We recommend checking the hazards posed by the process medium being used (e.g.

▶ GESTIS (CLP) hazardous substances database). Depending on the process medium and/or the activity, the protective equipment required includes:

- Protective clothing, safety gloves and eye protection in applications with hot, cold and/or corrosive media
- Wear hearing protection when working near the valve

➔ Check with the plant operator for details on further protective equipment.

## Safety instructions and measures

### Qualifications of operating personnel

The regulators must be mounted, started up, serviced and repaired by fully trained and qualified personnel only; the accepted industry codes and practices must be observed. According to these mounting and operating instructions, trained personnel refers to individuals who are able to judge the work they are assigned to and recognize possible hazards due to their specialized training, their knowledge and experience as well as their knowledge of the applicable standards.

### Revisions and other modifications

Revisions, conversions or other modifications of the product are not authorized by SAMSON. They are performed at the user's own risk and may lead to safety hazards, for example. Furthermore, the product may no longer meet the requirements for its intended use.

### Warning against residual hazards

To avoid personal injury or property damage, plant operators and operating personnel must prevent hazards that could be caused in the regulators by the process medium, the operating pressure or by moving parts by taking appropriate precautions. Plant operators and operating personnel must observe all hazard statements, warnings and caution notes in these mounting and operating instructions.

Hazards resulting from the special working conditions at the installation site of the regulator must be identified in a risk assessment and prevented through the corresponding safety instructions drawn up by the operator.

We also recommend checking the hazards posed by the process medium being used (e.g.

▶ GESTIS (CLP) hazardous substances database).

→ Observe safety measures for handling the device as well as fire prevention and explosion protection measures.

These mounting and operating instructions deals with the standard version of the device. Components of the device that differ to those used for the standard version described in this document can be exchanged with other certain SAMSON components. The residual hazards of these components are described in the associated mounting and operating instructions (see documents listed under 'Referenced documentation').

### Safety features

The regulators do not have any special safety features. When relieved of pressure, the Type 2357-1 Regulator is opened by the force of the internal valve springs and the Type 2357-2 Regulator is closed by the force of the internal valve springs.

### Responsibilities of the operator

Operators are responsible for proper use and compliance with the safety regulations. Operators are obliged to provide these mounting and operating instructions as well as the referenced documents to the operating personnel and to instruct them in proper operation. Furthermore, operators must ensure that operating personnel or third parties are not exposed to any danger.

Operators are additionally responsible for ensuring that the limits for the product defined in the technical data are observed. This also applies to the start-up and shutdown procedures. Start-up and shutdown procedures fall within the scope of the operator's duties and, as such, are not part of these mounting and operating instructions. SAMSON is unable to make any statements about these procedures since the operative details (e.g. differential pressures and temperatures) vary in each individual case and are only known to the operator.

### Responsibilities of operating personnel

Operating personnel must read and understand these mounting and operating instructions as well as the referenced documents and observe the specified hazard statements, warnings and caution notes. Furthermore, operating personnel must be familiar with the applicable health, safety and accident prevention regulations and comply with them.

### Referenced standards, directives and regulations

The regulator complies with the requirements of the European Pressure Equipment Directive 2014/68/EU, Machinery Directive 2006/42/EC, Directive 2016 No. 1105 Pressure Equipment (Safety) Regulations 2016 and Directive 2008 No. 1597 Supply of Machinery (Safety) Regulations 2008. Regulators with a CE marking and/or UKCA marking have a declaration of conformity, which includes information about the applied conformity assessment procedure. The declaration of conformity is included in the 'Certificates' section.

According to the ignition hazard assessment performed in accordance with Clause 5.2 of ISO 80079-36, the non-electrical regulators do not have their own potential ignition source even in the rare incident of an operating fault. As a result, they do not fall within the scope of Directive 2014/34/EU.

➔ For connection to the equipotential bonding system, observe the requirements specified in Clause 6.4 of EN 60079-14 (VDE 0165-1).

## Safety instructions and measures

### Referenced documentation

The following documents apply in addition to these mounting and operating instructions:

- Data sheets for
  - e.g. **Spare parts and accessories · Self-operated regulators for cryogenic media** ▶ T 2570
- Manuals
  - Oxygen manual** ▶ H 01
- Mounting and operating instructions as well as data sheets for additional fittings (e.g. shut-off valves, pressure gauges etc.).



## 1.1 Notes on possible severe personal injury

### DANGER

#### **Risk of bursting in the regulator.**

Regulators and pipelines are pressure equipment. Impermissible pressure or improper opening of the regulator can lead to regulator components bursting.

- Observe the maximum permissible pressure for regulator and plant.
- If necessary, a suitable overpressure protection must be installed on site in the plant section.
- Before starting any work on the regulator, depressurize all plant sections affected as well as the regulator.
- Drain the process medium from all the plant sections affected as well as the regulator.
- Wear personal protective equipment.

#### **Risk of injury due to incorrect handling of oxygen or cryogenic gases in applications.**

The regulator can be used for oxygen service or applications with cryogenic gases. Oxygen is a hazardous substance, which reacts quickly, leading to combustion and explosions. Contact with cryogenic gases causes severe frostbite and cold burns (cryogenic burns). Operating personnel must be trained for these applications. Unqualified operating personnel expose themselves and others to an increased risk of injury.

- Operating personnel must be sufficiently trained and be made aware of the hazards in applications involving oxygen or cryogenic gases.
- Instructions and information on how to safely handle devices for oxygen service can be found in the Manual ► H 01.

## 1.2 Notes on possible personal injury

### **⚠ WARNING**

#### **Risk of burn injuries due to hot or cold components and pipelines.**

Depending on the process medium, regulator components and pipelines may get very hot or cold and cause burn injuries.

- Allow components and pipelines to cool down or warm up to the ambient temperature.
- Wear protective clothing and safety gloves.

#### **Damage to health relating to the REACH regulation.**

If a SAMSON device contains a substance listed as a substance of very high concern on the candidate list of the REACH regulation, this is indicated on the SAMSON delivery note.

- Information on safe use of the part affected. ► [www.samsongroup.com/en/about-samson/material-compliance/reach-regulation/](http://www.samsongroup.com/en/about-samson/material-compliance/reach-regulation/)

#### **Risk of personal injury due to residual process medium in the regulator.**

While working on the regulator, residual process medium can escape and, depending on its properties, may lead to personal injury, e.g. (chemical) burns.

- If possible, drain the process medium from all the plant sections affected and the regulator.
- Wear protective clothing, safety gloves and eye protection.

#### **Risk of personal injury through incorrect operation, use or installation as a result of information on the regulator being illegible.**

Over time, markings, labels and nameplates on the regulator may become covered with dirt or become illegible in some other way. As a result, hazards may go unnoticed and the necessary instructions not followed. There is a risk of personal injury.

- Keep all relevant markings and inscriptions on the device in a constantly legible state.
- Immediately renew damaged, missing or incorrect nameplates or labels.

## 1.3 Notes on possible property damage

### ! NOTICE

**Risk of excess pressure damaging plant sections due to construction-related seat leakage through the regulator.**

- Always install a safety device (e.g. safety excess pressure valve or safety relief valve) in the plant.

**Risk of regulator damage due to incorrectly attached slings.**

- Do not attach load-bearing slings to the regulator.

**Risk of regulator damage due to unsuitable medium properties.**

The regulator is designed for a process medium with defined properties.

- Only use the process medium specified for sizing the equipment.

**Risk of regulator damage due to contamination (e.g. solid particles) in the pipeline.**

The plant operator is responsible for cleaning the pipelines in the plant.

- Flush the pipelines before start-up.

**Risk of leakage and regulator damage due to excessively high or low tightening torques.**

Observe the specified torques when tightening regulator components. Excessive tightening torques lead to parts wearing out more quickly. Parts that are too loose may cause leakage.

- Observe the specified tightening torques (see 'Tightening torques' in Annex).

**Risk of regulator damage due to the use of unsuitable tools.**

Certain tools are required to work on the regulator.

- Only use tools approved by SAMSON.  
When in doubt, consult SAMSON.

**Risk of the process medium being contaminated through the use of unsuitable lubricants and/or contaminated tools and components.**

- Keep the regulator and the tools used free from solvents and grease.
- Make sure that only suitable lubricants are used.

## 1.3 Notes on possible property damage

### **!** NOTICE

#### **Incorrect control due to the formation of ice on the regulator.**

Medium temperatures below 0 °C may cause ice to form on the regulator, depending on the air humidity. This may affect, in particular, the functioning of the internal set point springs.

- Prevent the formation of ice by taking appropriate precautions (e.g. enclosure, trace heater etc.). The plant operator is responsible for selecting and implementing appropriate precautions. See the 'Installation' section.
- In the event that the formation of ice restricts the movement of the springs, we recommend using a heat gun to melt the ice.

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### **i** Note

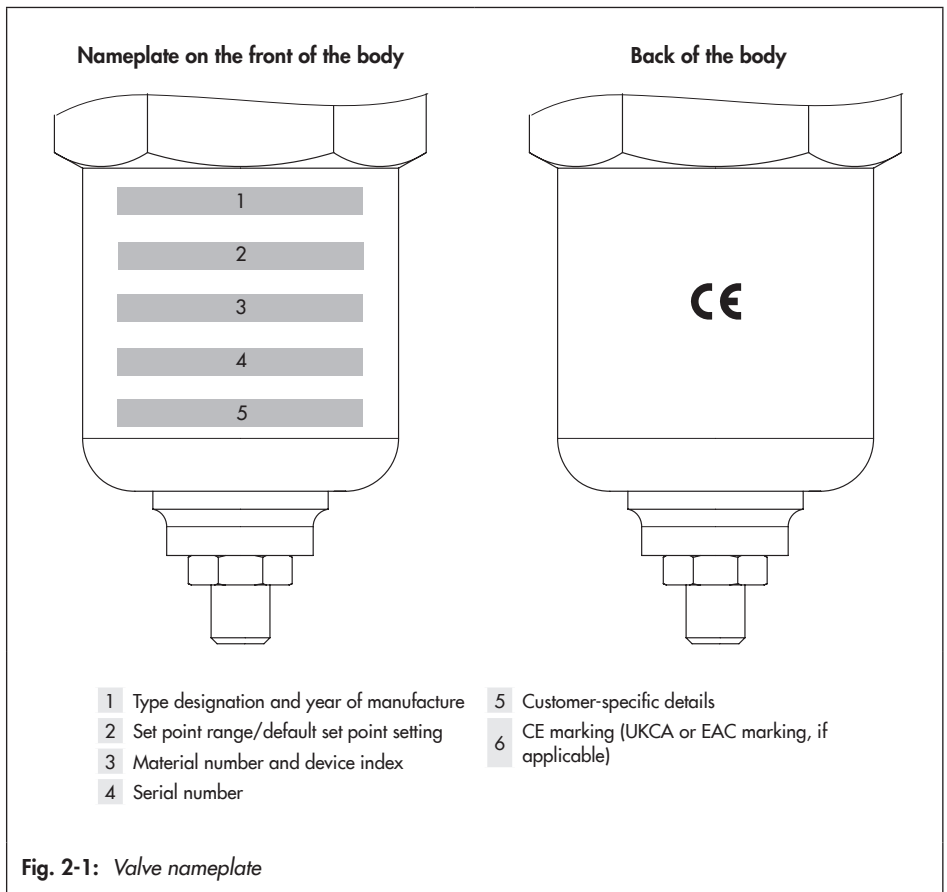
*SAMSON's After-sales Service can support you concerning lubricant, tightening torques and tools approved by SAMSON.*

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## 2 Markings on the device

The nameplate shown was up to date at the time of publication of this document. The nameplate on the device may differ from the one shown.

