

# MOUNTING AND OPERATING INSTRUCTIONS

**SAMSON**

## **EB 2540 EN**

**Translation of original instructions**



**Type 2404-2 Excess Pressure Valve with Pilot Valve**  
Self-operated regulator for small set point ranges

Edition December 2025

**CE**

**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 (aftersalesservice@samsongroup.com).



Documents relating to the device, such as the mounting and operating instructions, are 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*

**ℹ Note**

*Additional information*

**💡 Tip**

*Recommended action*

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# 1 Safety instructions and measures

## Intended use

The SAMSON Type 2404-2 Regulator is an excess pressure valve with pilot valve for small set point ranges. It consists of a Type 2406 Valve (DN 65 to 150) or Type 2422 Valve as the main valve with a Type 2420 Diaphragm Actuator (DN 200 to 400), Type 2406 Pilot Valve and the Type 2441 Input Pressure Regulator. The tested regulator is delivered as an assembled unit.

The self-operated regulator is used to control the pressure in storage tanks. Gases in processing and industrial plants can be controlled by the regulator.

The regulator is designed to operate under exactly defined conditions (e.g. operating pressure, process medium, temperature). Therefore, operators must ensure that the regulator is only used in operating conditions that meet the specifications used for sizing the regulator at the ordering stage. In case operators intend to use the regulators 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 regulator is 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

## **Safety instructions and measures**

### **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 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.

### **Personal protective equipment**

SAMSON recommends 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
- Hard hat
- Safety harness, e.g. when working at height
- Safety footwear, if applicable ESD (electrostatic discharge) footwear

➔ 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 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 standard operating procedures drawn up by the operator.

SAMSON also recommends 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 deal 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 section 'Referenced documents').

### **Safety features**

The Type 2404-2 Regulator does not have any special safety features. When relieved of pressure, the regulator is closed by the force of the set point springs.

### **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.

### **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.

## Safety instructions and measures

### Referenced standards, directives and regulations

The regulators comply with the requirements of the European Pressure Equipment Directive 2014/68/EU and the Machinery Directive 2006/42/EC. Regulators with a CE marking have a EU declaration of conformity which includes information about the applied conformity assessment procedure. The EU declaration of conformity is included in the 'Certificates' chapter.

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).

### Referenced documents

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

- Mounting and operating instructions for
  - e.g. **Type 2 N or 2 NI Strainer** ▶ EB 1015
  - e.g. **Type 2406 Excess Pressure Valve** ▶ EB 2522
  - e.g. **Type 2441 Pressure Reducing Valve** ▶ EB 2626-1
- 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 pressure equipment.**

Regulators and pipelines are pressure equipment. Impermissible pressure or improper opening of the pressure equipment 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 the plant sections affected as well as from the regulator.
- ➔ Wear personal protective equipment.

## 1.2 Notes on possible personal injury

### WARNING

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

### **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.

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

The noise emissions depend on the valve version, plant facilities and process medium.

- ➔ Wear hearing protection when working near the valve.

#### **Risk of personal injury due to pressurized components and as a result of process medium being discharged.**

Incorrect opening of pressure equipment or mounting parts may lead to the process medium escaping to the atmosphere.

- ➔ Do not unscrew the control line while the valve is pressurized.

#### **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 the 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/)).

## 1.3 Notes on possible property damage

### NOTICE

#### **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 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 surfaces.

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

#### **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 the device.

#### **Risk of leakage and regulator damage due to over- or under-torquing.**

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 the 'Tightening torques' chapter in the Appendix).

#### **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.

### **NOTICE**

**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.

**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.

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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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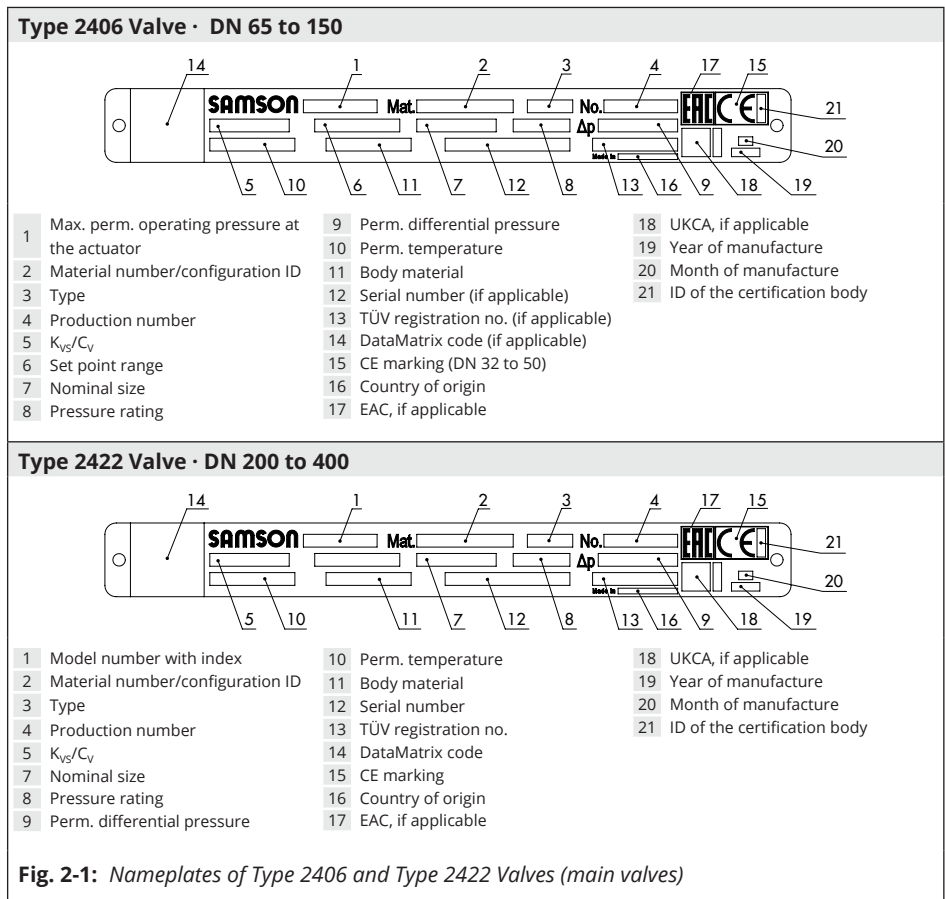


## 2 Markings on the device

Several nameplates are affixed to the device. The nameplates are used to identify the separate regulator components.

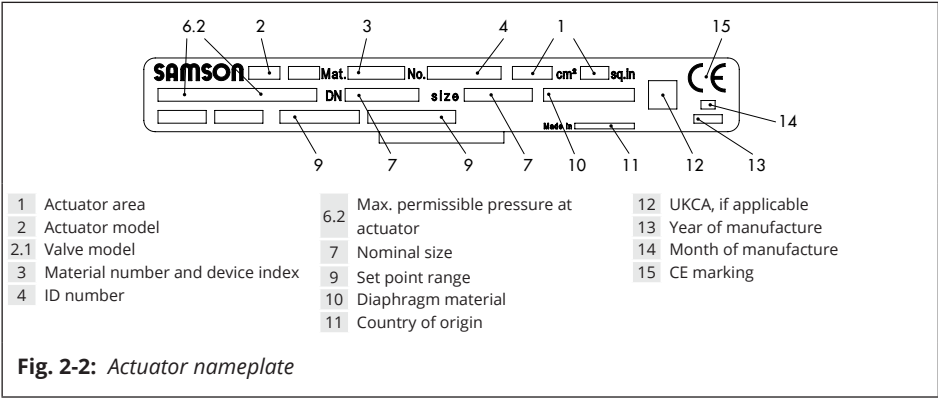
### 2.1 Nameplates

#### 2.1.1 Nameplate of main valve

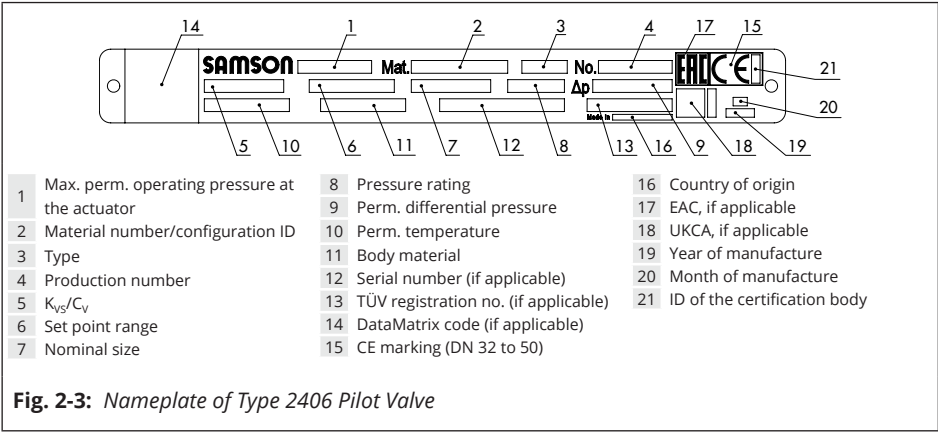


Markings on the device

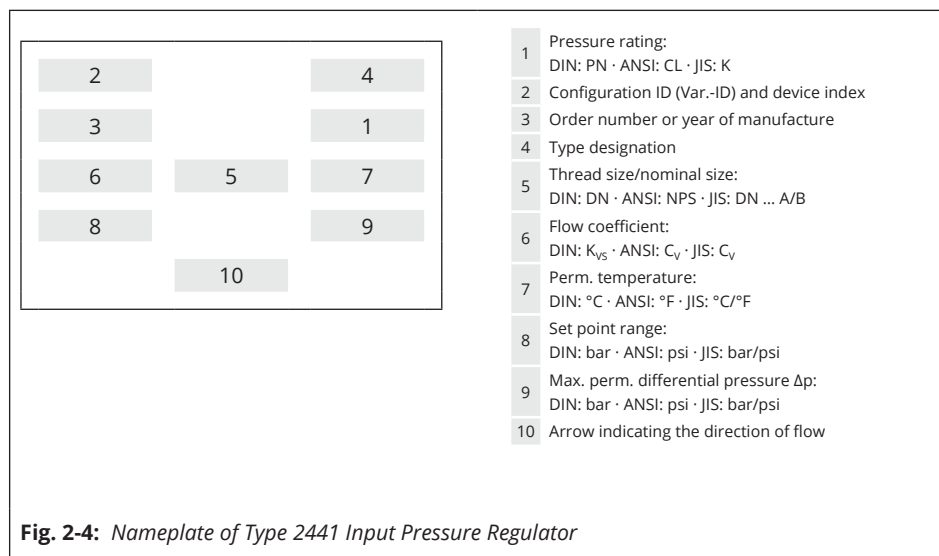
2.1.2 Actuator nameplate



2.1.3 Nameplate of pilot valve



## 2.1.4 Nameplate of input pressure regulator



2.2 Location of the nameplates

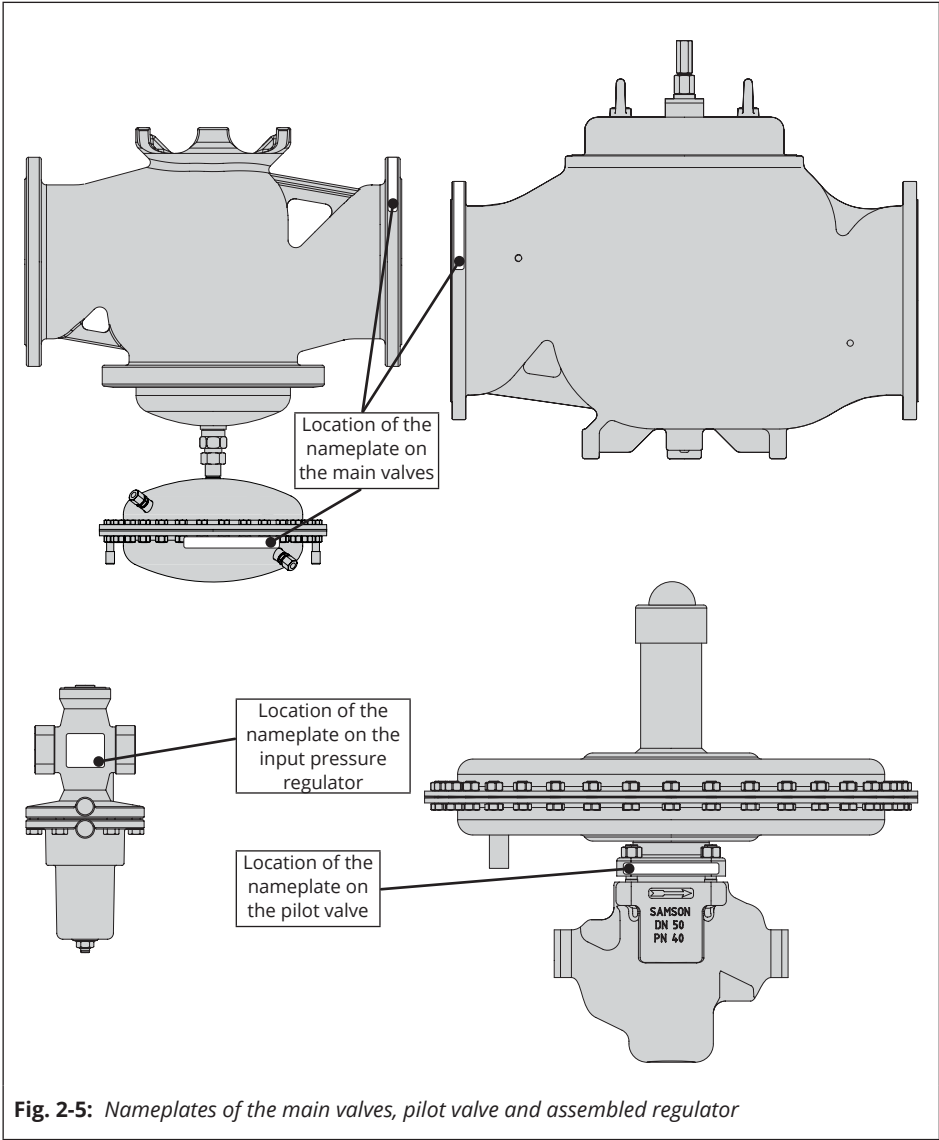


Fig. 2-5: Nameplates of the main valves, pilot valve and assembled regulator

## 2.3 Material identification number

For more details on the nameplate, see Chapter 2.1.3.

