

# MOUNTING AND OPERATING INSTRUCTIONS



## EB 2560 EN

Translation of original instructions



Type 2357-11 Pressure Build-up Regulator/  
Type 2357-21 Excess Pressure Valve

## Type 2357-11 Pressure Build-up Regulator · Type 2357-21 Excess Pressure Valve

Self-operated Pressure Regulators

Edition October 2024



## 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.

- 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) > **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 General safety instructions

- The regulators are to be mounted, started up or serviced by fully trained and qualified personnel only; the accepted industry codes and practices are to be observed. Make sure employees or third parties are not exposed to any danger.
- All safety instructions and warnings given in these mounting and operating instructions, particularly those concerning installation, start-up, and maintenance, must be strictly 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 dangers due to their specialized training, their knowledge and experience as well as their knowledge of the applicable standards.
- The regulators comply with the requirements of the European Pressure Equipment Directive 2014/68/EU and Machinery Directive 2006/42/EC. Regulators with a CE marking have a declaration of conformity, which includes information about the applied conformity assessment procedure. The declaration of conformity is included in the 'Certificates' chapter.
- To ensure appropriate use, only use the regulator in applications where the operating pressure and temperatures do not exceed the specifications used for sizing the regulator at the ordering stage.
- The manufacturer does not assume any responsibility for damage caused by external forces or any other external factors.
- Any hazards that could be caused in the pressure regulator by the process medium, operating pressure or by moving parts are to be prevented by taking appropriate precautions.
- Proper transport, storage, installation, operation, and maintenance are assumed.

## 2 Process medium and scope of application

Pressure regulators for cryogenic gases and liquids as well as other liquids, gases and vapors. Operating pressures up to 63 bar, with set points from 1 to 40 bar. Temperature range from -200 to +200 °C. Oxygen clean according to international standards and guidelines.

The regulators are designed to keep the pressure constant to the adjusted set point, especially in cryogenic plants.

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**! WARNING**

***Risk of injury and property damage due to high pressure in the plant.***

*A suitable overpressure protection must be installed on site in the plant section.*

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### 2.1 Transportation and storage

The regulators must be carefully handled, transported and stored. Protect the regulators against adverse influences, such as dust, dirt or moisture during storage and transportation before being installed.

In the delivered state, the pressure regulators are packed to be free of oil and grease for oxygen service. To avoid contamination, do not open the packaging until immediately before installation.

### 3 Design and principle of operation

See Fig. 1 on page 7.

Ports A and B are marked on the valve body.

#### **Type 2357-11 Pressure Build-up Regulator**

Functioning as a Type 2357-11 Pressure Build-up Regulator (Fig. 1) with 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 of pressure when the pressure exceeds the set point by 5 bar. After overcoming the force of the top plug spring (16), the valve opens to equalize the pressures.

The valve is open when no pressure is applied. The pressure upstream of the valve (port B) is transmitted to the operating diaphragm (3). The positioning force produced moves the valve plug (2) depending on the spring force adjustable at the set point adjuster (10). The valve closes when the pressure upstream of the valve (port B) increases.

#### **Type 2357-11 Pressure Reducing Valve**

The process medium flows from port A to port B when the Type 2357-11 Pressure Regulator is used as a pressure reducing valve.

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 2357-21 Excess Pressure Valve**

The medium flows through the Type 2357-21 Excess Pressure Valve (Fig. 1) from port B to port A. The valve is closed when no pressure is applied. The pressure at port B 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 integrated non-return unit prevents the medium from flowing back.

#### **EC type examination**

An EC type examination according to the Pressure Equipment Directive 2014/68/EU, Module B has been performed on the Type 2357-11 Regulator.

