

# MOUNTING AND OPERATING INSTRUCTIONS



## EB 2546-1 EN

Translation of original instructions



**Type 36-3 Safety Shut-off Valve (SSV) with pressure reducing valve**

Edition November 2018



## 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 Department (aftersaleservice@samson.de).



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.samson.de](http://www.samson.de) > **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 36-3 Regulator is a safety shut-off valve (SSV) with pressure reducing valve.

The self-operated regulator is used to control the downstream pressure  $p_2$  in the pipeline to the adjusted set point. It controls liquids in process plants and district heating applications.

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 regulators in other applications or conditions than 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 accessories 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 in these instructions
- Changing parts, service or repair work on TÜV-tested Type 36-3

## Qualifications of operating personnel

The regulator must be mounted, started up, serviced and repaired by fully trained and qualified personnel only; the accepted industry codes and practices are to 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.

## Safety instructions and measures

### Personal protective equipment

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

▶ GESTIS (CLP) hazardous substance database).

- Provide protective equipment (e.g. safety gloves, eye protection) appropriate for the process medium used.
- Wear hearing protection when working near the regulator.
- Check with the plant operator for details on further protective equipment.

### 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 regulator by the process medium, the operating pressure, the signal pressure or by moving parts by taking appropriate precautions. They must observe all hazard statements, warning and caution notes in these mounting and operating instructions, especially for installation, start-up and service work.

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

▶ GESTIS (CLP) hazardous substance database).

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

### Responsibilities of the operator

The operator is responsible for proper operation 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, the operator must ensure that operating personnel or third persons are not exposed to any danger.

### 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, the operating personnel must be familiar with the applicable health, safety and accident prevention regulations and comply with them.

### Referenced standards and regulations

The regulators comply with the requirements of the European Pressure Equipment Directive 2014/68/EU. Regulators with a CE marking have an EU declaration of conformity, which includes information about the applied conformity assessment procedure. This EU declaration of conformity is included in the Annex of these instructions (see section 10.2).

According to the ignition risk assessment performed in accordance with EN 13463-1:2009, section 5.2, 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 section 6.4 of EN 60079-14 (VDE 0165 Part 1).

## 1.1 Notes on possible severe personal injury

### DANGER

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

Regulators and pipelines are pressure equipment. Improper opening can lead to components bursting.

- Before starting any work on the regulator, depressurize all plant sections concerned as well as the valve.
- Drain the process medium from all the plant sections concerned as well as the valve.
- Wear personal protective equipment.

## 1.2 Notes on possible personal injury

### WARNING

#### **Risk of personal injury due to preloaded springs.**

Regulators in combination with preloaded set point springs are under tension. These regulators can be identified by the red warning label on the actuator's set point springs.

- Before starting any work on the springs, relieve the compression from the preloaded springs.
- Only use the SAMSON disassembly tool (1280-4052).

#### **Crush hazard arising from moving parts.**

The regulator contains moving parts (actuator and plug stems), which can injure hands or fingers if inserted into the valve.

- Do not insert hands or fingers between the set point springs while the regulator is in operation.
- Before performing any work on the regulator, depressurize the plant. Disconnect or shut off the external control line.

## 1.2 Notes on possible personal injury

### WARNING

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

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

- Information on safe use of the part affected,  
see ► <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. burns.

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

#### **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 heat up.
- Wear protective clothing and safety gloves.

## 1.3 Notes on possible property damage

### ! NOTICE

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

→ Do not attach load-bearing slings to the actuator housing.

#### **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.

#### **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.

→ Observe the maximum permissible pressure for regulator and plant.

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

The lubricants to be used depend on the regulator material. Unsuitable lubricants may corrode and damage the surface.

→ Only use lubricants approved by SAMSON.

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

Observe the specified torques on tightening regulator components. Excessively tightened torques lead to parts wearing out quicker. Parts that are too loose may cause leakage.

→ Observe the specified tightening torques.

#### **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.

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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