### 2.1 Nameplate inscriptions



## **2.2 Material identification number**

Contact SAMSON specifying the material number to find out which material is used. The material number is specified on the nameplate (Material number and device index, 3).

For more details on the nameplate, see section 2.1.

### 3 Design and principle of operation

→ See Fig. 3-1

#### Type 2357-1

→ Pressure build-up regulator

Direction of flow from port B to port A. The pressure upstream of the valve (port B) is transmitted to the operating diaphragm. The valve closes when the upstream pressure increases and opens when the upstream pressure drops.

The pressure build-up regulator operates as a safety valve and relieves the pressure chamber upstream of the inlet of pressure when the pressure exceeds the set point by 5 bar. After overcoming the spring force of the top springs (16), the valve opens to equalize the pressures.

→ Pressure reducing valve

Direction of flow from port A to port B. The valve is open when no pressure is applied.

The pressure downstream of the valve (port B) is transmitted to the operating diaphragm (3). The positioning force produced moves the valve plug (2.1) depending on the spring force adjustable at the set point adjuster (10). The valve closes when the pressure downstream of the valve (port B) rises.

#### Type 2357-2

→ Excess pressure valve

Direction of flow always from port A to port B. The valve is closed when no pressure is applied. The pressure at port A is transmitted internally to the operating diaphragm (3). The positioning force produced opposes the adjustable spring force. The valve opens when the pressure increases until the set point is reached.

The regulator can be optionally equipped with a non-return unit (12), which prevents the medium from flowing back through the valve.

#### EC type examination

An EC type examination according to the Pressure Equipment Directive 97/23/EC, Module B has been performed on the regulators (PN 50 version).

## Design and principle of operation

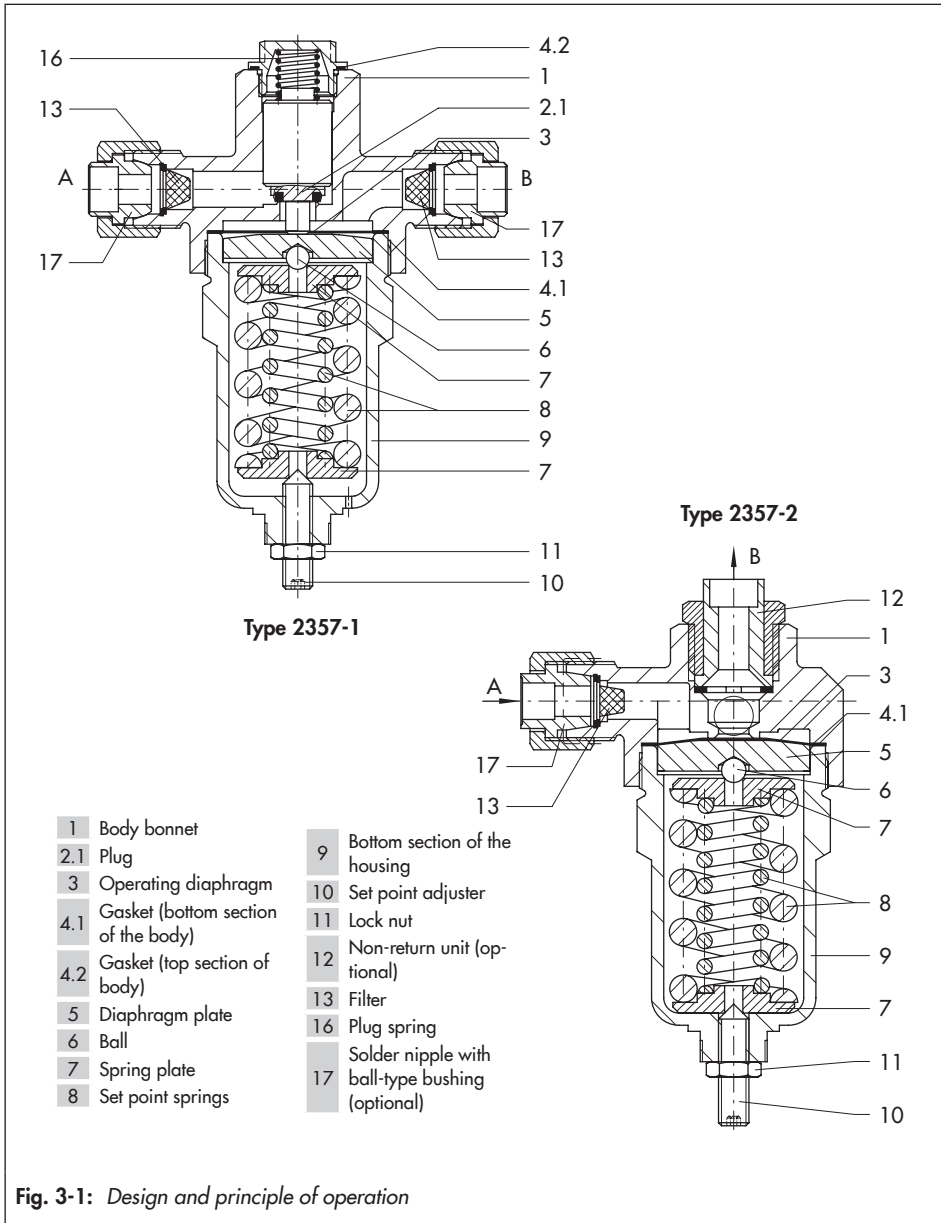


Fig. 3-1: Design and principle of operation



### 3.1 Additional fittings

→ See Fig. 3-2

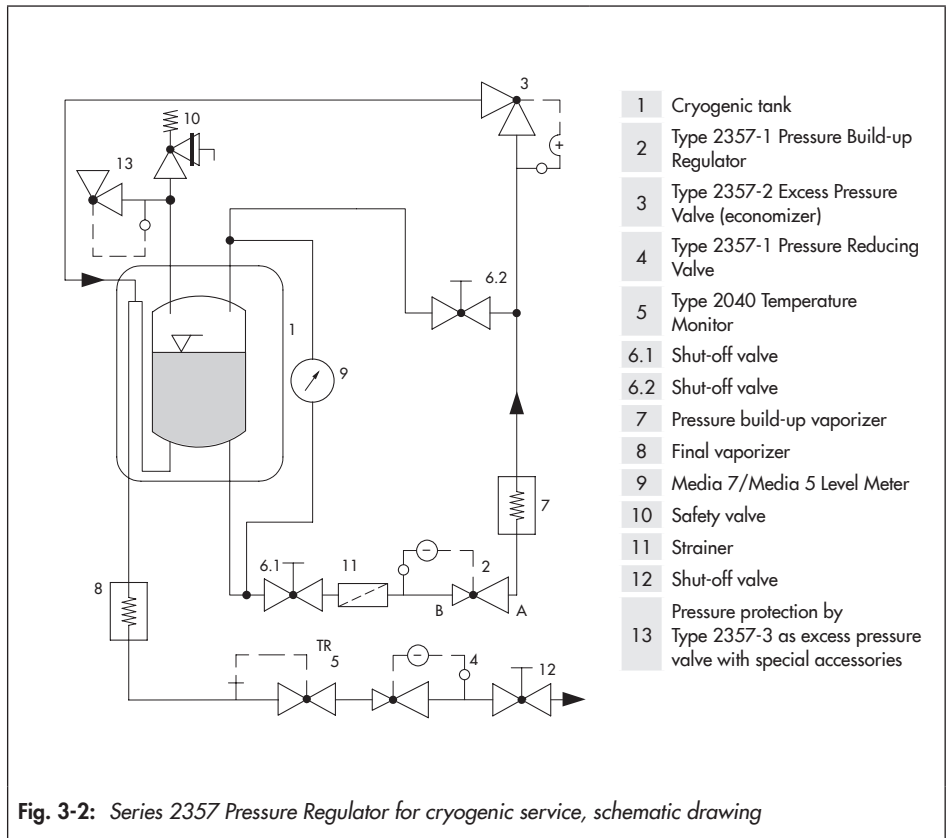
#### Insulation

Regulators can be insulated to reduce heat energy transfer.

Refer to the instructions in the 'Installation' section.

#### Shut-off valves

We recommend installing shut-off valves (6.1, 6.2, 12). Their installation ensures the plant does not be completely shut down for service and repair work on the regulator or when the plant is not operated for extended periods.



### 3.2 Technical data

The regulator nameplate provides information on the regulator version (see the 'Markings on the device' section).

#### **i** Note

More information is available in Data Sheet  
▶ T 2557.

#### Process medium and scope of application

The Type 2357-1 and Type 2357-2 Pressure Regulators are designed to keep the pressure constant to an adjusted set point, especially in cryogenic plants.

- Pressure regulators for **cryogenic gases and liquids as well as other liquids, gases and vapors**
- Temperature range from **-196** to **+200 °C**
- Set points from **0.2** to **40 bar**
- Valve size **G 3/4**
- Pressure rating **PN 40** and **50**

#### **Type 2357-1 (pressure reducing valve):**

**The regulator closes when the downstream pressure rises**

#### **Type 2357-1 (pressure build-up regulator):**

**The regulator opens when the upstream pressure drops**

#### **Type 2357-2 Excess Pressure Valve:**

**The regulator opens when the upstream pressure rises.**

#### Conformity

The Type 2357-1 and Type 2357-2 Regulators bear the CE mark of conformity.



#### EC type examination

An EC type examination according to the Pressure Equipment Directive 97/23/EC, Module B has been performed on the regulators (PN 50 version).

#### Serial number

The devices are marked with a serial number on the nameplate. Details on the nameplate are listed in ▶ EB 2557 .



#### Noise emissions

SAMSON is unable to make general statements about noise emissions. The noise emissions depend on the regulator version, plant facilities, process medium and operating conditions.