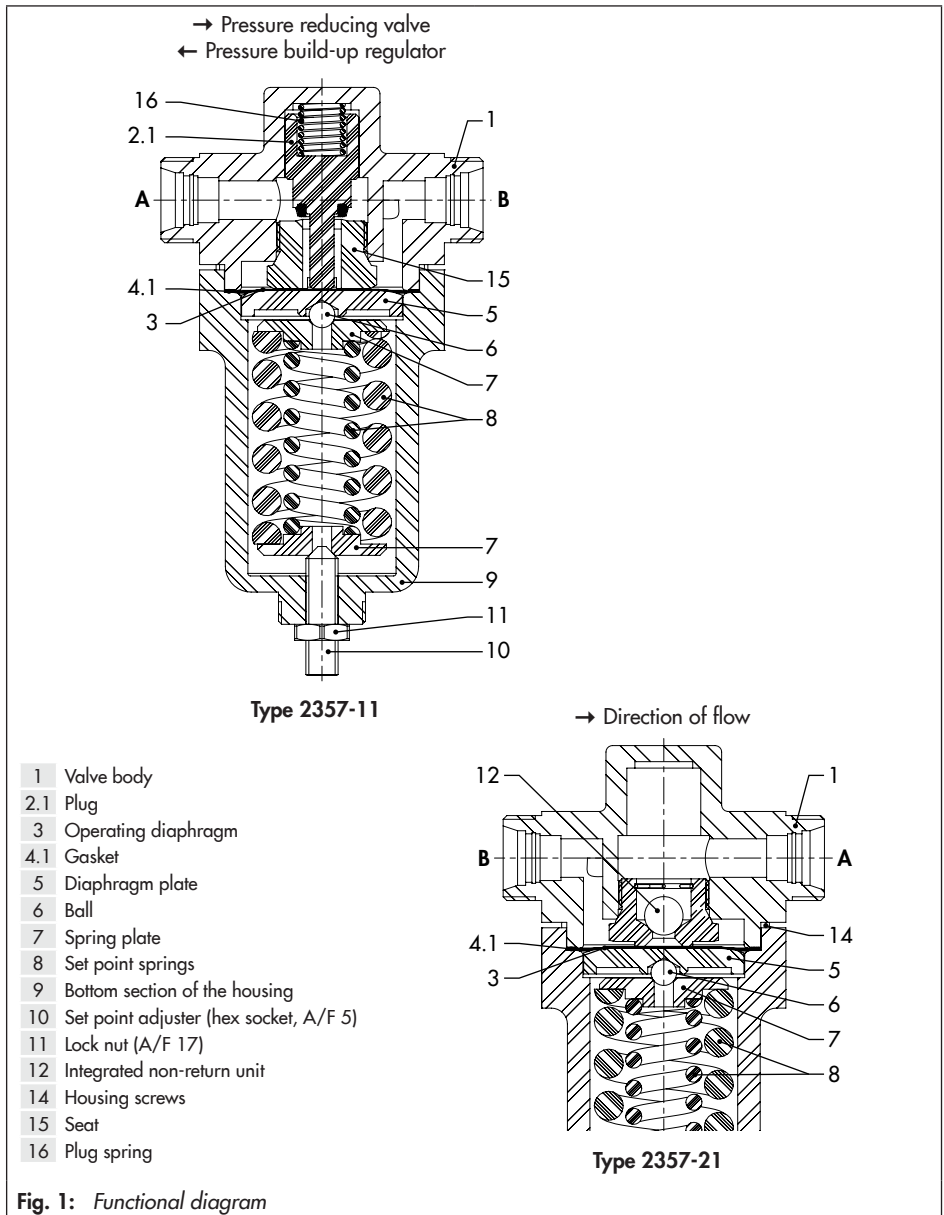


Fig. 1: Functional diagram

### 4 Installation

In the delivered state, the regulators are packed to be free of oil and grease for oxygen service.

#### **⚠ 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.*

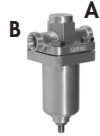
Flush and clean the pipeline thoroughly before installing the regulator.

- Make sure the regulator is installed free of stress.
- Install a strainer upstream of the regulator.

Otherwise, impurities in the pipeline may impair the proper functioning of the valve, above all the tight shut-off.

### 4.1 Mounting orientation

Install the pressure regulator with the actuator housing suspended downward in horizontal pipelines. Observe the flow direction.



**Type 2357-11 Pressure Build-up Regulator** with safety function

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

**Type 2357-11 Pressure Reducing Valve**

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

**Type 2357-21 Excess Pressure Valve** with non-return unit

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

The ports are marked.

Required spare parts and accessories are listed in Data Sheet ► T 2570.

### 4.2 Shut-off valve

We recommend installing a hand-operated shut-off valve both upstream and downstream of the regulator. This allows the plant to be shut down for cleaning and maintenance, and when the plant is not used for longer periods of time.

Install a pressure gauge at a suitable point to monitor the pressures prevailing in the plant.



## 5 Operation

See Fig. 1 on page 7.

### 5.1 Start-up

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

### 5.2 Set point adjustment

Every pressure regulator is delivered with the set point listed in Table 1 already adjusted.

Turn the set point adjuster (10) using Allen key (width across flats 5) to change the default 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. 2.

To increase the set point, turn the set point adjuster into the body (↻) and out of the body (↺) to reduce it.