### 2.1 Regulator nameplate

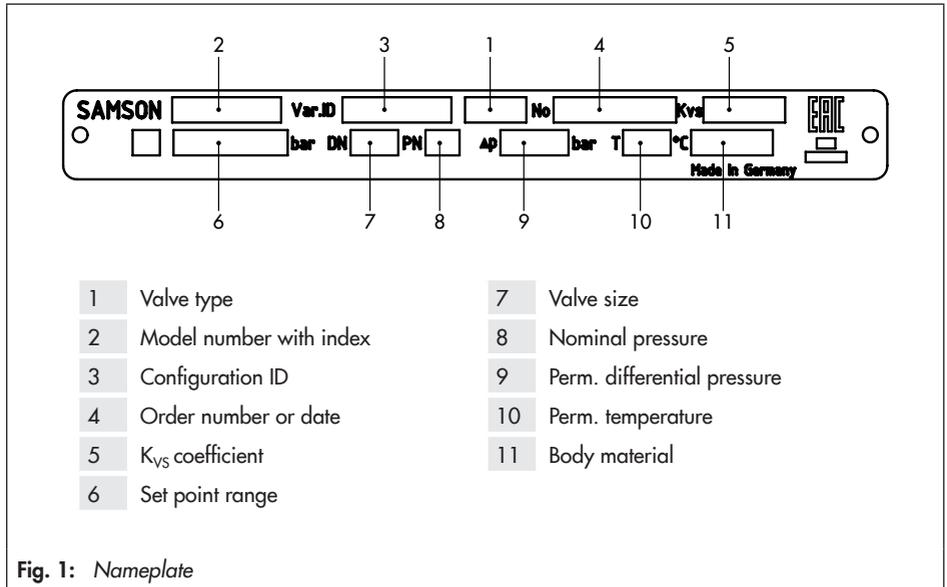


Fig. 1: Nameplate

The nameplate of all sizes is affixed to the body flange (see Fig. 2).

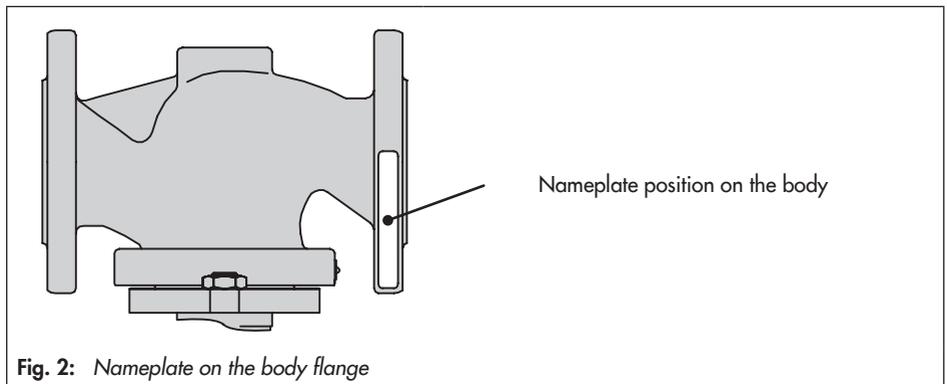


Fig. 2: Nameplate on the body flange

### 2.2 Material number

Specifying the configuration ID, you can contact us to find out which material is used. The configuration ID is specified on the nameplate (3, configuration ID). For more details on the nameplate, see section 2.1.

## 3 Design and principle of operation

→ Refer to Fig. 3

The Type 36-3 Pressure Reducing Valve mainly consists of the spring-loaded globe valve with balanced plug and the actuator with one operating diaphragm and one backup diaphragm.

The pressure reducing valve is used to maintain the pressure downstream of the valve to an adjusted set point.

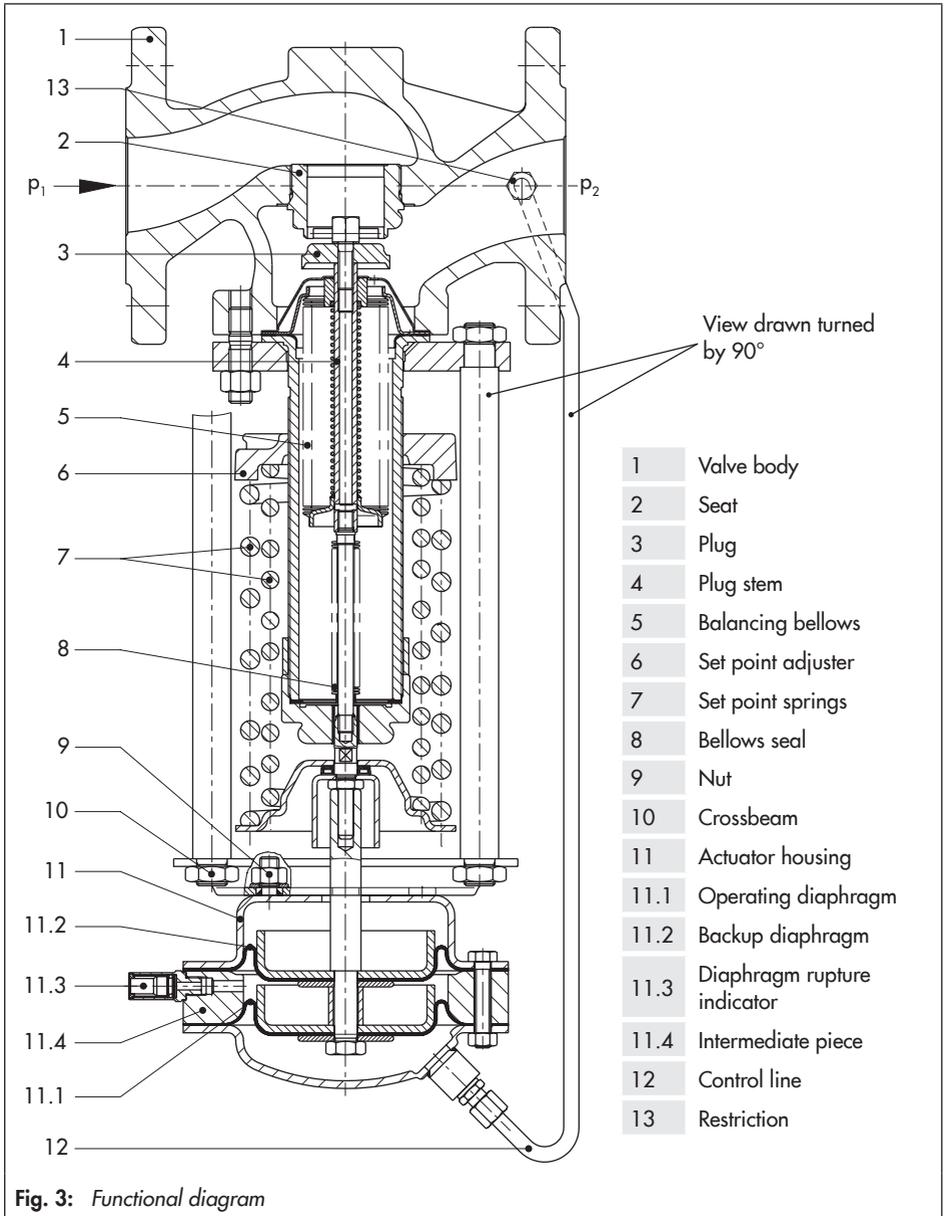
The valve closes when the downstream pressure rises.