#### Dimensions and weights

Table 3-4 provides a summary of the dimensions and weights. The lengths and heights in the dimensional drawings are shown on page 3-6.

**Table 3-1: Technical data · All pressures in bar (gauge)**

Type ... Regulator	2357-1		2357-2	
K <sub>VS</sub> coefficient	0.25	0.8	1.25	0.4
Set point ranges <sup>1)</sup> in bar	1 to 25 · 10 to 36	1 to 8 · 5 to 25 · 8 to 40		1 to 25 · 10 to 36
Pressure rating	PN 40	PN 50 <sup>2)</sup>		PN 40
Max. permissible operating pressure	50 bar			
Max. permissible differential pressure Δp	Type 2357-1	Gases: 30 bar · Liquids: 6 bar		
	Type 2357-2	3 bar (> 3 bar only with special accessories; K <sub>VS</sub> coefficient reduced to 0.02)		
Safety function for Type 2357-1	5 bar above the set point			
Temperature range	-196 to +200 °C			
Conformity	 · 			

<sup>1)</sup> Further set point ranges on request

<sup>2)</sup> For oxygen p<sub>max</sub> = 40 bar

**Table 3-2: Materials · Material numbers according to DIN EN**

Type ... Regulator	2357-1	2357-2
Body and cover	CC754S-GM (brass) <sup>1)</sup>	
Plug	CW602N (brass) with PTFE soft seal	–
Operating diaphragm	CuBe	
Set point springs	Stainless steel 1.4310	
Body gasket	PTFE	

<sup>1)</sup> PN 40: CW617N (brass)

**Table 3-3: Valve versions and end connections**

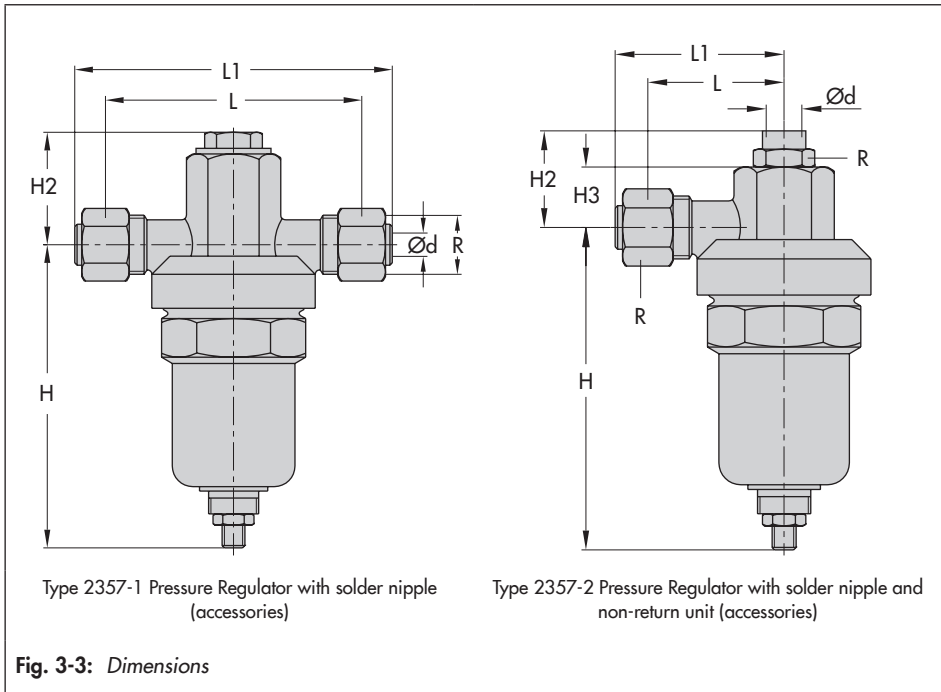
Regulators	Design	Version	Connections	
			Input	Output
Type 2357-1	Pressure build-up regulator/pressure reducing valve	Globe valve	G ¾ A conical joint	
Type 2357-2	Excess pressure valve	Angle valve	G ¾ A conical joint	G ¾ female thread

## Design and principle of operation

**Table 3-4:** Dimensions in mm and weights in kg

Type ... Regulator	2357-1		2357-2	
	PN 40	PN 50	PN 40	PN 50
Length L	110 mm		55 mm	
Length L1	150 mm		75 mm	
Height H	95 mm	140 mm	95 mm	140 mm
Height H2	35 mm	51 mm	40 mm	
Height H3	-		25 mm	
Pipe Ød	15 or 16 mm			
Connection R	G 3/4			
<b>Weight, approx.</b>	0.9 kg	2.0 kg	0.6 kg	1.7 kg

## Dimensional drawings



## 4 Shipment and on-site transport

The work described in this section is only to be performed by personnel appropriately qualified to carry out such tasks.

### 4.1 Accepting the delivered goods

After receiving the shipment, proceed as follows:

1. Check the scope of delivery. Check that the specifications on the nameplate and on the regulator itself match the specifications in the delivery note. See the 'Markings on the device' section for nameplate details.
2. Check the shipment for transportation damage. Report any damage to SAMSON and the forwarding agent (refer to delivery note).
3. Determine the weight and dimensions of the units to be lifted and transported in order to select the appropriate lifting equipment and lifting accessories. Refer to the transport documents and the 'Design and principle of operation' section.

### 4.2 Removing the packaging from the regulator

The regulator is a ready-to-install assembly in the delivered state.

- Do not open or remove the packaging until immediately before lifting to install the regulator into the pipeline.
- Leave the regulator in its transport container or on the pallet to transport it on site.
- Dispose and recycle the packaging in accordance with the local regulations.

### 4.3 Transporting and lifting the regulator

Due to the low service weight, lifting equipment is not required to lift and transport the regulator (e.g. to install it into the pipeline).

- Leave the regulator in its transport container or on the pallet to transport it.
- Observe the transport instructions.

#### Transport instructions

- Protect the regulator against external influences (e.g. impact).
- Do not damage the corrosion protection (paint, surface coatings). Repair any damage immediately.
- Protect the regulator against moisture and dirt.
- The permissible ambient temperature of standard regulators is  $-196$  to  $+200$  °C.

## 4.4 Storing the regulator

---

### **NOTICE**

**Risk of regulator damage due to improper storage.**

- Observe the storage instructions.
- Avoid long storage times.
- Contact SAMSON in case of different storage conditions or longer storage times.

---

### **Storage instructions**

- Protect the regulator against external influences (e.g. impact).
- Secure the regulator in the stored position against slipping or tipping over.
- Do not damage the corrosion protection (paint, surface coatings). Repair any damage immediately.
- Protect the regulator against moisture and dirt. Store it at a relative humidity of less than 75 %. In damp spaces, prevent condensation. If necessary, use a drying agent or heating.
- Make sure that the ambient air is free of acids or other corrosive media.
- The permissible storage temperature of standard regulators is  $-20$  to  $+65$  °C/ $-4$  to  $+150$  °F.
- Do not place any objects on the regulator.

---

### **Note**

We recommend regularly checking the regulator and the prevailing storage conditions during long storage periods.

---

### **Special storage instructions for elastomers**

Elastomer, e.g. O-rings

- We recommend a storage temperature of  $15$  °C/ $60$  °F for elastomers.
- Store elastomers away from lubricants, chemicals, solutions and fuels.

---

### **Tip**

SAMSON's After-sales Service can provide more detailed storage instructions on request.

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## 5 Installation

The work described in this section is only to be performed by personnel appropriately qualified to carry out such tasks.

### 5.1 Installation conditions

#### Work position

The work position for the regulator is the front view onto all operating controls on the regulator (including any additional fittings) seen from the position of operating personnel.

Plant operators must ensure that, after installation of the device, the operating personnel can perform all necessary work safely and easily access the device from the work position.

#### Pipeline routing

The inlet and outlet lengths vary depending on several variables and process conditions and are intended as recommendations. Contact SAMSON if the lengths are significantly shorter than the recommended lengths.

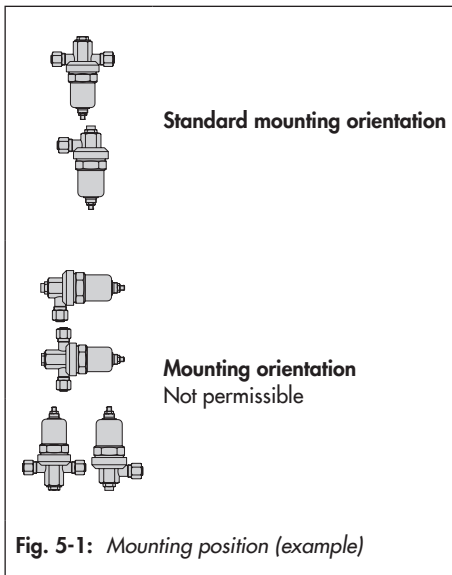
To ensure that the regulator functions properly, proceed as follows:

- Observe the inlet and outlet lengths (see Table 5-1). Contact SAMSON if the regulator conditions or state of the medium process deviate.
- Install the regulator free of stress and with the least amount of vibrations as possible. Read information under 'Mounting position' in this section.
- Install the regulator allowing sufficient space to remove it or to perform service work on it.

#### Mounting position

To ensure that the regulator functions properly, proceed as follows:

- Install horizontally with the spring housing suspended downward (see Fig. 5-1).
- Build-up pressure regulator (Type 2357-1) with safety function: direction of flow from port **B** to port **A**
- Pressure reducing valve (Type 2357-1): 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.
- The ports are marked.
- Contact SAMSON if the mounting position is not as specified above.



## 5.2 Preparation for installation

Before installation, make sure the following conditions are met:

- The regulator is clean and not damaged.
- The regulator data on the nameplate (type designation, valve size, material, pressure rating etc.) match the plant conditions (size and pressure rating of the pipeline, medium temperature etc.). See the 'Markings on the device' section for nameplate details.
- The requested or required additional fittings (see the 'Design and principle of operation' section) have been installed or prepared as necessary before installing the regulator.

Proceed as follows:

- Lay out the necessary material and tools to have them ready during installation work.
- Flush the pipeline **before** installing the regulator.  
The plant operator is responsible for cleaning the pipelines in the plant.
- Check any mounted pressure gauges to make sure they function properly.

### Support or suspension

#### **i Note**

*The plant engineering company is responsible for selecting and implementing a suitable support or suspension of the installed regulator and the pipeline.*

Depending on the regulator version and mounting position, the regulator and pipeline must be supported or suspended.