#### ! 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. Undo the lock nut (11, width across flats 17) 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 (10) the required amount of turns as specified in Fig. 2 on page 10.

Based on the default setting, any subsequent change to the set point can also be made by determining the required number of turns using the specifications listed in Table 1.

3. Lock the setting with the lock nut (11).

### 5.3 Changing the set point range

The default set point ranges can be adapted to your specific requirements. Contact SAMSON (see Chapter 7) for further details.

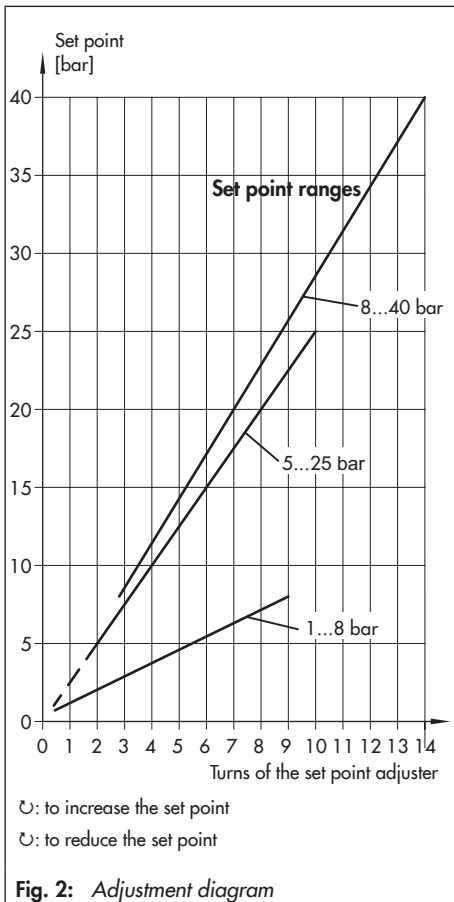
### 5.4 Decommissioning

Close first the shut-off valve on the upstream side of the valve and then on the downstream side of the valve.

## Servicing

**Table 1:** Set point adjustment (default)

Set point range		1 to 8 bar	5 to 25 bar	8 to 40 bar
Set point adjusted at the factory (approx.)	2357-11	3 bar	12 bar	25 bar
	2357-21	4 bar	13 bar	26 bar
Set point change per turn		1 bar	2.5 bar	3.5 bar



## 6 Servicing

The regulators do not require much maintenance. Nevertheless, they are 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.

### **⚠ WARNING**

**Process medium can escape uncontrolled on dismantling the regulator.**

**Risk of cold burns!**

Allow the regulator to defrost before depressurizing and draining it and remove it from the pipeline.

If faults or malfunctions cannot be remedied, contact SAMSON (see Chapter 7).

## 6.1 Exchanging the seat and plug

See Fig. 1.

1. Undo the lock nut (11) and turn the set point adjuster (10) counterclockwise  $\cup$  to fully relieve the internal set point springs (8).
2. Unscrew the body screws (14) using an open-end wrench (size 19 mm). Lift off the valve body (1).
3. Unscrew the seat (15) using a seat wrench (size 30 mm socket). Remove the plug (2.1).
4. Insert the plug spring (16) into the new plug (Type 2357-11 only). Tighten the seat using a seat wrench. (tightening torque of 130 Nm). Use a suitable high-performance lubricant (e.g. Gleitmo 595, SAMSON order no. 8150-0116).
5. Check the PTFE gasket (4.1) and replace it, if necessary.
6. Carefully mount the valve body (1) and fasten it onto the bottom section of the body (9) (tightening torque 50 Nm).

## 6.2 Exchanging the non-return unit

See Fig. 1.

1. Undo the lock nut (11) and turn the set point adjuster (10) counterclockwise  $\cup$  to fully relieve the internal set point springs (8).
2. Unscrew the body screws (14) using an open-end wrench (size 19 mm). Lift off the valve body (1).
3. Unscrew the integrated non-return unit (12) using a seat wrench (30 mm size socket) and lift off the valve body (1).
4. Check the ball and seating surface. Replace the entire non-return unit, if necessary. Mount the non-return unit using a seat wrench. (tightening torque of 130 Nm). Use a suitable high-performance lubricant (e.g. Gleitmo 595, SAMSON order no. 8150-0116).
5. Check the PTFE gasket (4.1) and replace it, if necessary.
6. Carefully mount the valve body (1) and fasten it onto the spring housing (9) using the body screws (14) (tightening torque 50 Nm).