### 2.3.1 Type 2406 as main valve

The material is specified in the 'Body material' field (DIN/ANSI, item 11). Specifying the material number, you can contact us to find out more details. For more details on the nameplate, see Chapter 2.1.

### 2.3.5 Type 2441 Input Pressure Regulator

The material is indicated on the cast body. Specifying the material number, you can contact us to find out more details. For more details on the nameplate, see Chapter 2.1.4.

### 2.3.2 Type 2422 as main valve

The material is specified in the 'Body material' field (DIN/ANSI, item 11). Specifying the material number, you can contact us to find out more details. For more details on the nameplate, see Chapter 2.1.

### 2.3.3 Type 2420 Actuator

Specifying the material number, you can contact SAMSON to find out which material is used. It is specified on the nameplate in the 'MNo.' field (3). For more details on the nameplate, see Chapter 2.1.2.

### 2.3.4 Type 2406 Pilot Valve

The material is specified in the 'Body material' field (DIN/ANSI, item 11). Specifying the material number, you can contact us to find out more details.

**Markings on the device**

### 3 Design and principle of operation

→ See Fig. 3-6

The following components interact to regulate the pressure of the inert gas.

The input pressure regulator (3) is delivered ready-adjusted. It reduces the supply pressure  $p$  (medium: inert gas or compressed air) to the input pressure  $p_e$  for the pilot valve (2) to approx.

1 bar/15 psi (positive pressure), ensuring precise pressure control even at varying upstream pressures.

The pilot valve (2) compares the actual pressure with the set point pressure. In the idle state, the pilot valve is closed by the force of the set point spring (2.1).

The upstream pressure  $p_1$  to be controlled is routed to the pilot valve over the control line (2.4). The force created by the upstream pressure  $p_1$  at the operating diaphragm (2.2) is compared with the adjusted spring force of the set point spring. The pilot valve opens when the blanketing gas pressure in the tank rises above the adjusted set point. This causes the control pressure  $p_s$  to increase as well. The main valve also starts to open when the force of the control pressure  $p_s$  acting on the actuator diaphragm (1.2) in the main valve (1) is greater than the force of the closing spring (1.1). As a result, the blanketing gas is vented to the atmosphere or recovered for processing until the tank blanketing is

re-stabilized or the pressure falls below adjusted set point.

The needle valve (4) is delivered ready-adjusted and lead-sealed.

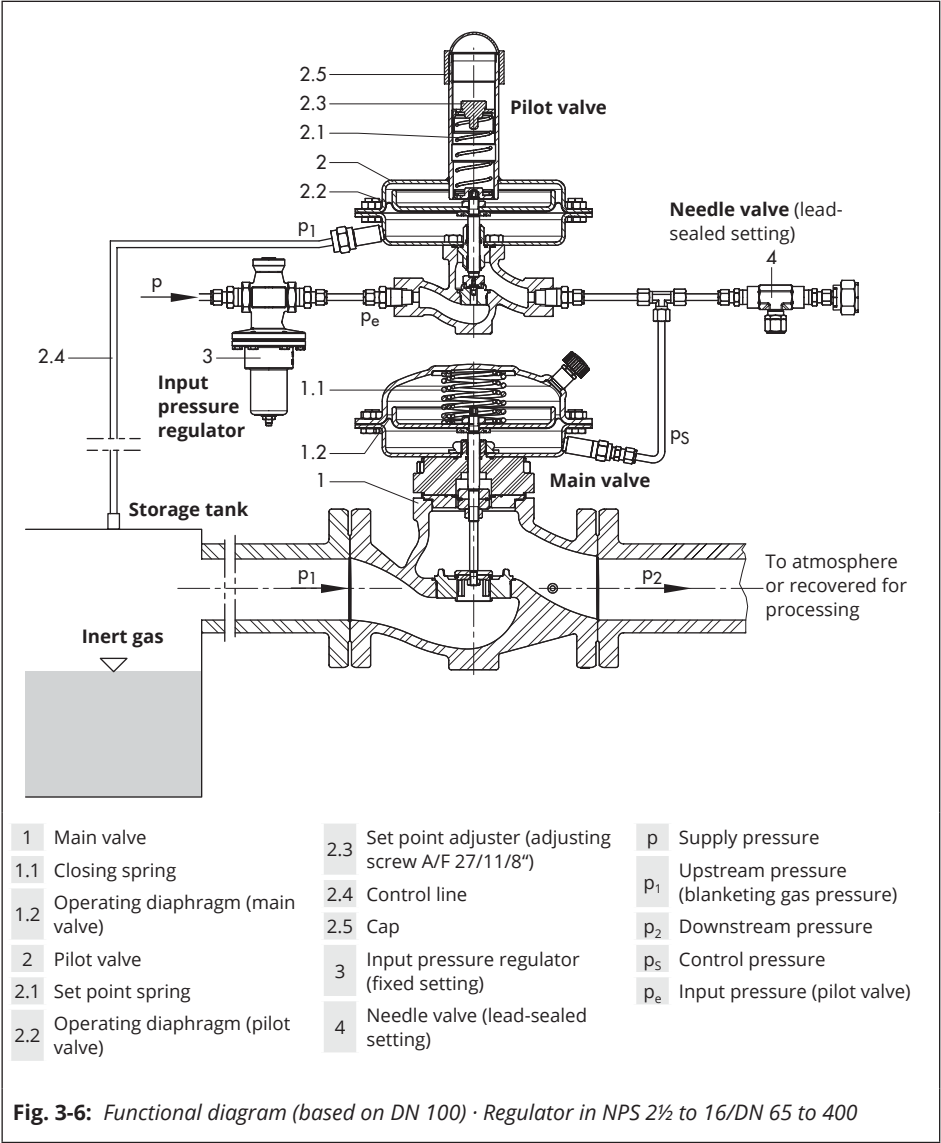
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#### **i Note**

*Optionally, the outlet (1/8 NPT) of the needle valve (4) can be routed to the downstream pressure ( $p_2$ ) side of the main valve.*

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Design and principle of operation





## 3.1 Additional fittings

→ See Fig. 3-7

### Pressure gauge

Install a pressure gauge (3) at suitable points to monitor the pressures prevailing in the storage tank.

### Shut-off valves

SAMSON recommends installing a shut-off valve (1) both upstream of the strainer.

### Strainer

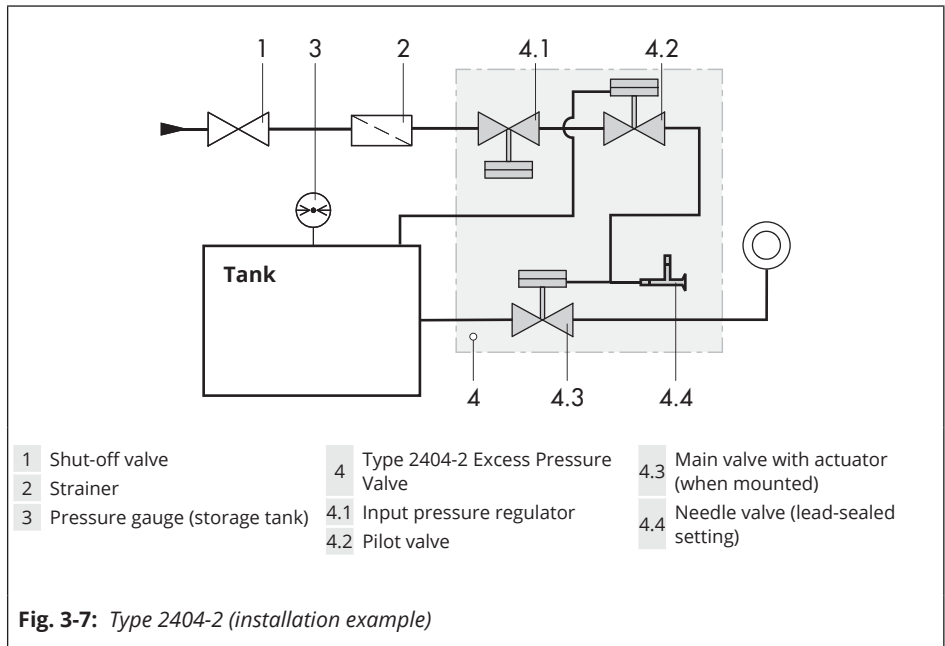
SAMSON recommends installing a SAMSON strainer (2) upstream of the

input pressure regulator. It prevents solid particles in the process medium from damaging the regulator.

- Do not use the strainer to permanently filter the process medium.
- Select a strainer (mesh size) suitable for the process medium.

### **i** Note

*Any impurities carried along by the process medium may impair the proper functioning of the regulator. SAMSON recommends installing a strainer (e.g. SAMSON Type 2 NI) upstream of the input pressure regulator (► EB 1015).*



### 3.2 Technical data

The nameplates on the individual components of the regulator provide information on the component version (see the 'Markings on the device' chapter).

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#### **Note**

*More information is available in Data Sheet ► T 2540.*

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#### Conformity

The Type 2404-2 Regulator bears both the CE and EAC marks of conformity.



#### Process medium and scope of application

The Type 2404-2 Excess Pressure Valve with pilot valve for small set point ranges is used to maintain the tank pressure to an adjusted set point.

- For **gases**
- Medium temperature range  
**-5 to +195 °F/-20 to +90 °C**
- Set points  
**0.075 to 3 psi/5 to 200 mbar**
- Nominal sizes  
**NPS 2½ to 16/DN 65 to 400**
- Pressure rating  
**Class 125, 150, 300/PN 16, 40**

#### Leakage class

The soft-seated regulator has the leakage class IV according to IEC 60534-4.

#### 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 3-8 and Table 3-9 provide an overview of the dimensions and weights. The lengths and heights in the dimensional drawings are shown on page 3-9 onwards.

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

| Type 2406 as main valve, balanced by a diaphragm                          |   |                  |                  |                             |                 |
|---|---|------------------|------------------|-----------------------------|-----------------|
| Nominal size  | NPS 2½<br>DN 65                             | NPS 3<br>DN 80   | NPS 4<br>DN 100  | –<br>DN 125                 | NPS 6<br>DN 150 |
| Pressure rating   | Class 125, 150, 300 · PN 16, 40             |                  |                  | Class 125, 150<br>PN 16, 40 |                 |
| C <sub>v</sub> coefficients   | 60  | 94               | 145              | –                           | 450             |
| K <sub>vs</sub> coefficients  | 50  | 80               | 125              | 250                         | 380             |
| Actuator area   | 50 in² · 320 cm²                            |                  |                  |                             |                 |
| Leakage class according to ANSI/<br>FCI 70-2 or IEC 60534-4               | Soft-seated, minimum Class IV               |                  |                  |                             |                 |
| Perm. differential pressure Δp  | 175 psi · 12 bar                            |                  |                  |                             |                 |
| Perm. temperature   | –5 to +195 °F · –20 to +90 °C <sup>1)</sup> |                  |                  |                             |                 |
| Conformity  | CE  |                  |                  |                             |                 |
| Type 2422 as main valve, balanced by a diaphragm, with Type 2420 Actuator |   |                  |                  |                             |                 |
| Nominal size  | NPS 8<br>DN 200                             | NPS 10<br>DN 250 | NPS 12<br>DN 300 | NPS 16<br>DN 400            |                 |
| Pressure rating   | Class 125, 150 · PN 16, 40                  |                  |                  |                             |                 |
| C <sub>v</sub> coefficients   | 760   | 930              | 1440             | 2400                        |                 |
| K <sub>vs</sub> coefficients  | 650   | 800              | 1250             | 2000                        |                 |
| Actuator area of Type 2420  | 320 cm²                                     |                  |                  | 640 cm²                     |                 |
| Leakage class according to ANSI/<br>FCI 70-2 or IEC 60534-4               | Soft-seated, minimum Class IV               |                  |                  |                             |                 |
| Perm. differential pressure Δp  | 145 psi · 10 bar                            |                  |                  |                             | 90 psi · 6 bar  |
| Perm. temperature   | –5 to +195 °F · –20 to +90 °C <sup>1)</sup> |                  |                  |                             |                 |
| Conformity  | CE  |                  |                  |                             |                 |