#### **! NOTICE**

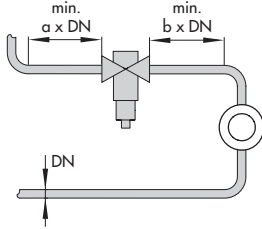
*Do not attach supports directly to the regulator.*

#### **i Note**

*The plant operator is responsible for cleaning the pipelines in the plant.*



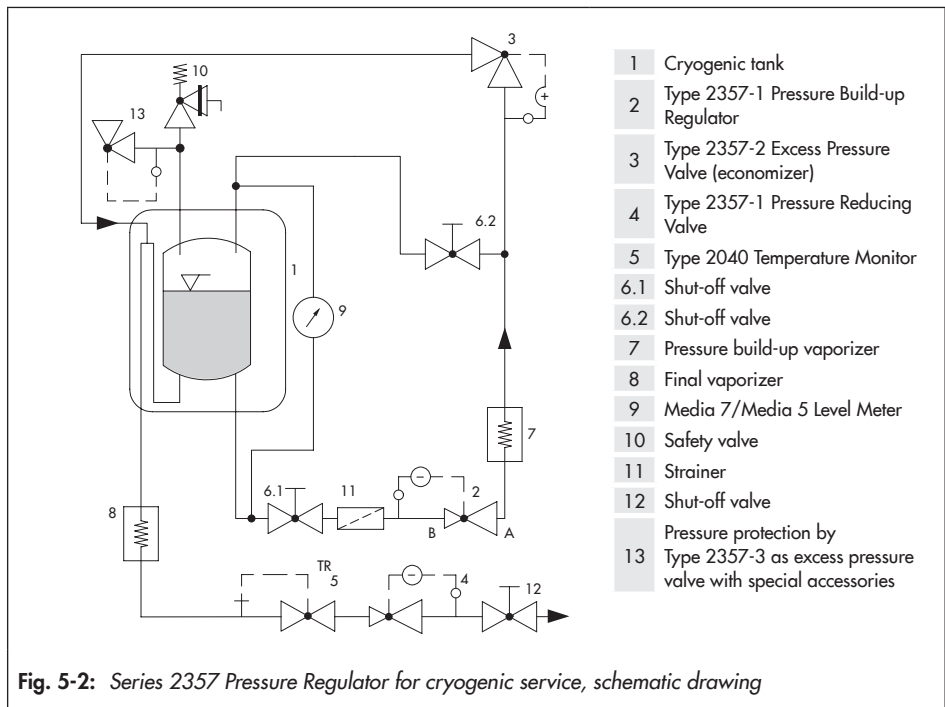
**Table 5-1: Inlet and outlet lengths**



The diagram shows a valve with an inlet pipe on the left and an outlet pipe on the right. The inlet pipe has a length labeled 'min. a x DN'. The outlet pipe has a length labeled 'min. b x DN'. A vertical pipe labeled 'DN' is shown below the inlet pipe.

a Inlet length  
b Outlet length

State of process medium	Valve conditions	Inlet length a	Outlet length b
Gas	$Ma \leq 0.3$	2	4
Vapor	$Ma \leq 0.3$	2	4
Liquid	Free of cavitation/ $w < 3 \text{ m/s}$	2	4
	Cavitation producing noise/ $w \leq 3 \text{ m/s}$	2	4



**Fig. 5-2: Series 2357 Pressure Regulator for cryogenic service, schematic drawing**

### 5.3 Installation activities

In the delivered state, the regulators are packed to be free of oil and grease for oxygen service as ready-to-install assemblies. The activities listed below are necessary for installation and before start-up of the regulators.

---

#### **⚠ WARNING**

***Use of oil and grease in oxygen atmospheres.***

*Risk of explosion!*

- *Make sure that the regulator is absolutely clean and free of oil and grease on installing it.*

---

#### **ⓘ NOTICE**

***Risk of regulator damage due to excessively high or low tightening torques.***

*Observe the specified torques when tightening regulator components. Excessive tightening torques lead to parts wearing out more quickly. Parts that are too loose may cause leakage.*

- *Observe the specified tightening torques (see 'Tightening torques' in Annex).*

---

#### **ⓘ NOTICE**

***Risk of excess pressure damaging plant sections due to construction-related seat leakage through the regulator.***

- *Always install a safety device (e.g. safety excess pressure valve or safety relief valve) in the plant.*

---

#### **ⓘ NOTICE**

***Risk of regulator damage due to the use of unsuitable tools.***

- *Only use tools approved by SAMSON (see 'Tools' in Annex).*

---

#### **ⓘ NOTICE**

***Risk of regulator damage due to the use of unsuitable lubricants.***

- *Only use lubricants approved by SAMSON (see 'Lubricants' in Annex).*
-

### 5.3.1 Installing the regulator

1. Close the shut-off valves upstream and downstream of the regulator while the regulator is being installed.
2. Allow pipelines to reach ambient temperature.
3. Observe the flow direction through the regulator.
4. Bolt the pipe to the valve free of stress.
5. Slowly open the shut-off valves in the pipeline after the regulator has been installed.

### 5.3.2 Cleaning the pipeline

We recommend additionally flushing the pipeline without the installed regulator before start-up. In this case, install a suitable length of pipe into the pipeline in place of the regulator.

- Observe the mesh size of the upstream strainer for the maximum particle size. Use strainers to suit the process medium.
- Check the strainer for dirt each time the pipeline is flushed and clean it, if necessary.

### 5.4 Testing the regulator

---

#### **⚠ DANGER**

***Risk of bursting due to incorrect opening of pressurized equipment or components.***

*Regulators and pipelines are pressure equipment that may burst when handled incorrectly. Flying projectile fragments or the release of process medium under pressure can cause serious injury or even death.*

*Before working on the regulator:*

- *Depressurize all plant sections concerned and the regulator.*
  - *Drain the process medium from all the plant sections concerned as well as the valve.*
- 

---

#### **⚠ DANGER**

***Risk of personal injury due to process medium escaping.***

- *Do not start up the regulator until all parts have been mounted.*
- 

---

#### **⚠ WARNING**

***Risk of hearing loss or deafness due to loud noise.***

*Noise emission (e.g. cavitation or flashing) may occur during operation caused by the process medium and the operating conditions.*

- *Wear hearing protection when working near the regulator.*
-

---

### **⚠ WARNING**

**Risk of burn injuries due to hot or very cold components and pipelines.**

Depending on the process medium, the regulator and pipelines may get very hot or cold and cause burn injuries.

➔ Wear protective clothing and safety gloves.

---

SAMSON regulators are delivered ready for use. To test the regulator functioning before start-up or putting back the regulator into operation, perform the following tests:

### 5.4.1 Leak test

The plant operator is responsible for performing the leak test and selecting the test method. The leak test must comply with the requirements of the national and international standards that apply at the site of installation.

---

### **💡 Tip**

*SAMSON's After-sales Service can support you to plan and perform a leak test for your plant.*

---

1. Slowly open the shut-off valve installed upstream of the regulator.
2. Apply the required test pressure.
3. Check the regulator for leakage to the atmosphere.
4. Depressurize the pipeline section and regulator.

5. Rework any parts that leak and repeat the leak test.

### 5.4.2 Pressure test

---

#### **i Note**

*The plant operator is responsible for performing the pressure test. SAMSON's After-sales Service can support you to plan and perform a pressure test for your plant.*

---

#### **⚠ NOTICE**

**Risk of regulator damage due to a sudden pressure increase and resulting high flow velocities.**

➔ *Slowly open the shut-off valves.*

---

During the pressure test, make sure the following conditions are met:

- ➔ Do not allow the pressure to exceed the 1.5 times the pressure rating of the regulator body.
- ➔ The regulator must remain open.
- ➔ Make sure that the pressure rises simultaneously upstream and downstream of the regulator to avoid damaging the plug.

## 6 Start-up

The work described in this section is only to be performed by personnel appropriately qualified to carry out such tasks.

### **⚠ DANGER**

**Risk of personal injury due to process medium escaping.**

→ Do not start up the regulator until all parts have been mounted.

### **⚠ WARNING**

**Risk of burn injuries due to hot or cold components and pipeline.**

Regulator components and the pipeline may become very hot or cold. Risk of burn injuries.

- Allow components and pipelines to cool down or warm up to the ambient temperature.
- Wear protective clothing and safety gloves.

### **⚠ WARNING**

**Risk of hearing loss or deafness due to loud noise.**

Noise emission (e.g. cavitation or flashing) may occur during operation caused by the process medium and the operating conditions.

- Wear hearing protection when working near the valve.

### **ⓘ NOTICE**

**Risk of impaired functioning of the regulator and leakage at the joint due to installation under tension.**

- Bolt the regulator to the pipeline free of stress.
- If necessary, support the pipelines near to the connections.
- Do not attach supports directly to the valve or control thermostat.

Before start-up or putting the regulator back into service, make sure the following conditions are met:

- The regulator is properly installed into the pipeline (see the 'Installation' section).
- The leak and function tests have been completed successfully (see the 'Testing the regulator' section).
- The prevailing conditions in the plant section concerned meet the regulator sizing requirements (see information under 'Intended use' in the 'Safety instructions and measures' section).

### 6.1 Start-up and putting the device back into operation

1. Depending on the field of application, allow the regulator to cool down or warm up to reach ambient temperature before start up.
2. Slowly open the shut-off valves in the pipeline. Slowly opening these valves prevents a sudden surge in pressure and high flow velocities which can damage the valve.
3. Check the regulator to ensure it functions properly.

### 6.2 Starting up the plant when vapors and liquids are controlled

1. Open the shut-off valves slowly preferably starting from the upstream pressure side. Open all shut-off valves upstream of the tank.
2. Fill the plant **slowly** with the process medium. Avoid pressure surges.
3. Make sure that the pressure rises simultaneously upstream and downstream of the regulator to avoid damaging the plug.
4. To start up the regulator, open shut-off valves **slowly**.
5. Check the adjusted pressure set point at the pressure gauge installed near the regulator.

## 7 Operation

Immediately after completing start-up or placing the regulator back into service (see the 'Start-up' section), the regulator is ready for use.

### **⚠ WARNING**

#### **Risk of burn injuries due to hot or cold components and pipeline.**

*Regulator components and the pipeline may become very hot or cold. Risk of burn injuries.*

- Allow components and pipelines to cool down or warm up to the ambient temperature.
- Wear protective clothing and safety gloves.

### **⚠ WARNING**

#### **Risk of hearing loss or deafness due to loud noise.**

*Noise emission (e.g. cavitation or flashing) may occur during operation caused by the process medium and the operating conditions.*

- Wear hearing protection when working near the valve.

## 7.1 Adjusting the set point

Every pressure regulator is delivered with the set point listed in Fig. 7-1 already adjusted.

Turn the set point adjuster (10) using an Allen key (width across flats 5) to change the default set point.

### Set point adjuster

- Turn the set point adjuster clockwise (↻) to increase the pressure set point.
- Turn the set point adjuster counterclockwise (↺) to reduce the pressure set point.

Provided a pressure gauge has been installed at a suitable point in the plant, the required set point can be directly adjusted while monitoring the pressure reading at the gauge.