### 7 After-sales service

If malfunctions or defects occur, contact the SAMSON's After-sales Service for support. The addresses of SAMSON AG, its subsidiaries, representatives and service facilities worldwide can be found on the SAMSON website (► [www.samsongroup.com](http://www.samsongroup.com)), in all SAMSON product catalogs or on the back of these Mounting and Operating Instructions.

Please send your inquiries to: [service@samsongroup.com](mailto:service@samsongroup.com)

To assist diagnosis and in case of an unclear mounting situation, specify the following details (see Chapter 9):

- Type designation and  $K_{VS}$  coefficient
- Model number with index
- Upstream and downstream pressure
- Temperature and process medium
- Min. and max. flow rate
- 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.)

### 8 Disposal



SAMSON is a producer registered at the following European institution ► <https://www.samsongroup.com/en/about-samson/environment-social-governance/material-compliance/waste-electrical-and-electronic-equipment-veee-and-its-safe-disposal/>.  
WEEE reg. no.: DE 62194439

Information on substances listed as substances of very high concern (SVHC) on the candidate list of the REACH regulation can be found in the document "Additional Information on Your Inquiry/Order", which is added to the order documents, if applicable. This document includes the assigned SCIP number, which can be entered into the database on the European Chemicals Agency (ECHA) website (► <https://www.echa.europa.eu/scip-database>) to find out more information on the SVHC.

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#### **i Note**

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

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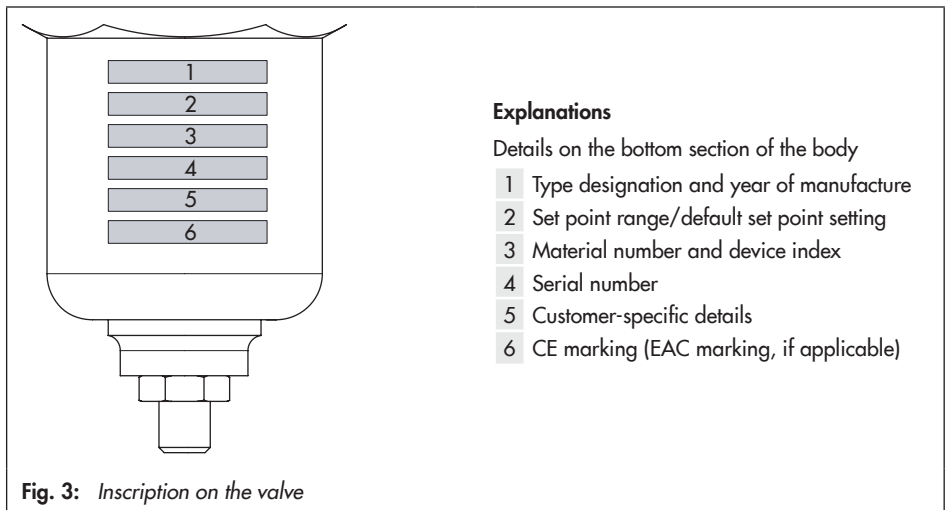
#### **💡 Tip**

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

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

## 9 Inscriptions on the regulator



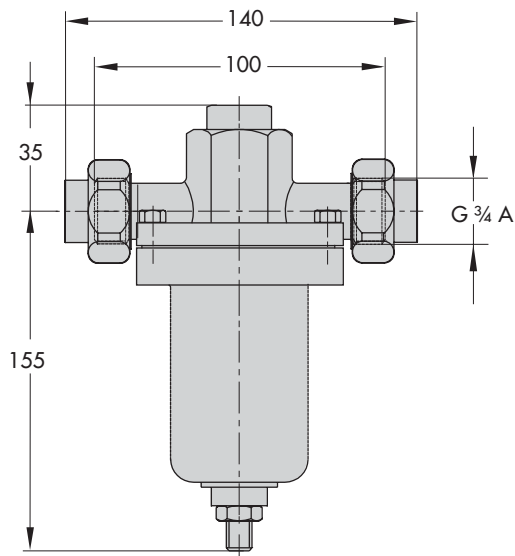
### Explanations

Details on the bottom section of the body

- 1 Type designation and year of manufacture
- 2 Set point range/default set point setting
- 3 Material number and device index
- 4 Serial number
- 5 Customer-specific details
- 6 CE marking (EAC marking, if applicable)

Fig. 3: Inscription on the valve

## 10 Dimensions and weights



Type 2357-11 Pressure Regulator/Type 2357-21 Excess Pressure Valve with welding ends  
(accessories)