The process medium flows through the valve between seat (2) and plug (3) in the direction indicated by the arrow on the body. The position of the valve plug determines the flow rate and, as a result, the pressure ratio across the valve. The plug stem is sealed by a frictionless bellows (8). The downstream pressure  $p_2$  to be controlled is transmitted over the control line (12) to the operating diaphragm (11.1) where it is converted into a

positioning force. This force is used to move the valve plug depending on the force of the set point springs (7). The spring force is adjustable at the set point adjuster (6). The valves with  $K_{VS}$  4 and higher have a balancing bellows (5). The upstream pressure acts on the outside of the bellows and the downstream pressure on the inside of the bellows. As a result, the forces produced by the upstream and downstream pressures acting on the plug are balanced out.

The regulator is equipped with two independent operating diaphragms: one operating diaphragm (11.1) and a backup diaphragm (11.2).

As a result, the regulator can continue to function in the event that the operating diaphragm fails. To indicate the diaphragm failure, a diaphragm rupture indicator is installed in the intermediate piece (11.4).



## Design and principle of operation

### 3.1 Technical data

The regulator's nameplate contains information on the regulator version (see section 2.1).

#### Process medium and scope of application

The Type 36-3 Safety Pressure Reducing Valve is designed to maintain pressure downstream of the regulator to the adjusted set point district heating systems or large heating networks.

The regulator is suitable for controlling **liquids**.

- Liquids up to **150 °C**

The regulator is open when relieved of pressure. It closes when the downstream pressure rises above the adjusted set point.

#### Type test

The device has been type tested as a safety shut-off valve (SSV) by the German Technical Inspectorate (TÜV) according to the requirements stipulated by AGFW (German District Heating Association).

The test mark is available on request.

#### Temperature range

The Type 36-3 Regulator is designed for a temperature range from 0 to +150 °C.

#### Leakage class

The regulator has the leakage class I according to IEC 60534-4.

#### Noise emission

SAMSON is unable to make general statements about noise emission as it depends on the regulator version, plant facilities and process medium.

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#### **WARNING**

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

*Wear hearing protection when working near the regulator.*

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#### Dimensions and weights

Table 3 provides a summary of the dimensions and weights. The lengths and heights in the dimensional drawings are shown on page 16 onwards.