When a pressure gauge is not installed, adjust the set point using the adjustment diagram Fig. 7-1.

### **⚠ NOTICE**

#### **Set point adjuster screwed too tight.**

*The regulator is blocked and the medium flow through it is restricted. Pressure regulation is no longer possible.*

- Only screw the set point adjuster up to the point where the spring tension can still be felt.

### How to proceed:

1. Loosen the lock nut (11, width across flats 17) to allow the set point adjuster to move freely.
2. Determine the difference between the preadjusted set point (Fig. 7-1) and the required set point. Turn the set point adjuster (10) the required amount of turns as specified in Fig. 7-1.  
Any subsequent change to the set point can be also be made by determining the required number of turns using the specifications listed in Fig. 7-1.
3. Lock the setting with the lock nut (11).

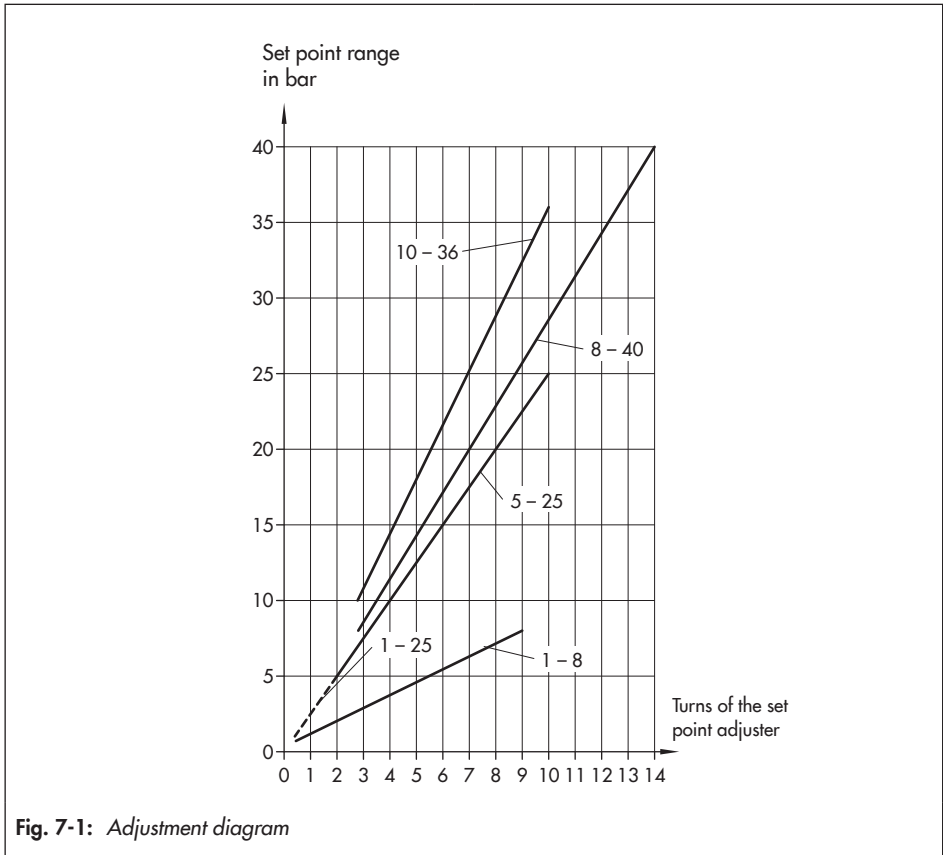


Fig. 7-1: Adjustment diagram

Table 7-1: Set point adjustment

Pressure rating	PN 40			PN 50				
	0.2 to 3 bar	1 to 25 bar	10 to 36 bar	0.2 to 2.5 bar	1 to 8 bar	5 to 25 bar	8 to 40 bar	
Set point range								
Set point adjusted at the factory (approx.)	2357-1	1 bar	12 bar	20 bar	1 bar	3 bar	12 bar	25 bar
	2357-2	1 bar	13 bar	21 bar	1 bar	4 bar	13 bar	26 bar
Set point change per turn	0.4 bar	2.5 bar	3.5 bar	0.4 bar	1 bar	2.5 bar	3.5 bar	



## 8 Malfunctions

### 8.1 Troubleshooting

#### 8.1.1 Type 2357-1 as pressure reducing valve

Malfunction	Possible reasons	Recommended action
Pressure exceeds the adjusted set point.	Seat and plug are worn or leak.	<ul style="list-style-type: none"> <li>→ Clean the seat and plug.</li> <li>→ Replace the damaged plug.</li> <li>→ Contact SAMSON's After-sales Service.</li> </ul>
	Foreign particles blocking the plug	<ul style="list-style-type: none"> <li>→ Remove foreign particles.</li> <li>→ Replace damaged parts.</li> <li>→ Contact SAMSON's After-sales Service.</li> </ul>
	$K_{VS}/C_V$ coefficient too large	<ul style="list-style-type: none"> <li>→ Check the sizing.</li> <li>→ Change <math>K_{VS}/C_V</math> coefficient, if necessary or install a different sized regulator.</li> <li>→ Contact SAMSON's After-sales Service.</li> </ul>
	Spring frozen due to condensate collecting in the spring housing.	<ul style="list-style-type: none"> <li>→ Allow the regulator to thaw or use a heat to melt the ice.</li> <li>→ Contact SAMSON's After-sales Service.</li> </ul>
Pressure drops below the adjusted set point.	Valve installed against the flow.	<ul style="list-style-type: none"> <li>→ Install the valve so that the direction of flow matches the direction indicated by the arrow on the body.</li> </ul>
	Strainer blocked.	<ul style="list-style-type: none"> <li>→ Clean the strainer.</li> </ul>
	A safety device has been triggered.	<ul style="list-style-type: none"> <li>→ Check plant. Unlock safety device (where necessary).</li> </ul>
	$K_{VS}/C_V$ coefficient too small	<ul style="list-style-type: none"> <li>→ Check the sizing.</li> <li>→ Change <math>K_{VS}/C_V</math> coefficient, if necessary or install a different sized regulator.</li> <li>→ Contact SAMSON's After-sales Service.</li> </ul>
	Foreign particles blocking the plug	<ul style="list-style-type: none"> <li>→ Remove foreign particles.</li> <li>→ Replace damaged parts.</li> <li>→ Contact SAMSON's After-sales Service.</li> </ul>
Pressure fluctuates.	$K_{VS}/C_V$ coefficient too large	<ul style="list-style-type: none"> <li>→ Check the sizing.</li> <li>→ Change <math>K_{VS}/C_V</math> coefficient, if necessary or install a different sized regulator.</li> <li>→ Contact SAMSON's After-sales Service.</li> </ul>
Jerky control response	Increased friction, e.g. due to foreign particles between seat and plug.	<ul style="list-style-type: none"> <li>→ Remove foreign particles.</li> <li>→ Replace damaged parts.</li> <li>→ Contact SAMSON's After-sales Service.</li> </ul>

## Malfunctions

Malfunction	Possible reasons	Recommended action
Loud flow-induced noise	High flow velocity, cavitation.	<ul style="list-style-type: none"> <li>→ Check the sizing.</li> <li>→ Install larger regulator, if necessary.</li> </ul>

### 8.1.2 Type 2357-1 as pressure build-up regulator

Malfunction	Possible reasons	Recommended action
Pressure exceeds the adjusted set point.	Seat and plug are worn or leak.	<ul style="list-style-type: none"> <li>→ Clean the seat and plug.</li> <li>→ Replace the damaged plug.</li> <li>→ Contact SAMSON's After-sales Service.</li> </ul>
	Foreign particles blocking the plug	<ul style="list-style-type: none"> <li>→ Remove foreign particles.</li> <li>→ Replace damaged parts.</li> <li>→ Contact SAMSON's After-sales Service.</li> </ul>
	$K_{VS}/C_V$ coefficient too large	<ul style="list-style-type: none"> <li>→ Check the sizing.</li> <li>→ Change <math>K_{VS}/C_V</math> coefficient, if necessary or install a different sized regulator.</li> <li>→ Contact SAMSON's After-sales Service.</li> </ul>
	A safety device has been triggered.	<ul style="list-style-type: none"> <li>→ Check plant. Unlock safety device (where necessary).</li> </ul>
	Spring frozen due to condensate collecting in the spring housing.	<ul style="list-style-type: none"> <li>→ Allow the regulator to thaw or use a heat to melt the ice.</li> <li>→ Contact SAMSON's After-sales Service.</li> </ul>
Pressure drops below the adjusted set point.	Valve installed against the flow.	<ul style="list-style-type: none"> <li>→ Install the valve so that the direction of flow matches the direction indicated by the arrow on the body.</li> </ul>
	Strainer blocked.	<ul style="list-style-type: none"> <li>→ Clean the strainer.</li> </ul>
	$K_{VS}/C_V$ coefficient too small	<ul style="list-style-type: none"> <li>→ Check the sizing.</li> <li>→ Change <math>K_{VS}/C_V</math> coefficient, if necessary or install a different sized regulator.</li> <li>→ Contact SAMSON's After-sales Service.</li> </ul>
	Foreign particles blocking the plug	<ul style="list-style-type: none"> <li>→ Remove foreign particles.</li> <li>→ Replace damaged parts.</li> <li>→ Contact SAMSON's After-sales Service.</li> </ul>
Pressure fluctuates.	$K_{VS}/C_V$ coefficient too large	<ul style="list-style-type: none"> <li>→ Check the sizing.</li> <li>→ Change <math>K_{VS}/C_V</math> coefficient, if necessary or install a different sized regulator.</li> <li>→ Contact SAMSON's After-sales Service.</li> </ul>
Jerky control response	Increased friction, e.g. due to foreign particles between seat and plug.	<ul style="list-style-type: none"> <li>→ Remove foreign particles.</li> <li>→ Replace damaged parts.</li> <li>→ Contact SAMSON's After-sales Service.</li> </ul>

Malfunction	Possible reasons	Recommended action
Loud flow-induced noise	High flow velocity, cavitation.	<ul style="list-style-type: none"> <li>→ Check the sizing.</li> <li>→ Install larger regulator, if necessary.</li> </ul>