<sup>1)</sup> Max. 175 °F (80 °C) for EPDM and NBR versions

**Table 3-2:** *Technical data for pilot valve · All pressures in bar (gauge)*

| Type 2406 Pilot Valve         |   |                                    |                                   |                                  |
|-------------------------------|---|------------------------------------|-----------------------------------|----------------------------------|
| Connection                    | ½ NPT   |                                    |                                   |                                  |
| Pressure rating               | Class 300   |                                    |                                   |                                  |
| C <sub>v</sub> coefficient    | 1.2   |                                    |                                   |                                  |
| K <sub>vs</sub> coefficient   | 1   |                                    |                                   |                                  |
| Set point ranges              | 0.075 to 0.2 psi/<br>5 to 15 mbar                                 | 0.15 to 0.45 psi/<br>10 to 30 mbar | 0.35 to 0.9 psi/<br>25 to 60 mbar | 0.75 to 3 psi/<br>50 to 200 mbar |
| Actuator area                 | 100 in²/640 cm²   | 50 in²/320 cm²                     | 50 in²/320 cm²                    | 50 in²/320 cm²                   |
| Input pressure p <sub>e</sub> | Fixed setting by input pressure regulator, min. 15 psi/min. 1 bar |                                    |                                   |                                  |
| Perm. temperature             | -5 to +195 °F/-20 to +90 °C <sup>1)</sup>                         |                                    |                                   |                                  |

<sup>1)</sup> Max. 175 °F (80 °C) for EPDM and NBR versions

**Table 3-3:** *Technical data for input pressure regulator · All pressures in bar (gauge)*

| Type 2441 Input Pressure Regulator |                            |
|------------------------------------|----------------------------|
| Connection                         | ½ NPT                      |
| Pressure rating                    | Class 300                  |
| C <sub>v</sub> coefficient         | 1.2                        |
| K <sub>vs</sub> coefficient        | 1                          |
| Set point range                    | 15 to 60 psi<br>1 to 4 bar |

**Table 3-4:** *Materials for main valve · Material numbers according to ASTM and DIN EN*

| <b>Type 2406 as main valve</b>                              |   |
|---|---|
| Body  | A126B, A216 WCC, A351 CF8M · EN-GJL-250, 1.0619, 1.4408   |
| Valve seat  | 1.4404/316L   |
| Plug  | 1.4404/316L   |
| Plug seal   | EPDM · NBR · FKM  |
| Operating diaphragm, balancing diaphragm                    | EPDM · NBR <sup>4)</sup> · FKM  |
| Internal parts, guiding parts                               | 1.4404/316L   |
| Diaphragm cases   | 1.0332 (1.4301/stainless steel housing)   |
| Actuator springs  | 1.4310 <sup>3)</sup>  |
| <b>Type 2422 Valve (main valve) with Type 2420 Actuator</b> |   |
| Body  | A126B, A216 WCC, A351 CF8M · EN-GJL-250, 1.0619, 1.4408   |
| Valve seat and plug   | NPS 8 to 10 (DN 200 to 250): CF3M (1.4409)<br>NPS 12 and 16 (DN 300 and 400): 304 or 410 (1.4301) <sup>1)</sup> |
| Plug seal   | EPDM · NBR · FKM  |
| Operating diaphragm, balancing diaphragm                    | EPDM · NBR · FKM <sup>2)</sup>  |
| Internal parts, guiding parts                               | 1.4404/316L   |
| Diaphragm cases   | 1.0332 (1.4301/stainless steel housing)   |
| Actuator springs  | 1.4310 <sup>3)</sup>  |

1) NPS 12 and 16: optionally 1.4404/316L

2) NPS 8, 10 and 12 (DN 200, 250 and 300) only

3) Versions for sour gas service (NACE): Hastelloy®

4) Not for NPS 2½, 3 and 4/DN 65, 80 and 100

## Design and principle of operation

**Table 3-5:** *Materials for pilot valve · Material numbers according to ASTM and DIN EN*

| Pilot valve                   | Type 2406 <sup>1)</sup> |
|-------------------------------|-------------------------|
| Body                          | A216 WCC · A351 CF8M    |
| Valve seat                    | 1.4404/316L             |
| Plug                          | 1.4404/316L             |
| Plug seal                     | EPDM · NBR · FKM        |
| Operating diaphragm           | EPDM · FKM              |
| Internal parts, guiding parts | 1.4404/316L             |
| Set point spring              | 1.4310                  |

<sup>1)</sup> Versions for sour gas service (NACE) possible

**Table 3-6:** *Materials for input pressure regulator · Material numbers according to ASTM and DIN EN*

| Input pressure regulator      | Type 2441        |
|-------------------------------|------------------|
| Body                          | 1.4408/A351 CF8M |
| Valve seat                    | 1.4404/316L      |
| Plug                          | 1.4404/316L      |
| Plug seal                     | EPDM · NBR · FKM |
| Balancing bellows             | 1.4571           |
| Operating bellows             | 1.4571           |
| Set point spring, plug spring | 1.4310           |

**Table 3-7:** *Materials used for mounting kit · Material numbers according to ASTM and DIN EN*

| Mounting kit             |                  |
|--------------------------|------------------|
| Hook-up                  | Stainless steel  |
| NPT screw fittings       | 1.4404/316L      |
| Needle valve             | 1.4404/316L      |
| Input pressure regulator | 1.4408/A351 CF8M |

# Dimensions · NPS 2½ to 6/DN 65 to 150

**Table 3-8:** Dimensions · NPS 2½ to 6 (DN 65 to 150) (see Fig. 3-8 to Fig. 3-10)

| Type 2404-2        |                                   | NPS 2½<br>DN 65                   | NPS 3<br>DN 80   | NPS 4<br>DN 100  | –<br>DN 125       | NPS 6<br>DN 150   |
|--------------------|-----------------------------------|-----------------------------------|------------------|------------------|-------------------|-------------------|
| L1                 | Class 125 and 150                 | 10.9"/<br>276 mm                  | 11.7"/<br>298 mm | 13.9"/<br>352 mm | –                 | 17.75"/<br>451 mm |
|                    | Class 300                         | 11.5"/<br>292 mm                  | 12.5"/<br>318 mm | 14.5"/<br>368 mm | –                 |                   |
| L1                 | PN 16 and 40                      | 11.4"/<br>290 mm                  | 12.2"/<br>310 mm | 13.8"/<br>350 mm | 15.75"/<br>400 mm | 18.9"/<br>480 mm  |
| L2 (approx.)       |                                   | 14.2"/360 mm                      |                  |                  |                   | 12.5"/317 mm      |
| L3 (approx.)       |                                   | 9.4"/240 mm                       |                  |                  |                   | 8.3"/212 mm       |
| ØD                 | 5 to 15 mbar/<br>0.075 to 0.2 psi | Ø15"/380 mm, A = 100 in²/640 cm²  |                  |                  |                   |                   |
|                    | 10 to 30 mbar<br>0.15 to 0.45 psi | Ø11.2"/285 mm, A = 50 in²/320 cm² |                  |                  |                   |                   |
|                    | 25 to 60 mbar<br>0.35 to 1.5 psi  | Ø11.2"/285 mm, A = 50 in²/320 cm² |                  |                  |                   |                   |
|                    | 50 to 200 mbar<br>0.75 to 3 psi   | 11.2"/285 mm                      |                  |                  |                   |                   |
| H <sup>1) 2)</sup> | EPDM · NBR                        | 25.4"/<br>645 mm                  | 25.8"/<br>655 mm | 26.8"/<br>680 mm | 29"/<br>735 mm    | 29.9"/<br>760 mm  |
|                    | FKM                               |                                   |                  |                  | 30.9"/<br>784 mm  | 31.9"/<br>810 mm  |
| H3                 |                                   | 3.8"/<br>98 mm                    | 3.9"/<br>100 mm  | 4.7"/<br>120 mm  | 5.7"/<br>145 mm   | 6.9"/<br>175 mm   |
| b (approx.)        |                                   | 9.9"/250 mm                       |                  |                  |                   |                   |
| Weight, approx.    |                                   | 123 lb/56 kg                      | 135 lb/61 kg     | 154 lb/70 kg     | 280 lb/127 kg     | 291 lb/132 kg     |

<sup>1)</sup> For 640 cm² actuator: height H + 8 mm

<sup>2)</sup> Overall height increases by 20 mm for stainless steel version with actuator ØD = 320 cm².

## Design and principle of operation

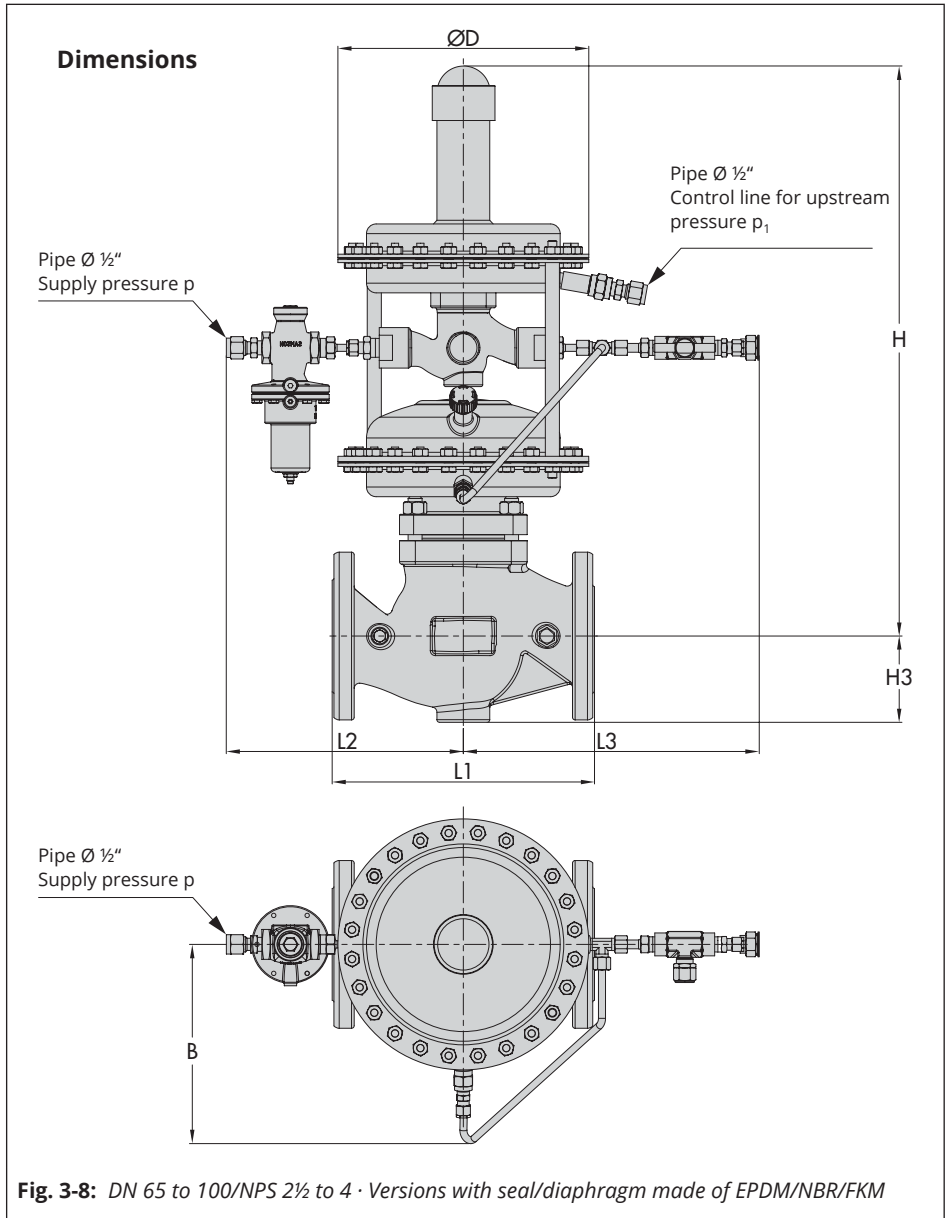
### Dimensions · DN 200 to 400 · NPS 8 to 16