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

Valve size	DN	15	20	25	32	40	50	65	80	100	
K <sub>VS</sub> coefficient		4.0	6.3	8.0	16.0	20.0	32.0	50.0	80.0	125.0	
x <sub>FZ</sub> value		0.60		0.55		0.50	0.45	0.40	0.35		
Pressure rating		PN 16, 25 or 40									
Max. permissible differential pressure Δp		25 bar						20 bar		16 bar	
Overload protection		12 bar (on one side)									
Max. permissible temperature		150 °C									
Max. permissible ambient temperature		80 °C									
Set point ranges	bar	2.0 to 4.2 · 2.4 to 6.3 · 6.0 to 10.5									
Leakage class according to IEC 60534-4		≤0.05 % of K <sub>VS</sub> coefficient									
Compliance		<b>CE ENEC</b>									

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

Valve			
Pressure rating	PN 16	PN 25	PN 40
Body	Cast iron EN-GJL-250	Spheroidal graphite iron EN-GJS-400-18-LT	Cast steel 1.0619
Seat	Stainless steel		
Plug with PTFE soft seal	Stainless steel		
Balancing bellows and bellows seal	Stainless steel		

Actuator	
Diaphragm cases	Sheet steel S235JR (St 37-2)
Diaphragm	EPDM with fabric reinforcement

## Dimensional drawings

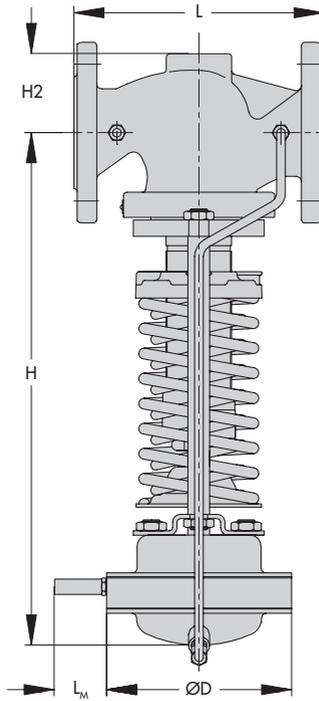


Fig. 4: Dimensions

Table 3: Dimensions in mm and weights

Valve size	DN	15	20	25	32	40	50	65	80	100	
Length	L	130	150	160	180	200	230	290	310	350	
Height	H	415			470			600		615	
Height	Forged steel	H2	53	-	70	-	92	98	-	128	-
	Other materials		44			72			98		118
Diaphragm housing	ØD	170 mm, A = 80 cm <sup>2</sup>									
Length	L <sub>M</sub>	30 mm									
<b>Weight</b>											
Weight for PN 16 <sup>1)</sup>	(approx. kg)	13.0	14.0	14.5	20.0	22.0	25.5	41.5	48.5	57.5	

<sup>1)</sup> +10 % for spheroidal graphite iron EN-GJS-400-18-LT (PN 25) and cast steel 1.0619 (PN 40)

## 4 Measures for preparation before installation

After receiving the shipment, proceed as follows:

1. Check the scope of delivery. Compare the shipment received with the delivery note.
2. Check the shipment for transportation damage. Report any damage to SAMSON and the forwarding agent (refer to delivery note).

### 4.1 Unpacking

#### **NOTICE**

*Risk of regulator damage due to foreign particles entering the valve.*

*The protective caps fitted on the regulator's inlet and outlet prevent foreign particles from entering the regulator and damaging it. Do not remove the protective caps until immediately before installation.*

#### **Note**

*Do not remove the packaging until immediately before installation.*

Proceed as follows to lift and install the regulator:

1. Remove the packaging from the controller.
2. Dispose of the packaging in accordance with the valid regulations.

## 4.2 Transport, lifting and storage

#### **⚠ DANGER**

*Hazard due to suspended loads falling. Stay clear of suspended or moving loads.*

#### **⚠ WARNING**

*Risk of lifting equipment tipping and risk of damage to lifting accessories due to exceeding the rated lifting capacity.*

- Only use approved lifting equipment and accessories whose minimum lifting capacity is higher than the weight of the regulator.
- Refer to Table 3 for weights.

#### **⚠ WARNING**

*Risk of personal injury due to the regulator tipping.*

- Observe the regulator's center of gravity.
- Secure the regulator against tipping over or turning.

#### **Note**

*Personnel must be trained to secure, transport and lift the regulator properly.*

### 4.2.1 Transport

The regulator can be transported using lifting equipment (e.g. crane or forklift).

- 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.
- Observe the permissible ambient temperatures (see section 3.1).

### 4.2.2 Lifting

To install a large regulator into the pipeline, use lifting equipment (e.g. crane or forklift) to lift it.

#### Lifting instructions

- Secure slings against slipping.
- Make sure the slings can be removed after installation.
- Prevent the regulator from tilting or tipping.
- Do not leave loads suspended when interrupting work for longer periods of time.
- Make sure that the axis of the pipeline is always horizontal during lifting and the axis of the plug stem is always vertical.