### 8.1.3 Type 2357-2 as excess pressure valve

Malfunction	Possible reasons	Recommended action
Pressure exceeds the adjusted set point.	Seat and ball are worn or leak.	<ul style="list-style-type: none"> <li>→ Clean the seat and ball.</li> <li>→ Contact SAMSON's After-sales Service.</li> </ul>
	Foreign particles blocking the plug	<ul style="list-style-type: none"> <li>→ Remove foreign particles.</li> <li>→ Replace damaged parts.</li> <li>→ Contact SAMSON's After-sales Service.</li> </ul>
	A safety device has been triggered.	<ul style="list-style-type: none"> <li>→ Check plant. Unlock safety device (where necessary).</li> </ul>
	$K_{VS}/C_V$ coefficient too small	<ul style="list-style-type: none"> <li>→ Check the sizing.</li> <li>→ Change <math>K_{VS}/C_V</math> coefficient, if necessary or install a different sized regulator.</li> <li>→ Contact SAMSON's After-sales Service.</li> </ul>
	Spring frozen due to condensate collecting in the spring housing.	<ul style="list-style-type: none"> <li>→ Allow the regulator to thaw or use a heat to melt the ice.</li> <li>→ Contact SAMSON's After-sales Service.</li> </ul>
Pressure drops below the adjusted set point.	Strainer blocked.	<ul style="list-style-type: none"> <li>→ Clean the strainer.</li> </ul>
	$K_{VS}/C_V$ coefficient too large	<ul style="list-style-type: none"> <li>→ Check the sizing.</li> <li>→ Change <math>K_{VS}/C_V</math> coefficient, if necessary or install a different sized regulator.</li> <li>→ Contact SAMSON's After-sales Service.</li> </ul>
	Foreign particles blocking the plug	<ul style="list-style-type: none"> <li>→ Remove foreign particles.</li> <li>→ Replace damaged parts.</li> <li>→ Contact SAMSON's After-sales Service.</li> </ul>
Upstream pressure fluctuates	$K_{VS}/C_V$ coefficient too large	<ul style="list-style-type: none"> <li>→ Check the sizing.</li> <li>→ Change <math>K_{VS}/C_V</math> coefficient, if necessary or install a different sized regulator.</li> <li>→ Contact SAMSON's After-sales Service.</li> </ul>
Jerky control response	Increased friction, e.g. due to foreign particles between seat and plug.	<ul style="list-style-type: none"> <li>→ Remove foreign particles.</li> <li>→ Replace damaged parts.</li> <li>→ Contact SAMSON's After-sales Service.</li> </ul>
Loud flow-induced noise	High flow velocity, cavitation.	<ul style="list-style-type: none"> <li>→ Check the sizing.</li> <li>→ Install larger regulator, if necessary.</li> </ul>

---

### Note

Contact SAMSON's After-sales Service for malfunctions not listed in the tables.

---

The malfunctions listed in section 8.1 are caused by mechanical faults and incorrect regulator sizing. In the simplest case, the functioning can be restored following the recommended action. Special tools may be required to rectify the fault.

Exceptional operating and installation conditions may lead to changed situations that may affect the control response and lead to malfunctions. For troubleshooting, the conditions, such as installation, process medium, temperature and pressure conditions, must be taken into account.

---

### Tip

SAMSON's After-sales Service can support you in drawing up an inspection and test plan for your plant.

---

## 8.2 Emergency action

Plant operators are responsible for emergency action to be taken in the plant.

We recommend removing the regulator from the pipeline before repairing it.

In the event of a regulator malfunction:

1. Close the shut-off valves upstream and downstream of the regulator to stop the process medium from flowing through the regulator.
2. Perform troubleshooting (see section 8.1).
3. Rectify those malfunctions that can be remedied based on the instructions provided here. Contact SAMSON's After-sales Service in all other cases.

### **Putting the regulator back into operation after a malfunction**

See the 'Start-up' section.

## 9 Servicing

The regulator does not require any maintenance. Nevertheless, it is subject to natural wear, particularly at the seat, plug and operating diaphragm. Depending on the operating conditions, check the regulator at regular intervals to avoid possible malfunctions.

Plant operators are responsible for drawing up an inspection and test plan. Details on faults and how to remedy them can be found in the 'Malfunctions' section.

The work described in this section is only to be performed by personnel appropriately qualified to carry out such tasks.

We recommend removing the regulator from the pipeline before performing any maintenance or service work.

---

### **⚠ WARNING**

**Risk of burn injuries due to hot or cold components and pipeline.**

*Regulator components and the pipeline may become very hot or cold. Risk of burn injuries.*

- ➔ *Allow components and pipelines to cool down or warm up to the ambient temperature.*
  - ➔ *Wear protective clothing and safety gloves.*
- 

### **⚠ WARNING**

**Risk of personal injury due to residual process medium in the regulator.**

*While working on the regulator, residual process medium can escape and, depending on its properties, may lead to personal injury, e.g. (chemical) burns.*

- ➔ *Wear protective clothing, safety gloves and eye protection.*
- 

### **ⓘ NOTICE**

**Risk of regulator damage due to excessively high or low tightening torques.**

*Observe the specified torques when tightening regulator components. Excessive tightening torques lead to parts wearing out more quickly. Parts that are too loose may cause leakage.*

- ➔ *Observe the specified tightening torques (see 'Tightening torques' in Annex).*
-

### **NOTICE**

**Risk of regulator damage due to the use of unsuitable tools.**

→ Only use tools approved by SAMSON (see 'Tools' in Annex).

### **NOTICE**

**Risk of regulator damage due to the use of unsuitable lubricants.**

→ Only use lubricants approved by SAMSON (see 'Lubricants' in Annex).

### **Note**

**The regulator was checked by SAMSON before it left the factory.**

- Certain test results certified by SAMSON lose their validity when the regulator is opened. Such testing includes seat leakage and leak tests.
- The product warranty becomes void if service or repair work not described in these instructions is performed without prior agreement by SAMSON's After-sales Service.
- Only use original spare parts by SAMSON, which comply with the original specifications.

### **Note**

Check the filters in ports A and B for dirt and, if necessary, clean them.

### **Tip**

SAMSON's After-sales Service can support you in drawing up an inspection and test plan for your plant.

### **Legend for Fig. 9-1**

- |     |   |
|-----|---|
| 1   | Top section of body                             |
| 2.1 | Plug  |
| 3   | Operating diaphragm                             |
| 4.1 | Gasket (bottom section of the body)             |
| 4.2 | Gasket (top section of the body)                |
| 5   | Diaphragm plate                                 |
| 6   | Ball  |
| 7   | Spring plate                                    |
| 8   | Set point springs                               |
| 9   | Bottom section of the body                      |
| 10  | Set point adjuster                              |
| 11  | Lock nut  |
| 12  | Non-return unit (optional)                      |
| 13  | Filter  |
| 16  | Plug spring                                     |
| 17  | Solder nipple with ball-type bushing (optional) |

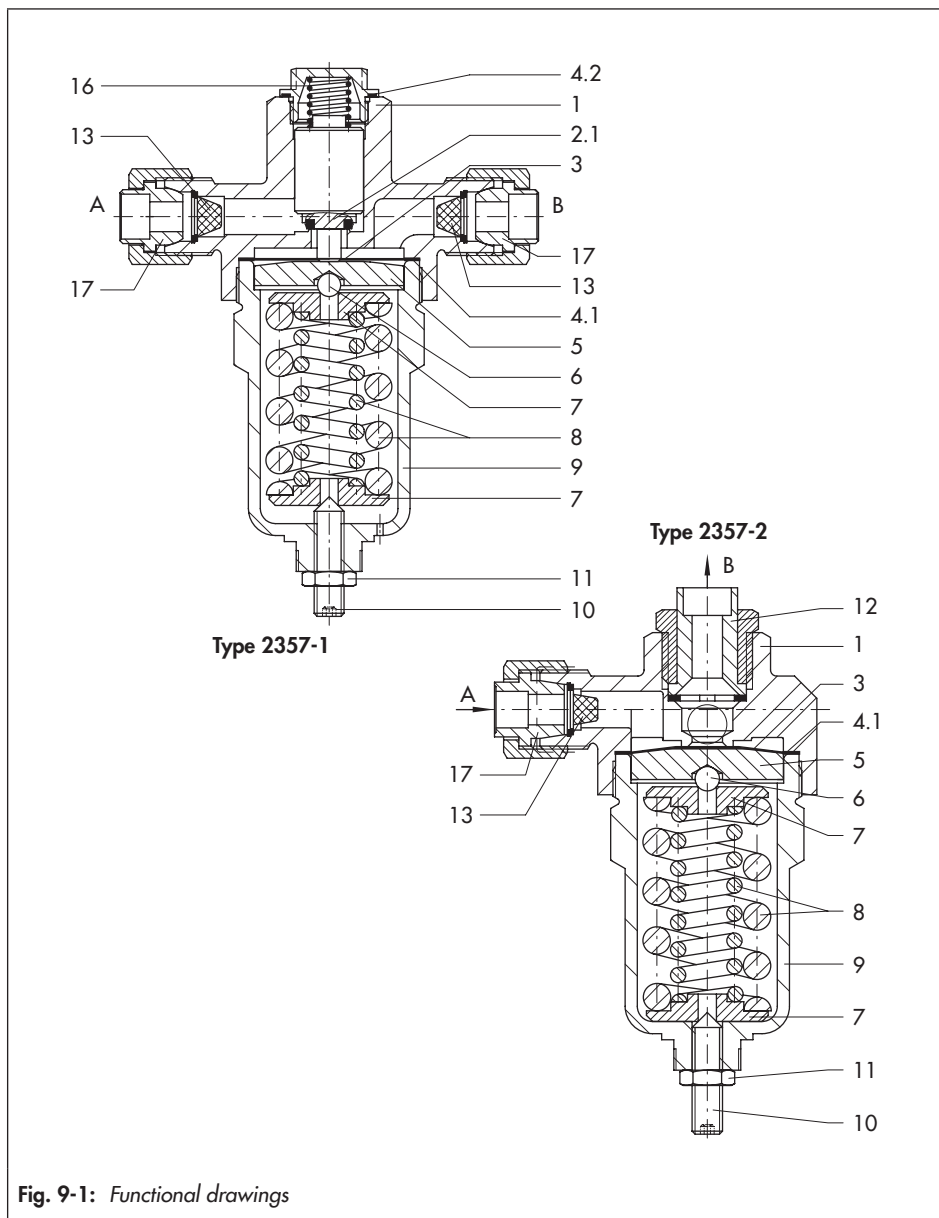


Fig. 9-1: Functional drawings

### 9.1 Preparing the valve for service work

1. Lay out the necessary material and tools to have them ready for the service work.
2. Put the regulator out of operation (see the 'Decommissioning' section).



#### Tip

*We recommend removing the regulator from the pipeline before performing any service work (see the 'Removing the regulator from the pipeline' section).*

---

The following service work can be performed after preparation is completed:

- Change set point range (see section 9.4)
- Clean and exchange the seat and plug (see section 9.5)

### 9.2 Installing the regulator after service work

- Put the regulator back into operation (see the 'Start-up' section). Make sure the requirements and conditions for start-up or putting the valve back into operation are met.

### 9.3 Service work

- Before performing any service work, preparations must be made to the regulator (see section 9.1).
- After all service work is completed, check the regulator before putting it back into operation (see 'Testing the regulator' in the 'Installation' section).