**Table 3-9:** *Dimensions · DN 200 to 400 · NPS 8 to 16 (see Fig. 3-11 and Fig. 3-12)*

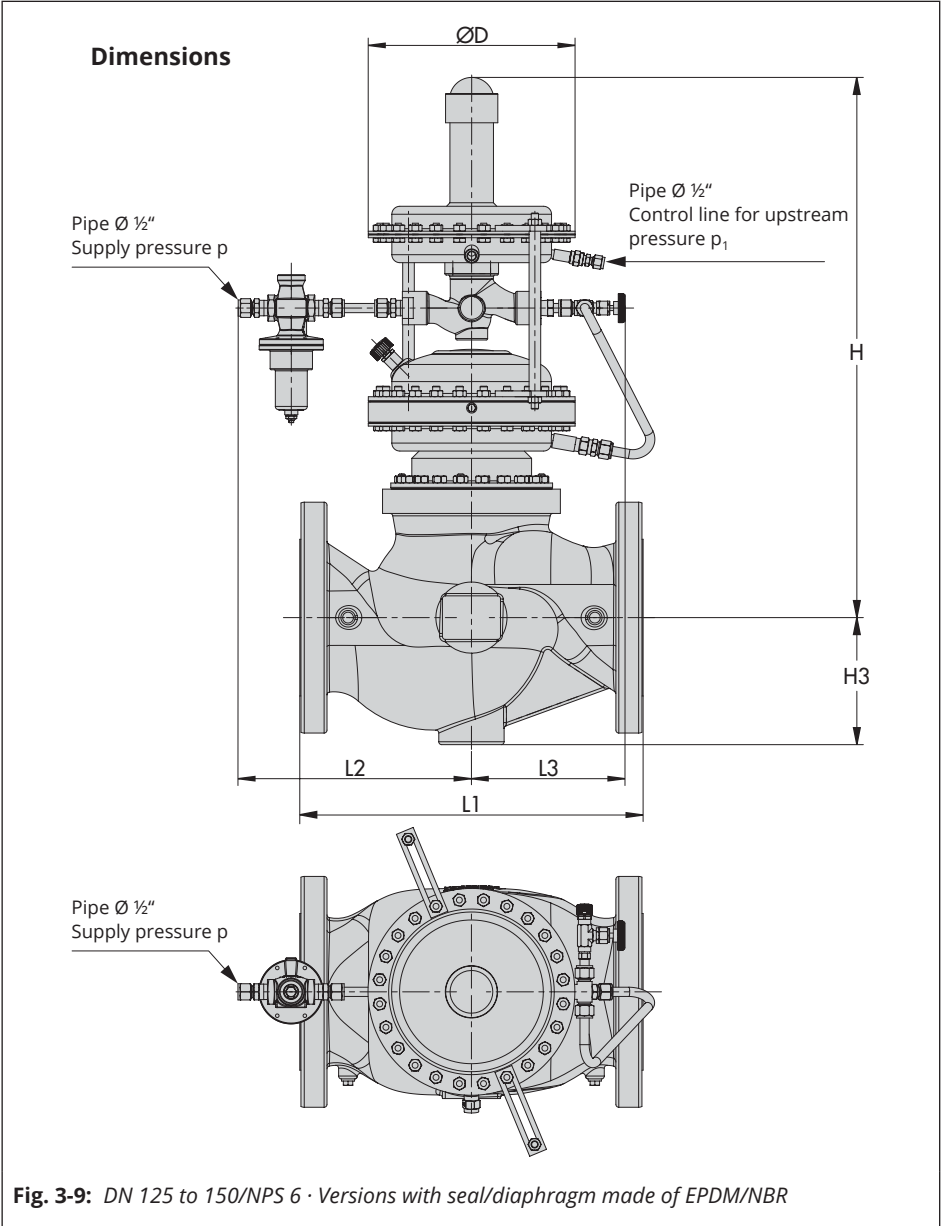
| Type 2404-2     |  | NPS 8<br>DN 200  | NPS 10<br>DN 250 | NPS 12<br>DN 300 | NPS 16<br>DN 400 |
|-----------------|--|--|------------------|------------------|------------------|
| L1              | Class 125 and 150                            | 21.4"/543 mm   | 26.5"/673 mm     | 28.9"/736 mm     | 40"/1016 mm      |
| L1              | PN 16 and 40                                 | 18.9"/480 mm   | 23.6"/600 mm     | 28.7"/730 mm     | 33.5"/850 mm     |
| L2 (approx.)    |  | 14.9"/378 mm   |                  | 19.7"/500 mm     |                  |
| L3 (approx.)    |  | 8.2"/208 mm  |                  | 12.3"/313 mm     | 13.5"/343 mm     |
| ØD              | 0.075 to 0.2 psi/<br>5 to 15 mbar            | Ø15"/380 mm, A = 100 in <sup>2</sup> /640 cm <sup>2</sup>  |                  |                  |                  |
|                 | 0.15 to 0.45 psi/<br>10 to 30 mbar           | Ø11.2"/285 mm, A = 50 in <sup>2</sup> /320 cm <sup>2</sup> |                  |                  |                  |
|                 | 0.35 to 1.5 psi/25 to 60 mbar                | Ø11.2"/285 mm, A = 50 in <sup>2</sup> /320 cm <sup>2</sup> |                  |                  |                  |
|                 | 0.75 to 3 psi/<br>50 to 200 mbar             | Ø11.2"/285 mm, A = 50 in <sup>2</sup> /320 cm <sup>2</sup> |                  |                  |                  |
| H <sup>1)</sup> | EPDM · NBR                                   | 28.3"/720 mm   | 29.1"/738 mm     | 29.9"/758 mm     | 30.6"/778 mm     |
|                 | FKM  | 30.9"/783 mm   | 31.7"/803 mm     | 32.5"/823 mm     | –                |
| H3              |  | 9.3"/235 mm  | 10.2"/260 mm     | 11.2"/285 mm     | 14.6"/370 mm     |
| b (approx.)     | 50 in <sup>2</sup> /<br>320 cm <sup>2</sup>  | 19.5"/495 mm   | 20.7"/525 mm     | 22.3"/567 mm     | 25.2"/641 mm     |
|                 | 100 in <sup>2</sup> /<br>640 cm <sup>2</sup> | 21.3"/542 mm   | 22.6"/573 mm     | 23.8"/605 mm     | 25.9"/658 mm     |
| Weight, approx. |  | 529 lb/240 kg  | 573 lb/260 kg    | 772 lb/350 kg    | 1477 lb/670 kg   |

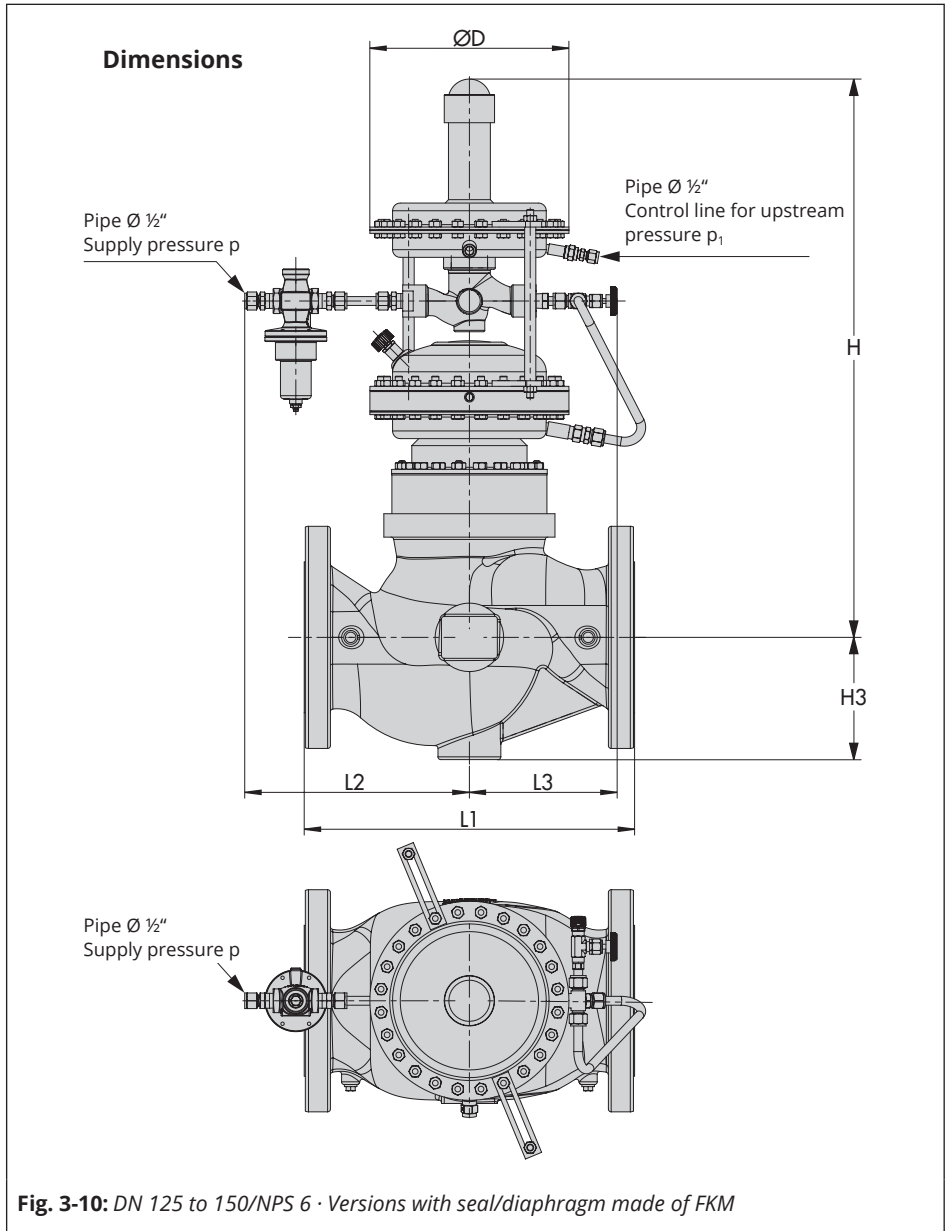
<sup>1)</sup> For 640 cm<sup>2</sup> actuator: height H +8 mm