### Lifting

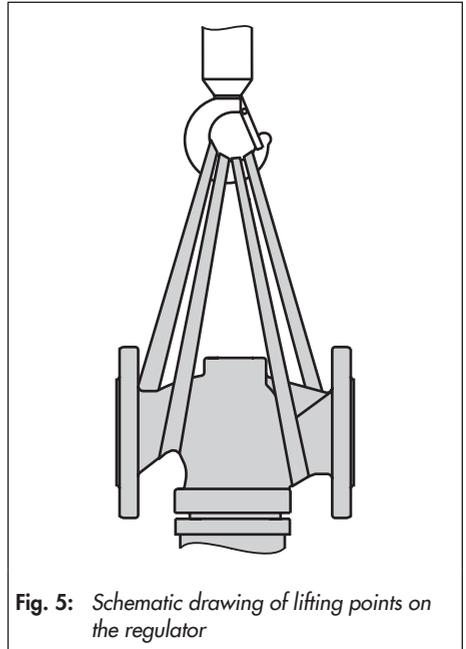
1. Attach one sling to the flange of the body and to the rigging equipment (e.g. hook) of the crane or forklift (see Fig. 5).
2. Carefully lift the regulator. Check whether the lifting equipment and accessories can bear the weight.
3. Move the regulator at an even pace to the site of installation.
4. Install the regulator into the pipeline. See section 5.
5. After installation in the pipeline, check whether the regulator flanges are bolted tight.
6. Remove slings.

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#### **Tip**

We recommend using a hook with safety latch (see Fig. 5). The safety latch prevents the slings from slipping during lifting and transporting.

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**Fig. 5:** Schematic drawing of lifting points on the regulator

### 4.2.3 Storage

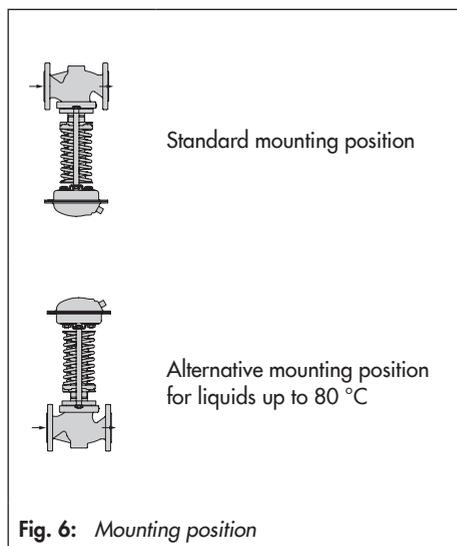
#### **NOTICE**

*Risk of regulator damage due to improper storage.*

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

#### **Note**

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



#### **Storage 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. 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  $+149$  °F).
- Do not place any objects on the regulator.

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

Elastomer, e.g. actuator diaphragm

- We recommend a storage temperature of  $15$  °C ( $59$  °F) for elastomers.

#### **Tip**

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

## 5 Installation

### 5.1 Preparation for installation

Proceed as follows:

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#### **i Note**

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

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- Check the valve to make sure it is clean and not damaged.
  - Flush and clean the pipeline thoroughly **before** installing the regulator.
- 

#### **i Note**

*Any impurities carried along by the process medium may impair the proper functioning of the regulator. We recommend installing a strainer (e.g. SAMSON Type 2) upstream of the pressure reducing valve.*

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- Check to make sure that the type designation, valve size, material, pressure rating and temperature range of the valve match the plant conditions (size and pressure rating of the pipeline, medium temperature etc.).
- Check any mounted pressure gauges to make sure they function.

### 5.2 Checking the installation conditions

#### Pipeline routing and mounting position

- Install the actuator housing with the set point springs suspended downward in horizontal pipelines (see section Fig. 6).
  - Install a strainer upstream of the regulator (see section 5.3).
  - Make sure the direction of flow matches the direction indicated by the arrow on the body.
  - Install the regulator free of stress.
  - Make sure that the regulator remains freely accessible after the plant has been completed.
- 

#### **!** NOTICE

*Damage due to freezing.*

*Protect the regulator from icing up when controlling media that can freeze. Remove the regulator from the pipeline when the plant is shut down if the regulator is not installed areas free from frost.*

---

#### **!** NOTICE

*Do not attach supports directly to the valve or actuator.*

---

### 5.3 Additional fittings

#### Strainer

A strainer installed upstream in the flow pipe holds back any dirt or other foreign particles carried along by the medium. For example, the SAMSON Type 2 NI Strainer is suitable (► T 1015).

The following points must be observed during installation of the strainer:

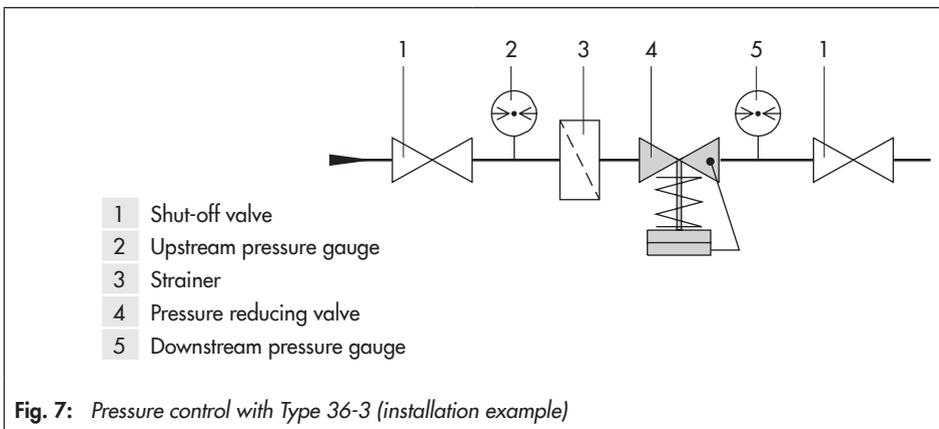
- Install the strainer upstream of the Type 36-3 Regulator.
- Do not use the strainer to permanently filter the process medium.
- Select a strainer (mesh size) suitable for the process medium.
- Allow sufficient space to remove the filter.
- Observe the flow direction.
- In horizontal pipelines, the filter element faces downward.
- Install strainers in vertical pipelines with the medium flowing upward with the drain plug facing upward.

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#### **i** Note

*Check the strainer at regular intervals and clean it, if necessary.*

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### Bypass and shut-off valves

- Install a hand-operated shut-off valve both upstream of the strainer and downstream of the regulator to be able to shut down the plant for cleaning and maintenance and when the plant is not used for longer periods of time (see Fig. 7).
- The bypass ensures that the plant does not need to be shut down for service and repair work on the regulator.

### Pressure gauges

- Install a pressure gauge both upstream and downstream of the regulator to monitor the pressures prevailing in the plant (see Fig. 7).

### Insulation

To insulate cold systems, we recommend first filling the plant and carefully rinsing it. The regulator must not yet be insulated at this stage.

1. Start up the plant and adjust the set point.
2. Shut down the plant again and let it heat up until the condensation water has dried off.
3. Insulate the regulator and pipes conveying the process medium using insulation material with a water vapor barrier. If the control line is to be routed through the insulation, special care must be taken with the sealing since slight changes in shape may occur. The insulation thickness depends on the medium temperature and the ambient conditions. 50 mm is a typical thickness.

## 6 Start-up and operation

### 6.1 Start-up

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#### **⚠ DANGER**

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

*– First start up the regulator after mounting all parts.*

---

#### **⚠ WARNING**

*Crush hazard arising from moving parts. Do not insert hands or fingers into the set point springs while the regulator is in operation.*

---

#### **⚠ WARNING**

*Risk of burn injuries due to hot or very cold components and pipelines. Depending on the process medium, valve components and pipelines may get very hot or cold and cause burn injuries. Wear protective clothing and safety gloves.*

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After installation in the pipeline, the regulator can be put into operation.

### 6.1.1 Installing the regulator

1. Close the shut-off valve in the pipeline while the valve is being installed.
2. Remove the protective caps from the valve ports before installing the regulator.
3. Lift the valve using suitable lifting equipment to the site of installation. Observe the flow direction through the valve. The arrow on the valve indicates the direction of flow.
4. Make sure that the correct flange gaskets are used.
5. Bolt the pipe to the valve free of stress.
6. Depending on the field of application, allow the valve to cool down or heat up to reach ambient temperature before start up.
7. Slowly open the shut-off valve in the pipeline after the valve has been installed.

## 6.1.2 Pipeline flushing

SAMSON We recommend flushing the pipeline with installed regulator before start-up.

- Unscrew the control line (see Fig. 3).
- Seal the valve body with G 1/4 stoppers.
- 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.

If the regulator malfunctions due to clogging after flushing the pipeline, proceed as described in Table 4.

## 6.1.3 Pressure test

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### **!** NOTICE

*Risk of the operating diaphragm bursting due to excessive pressure during pressure testing.*

- *The pressure must not exceed the maximum permissible pressure by 1.5 times the pressure rating.*
  - *Remove the control line from the regulator and seal the open connection with a blanking plug (accessories: blanking plug 8323-0030 and seal 8412-0771).*
- 

### **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.*

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### **!** NOTICE

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

*Slowly open the shut-off valves.*

---

## Start-up and operation

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

- Detach the control line and seal the openings at the valve body and the pipeline with suitable end plugs. Alternatively, install a shut-off valve in the control line.
- Make sure that the pressure rises simultaneously upstream and downstream of the regulator to avoid damaging the balancing bellows.
- Do not allow the pressure to exceed the 1.5 times the nominal pressure of the valve body.
- The valve must remain open. Therefore, set the maximum set point to ensure that the regulator does not close. Alternatively, detach the control line and seal the opening at the valve body with a G ¼ blanking plug.

### Additional points that apply:

- Start up the regulator after mounting all parts. Make sure the control line is open and correctly connected.
- Open the shut-off valves slowly preferably starting from the upstream pressure side. Afterwards, open all the valves on the consumer side (downstream of the regulator).
- Fill the plant slowly with the process medium. Avoid pressure surges.