Weight: approx. 4 kg

All dimensions in mm

**Fig. 4:** *Dimensions and weights*

## 11 Technical data

Type	2357-11	2357-21
$K_{VS}$ coefficient	0.8	1.25
Set point ranges <sup>1)</sup> in bar	1 to 8 · 5 to 25 · 8 to 40	
Max. permissible operating pressure $p_{max}$	63 bar <sup>2)</sup>	
Safety function for Type 2357-11	5 bar above the set point	
Max. permissible differential pressure $\Delta p_{max}$	Types 2357-11 Pressure Reducing Valves: Gases 30 bar · Liquids 6 bar Type 2357-21 Excess Pressure Valve: 3 bar (>3 bar only with special accessories)	
Operating time	Up to 10 years (depending on the operating conditions of the device). We recommend checking whether the device functions properly every 5 years.	
Intended lifetime	Normally 15 years (depending on the operating conditions of the device)	
Maximum storage period	24 months (provided the storage conditions specified in Chapter 2.1 are observed)	
Temperature range	-200 to +200 °C	
Conformity	<b>CE</b>	

1) Further set point ranges on request

2) For oxygen  $p_{max} = 40$  bar

## 12 Certificates

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

- EU declaration of conformity in compliance with Pressure Equipment Directive 2014/68/EU on page 16.
- EC-type examination according to Directive 2014/68/EC, see page 17.
- EU declaration of conformity in compliance with Machinery Directive 2006/42/EC for Type 2357-11 and Type 2357-21 Regulators on page 18.

EU DECLARATION OF CONFORMITY  
TRANSLATION



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

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

**Pressure Regulator PR 2357-1, -11, -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-22-0002-01


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


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, 4 place des Saisons, 92400 Courbevoie, France**  
**Manufacturer: SAMSON AG, Weismüllerstraße 3, 60314 Frankfurt am Main, Germany**

Frankfurt am Main, 06. September 2024

  
\_\_\_\_\_  
Norbert Tollas  
Senior Vice President  
Global Operations

  
\_\_\_\_\_  
i. V. P.  
Peter Scheermesser  
Director  
Product Maintenance & Engineered Products

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# Zertifikat

## EU-Baumusterprüfung (Baumuster) nach Richtlinie 2014/68/EU

Zertifikat-Nr.: 01 202 969/B-22-0002-01

Name und Anschrift des  
Herstellers: Samson AG  
Weismüllerstraße 3  
60315 Frankfurt

Hiermit wird bescheinigt, dass das unten genannte  
EU-Baumuster die Anforderungen der Richtlinie 2014/68/EU  
erfüllt.

Geprüft nach Richtlinie  
2014/68/EU:

**Modul B**  
**EU-Baumusterprüfung (Baumuster)**

Prüfbericht-Nr.: 968/FSP 2402.02/24

Beschreibung des Baumusters: Sicherheitsdruckregler ohne Hilfsenergie als Ausrüstungsteil mit  
Sicherheitsfunktion

Typ: 2357-1, 2357-3, 2357-11

Fertigungsstätte/Lieferer: Samson AG  
Weismüllerstraße 3  
60315 Frankfurt

Gültig bis: 03/2032  
Dieses Zertifikat verliert seine Gültigkeit, wenn das Produkt in  
irgendeiner Weise geändert oder modifiziert wird.

Das CE-Zeichen darf erst am Produkt angebracht und die Konformitätserklärung erst ausgestellt  
werden, wenn ein korrespondierendes Konformitätsbewertungsverfahren der Richtlinie 2014/68/EU  
bezogen auf die Produktion/das Produkt vollständig erfüllt ist.

Köln, 16.04.2024



  
Wolf Rückwart

TÜV Rheinland Industrie Service GmbH  
Notifizierte Stelle für Druckgeräte, Kennnummer 0035  
Am Grauen Stein, D-51105 Köln, DEUTSCHLAND

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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 2357-11 Pressure Build-up Regulator

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 2357-11 Pressure Build-up Regulator: Mounting and Operating Instructions EB 2560

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

A handwritten signature in blue ink, appearing to read "ppc. N. Tollas".

Norbert Tollas  
Senior Vice President  
Global Operations

A handwritten signature in blue ink, appearing to read "i. v. P. Scheermesser".

Peter Scheermesser  
Director  
Product Maintenance and Engineered  
Products

Revision no. 00

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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 2357-21 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 2357-21 Excess Pressure Valve: Mounting and Operating Instructions EB 2560

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

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