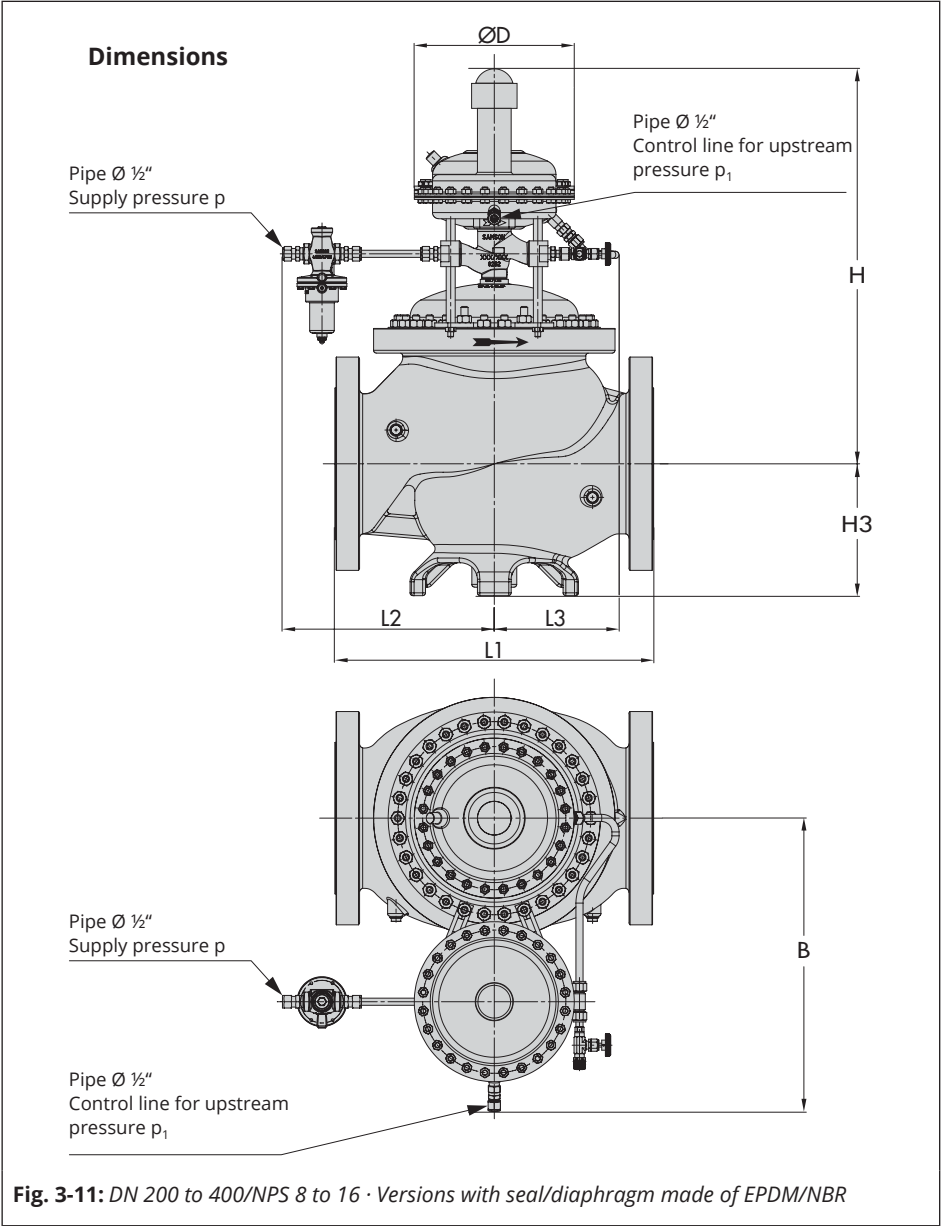


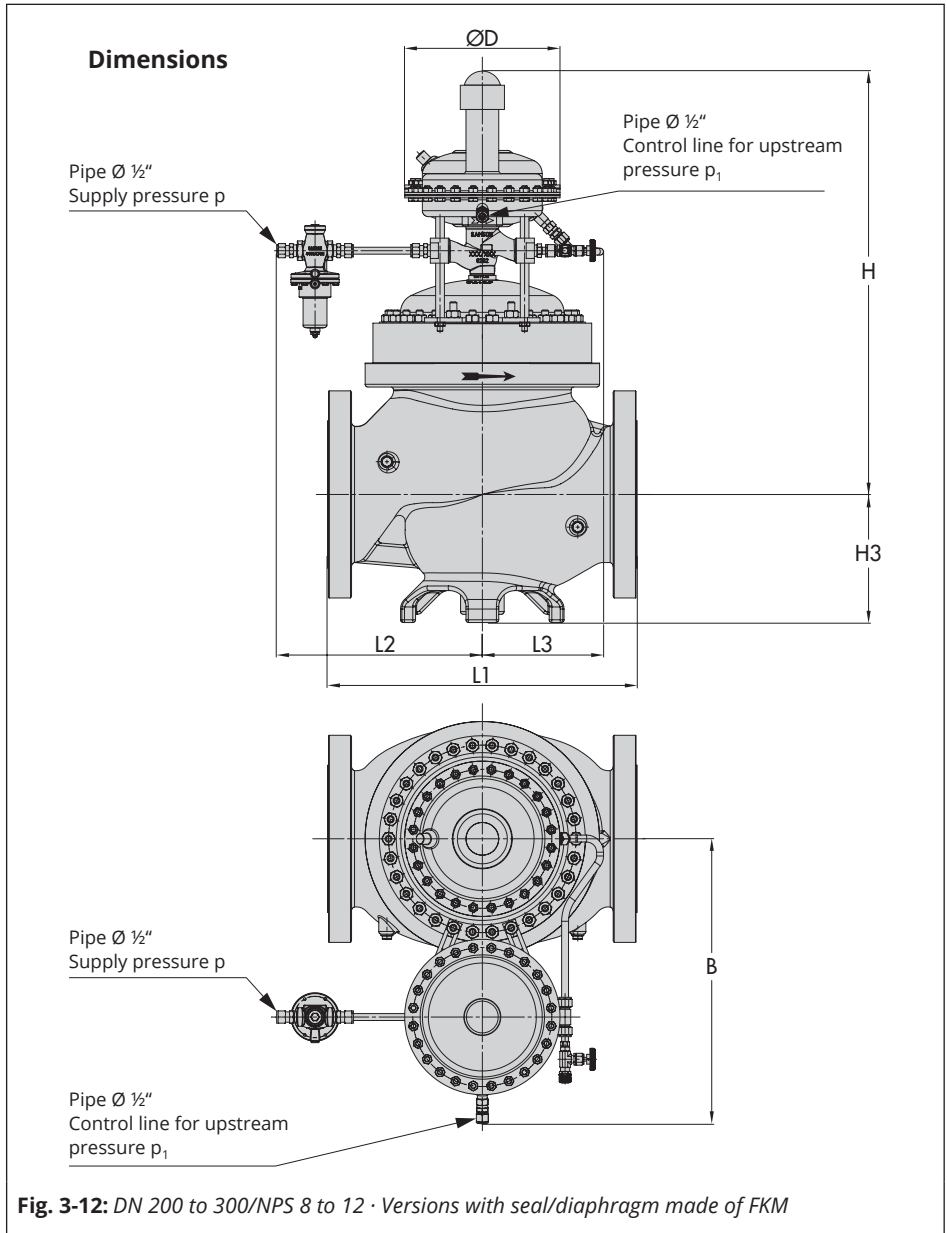
Design and principle of operation





Design and principle of operation







## 4 Shipment and on-site transport

The work described in this chapter is to be performed only 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 nameplates on the valves and actuator (if it exists) match the specifications in the delivery note. See the 'Markings on the device' chapter 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' chapter.

### 4.2 Removing the packaging from the regulator

The tested regulator is delivered as an assembled unit.

Proceed as follows to lift and install the valve:

- ➔ Do not open or remove the packaging until immediately before lifting to install the regulator into the pipeline.
- ➔ Leave the regulator components in its transport container or on the pallet to transport it on site.
- ➔ Do not remove the protective caps from the inlet and outlet until immediately before installing the valve into the pipeline. They prevent foreign particles from entering the valve.
- ➔ Dispose and recycle the packaging in accordance with the local regulations.

### 4.3 Transporting and lifting the regulator

#### DANGER

##### ***Danger due to suspended loads falling.***

- Stay clear of suspended or moving loads.
- Close off and secure the transport paths.

#### WARNING

##### ***Risk of lifting equipment tipping over 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 (including any packaging).
- Refer to the 'Design and principle of operation' chapter for the weights.

#### WARNING

##### ***Risk of injury due to incorrect lifting without the use of lifting equipment.***

*Lifting the regulator without the use of lifting equipment may lead to injuries (back injuries in particular) depending on its weight.*

- Observe the guideline weight for manual handling: 15 to max. 55 kg taking into account age, gender and physical fitness

- Observe the occupational health and safety regulations valid in the country of use.

#### 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.

#### Tip

*Our after-sales service can provide more detailed transport and lifting instructions on request.*

### 4.3.1 Transporting the regulator

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 piping and any mounted valve accessories against damage.



- ➔ Protect the regulator against moisture and dirt.
- ➔ The permissible ambient temperature of standard regulators is  $-20$  to  $+80$  °C.

### 4.3.2 Lifting the regulator

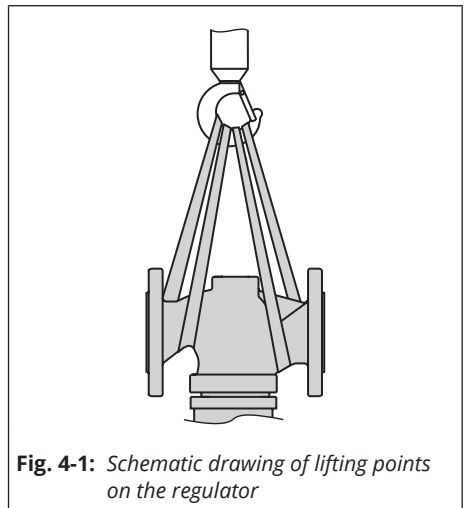
To install a large regulator into the pipeline, use lifting equipment (e.g. crane or forklift) to lift it.

#### Lifting instructions

- ➔ Use a hook with safety latch to secure the slings from slipping off the hook during lifting and transporting (see Fig. 4-1).
- ➔ Secure slings against slipping.
- ➔ Make sure the slings can be removed from the device once it has been installed into the pipeline.
- ➔ 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 body flange and one sling to the rigging equipment (e.g. hook) of the crane or forklift (see Fig. 4-1).
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 the 'Installation' chapter).
5. After installation in the pipeline, check whether the regulator flanges are bolted tight.
6. Remove slings.



**Fig. 4-1:** Schematic drawing of lifting points on the regulator

### 4.4 Storing the regulator

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#### **NOTICE**

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

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

#### **Note**

*SAMSON recommends to regularly check the regulator and the prevailing storage conditions during long storage periods.*

---

#### **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.
- Do not place any objects on the regulator.

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

Elastomer, e.g. operating diaphragm

- To keep elastomers in shape and to prevent cracking, do not bend them or hang them up.
  - Store elastomers away from lubricants, chemicals, solutions and fuels.
  - SAMSON recommends a storage temperature of 15 °C for elastomers.
- 

#### **Tip**

*Our after-sales service can provide more detailed storage instructions on request.*

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## 5 Installation

The work described in this chapter is to be performed only 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

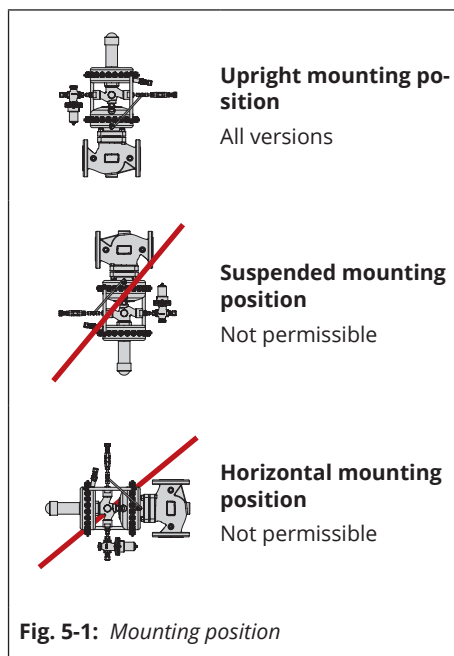
The inlet and outlet lengths vary depending on several variables and process conditions and are intended as recommendations. Contact SAMSON if the lengths are significantly shorter than the recommended lengths.

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

- ➔ Install the regulator allowing sufficient space to remove the actuator and valve or to perform service work on them.
- ➔ Install the regulator free of stress and with the least amount of vibrations as possible. Read sections

“Mounting position” and “Support or suspension” in this chapter.

#### Mounting position



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

- ➔ Mounting position: install the actuator housing suspended upward in horizontal pipelines (see Fig. 5-1).
- ➔ Leave sufficient space for set point adjustment at the pilot valve.
- ➔ Make sure the direction of flow matches the direction indicated by the arrow on the body.

# Installation

➔ Contact SAMSON if the mounting position is not as specified above.

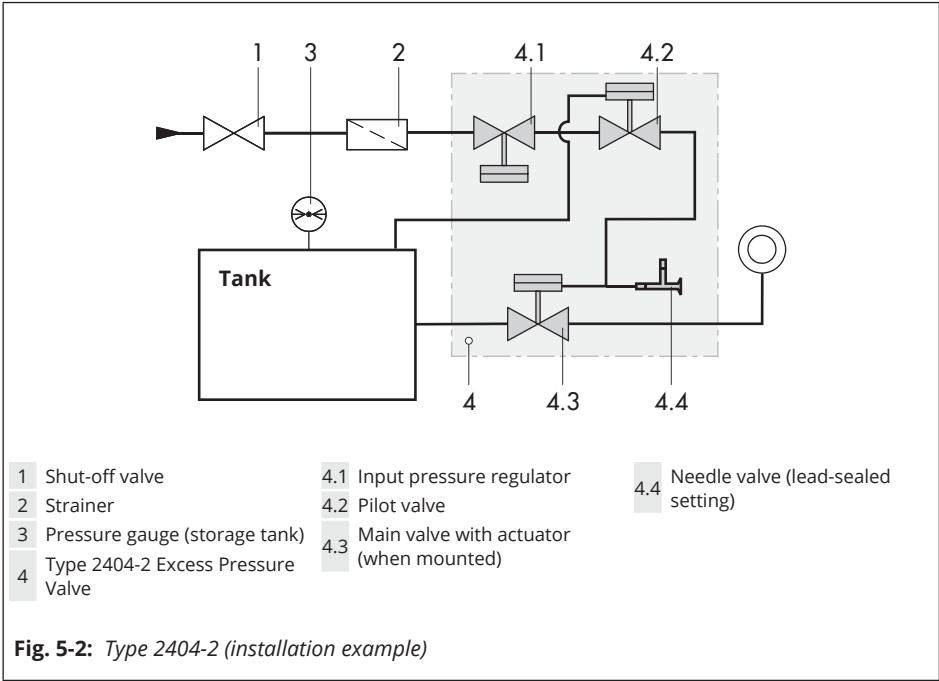
## Support or suspension

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

### **i** Note

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

**! NOTICE**  
Do not attach supports directly to the valve, actuator or control line.



## 5.2 Preparation for installation

Before installation, make sure that the following conditions are met:

- All the components of the regulator are clean.
- All the components of the regulator and piping are not damaged.
- Install a strainer upstream of the input pressure regulator.
- The data on the nameplates (type designation, nominal size, material, pressure rating and temperature range) match the plant conditions (nominal size and pressure rating of the pipeline, medium temperature etc.). See the 'Markings on the device' chapter for nameplate details.
- The requested or required additional fittings (see the 'Design and principle of operation' chapter) have been installed or prepared as necessary before installing the valve.

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.

## 5.3 Installation

➔ See Fig. 5-2.

Tested SAMSON regulators are delivered as assembled units. The activities listed below are necessary for installation and before start-up of the regulator.

---

### ! NOTICE

#### **Risk of regulator damage due to over- or under-torquing.**

*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 the 'Tightening torques' chapter in the Appendix).*

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### ! NOTICE

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

➔ *Only use tools approved by SAMSON (see the 'Tools' chapter in the Appendix).*

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### ! NOTICE

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

➔ *Only use lubricants approved by SAMSON (see the 'Lubricants' chapter in the Appendix).*

---

### 5.3.1 Installing the regulator

Install the regulator in such a way that it is still easily accessible after the plant is completed to facilitate maintenance or revision work.

Allow enough space (min. 150 mm) for set point adjustment (2.3) at the pilot valve (2) using a socket wrench.

1. While installing the regulator, close the shut-off valve (1) in the supply line upstream of the input pressure regulator (see Fig. 5-2).
2. Depressurize the plant.
3. Remove the protective caps from the valve ports before installing the valve.
4. 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.
5. Make sure that the correct flange gaskets are used.
6. Bolt the pipe to the valve free of stress.
7. Fasten the supply line (pipe Ø ½") to the input pressure regulator (4.1) free of stress (see Fig. 5-2).
8. Fasten the control line (pipe Ø ½") to the pilot valve (4.2) free of stress (see Fig. 5-2).
9. Slowly open the shut-off valve in the supply pipeline after the regulator has been installed.

### 5.3.2 Cleaning the pipeline

SAMSON recommends 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.
- ➔ Disconnect the control line.
- ➔ Drain the process medium from the plant sections affected as well as from 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, valve components 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 (1) installed upstream of the regulator (see Fig. 5-2).
2. Apply the required test pressure.
3. Check the regulator for leakage to the atmosphere.

## Installation

4. Depressurize the pipeline section and valve.
5. Rework any parts that leak and repeat the leak test.

→ Make sure that the pressure rises simultaneously upstream and downstream of the regulator to avoid damaging it.