## 6.2 Adjusting the set point

- Refer to Fig. 3
- The required downstream pressure is set by turning the set point adjuster (6) using an open-end wrench (up to DN 50 with width across flats SW 19 and for DN 65 and larger with SW 24).
- Turn the set point adjuster clockwise (↻) to increase the pressure set point.
- Turn the set point adjuster counterclockwise (↺) to reduce the pressure set point.

The pressure gauge located on the downstream pressure side allows the adjusted set point to be monitored.

## 7 Maintenance

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.

### **⚠ DANGER**

*Risk of bursting in pressure equipment. Regulators and pipelines are pressure equipment. Improper opening can lead to bursting of the regulator.*

- Before starting any work on the regulator, depressurize all plant sections concerned as well as the regulator.
- Drain the process medium from all the plant sections concerned as well as the regulator.
- Wear personal protective equipment.

### **⚠ 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 eyewear.*

### **⚠ 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 heat up.
- Wear protective clothing and safety gloves.

### **ⓘ NOTICE**

*Risk of regulator damage due to incorrect servicing or repair.*

*Service and repair work must be performed by trained staff only.*

### **ⓘ NOTICE**

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

*Observe the specified torques on tightening regulator components. Excessively tightened torques lead to parts wearing out quicker.*

*Parts that are too loose may cause leakage. Observe the specified tightening torques.*

### **ⓘ NOTICE**

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

*Only use tools approved by SAMSON.*

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### NOTICE

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

*Only use lubricants approved by SAMSON.*

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### Note

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

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### Note

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

- Certain test results (seat leakage and leak test) certified by SAMSON lose their validity when the regulator is opened.*
  - 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.*
- 

### Tip

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

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## 7.1 Preparation for return shipment

Defective devices can be returned to SAMSON for repair.

Proceed as follows to return devices to SAMSON:

1. Put the regulator out of operation (see section 9.1).
2. Decontaminate the regulator. Remove any residual process medium.
3. Fill in the Declaration on Contamination. The declaration form can be downloaded from our website at  
▶ [www.samsongroup.com](http://www.samsongroup.com) > Service & Support > After-sales Service.
4. Continue as described on our website at  
▶ [www.samsongroup.com](http://www.samsongroup.com) > Service & Support > After-sales Service > Returning goods.

## 7.2 Ordering spare parts and operating supplies

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

### Spare parts

There are no spare parts available for the Type 36-3 Regulator.

### Lubricants

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

### Tools

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

## 8 Malfunctions

The malfunctions listed in Table 4 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 for repair work.

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.

SAMSON's After-sales Service can help during troubleshooting. Further information is available in section 10.1.

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

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### Tip

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

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### Note

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

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**Table 4: Troubleshooting**

Malfunction	Possible reasons	Recommended action
Downstream pressure drops below the adjusted set point.	Insufficient pressure pulses on the operating diaphragm.	<ul style="list-style-type: none"> <li>→ Clean the control line and screw fittings.</li> <li>→ Draw up an energy balance.</li> </ul>
	Regulator installed against the flow.	→ Install the regulator so that the direction of flow matches the direction indicated by the arrow on the body.
	Regulator or $K_{VS}/C_V$ 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> </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>
	Safety device, e.g. pressure limiter, has been triggered	→ Check plant. Unlock safety device.
	Strainer blocked.	→ Clean strainer.
Downstream pressure exceeds the adjusted set point.	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>
	Seat and plug are worn or leak.	<ul style="list-style-type: none"> <li>→ Clean the seat and plug.</li> <li>→ Replace the damaged seat and plug.</li> <li>→ Contact SAMSON's After-sales Service.</li> </ul>
	Regulator or $K_{VS}/C_V$ 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> </ul>
	Control line blocked	→ Clean the control line and screw fittings.
Jerky control response	Increased friction, e.g. due to foreign particles between seat and plug or in the stem guide on the bonnet.	<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>
Slow control response	Control line blocked by dirt causing the flow through it to be restricted.	→ Clean the control line.