## 9.4 Changing the set point range

The set point ranges adjusted in the factory can be changed by changing the set point springs (8) and operating diaphragm (3) (► T 2570).

### Removing the set point springs

1. Put the regulator out of operation (see the 'Decommissioning' section).
2. Loosen lock nut (11) and relieve the tension from the set point springs (8) by turning the set point adjuster (10) counterclockwise (↺) as far as it will go.
3. Place the bottom section of the body (9) into a vise, but do not clamp it. Preferably use a box wrench (size 55 mm). Unscrew the body (1) using an open-end wrench (size 36 mm).
4. Remove the operating diaphragm (3), ball (6), diaphragm plate (5) and spring plate (7). Be careful not to damage the operating diaphragm (3).
5. Remove the set point springs (8).

### Mounting the set point springs

1. Insert the set point springs (8) for the required set point range.
2. Place spring plates (7), ball (6) and diaphragm plate (5) onto the set point springs (8) and insert into the bottom section of the body (9).
3. Place the required number of diaphragms onto the diaphragm plate (depending on the set point).
4. Renew the PTFE gasket (4.1) in the top section of the body (1).
5. Place on the top section of the body (1) and fasten it with the bottom section (9). Observe the specified tightening torques (see 'Tightening torques' in Annex).
6. Put the regulator back into operation (see the 'Start-up' section).

## 9.5 Cleaning and exchanging the seat and plug

Contact SAMSON's After-sales Service for more information on cleaning and exchanging the seat and plug.

### 9.6 Ordering spare parts and operating supplies

Contact your nearest SAMSON subsidiary or SAMSON's After-sales Service for information on spare parts, lubricants and tools.

#### Spare parts

See Annex and Data Sheet (▶ T 2570) for details on spare parts.

#### Lubricant

Contact SAMSON's After-sales Service for more information on lubricants.

#### Tools

Contact SAMSON's After-sales Service for more information on tools.

## 10 Decommissioning

The work described in this section is only to be performed by personnel appropriately qualified to carry out such tasks.

### **⚠ DANGER**

#### ***Risk of bursting due to incorrect opening of pressurized equipment or components.***

*Regulators and pipelines are pressure equipment that may burst when handled incorrectly. Flying projectile fragments or the release of process medium under pressure can cause serious injury or even death.*

#### ***Before working on the regulator:***

- *Depressurize all plant sections concerned and the regulator.*
- *Drain the process medium from all the plant sections affected as well as the regulator.*

### **⚠ WARNING**

#### ***Risk of burn injuries due to hot or cold components and pipeline.***

*Regulator components and the pipeline may become very hot or cold. Risk of burn injuries.*

- *Allow components and pipelines to cool down or warm up to the ambient temperature.*
- *Wear protective clothing and safety gloves.*

### **⚠ WARNING**

#### ***Risk of hearing loss or deafness due to loud noise.***

*Noise emission (e.g. cavitation or flashing) may occur during operation caused by the process medium and the operating conditions.*

- *Wear hearing protection when working near the regulator.*

### **⚠ WARNING**

#### ***Risk of personal injury due to residual process medium in the regulator.***

*While working on the regulator, residual process medium can escape and, depending on its properties, may lead to personal injury, e.g. (chemical) burns.*

- *Wear protective clothing, safety gloves and eye protection.*

To decommission the regulator for service work or disassembly, proceed as follows:

1. Close the shut-off valves on the downstream and upstream side of the plant.
2. Completely drain the pipelines and regulator.
3. Depressurize the plant.
4. Allow the pipeline and regulator components to cool down or warm up to the ambient temperature.



## 11 Removal

The work described in this section is only to be performed by personnel appropriately qualified to carry out such tasks.

### **⚠ WARNING**

#### ***Risk of burn injuries due to hot or cold components and pipeline.***

*Regulator components and the pipeline may become very hot or cold. Risk of burn injuries.*

- *Allow components and pipelines to cool down or warm up to the ambient temperature.*
- *Wear protective clothing and safety gloves.*

### **⚠ WARNING**

#### ***Risk of personal injury due to residual process medium in the regulator.***

*While working on the regulator, residual process medium can escape and, depending on its properties, may lead to personal injury, e.g. (chemical) burns.*

- *Wear protective clothing, safety gloves and eye protection.*

Before removing the valve, make sure the following conditions are met:

- The regulator is put out of operation (see the 'Decommissioning' section).

### 11.1 Removing the regulator from the pipeline

1. Support the regulator to hold it in place when separated from the pipeline (see the 'Shipment and on-site transport' section).
2. Undo the pipe connections.
3. Remove the regulator from the pipeline (see the 'Shipment and on-site transport' section).



## 12 Repairs

If the regulator does not function properly according to how it was originally sized or does not function at all, it is defective and must be repaired or exchanged.

### **!** NOTICE

**Risk of regulator damage due to incorrect service or repair work.**

- Do not perform any repair work on your own.
- Contact SAMSON's After-sales Service for repair work.

### 12.1 Returning devices to SAMSON

Defective devices can be returned to SAMSON for repair.

Proceed as follows to return devices:

4. Exceptions apply concerning some special device models
  - ▶ [www.samsongroup.com](http://www.samsongroup.com) > Service & Support > After-sales Service.
5. Send an e-mail
  - ▶ [retouren@samsongroup.com](mailto:retouren@samsongroup.com) to register the return shipment including the following information:

- Type
- Article no.
- Material number
- Original order
- Completed Declaration on Contamination, which can be downloaded from our website at
  - ▶ [www.samsongroup.com](http://www.samsongroup.com) > Service & Support > After-sales Service.

**After checking your registration, we will send you a return merchandise authorization (RMA).**

6. Attach the RMA (together with the Declaration on Decontamination) to the outside of your shipment so that the documents are clearly visible.
7. Send the shipment to the address given on the RMA.

### **i** Note

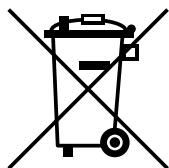
*Further information on returned devices and how they are handled can be found at*

- ▶ [www.samsongroup.com](http://www.samsongroup.com) > Service & Support > After-sales Service.





## 13 Disposal



SAMSON is a producer registered at the following European institution ► <https://www.ewrn.org/national-registers/national-registers>.  
WEEE reg. no.:  
DE 62194439/FR 025665

- Observe local, national and international refuse regulations.
- Do not dispose of components, lubricants and hazardous substances together with your other household waste.

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### **i** Note

*We can provide you with a recycling passport according to PAS 1049 on request. Simply e-mail us at [offersaleservice@samsongroup.com](mailto:offersaleservice@samsongroup.com) giving details of your company address.*

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### Tip

*On request, we can appoint a service provider to dismantle and recycle the product as part of a distributor take-back scheme.*

---



## 14 Certificates

The EU and UKCA declarations of conformity are included on the next pages:

- EU declaration of conformity in compliance with Pressure Equipment Directive 2014/68/EU on page 14-2.
- EC-type examination according to Directive 97/23/EC, see page 14-3.
- EU declaration of conformity in compliance with Machinery Directive 2006/42/EC for Type 2357-1 and Type 2357-2 Regulators on page 14-4.
- UKCA declaration of conformity in compliance with Directive 2016 No. 1105 on page 14-6.
- UKCA declaration of conformity in compliance with Directive 2008 No. 1597 for Type 2357-1 and Type 2357-2 Regulators on page 14-7.

### 14.1 Information on the UK sales region

The following information corresponds to the Pressure Equipment (Safety) Regulations 2016, STATUTORY INSTRUMENTS, 2016 No. 1105 (UKCA marking). It does not apply to Northern Ireland.

#### Importer

SAMSON Controls Ltd  
Perrywood Business Park  
Honeycrock Lane  
Redhill, Surrey RH1 5JQ

Phone: +44 1737 766391

E-mail: [sales-uk@samsongroup.com](mailto:sales-uk@samsongroup.com)

Website: [uk.samsongroup.com](http://uk.samsongroup.com)

EU DECLARATION OF CONFORMITY  
TRANSLATION



**Module D, No. / N° CE-0062-PED-D-SAM 001-22-DEU**

For the following products, SAMSON hereby declares under its sole responsibility:

**Pressure Regulator PR 2357-1, -11, -2-, -21, -3**

the conformity with the following requirement.

Directive of the European Parliament and of the Council on the harmonization of the laws of the Member States relating to the making available on the market of pressure equipment. 2014/68/EU of 15 May 2014

EC Type Examination Certificate Module B Certificate no. 01 202 969/B-22-0002

Conformity assessment procedure applied Module D Certificate no. CE-0062-PED-D-SAM-001-22-DEU

The design is based on the procedures specified in the following standards:  
DIN EN 12516-3 or ASME B16.24

The manufacturer's quality management system is monitored by the following notified body:

**Bureau Veritas Services SAS, 8 Cours du Triangle, 92800 PUTEAUX – LA DEFENSE, France  
Manufacturer: SAMSON AG, Weismüllerstraße 3, 60314 Frankfurt am Main, Germany**

Frankfurt am Main, 01. December 2022

Norbert Tollas  
Senior Vice President  
Global Operations

Peter Scheermesser  
Director  
Product Maintenance & Engineered Products

Revision 05

# Zertifikat

## EG-Baumusterprüfung nach Richtlinie 97/23/EG

Zertifikat Nr.: 01 202 931-B-10-16

Name und Anschrift des  
Herstellers:

**Samson AG**  
**Weismüllerstraße 3**  
**60314 Frankfurt**

Hiermit wird bescheinigt, dass das unten genannte  
EG-Baumuster die Anforderungen der Richtlinie  
97/23/EG erfüllt.

Geprüft nach Richtlinie 97/23/EG:

**EG-Baumusterprüfung (Modul B)**

Prüfbericht Nr.:

V 373 2010 B2 vom 19.11.2010

Beschreibung des Baumuster:

**Sicherheitsdruckregler ohne Hilfsenergie**  
**Sicherheitsüberströmventile ohne Hilfsenergie**

Typbezeichnung

2357 ...

Fertigungsstätte/Lieferer:

**Samson AG**  
**Weismüllerstraße 3**  
**60314 Frankfurt**

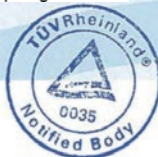
Gültig bis:

11/2020

Das CE-Zeichen darf erst am Produkt angebracht und die Konformitätserklärung erst  
ausgestellt werden, wenn ein korrespondierendes Konformitätsbewertungsverfahren der  
Richtlinie 97/23/EG bezogen auf Produktion/Produkt vollständig erfüllt ist.