### 5.4.2 Pressure test

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#### **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.*

---

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

- Observe the maximum pressure rating of the plant.
- Do not allow the pressure to exceed 1.5 times the pressure rating of the valve body.
- Do not apply a pressure above the maximum specified pressure rating to the regulator components (see nameplates of the regulator components).  
If necessary, shut off the control lines on performing a pressure test on the main valve.

### 5.5 Insulation

To insulate cold systems, SAMSON recommends 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 (see the 'Start-up' chapter).
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 a 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

The work described in this chapter is to be performed only 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 pressurized components and as a result of process medium being discharged.**

- ➔ *Do not unscrew the control line while the valve is pressurized.*

### 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.*

### DANGER

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

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

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

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

### NOTICE

#### **Damage to the regulator/plant due to the use of the incorrect supply medium.**

- ➔ *Only use compressed air or inert gas as the supply pressure.*

### 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 valve in the supply pipeline. Slowly opening these valves prevents a sudden surge in pressure and high flow velocities which may damage the regulator.
3. Apply the upstream pressure  $p_1$  to the control line (2.4) for the pilot valve (2).
4. Check the regulator to ensure it functions properly.

## 7 Operation

Immediately after completing start-up or placing the regulator back into service (see the 'Start-up' chapter), 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 personal injury due to pressurized components and as a result of process medium being discharged.**

- Do not unscrew the control line while the valve is pressurized.

### 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

Adjust the set point by tensioning the set point springs (2.1) at the set point adjuster (2.3) (adjusting screw) on the pilot valve (2).

The pilot valve governs internally the control pressure  $p_s$  for the main valve and regulates the pressure to the adjusted set point pressure.

### Note

*While the set point is being adjusted, at least 5 to 10 % of the maximum flow rate expected in the operating state must flow through the regulator.*

If the regulator has not been delivered with a ready-adjusted set point, proceed as follows:

### How to proceed:

1. Remove the cap (2.5) from the pilot valve.
2. Adjust the required upstream pressure set point while the plant (consumer) is open by turning the adjusting screw (2.3). See Fig. 7-1.
  - Turn clockwise (↻) to increase the pressure set point (the pressure rises).
  - Turn counterclockwise (↺) to reduce the pressure set point (the pressure drops).

## Operation

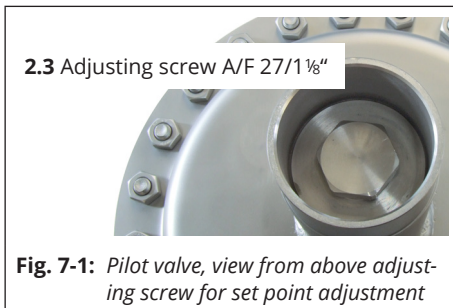
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### **Note**

*Do not unscrew the adjusting screw completely on turning it counterclockwise (↺). Do not screw the adjusting screw as far as it will go on turning it clockwise (↻). Otherwise the travel will be restricted or the valve will even remain stuck in the closed position.*

---

3. Monitor the set point pressure to be adjusted at the pressure gauge on the upstream pressure side. When the upstream pressure reaches the set point pressure, the pilot valve (2) opens, causing the main valve (1) to open as well.
4. Remount the cap after adjusting the set point.



## 8 Malfunctions

### 8.1 Troubleshooting

| Malfunction  | Possible reasons  | Recommended action  | NOTICE   |
|--|---|---|--|
| <b>Malfunction only occurs when the consumer is closed or during low load:</b> |   |   |  |
| Upstream pressure does not reach the adjusted set point                        | <b>Pilot valve</b><br>Leak between seat and plug  | → Remove valve from the pipeline and clean seat and plug. Renew plug, if necessary. If this is not possible, return regulator for repair. | Install a shut-off valve instead of the pilot valve. If the main valve closes when the shut-off valve is closed, the pilot valve has caused the malfunction.               |
|  | <b>Main valve</b><br>Leakage between seat and plug  | → Remove valve from the pipeline and clean seat and plug. Renew plug, if necessary. If this is not possible, return regulator for repair. | –  |
|  | Balancing diaphragm of the main valve defective.  | → Replace the balancing diaphragm with a new one.   | Install a shut-off valve instead of the pilot valve. If the main valve does <b>not</b> open when the shut-off valve is opened, the main valve has caused the malfunction.  |
| <b>Malfunction occurs when the consumer is open or at maximum load:</b>        |   |   |  |
| Upstream pressure rises far above the adjusted set point.                      | The pilot valve does not function. Balancing diaphragm defective. Medium leaks from the actuator. | → Replace the defective component.  | Install a shut-off valve instead of the pilot valve. If the main valve closes when the shut-off valve is closed, the pilot valve has caused the malfunction.               |
|  | The pilot valve is blocked.   | → Clean the pilot valve. Apply grease to plug stem guides, if necessary. Replace defective parts.   | –  |
|  | Main valve seized up  | → Clean main valve.   | Install a shut-off valve instead of the pilot valve. If the main valve does not close when the shut-off valve is closed, the main valve has caused the malfunction.        |
|  | Balancing diaphragm of the main valve defective.  | → Replace the balancing diaphragm with a new one.   | Install a shut-off valve instead of the pilot valve. If the main valve does <b>not</b> close when the shut-off valve is closed, the main valve has caused the malfunction. |

## Malfunctions

| Malfunction                                     | Possible reasons  | Recommended action  | NOTICE  |
|---|---|---|---|
| The required set point pressure is not reached. | Strainer in the line in which the pilot valve is installed is clogged up.   | → Clean the strainer.   | –   |
|   | The required minimum differential pressure to operate the regulator is not available.                                 | → Raise upstream pressure or reduce downstream pressure.  | –   |
|   | Set point range of the pilot valve is too low.  | → Convert or replace pilot valve.   | –   |
|   | Main valve seized up  | → Clean main valve.   | Install a shut-off valve instead of the pilot valve and open it. If the main valve does <b>not</b> open when the shut-off valve is opened, the main valve has caused the malfunction. |
|   | The pilot valve is blocked.   | → Clean the pilot valve. Clean internal control line used to tap the downstream pressure.   |   |
|   | Main valve is sized to be too small ( $K_{VS}/C_V$ )  | → Resize the valve. Replace main valve.   | –   |
| Regulator's reaction is sluggish                | Strainer in the line in which the pilot valve is installed is clogged up.   | → Clean the strainer.   | –   |
|   | Inside the pilot valve is clogged up, impairing the flow through the valve.   | → Clean the inside of the pilot valve.  | –   |
|   | Control line blocked  | → Clean the control line.   | –   |
| Control loop hunts                              | $K_{VS}/C_V$ of pilot valve too large (after valve has been replaced).  | → Install pilot valve with suitable $K_{VS}/C_V$ coefficient.   | –   |
|   | The flow conditions in the plant at the location where the regulator is installed are not suitable for the regulator. | → Pipe reducers, instruments and diversions can change the flow conditions which may lead to an instable control process. Refer to the SAMSON document TV-SK 17041 for minimum distances. | If this is the case, send a sketch of the plant to SAMSON for a thorough analysis.  |
|   | $K_{VS}/C_V$ of main valve too large  | → Resize the valve. Replace main valve or reduced the flow rate (smaller $K_{VS}/C_V$ coefficient).   |   |
|   | Periodic excitation to vibrate originating from the plant   | → Contact SAMSON.   | Possibly change the natural frequency, e.g. over a needle valve when there is resonance in the plant.   |

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**i Note**

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

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The malfunctions listed in Chapter 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.

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## 8.2 Emergency action

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

SAMSON recommends removing the regulator from the pipeline before repairing it.

In the event of a regulator malfunction:

1. Close the shut-off valves to stop the process medium from flowing through the regulator.
2. Perform troubleshooting (see Chapter 8.1).
3. Rectify those malfunctions that can be remedied following the information given in this document. Contact SAMSON's After-sales Service in all other cases.

### Putting the device back into operation after a malfunction

See the 'Start-up' chapter.





## 9 Servicing

The regulator does not require much 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' chapter.

The work described in this chapter is to be performed only by personnel appropriately qualified to carry out such tasks. SAMSON recommends 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 over- or under-torquing.**

*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 the 'Tightening torques' chapter in the Appendix).*

### **NOTICE**

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

- ➔ *Only use tools approved by SAMSON (see the 'Tools' chapter in the Appendix).*

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### **NOTICE**

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

➔ *Only use lubricants approved by SAMSON (see the 'Lubricants' chapter in the Appendix).*

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### **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.*
- 

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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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## 9.1 Service work preparations

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' chapter).

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### **Tip**

*SAMSON recommends removing the regulator from the pipeline before performing any service work (see the 'Removing the regulator from the pipeline' chapter).*

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Contact SAMSON's After-sales Service to have service work performed.

## 9.2 Installing the regulator after service work

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

## 9.3 Service work

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

## **9.4 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**

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

### **Lubricants**

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 chapter is to be performed only 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 the plant sections affected as well as from the valve.

### **⚠ 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 pressurized components and as a result of process medium being discharged.***

- ➔ Do not unscrew the control line while the valve is pressurized.

### **⚠ 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.

## Decommissioning

To put the regulator out of operation for service work or before removing it from the pipeline, proceed as follows:

1. Close the shut-off valve (1).
2. Depressurize the plant.
3. Completely drain the pipelines and valve.
4. If necessary, allow the pipeline and regulator components to cool down or warm up to the ambient temperature.

## 11 Removal

The work described in this chapter is to be performed only 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, make sure that the following conditions are met:

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

### 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' chapter).
2. Undo the pipe joint connecting the input pressure regulator.
3. Unbolt the flanged joint of the main valve.
4. Remove the regulator from the pipeline (see the 'Shipment and on-site transport' chapter).

### 11.2 Removing the actuator

See the 'Servicing' chapter.





## 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 service and repair work.*

## 12.1 Returning devices to SAMSON

Defective devices can be returned to SAMSON for repair.

Proceed as follows to return devices:

1. Put the regulator out of operation (see the 'Decommissioning' chapter).
2. Decontaminate the valve. 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 > After-sales Service.
4. Continue as described on our website at ▶ [www.samsongroup.com](http://www.samsongroup.com) > SERVICE > After-sales Service > Returning goods.

### **Note**

*Further information on returned devices and how they are handled can be found at*  
▶ [www.samsongroup.com](http://www.samsongroup.com) > SERVICE > After-sales Service.



## 13 Disposal



SAMSON is a producer registered in Europe, agency in charge ► <https://www.samsongroup.com/en/about-samson/environment-social-governance/material-compliance/waste-electrical-and-electronic-equipment-weee-and-its-safe-disposal/>. WEEE reg. no.: DE 62194439

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

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 SCIP number assigned to the devices concerned. This number 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 contained in the device.