**Table 4: Troubleshooting**

Malfunction	Possible reasons	Recommended action
Downstream pressure hunts	Regulator 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> </ul>
	The restriction in the control line for pressure tapping is missing.	<ul style="list-style-type: none"> <li>→ Install a restriction.</li> <li>→ Contact SAMSON's After-sales Service.</li> </ul>
Loud noises	High flow velocity, cavitation	<ul style="list-style-type: none"> <li>→ Check the sizing.</li> <li>→ Install larger regulator, if necessary.</li> </ul>
Leakage at the actuator	Defective operating diaphragm and backup diaphragm	<ul style="list-style-type: none"> <li>→ Replace damaged diaphragms.</li> <li>→ Contact SAMSON's After-sales Service.</li> </ul>
Leakage at the diaphragm stem	Bellows seal on the diaphragm stem defective	<ul style="list-style-type: none"> <li>→ Replace the diaphragm stem with bellows seal.</li> <li>→ Contact SAMSON's After-sales Service.</li> </ul>
Red mark appears at the diaphragm rupture indicator.	Defective operating diaphragm	<ul style="list-style-type: none"> <li>→ Replace damaged diaphragm.</li> <li>→ Contact SAMSON's After-sales Service.</li> </ul>

**! NOTICE**

*Risk of TÜV approval (based on AGFW worksheet FW 504) for Type 36-3 becoming void. Consult SAMSON's After-sales Service before you change parts or perform service or repair work on TÜV-tested Type 36-3 Regulators.*

# 9 Decommissioning and removal

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### DANGER

*Risk of bursting in pressure equipment. Regulators and pipelines are pressure equipment. Improper opening can lead to bursting of the regulator.*

- *Before starting any work on the regulator, depressurize all plant sections concerned as well as the regulator.*
  - *Drain the process medium from all the plant sections concerned as well as the regulator.*
  - *Wear personal protective equipment.*
- 

### 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 eyewear.*

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### 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 heat up.*
  - *Wear protective clothing and safety gloves.*
- 

## 9.1 Decommissioning

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

1. Close the shut-off valve on the upstream side of the regulator.
2. Close the shut-off valve on the downstream side of the regulator.
3. Completely drain the pipelines and regulator.
4. Depressurize the plant. Shut off or disconnect the control line, if installed.
5. If necessary, allow the pipeline and device to cool down or heat up.
6. Unbolt the flange joint.
7. Remove the regulator from the pipeline.

## 9.2 Disposal

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

## 10 Annex

### 10.1 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 the After-sales Service at [aftersalesservice@samson.de](mailto:aftersalesservice@samson.de).

#### 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.samson.de](http://www.samson.de)) or in all SAMSON product catalogs.

To assist diagnosis and in case of an unclear mounting situation, specify the following details (so far as possible). See section 2:

- Device type and nominal size
- Model number and configuration ID
- 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.)

### 10.2 Certificates

The EU declaration of conformity is provided on the next page.



**EU-KONFORMITÄTserklärung  
EU DECLARATION OF CONFORMITY**

**Modul D/Module D, Nr./No. / N° CE-0062-PED-D-SAM 001-16-DEU-rev-A**

SAMSON erklärt in alleiniger Verantwortung für folgende Produkte:/For the following products, SAMSON hereby declares under its sole responsibility:

**Sicherheitsabsperrventil mit Druckminderer SAV 36-3 (2363)/Safety Shut-off Valve SSV 36-3 (2363)**

die Konformität mit nachfolgender Anforderung/the conformity with the following requirement.

Richtlinie des Europäischen Parlaments und des Rates zur Harmonisierung der Rechtsvorschriften der Mitgliedstaaten über die Bereitstellung von Druckgeräten auf dem Markt.	2014/68/EU	vom 15.05.2014
Directive of the European Parliament and of the Council on the harmonization of the laws of the Member States relating of the making available on the market of pressure equipment.	2014/68/EU	of 15 May 2014
EG-Baumusterprüfbescheinigung EC Type Examination Certificate	Modul B Module B	Zertifikat-Nr./Certificate no. 01 202 931-B-13-0022
Angewandtes Konformitätsbewertungsverfahren Conformity assessment procedure applied	Modul D Module D	Zertifikat-Nr./Certificate no. CE-0062-PED-D-SAM-001-16-DEU-rev-A

Dem Entwurf zu Grunde gelegt sind Verfahren aus:/The design is based on the procedures specified in the following standards:  
DIN EN 12516-2, DIN EN 12516-3 bzw./or ASME B16.1, ASME B16.34, ASME B16.42

Das Qualitätssicherungssystem des Herstellers wird von folgender benannter Stelle überwacht:  
The manufacturer's quality management system is monitored by the following notified body:

**Bureau Veritas S.A. Nr./No. 0062, Newtime, 52 Boulevard du Parc, Ile de la Jatte, 92200 Neuilly sur Seine, France  
Hersteller/Manufacturer: SAMSON AG, Weismüllerstraße 3, 60314 Frankfurt am Main, Germany**

Frankfurt am Main, 08. Februar 2017/08 February 2017

*Klaus Hörtschken*

Klaus Hörtschken  
Zentralabteilungsleiter/Head of Central Department  
Entwicklung Ventile und Antriebe/R&D, Valves and Actuators

*Dr. Michael Heß*

Dr. Michael Heß  
Zentralabteilungsleiter/Head of Central Department  
Product Management & Technical Sales

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**EB 2546-1 EN**



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