Köln, 19.11.2010

Dpl.-Ing. H. Peters



TÜV Rheinland-Zertifizierungsstelle  
für Druckgeräte der  
TÜV Rheinland Industrie Service GmbH  
Benannte Stelle, Kennnummer: 0035  
Am Grauen Stein, D-51105 Köln

TÜV Rheinland Energie und Umwelt GmbH  
Am Grauen Stein, 51105 Köln, Tel: ++49-221-806-2756, Fax: ++49-221-806-1349, e-mail: enertest.de.tuv.com  
D-011-Rev9

www.tuv.com

 **TÜVRheinland®**  
Genau. Richtig.

EU DECLARATION OF CONFORMITY  
TRANSLATION



**Declaration of Conformity of Final Machinery**

in accordance with Annex II, section 1.A. of the Directive 2006/42/EC

For the following products:

**Type 2357-1 Pressure Reducing Valve**

We hereby declare that the machinery mentioned above complies with all applicable requirements stipulated in Machinery Directive 2006/42/EC.

For product descriptions refer to:

- Type 2357-1 Pressure Reducing Valve: Mounting and Operating Instructions EB 2557

Referenced technical standards and/or specifications:

- VCI, VDMA, VGB: "Leitfaden Maschinenrichtlinie (2006/42/EG) – Bedeutung für Armaturen, Mai 2018" [German only]
- VCI, VDMA, VGB: "Zusatzdokument zum Leitfaden Maschinenrichtlinie (2006/42/EG) – Bedeutung für Armaturen vom Mai 2018" [German only], based on DIN EN ISO 12100:2011-03

Comment:

Information on residual risks of the machinery can be found in the mounting and operating instructions as well as in the referenced documents listed in the mounting and operating instructions.

Persons authorized to compile the technical file:

SAMSON AG, Weismüllerstraße 3, 60314 Frankfurt am Main, Germany  
Frankfurt am Main, 22 August 2022

Norbert Tollas  
Senior Vice President  
Global Operations

Peter Scheermesser  
Director  
Product Maintenance and Engineered Products

Revision no. 00

EU DECLARATION OF CONFORMITY  
TRANSLATION



**Declaration of Conformity of Final Machinery**

in accordance with Annex II, section 1.A. of the Directive 2006/42/EC

For the following products:

**Type 2357-2 Excess Pressure Valve**

We hereby declare that the machinery mentioned above complies with all applicable requirements stipulated in Machinery Directive 2006/42/EC.

For product descriptions refer to:

- Type 2357-2 Excess Pressure Valve: Mounting and Operating Instructions EB 2557

Referenced technical standards and/or specifications:

- VCI, VDMA, VGB: "Leitfaden Maschinenrichtlinie (2006/42/EG) – Bedeutung für Armaturen, Mai 2018" [German only]
- VCI, VDMA, VGB: "Zusatzdokument zum Leitfaden Maschinenrichtlinie (2006/42/EG) – Bedeutung für Armaturen vom Mai 2018" [German only], based on DIN EN ISO 12100:2011-03

Comment:

Information on residual risks of the machinery can be found in the mounting and operating instructions as well as in the referenced documents listed in the mounting and operating instructions.

Persons authorized to compile the technical file:

SAMSON AG, Weismüllerstraße 3, 60314 Frankfurt am Main, Germany  
Frankfurt am Main, 22 August 2022

Norbert Tollas  
Senior Vice President  
Global Operations

Peter Scheermesser  
Director  
Product Maintenance and Engineered Products

Revision no. 00

Classification: Public · SAMSON AKTIENGESELLSCHAFT · Weismüllerstraße 3 · 60314 Frankfurt am Main, Germany

Page 1 of 1

**UK  
CA** UK DECLARATION OF CONFORMITY  
ORIGINAL



**The Pressure Equipment (Safety) Regulations 2016  
Module D / N° CE-0062-PED-D-SAM 001-22-DEU**

For the following products, SAMSON hereby declares under its sole responsibility:

Devices	Type	Version
Self-operated Regulators	2357-1	Pressure Regulator
	2357-2	Excess Pressure Valve

The object of the declaration described above is in conformity with the relevant Union harmonization legislation:

Legislation: STATUTORY INSTRUMENTS – 2016 No. 1105 – CONSUMER PROTECTION HEALTH AND SAFETY – The Pressure Equipment (Safety) Regulations 2016	PE(S)R 2016	2022
EU-Type Examination	Module B	Certificate-No.: 01 202 969/B-22-0002 by TÜV Rheinland 0035
Applied conformity assessment procedure for fluids according to Article 4(1)	Module D	Certificate-No.: N°CE-0062-PED-D-SAM 001-22-DEU by Bureau Veritas 0062

The manufacturer's quality management system is monitored by the following approved body:  
**Bureau Veritas Services SAS, 8 Cours du Triangle, 92800 PUTEAUX – LA DEFENSE (No. 0062)**  
Designated Standards applied: EN 12516-3;  
Other technical standards applied: ASME B16.34

**Manufacturer:**  
**SAMSON AKTIENGESELLSCHAFT, Weismüllerstraße 3, 60314 Frankfurt am Main, Germany**  
Frankfurt am Main, 9<sup>th</sup> November 2022

Norbert Tollas  
Senior Vice President  
Global Operations

Peter Scheermesser  
Director  
Product Maintenance & Engineered Products

Revision 00

Classification: Public · SAMSON AKTIENGESELLSCHAFT · Weismüllerstraße 3 · 60314 Frankfurt am Main, Germany Page 1 of 1



**UK** UK DECLARATION OF CONFORMITY  
**CA** ORIGINAL



**Declaration of Conformity of Final Machinery**

in accordance with Schedule 2 Part 2 Annex II, section 1.A. of the Directive 2008 No. 1597 Supply of Machinery (Safety) Regulations 2008

For the following products:

**Type 2357-1 Pressure Regulator**

We hereby declare that the machinery mentioned above complies with all applicable requirements stipulated in Directive 2008 No. 1597 Supply of Machinery (Safety) Regulations 2008.

For product descriptions, refer to:

- Type 2357-1 Pressure Regulator: Mounting and Operating Instructions EB 2557

Valve accessories (e.g. positioners, limit switches, solenoid valves, lock-up valves, supply pressure regulators, volume boosters and quick exhaust valves) are classified as machinery components in this declaration of conformity. Machinery components can be mounted onto the above specified final machinery if they comply with the specifications and properties defined by SAMSON Manual H 02 "Appropriate Machinery Components for SAMSON Pneumatic Control Valves with a Declaration of Conformity of Final Machinery".

Referenced technical standards and/or specifications:

- VCI, VDMA, VGB: "Leitfaden Maschinenrichtlinie (2006/42/EG) – Bedeutung für Armaturen, Mai 2018" [German only]
- VCI, VDMA, VGB: "Zusatzdokument zum „Leitfaden Maschinenrichtlinie (2006/42/EG) – Bedeutung für Armaturen vom Mai 2018" [German only], based on DIN EN ISO 12100:2011-03

Comment:

Information on residual risks of the machinery can be found in the mounting and operating instructions of the valve and actuator as well as in the referenced documents listed in the mounting and operating instructions.

Persons authorized to compile the technical file:

SAMSON AG, Weismüllerstraße 3, 60314 Frankfurt am Main, Germany  
 Frankfurt am Main, 8 November 2022

Stephan Giesen  
 Director  
 Product Management

Peter Scheermesser  
 Director  
 Product Maintenance & Engineered Products

Revision 00

**UK**  
**CA** UK DECLARATION OF CONFORMITY  
ORIGINAL



**Declaration of Conformity of Final Machinery**

in accordance with Schedule 2 Part 2 Annex II, section 1.A. of the Directive 2008 No. 1597 Supply of Machinery (Safety) Regulations 2008

For the following products:  
**Type 2357-2 Excess Pressure Valve**

We hereby declare that the machinery mentioned above complies with all applicable requirements stipulated in Directive 2008 No. 1597 Supply of Machinery (Safety) Regulations 2008.

For product descriptions, refer to:

- Type 2357-2 Excess Pressure Valve: Mounting and Operating Instructions EB 2557

Valve accessories (e.g. positioners, limit switches, solenoid valves, lock-up valves, supply pressure regulators, volume boosters and quick exhaust valves) are classified as machinery components in this declaration of conformity. Machinery components can be mounted onto the above specified final machinery if they comply with the specifications and properties defined by SAMSON Manual H 02 "Appropriate Machinery Components for SAMSON Pneumatic Control Valves with a Declaration of Conformity of Final Machinery".

Referenced technical standards and/or specifications:

- VCI, VDMA, VGB: "Leitfaden Maschinenrichtlinie (2006/42/EG) – Bedeutung für Armaturen, Mai 2018" [German only]
- VCI, VDMA, VGB: "Zusatzdokument zum „Leitfaden Maschinenrichtlinie (2006/42/EG) – Bedeutung für Armaturen vom Mai 2018" [German only], based on DIN EN ISO 12100:2011-03

Comment:

Information on residual risks of the machinery can be found in the mounting and operating instructions of the valve and actuator as well as in the referenced documents listed in the mounting and operating instructions.

Persons authorized to compile the technical file:

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Revision 00

## 15 Annex

### 15.1 Tightening torques

**Table 15-1:** *Tightening torque*

Component	Width across flats	Pressure rating	Tightening torque in Nm
Body (1 with 8)	–	PN 40	180
	–	PN 50	250
Bottom section of the body (8)	SW 55	–	
Top section of the body (1)	SW 36	–	

### 15.2 Tools

SAMSON's After-sales Service can support you concerning tools approved by SAMSON.

### 15.3 Lubricant

SAMSON's After-sales Service can support you concerning lubricants and sealants approved by SAMSON.

## 15.4 Spare parts and accessories

Refer to ► T 2570 details on spare parts and accessories.

## 15.5 After-sales service

Contact SAMSON's After-sales Service for support concerning service or repair work or when malfunctions or defects arise.

### E-mail address

You can reach our after-sales service at [aftersalesservice@samsongroup.com](mailto:aftersalesservice@samsongroup.com).

### Addresses of SAMSON AG and its subsidiaries

The addresses of SAMSON, its subsidiaries, representatives and service facilities worldwide can be found on our website (► [www.samsongroup.com](http://www.samsongroup.com)) or in all SAMSON product catalogs.

### Required specifications

Please submit the following details:

- Type and valve size of the regulator
- Model number or material number
- Upstream and downstream pressure
- Temperature and process medium
- Min. and max. flow rate in m<sup>3</sup>/h
- Is a strainer installed?
- Installation drawing showing the exact location of the regulator and all the additionally installed components (shut-off valves, pressure gauge etc.)







**EB 2557 EN**



SAMSON AKTIENGESELLSCHAFT  
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Phone: +49 69 4009-0 · Fax: +49 69 4009-1507  
samson@samsongroup.com · www.samsongroup.com