### **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.*

### **💡 Tip**

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



## 14 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 14-2.

# EU DECLARATION OF CONFORMITY TRANSLATION



## Module A

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

| Devices                        | Series | Type   | Version   |
|--------------------------------|--------|--|---|
| Self-operated Regulators       | 43     | 2432   | DIN EN, body, CC499K and EN-GJS-400-18-LT, DN 50, PN 25, fluids G2, L2, L1 <sup>1)</sup>  |
|                                | 43     | 2436   | DIN EN, body, CC499K and EN-GJS-400-18-LT, DN 50, PN 25, fluids G2, L2, L1 <sup>1)</sup>  |
|                                | 43     | 2437   | DIN EN, body, CC499K and EN-GJS-400-18-LT, DN 50, PN 25, fluids G2, L2, L1 <sup>1)</sup>  |
|                                | ---    | 2111   | DIN EN, body, EN-GJS-400-18-LT, DN 50, PN 25, fluids G2, L2, L1 <sup>1)</sup><br>DIN EN, body, 1.0619 and 1.4408, DN 40-50, PN 40, fluids G2, L2, L1 <sup>1)</sup><br>ANSI, body, A216 WCC and A351 CF8M, NPS 1½-2, Class 300, fluids G2, L2, L1 <sup>1)</sup>  |
| Three-way valve                | ---    | 2119   | DIN EN, body, EN-GJL-250 and 1.0619, DN 65-125, PN 16, fluids G2, L2, L1 <sup>1)</sup><br>DIN EN, body, 1.0619, DN 50-80, PN 25, fluids G2, L2, L1 <sup>1)</sup><br>DIN EN, body, 1.0619 and 1.4408, DN 40-50, PN 40, fluids G2, L2, L1 <sup>1)</sup><br>ANSI, body, A216 WCC and A351 CF8M, NPS 2½-4, Class 150, fluids G2, L2, L1 <sup>1)</sup><br>ANSI, body, A216 WCC and A351 CF8M, NPS 1½, Class 300, fluids G2, L2, L1 <sup>1)</sup>                         |
|                                | ---    | 3222   | DIN EN, body, EN-GJS-400-18-LT, DN 50, PN 25, fluids G2, L2, L1 <sup>1)</sup><br>DIN EN, body, CC499K, DN 32-40, PN 25, all fluids  |
|                                | ---    | 3226   | DIN EN, body, CC499K, DN 50, PN 25, fluids G2, L2 <sup>2)</sup>   |
|                                | ---    | 3260   | DIN EN, body, EN-GJL-250, DN 65-200, PN 16, fluids G2, L2 <sup>2)</sup>   |
| Globe valve<br>Three-way valve | V2001  | 3531   | DIN EN, body, EN-GJS-400-18-LT, DN 50-80, PN 25, fluids G2, L2, L1 <sup>1)</sup>  |
|                                |        | 3535   | DIN EN, body, 1.0619 and 1.4408, DN 32-40, PN 25, all fluids<br>ANSI, body, A216 WCC and A351 CF8M, NPS 1½-2, Class 150, all fluids   |
|                                |        | ---  | DIN EN, body, EN-GJL-250, DN 65-125, PN 16, fluids G2, L2, L1 <sup>1)</sup><br>DIN EN, body, EN-GJS-400-18-LT, DN 50-80, PN 25, fluids G2, L2, L1 <sup>1)</sup>   |
|                                |        | ---  | ANSI, body, A126 B, NPS 3-4, Class 125, fluids G2, L2, L1 <sup>1)</sup><br>ANSI, body, A216 WCC and A351 CF8M, NPS 1½-2, Class 150, all fluids  |
| Control valve                  | ---    | 3214   | DIN EN, body, EN-GJS-400-18-LT, DN 50-80, PN 25, fluids G2, L2, L1 <sup>1)</sup><br>ANSI, body, A126 B, NPS 3-4, Class 125, fluids G2, L2, L1 <sup>1)</sup><br>ANSI, body, A216 WCC and A351 CF8M, NPS 1½-2, Class 150, all fluids  |
|                                | ---    | ---  | DIN EN, body, EN-GJL-250 and EN-GJS-400-18-LT, DN 65-125, PN 16, fluids G2, L2, L1 <sup>1)</sup><br>DIN EN, body, EN-GJS-418-LT, DN 50-80, PN 25, fluids G2, L2, L1 <sup>1)</sup><br>DIN EN, body, 1.0619 and 1.4408, DN 32-50, PN 16, all fluids<br>DIN EN, body, 1.0619 and 1.4408, DN 32-40, PN 25, all fluids<br>ANSI, body, A126 B, NPS 3-4, Class 125, fluids G2, L2, L1 <sup>1)</sup><br>ANSI, body, A216 WCC and A351 CF8M, NPS 1½-2, Class 150, all fluids |
|                                | ---    | ---  | DIN EN, body, EN-GJL-250 and EN-GJS-400-18-LT, DN 65-125, PN 16, fluids G2, L2, L1 <sup>1)</sup><br>DIN EN, body, EN-GJS-400-18-LT, DN 50-80, PN 25, fluids G2, L2, L1 <sup>1)</sup><br>DIN EN, body, 1.0619, 1.4408 and 1.6220+QT, DN 32-50, PN 16, all fluids<br>ANSI, body, A126 B, NPS 3-4, Class 125, fluids G2, L2, L1 <sup>1)</sup><br>ANSI, body, A216 WCC, A351 CF8M and A352 LCC, NPS 1½-2, Class 150, all fluids   |
|                                | ---    | ---  | DIN EN, body, CB7525, G 2 (DN50), PN25, fluids G2, L2 <sup>3)</sup>   |
| Strainers                      | 1N/1NI | 2601   | DIN EN, body, EN-GJL-250, DN 200-250, PN 10, fluids G2, L2, L1 <sup>1)</sup><br>DIN EN, body, EN-GJL-250, DN 65-125, PN 16, fluids G2, L2, L1 <sup>1)</sup><br>DIN EN, body, EN-GJS-400-18-LT, DN 100-125, PN 16, fluids G2, L2, L1 <sup>1)</sup><br>DIN EN, body, EN-GJS-400-18-LT, DN 50-80, PN 25, fluids G2, L2, L1 <sup>1)</sup><br>DIN EN, body, 1.4408, DN 32-50, PN 16, all fluids  |
| Strainers                      | 2N/2NI | 2602   | ANSI, body, A995 4A and A995 5A, NPS 1½-2, Class 150, all fluids  |
| Self-operated Regulators       | ---    | 2373/2375  | DIN EN, body, EN-GJS-400-18-LT, DN 50, PN 25, fluids G2, L2, L1 <sup>1)</sup>   |
|                                | ---    | 2440 (44-0B)<br>2441 (44-1B)<br>2446 (44-6B)   | DIN EN, body, EN-GJS-400-18-LT, DN 50, PN 25, fluids G2, L2, L1 <sup>1)</sup>   |
|                                | ---    | 2442 (44-2)<br>2443 (44-3)<br>2444 (44-4)<br>2447 (44-7)<br>2448 (44-8)<br>2449 (44-9) | DIN EN, body, EN-GJS-400-18-LT and CC499K, DN 50, PN 25, fluids G2, L2, L1 <sup>1)</sup>  |
|                                | ---    | ---  |   |

Revision 00

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# EU DECLARATION OF CONFORMITY TRANSLATION



| Devices                  | Series | Type   | Version  |
|--------------------------|--------|--|--|
| Self-operated Regulators | 45     | 2451 (45-1)<br>2452 (45-2)<br>2453 (45-3)<br>2454 (45-4)<br>2456 (45-6)<br>2459 (45-9) | DIN EN, body, EN-GJS-400-18-LT and CC499K, DN 50, PN 25, fluids G2, L2, L1 <sup>1)</sup>   |
|                          |        | 2465 (46-5)<br>2466 (46-6)<br>2467 (46-7)<br>2469 (46-9)                               | DIN EN, body, EN-GJS-400-18-LT and CC499K, DN 50, PN 25, fluids G2, L2, L1 <sup>1)</sup>   |
|                          |        | 2471 (47-1)<br>2474 (47-4)<br>2475 (47-5)<br>2479 (47-9)                               | DIN EN, body, EN-GJS-400-18-LT and CC499K, DN 50, PN 25, fluids G2, L2, L1 <sup>1)</sup>   |
|                          |        | 2488<br>2489   | DIN EN, body, EN-GJS-400-18-LT and CC499K, DN 50, PN 25, fluids G2, L2, L1 <sup>1)</sup>   |
|                          |        | 2405   | DIN EN, body, EN-GJS-400-18-LT, DN 50, PN 25, fluids G2, L2, L1 <sup>1)</sup><br>ANSI, body, A216 WCC and A351 CF8M, NPS 1½-2, Class 150, all fluids |
|                          | 40     | 2406   | DIN EN, body, EN-GJL-250, DN 65-125, PN 16, fluids G2, L2, L1 <sup>1)</sup>  |
|                          |        |  | DIN EN, body, EN-GJS-400-18-LT, DN 50, PN 25, fluids G2, L2, L1 <sup>1)</sup>  |
|                          |        |  | ANSI, body, A126 B, NPS 3-4, Class 125, fluids G2, L2, L1 <sup>1)</sup>  |
|                          |        |  | ANSI, body, A216 WCC and A351 CF8M, NPS 1½-2, Class 150, all fluids  |
|                          |        |  | DIN EN, body, EN-GJL-250, DN 65-100, PN 16, fluids G2, L2, L1 <sup>1)</sup>  |
|                          | 41     | 2412<br>2417   | DIN EN, body, EN-GJS-400-18-LT, DN 50-80, PN 25, fluids G2, L2, L1 <sup>1)</sup>   |
|                          |        |  | ANSI, body, A126 B, NPS 3-4, Class 125, fluids G2, L2, L1 <sup>1)</sup>  |
|                          | 42     | 2421 RS  | ANSI, body, A216 WCC and A351 CF8M, NPS 1½-2, Class 150, all fluids  |
|                          |        |  | DIN EN, body, 1.0619, 1.4408, 1.4571 and 1.4401/1.4404, DN 32-50, PN 16, all fluids  |
|                          | ---    | 2331<br>2337   | DIN EN, body, 1.0619, 1.4408, 1.4571 and 1.4401/1.4404, DN 32-40, PN 25, all fluids  |
|                          |        |  | ANSI, body, A216 WCC, A351 CF8M and A182 F316/A182 F316L, NPS 1½-2, Class 150, all fluids  |
|                          |        |  | DIN EN, body, EN-GJL-250, DN 65-200, PN 16, fluids G2, L2 <sup>2)</sup>  |
|                          |        |  | DIN EN, body, EN-GJS-400-18-LT, DN 65-150, PN 16, fluids G2, L2 <sup>2)</sup>  |
|                          |        |  | DIN EN, body, EN-GJS-400-18-LT, DN 65-125, PN 25, fluids G2, L2 <sup>2)</sup>  |
|                          | ---    | 2333<br>2335   | DIN EN, body, 1.0619, DN 65-200, PN 16, fluids G2, L2 <sup>2)</sup>  |
|                          |        |  | DIN EN, body, 1.0619, DN 65-100, PN 40, fluids G2, L2 <sup>2)</sup>  |
|                          | ---    | 2334   | DIN EN, body, EN-GJL-250, DN 65-125, PN 16, fluids G2, L2, L1 <sup>1)</sup>  |
|                          |        |  | DIN EN, body, EN-GJS-400-18-LT, DN 65-125, PN 16, fluids G2, L2, L1 <sup>1)</sup>  |
|                          | ---    | 2404-1   | DIN EN, body, EN-GJS-400-18-LT, DN 65-80, PN 25, fluids G2, L2, L1 <sup>1)</sup>   |
|                          |        |  | ANSI, body, A126 B, NPS 3-4, Class 125, fluids G2, L2, L1 <sup>1)</sup>  |
|                          | ---    | 2404-2   | DIN EN, body, EN-GJL-250, DN 65-125, PN16, fluids G2, L2, L1 <sup>1)</sup>   |
|                          |        |  | ANSI, body, A216 WCC und A351 CF8M, NPS 1½-2, Class 150, all fluids  |
|                          | ---    | 2404-2   | ANSI, body, A126 B, NPS 3-4, Class 125, fluids G2, L2, L1 <sup>1)</sup>  |
|                          |        |  | DIN EN, body, EN-GJL-250, DN 65-125, PN 16, fluids G2, L2, L1 <sup>1)</sup>  |

<sup>1)</sup> Gases according to Article 4(1)(c.i), second indent  
Liquids according to Article 4(1)(c.ii)

<sup>2)</sup> Gases according to Article 4(1)(c.i), second indent  
Liquids according to Article 4(1)(c.ii), second indent

EU DECLARATION OF CONFORMITY  
TRANSLATION



That the products mentioned above comply with the requirements of the following standards:

|  |            |                 |
|--|------------|-----------------|
| 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 |
| Applied conformity assessment procedure for fluids according to Article 4(1)   | Module A   |                 |

Technical standards applied: DIN EN 12516-2, DIN EN 12516-3, ASME B16.34

Manufacturer: SAMSON AG, Weismüllerstraße 3, 60314 Frankfurt am Main, Germany

Frankfurt am Main, 26. August 2022

ppa. Norbert Tollas  
Senior Vice President  
Global Operations

i.V. Peter Scheermesser  
Director  
Product Maintenance & Engineered Products

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## Module H / N° CE-0062-PED-H-SAM 001-22-DEU

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

| Devices                        | Series | Type   | Version   |
|--------------------------------|--------|--------|---|
| Three-way valve                | ---    | 2119   | DIN EN, body, EN-GJL-250 and 1.0619, DN 150, PN 16, fluids G2, L2, L1 <sup>1)</sup>     |
|                                |        |        | DIN EN, body, 1.0619, DN 100-150, PN 25, fluids G2, L2, L1 <sup>1)</sup>                |
|                                |        |        | DIN EN, body, 1.0619 and 1.4408, DN 65-150, PN 40, fluids G2, L2, L1 <sup>1)</sup>      |
|                                |        |        | ANSI, body, A216 WCC and A351 CF8M, NPS 6, Class 150, fluids G2, L2, L1 <sup>1)</sup>   |
|                                |        |        | ANSI, body, A216 WCC and A351 CF8M, NPS 2-6, Class 300, fluids G2, L2, L1 <sup>1)</sup> |
| Self-operated Regulators       | ---    | 3222   | DIN EN, body, CC499K, DN 50, PN 25, all fluids  |
| Three-way valve                | ---    | 3260   | DIN EN, body, EN-GJL-250, DN 250-300, PN 16, fluids G2, L2 <sup>1)</sup>                |
| Globe valve<br>Three-way valve | V2001  | 3531   | DIN EN, body, 1.0619 and 1.4408, DN 50-80, PN 25, all fluids                            |
|                                |        | 3535   | ANSI, body, A216 WCC and A351 CF8M, NPS 2½-3, Class 150, all fluids                     |
| Control valve                  | ---    | 3214   | DIN EN, body, EN-GJL-250, DN 150-400, PN 16, fluids G2, L2, L1 <sup>1)</sup>            |
|                                |        |        | DIN EN, body, EN-GJS-400-18-LT, DN 100-150, PN 25, fluids G2, L2, L1 <sup>1)</sup>      |
|                                |        |        | DIN EN, body, 1.0619, DN 32-400, PN 40, all fluids                                      |
|                                |        |        | ANSI, body, A126 B, NPS 6-10, Class 125, fluids G2, L2, L1 <sup>1)</sup>                |
|                                |        |        | ANSI, body, A216 WCC, NPS 2½-10, Class 150, all fluids                                  |
| Self-operated Regulators       | 42     | 2423   | ANSI, body, A216 WCC, NPS 1½-10, Class 300, all fluids                                  |
|                                |        |        | DIN EN, body, EN-GJL-250, DN 150-250, PN 16, fluids G2, L2, L1 <sup>1)</sup>            |
|                                |        |        | DIN EN, body, EN-GJS-400-18-LT, DN 150, PN 16, fluids G2, L2, L1 <sup>1)</sup>          |
|                                |        |        | DIN EN, body, EN-GJS-400-18-LT, DN 100-150, PN 25, fluids G2, L2, L1 <sup>1)</sup>      |
|                                |        |        | DIN EN, body, 1.0619 and 1.4408, DN 65-250, PN 16, all fluids                           |
|                                |        |        | DIN EN, body, 1.0619 and 1.4408, DN 50-250, PN 25, all fluids                           |
|                                |        |        | DIN EN, body, 1.0619 and 1.4408, DN 32-250, PN 40, all fluids                           |
|                                |        |        | ANSI, body, A126 B, NPS 6-10, Class 125, fluids G2, L2, L1 <sup>1)</sup>                |
|                                |        |        | ANSI, body, A216 WCC and A351 CF8M, NPS 2½-10, Class 150, all fluids                    |
|                                |        |        | ANSI, body, A216 WCC and A351 CF8M, NPS 1½-10, Class 300, all fluids                    |
|                                | 42     | 2422   | DIN EN, body, EN-GJL-250, DN 150-400, PN 16, fluids G2, L2, L1 <sup>1)</sup>            |
|                                |        |        | DIN EN, body, EN-GJS-400-18-LT, DN 100-150, PN 25, fluids G2, L2, L1 <sup>1)</sup>      |
|                                |        |        | DIN EN, body, 1.0619 and 1.4408, DN 65-400, PN 16, all fluids                           |
|                                |        |        | DIN EN, body, 1.0619 and 1.4408, DN 200-400, PN 25, all fluids                          |
|                                |        |        | DIN EN, body, 1.0619 and 1.4408, DN 32-400, PN 40, all fluids                           |
|                                |        |        | DIN EN, body, 1.0460, DN 40-50, PN 40, all fluids                                       |
|                                |        |        | DIN EN, body, 1.6220+QT, DN 65-250, PN 16, all fluids                                   |
|                                |        |        | DIN EN, body, 1.6220+QT, DN 200-250, PN 25, all fluids                                  |
|                                |        |        | DIN EN, body, 1.6220+QT, DN 32-250, PN 40, all fluids                                   |
|                                |        |        | ANSI, body, A126 B, NPS 6-16, Class 125, fluids G2, L2, L1 <sup>1)</sup>                |
|                                |        |        | ANSI, body, A216 WCC and A351CF8M, NPS 2½-16, Class 150, all fluids                     |
|                                |        |        | ANSI, body, A216 WCC and A351CF8M, NPS 1½-16, Class 300, all fluids                     |
|                                | 42     | 2421RS | ANSI, body, A105, NPS 1½-2, Class 300, all fluids                                       |
|                                |        |        | ANSI, body, A352 LCC, NPS 2½-10, Class 150, all fluids                                  |
|                                |        |        | ANSI, body, A352 LCC, NPS 1½-10, Class 300, all fluids                                  |
|                                |        |        | DIN EN, body, 1.0619 and 1.4408, DN 65-150, PN 16, all fluids                           |
|                                |        |        | DIN EN, body, 1.0619 and 1.4408, DN 50-150, PN 25, all fluids                           |
|                                |        |        | DIN EN, body, 1.0619 and 1.4408, DN 32-150, PN 40, all fluids                           |
|                                |        |        | DIN EN, body, 1.4571 and 1.4401/1.4404, DN 50, PN 25, all fluids                        |
|                                |        |        | DIN EN, body, 1.4571 and 1.4401/1.4404, DN 32-50, PN 40, all fluids                     |
|                                |        |        | ANSI, body, A216 WCC and A351 CF8M, NPS 2½-6, Class 150, all fluids                     |
|                                |        |        | ANSI, body, A216 WCC and A351 CF8M, NPS 1½-6, Class 300, all fluids                     |

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| Devices                  | Series | Type         | Version  |
|--------------------------|--------|--------------|--|
| Self-operated Regulators | 40     | 2405         | DIN EN, body, 1.0619, 1.4571, 1.4404, 1.4408, 1.0460, DN 32-50, PN40, all fluids   |
|                          |        |              | ANSI, body, A105, A182 F316L, A351 CF8M, A216 WCC, NPS 1½-2, Class 300, all fluids |
|                          |        | 2406         | DIN EN, body, EN-GJL-250, DN 150, PN 16, fluids G2, L2, L1 <sup>1)</sup>           |
|                          |        |              | DIN EN, body, 1.0619 and 1.4408, DN 32-150, PN 40, all fluids                      |
|                          |        |              | DIN EN, body, 1.0460 and 1.4404, DN 32-50, PN 40, all fluids                       |
|                          |        |              | ANSI, body, A126 B, NPS 6, Class 125, fluids G2, L2, L1 <sup>1)</sup>              |
|                          |        |              | ANSI, body, A216 WCC and A351 CF8M, NPS 2½-6, Class 150, all fluids                |
|                          |        |              | ANSI, body, A216 WCC and A351 CF8M, NPS 1½-6, Class 300, all fluids                |
|                          |        |              | ANSI, body, A105 and A182 F316L, NPS 1½-2, Class 300, all fluids                   |
|                          |        | 2412<br>2417 | DIN EN, body, EN-GJS-400-18-LT, DN 100, PN25, fluids G2, L2, L1 <sup>1)</sup>      |
|                          |        |              | DIN EN, body, 1.0619 and 1.4408, DN 32-100, PN 40, all fluids                      |
|                          |        |              | DIN EN, body, 1.0460, 1.4571 and 1.4404, DN 32-80, PN 40, all fluids               |
|                          |        |              | ANSI, body, A216 WCC and A351 CF8M, NPS 2½-4, Class 150, all fluids                |
|                          |        |              | ANSI, body, A216 WCC and A351 CF8M, NPS 1½-4, Class 300, all fluids                |
|                          |        |              | ANSI, body, A105 and A182 F316L, NPS 1½-3, Class 300, all fluids                   |
|                          | ---    | 2404-1       | DIN EN, body, EN-GJL-250, DN 150, PN16, fluids G2, L2, L1 <sup>1)</sup>            |
|                          |        |              | DIN EN, body, 1.0619 und 1.4408, DN 32-150, PN 40, all fluids                      |
|                          |        |              | ANSI, body, A126 B, NPS 6, Class 125, fluids G2, L2, L1 <sup>1)</sup>              |
|                          |        |              | ANSI, body, A216 WCC und A351 CF8M, NPS 2½-6, Class 150, all fluids                |
|                          |        |              | ANSI, body, A216 WCC und A351 CF8M, NPS 1½-6, Class 300, all fluids                |
|                          |        |              | DIN EN, body, EN-GJL-250, DN 150-400, PN 16, fluids G2, L2, L1 <sup>1)</sup>       |
|                          | ---    | 2404-2       | DIN EN, body, 1.0619 und 1.4408, DN 65-400, PN 16, all fluids                      |
|                          |        |              | DIN EN, body, 1.0619 und 1.4408, DN 65-400, PN 40, all fluids                      |
|                          |        |              | ANSI, body, A126 B, NPS 6-16, Class 125, fluids G2, L2, L1 <sup>1)</sup>           |
|                          |        |              | ANSI, body, A216 WCC und A351 CF8M, NPS 2½-16, Class 150, all fluids               |
|                          |        |              | ANSI, body, A216 WCC und A351 CF8M, NPS 2½-10, Class 300, all fluids               |
|                          |        |              | DIN EN, body, EN-GJL-250, DN 250, PN 16, fluids G2, L2 <sup>1)</sup>               |
|                          | ---    | 2331<br>2337 | DIN EN, body, 1.0619, DN 250, PN 16, fluids G2, L2 <sup>1)</sup>                   |
|                          |        |              | DIN EN, body, 1.0619, DN 200-250, PN 25, fluids G2, L2 <sup>1)</sup>               |
|                          |        |              | DIN EN, body, 1.0619, DN 125-250, PN 40, fluids G2, L2 <sup>1)</sup>               |
|                          |        |              | DIN EN, body, EN-GJL-250, DN 150-400, PN 16, fluids G2, L2, L1 <sup>1)</sup>       |
|                          |        |              | DIN EN, body, EN-GJS-400-18-LT, DN 100-150, PN 25, fluids G2, L2, L1 <sup>1)</sup> |
|                          |        |              | DIN EN, body, 1.0619 and 1.4408, DN 65-400, PN 16, all fluids                      |
|                          | ---    | 2333<br>2335 | DIN EN, body, 1.0619 and 1.4408, DN 200-400, PN 25, all fluids                     |
|                          |        |              | DIN EN, body, 1.0619 and 1.4408, DN 65-400, PN 40, all fluids                      |
|                          |        |              | ANSI, body, A126 B, NPS 6-16, Class 125, fluids G2, L2, L1 <sup>1)</sup>           |
|                          |        |              | ANSI, body, A216 WCC and A351 CF8M, NPS 2½-16, Class 150, all fluids               |
|                          |        |              | ANSI, body, A216 WCC and A351 CF8M, NPS 2½-16, Class 300, all fluids               |
|                          |        |              | DIN EN, body, EN-GJL-250, DN 150-400, PN 16, fluids G2, L2, L1 <sup>1)</sup>       |
|                          | ---    | 2334         | DIN EN, body, EN-GJS-400-18-LT, DN 150, PN 16, fluids G2, L2, L1 <sup>1)</sup>     |
|                          |        |              | DIN EN, body, EN-GJS-400-18-LT, DN 100-150, PN 25, fluids G2, L2, L1 <sup>1)</sup> |
|                          |        |              | DIN EN, body, 1.0619 and 1.4408, DN 65-400, PN 16, all fluids                      |
|                          |        |              | DIN EN, body, 1.0619 and 1.4408, DN 200-400, PN 25, all fluids                     |
|                          |        |              | DIN EN, body, 1.0619 and 1.4408, DN 65-400, PN 40, all fluids                      |
|                          |        |              | ANSI, body, A126 B, NPS 6-16, Class 125, fluids G2, L2, L1 <sup>1)</sup>           |
|                          | ---    | 2373<br>2375 | ANSI, body, A216 WCC and A351 CF8M, NPS 2½-16, Class 150, all fluids               |
|                          |        |              | ANSI, body, A216 WCC and A351 CF8M, NPS 2½-16, Class 300, all fluids               |
|                          |        |              | DIN EN, body, 1.4469 and 1.4470, DN 32-50, PN 40, all fluids                       |
|                          |        |              | ANSI, body, A995 5A and A995 4A, NPS 1½-2, Class 300, all fluids                   |
| Strainers                | 2N/2NI | 2602         | DIN EN, body, EN-GJL-250, DN 150-250, PN 16, fluids G2, L2, L1 <sup>1)</sup>       |
|                          |        |              | DIN EN, body, EN-GJS-400-18-LT, DN 150, PN 16, fluids G2, L2, L1 <sup>1)</sup>     |
|                          |        |              | DIN EN, body, EN-GJS-400-18-LT, DN 100-150, PN 25, fluids G2, L2, L1 <sup>1)</sup> |
|                          |        |              | DIN EN, body, 1.0619, DN 100-250, PN 16, all fluids                                |

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| Devices   | Series | Type | Version   |
|-----------|--------|------|---|
| Strainers | 2N/2NI | 2602 | DIN EN, body, 1.0619, DN 200-250, PN 25, all fluids |
|           |        |      | DIN EN, body, 1.0619, DN 32-250, PN 40, all fluids  |
|           |        |      | DIN EN, body, 1.4408, DN 65-100, PN 16, all fluids  |
|           |        |      | DIN EN, body, 1.4408, DN 32-100, PN 40, all fluids  |

<sup>1)</sup> Gases according to Article 4(1)(c.i), second indent  
Liquids according to Article 4(1)(c.ii)

That the products mentioned above comply with the requirements of the following standards:

|  |            |                        |
|--|------------|------------------------|
| 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        |
| Applied conformity assessment procedure for fluids according to Article 4(1)   | Module H   | by Bureau Veritas 0062 |

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  
Technical standards applied: DIN EN 12516-2, DIN EN 12516-3, ASME B16.34

Manufacturer: SAMSON AG, Weismuellerstrasse 3, 60314 Frankfurt am Main, Germany

Frankfurt am Main, 14. October 2022

ppe. Norbert Tollas  
Senior Vice President  
Global Operations

i.V. Peter Scheermesser  
Director  
Product Maintenance & Engineered Products



## 15 Appendix

### 15.1 Tightening torques

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

| Part                    | Width across flats | Tightening torque in Nm |
|-------------------------|--------------------|-------------------------|
| Adjusting screw (2.3)   | A/F 27             | –                       |
| Control line connection | –                  | 22                      |

### 15.2 Lubricants

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

### 15.3 Tools

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

### 15.4 Accessories

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

### 15.5 Spare parts

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

### 15.6 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 ***aftersaleservice@samsongroup.com***.

#### Addresses of SAMSON AG and its subsidiaries

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

### Required specifications

Please submit the following details:

- Device type
- Type and nominal size of the main valve, pilot valve and input pressure regulator (see nameplates).
- Model number or material number
- Supply pressure  $p$ , upstream pressure (inert gas pressure)  $p_1$  and downstream pressure  $p_2$
- Temperature and process medium
- Min. and max. flow rate in  $\text{m}^3/\text{h}$
- 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 2540 EN**



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