Type 3251 Valve

In combination with an actuator,
e.g. a SAMSON Type 3271 or Type 3277 Pneumatic Actuator

ANSI version

Translation of original instructions

Type 3251 Valve with Type 3271 Actuator

Mounting and Operating Instructions

EB 8052 EN

Edition March 2016

Note on these mounting and operating instructions

These mounting and operating instructions assist you in mounting and operating the device safely. The instructions are binding for handling SAMSON devices.

➔ For the safe and proper use of these instructions, read them carefully and keep them for later reference.

➔ If you have any questions about these instructions, contact SAMSON's After-sales Service Department (aftersalesservice@samson.de).

The mounting and operating instructions for the devices are included in the scope of delivery. The latest documentation is available on our website (www.samson.de) > Product documentation. You can enter the document number or type number in the [Find:] field to look for a document.

Definition of signal words

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

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

NOTICE
Property damage message or malfunction

Note:
Additional information

Tip:
Recommended action

1 Safety instructions and measures

Intended use

The SAMSON Type 3251 Globe Valve in combination with an actuator (e.g. Type 3271 or Type 3277 Pneumatic Actuator) is designed to regulate the flow rate, pressure or temperature of liquids, gases or vapors. The valve with its actuator is designed to operate under exactly defined conditions (e.g. operating pressure, process medium, temperature). Therefore, operators must ensure that the control valve is only used in applications that meet the specifications used for sizing the valve at the ordering stage. In case operators intend to use the control valve in other applications or conditions than specified, SAMSON must be contacted.

SAMSON does not assume any liability for damage resulting from the failure to use the valve 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 control valve is not suitable for the following applications:

– Use outside the limits defined during sizing and in the technical data
– Use outside the limits defined by the valve accessories mounted on the control valve

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

– Use of non-original spare parts
– Performing service and repair work not described in these instructions

Qualifications of operating personnel

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

Personal protective equipment

We recommend wearing the following protective equipment depending on the process medium:

– Protective clothing, gloves and eyewear in applications with hot, cold, and/or corrosive media
– Wear hearing protection when working near the valve.

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

Revisions and other modifications

Revisions, conversions or other modifications to 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.

Safety devices

Upon supply air or control signal failure, the valve moves to its fail-safe position (see section 3.1). The fail-safe action of the actuator is the same as its direction of action and is specified on the nameplate of SAMSON actuators (see actuator documentation).

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

Responsibilities of the operator

The operator is responsible for proper operation and compliance with the safety regulations. Operators are obliged to provide these mounting and operating instructions to the operating personnel and to instruct them in proper operation. Furthermore, operators must ensure that operating personnel or third persons are not exposed to any danger.

Responsibilities of operating personnel

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

Referenced standards and regulations

The control valves comply with the requirements of the European Pressure Equipment Directive 97/23/EC. Valves with a CE marking have a declaration of conformity which includes information about the applied conformity assessment procedure. This declaration of conformity is included in the Appendix of these instructions (see section 10.2).

According to the ignition risk assessment performed in accordance with EN 13463-1:2009, section 5.2, the non-electrical control valves 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 94/9/EC.

➔ For connection to the equipotential bonding system, observe the requirements specified in section 6.3 of EN 60079-14:2014-10 (VDE 0165 Part 1).

Referenced documentation

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

– Mounting and operating instructions for mounted actuator, e.g. ▶ EB 8310-X for SAMSON Type 3271 and Type 3277 Actuators
– Mounting and operating instructions for mounted valve accessories (positioner, solenoid valve etc.)
– ▶ WA 0029 for tools and lubricant

1.1 Notes on possible severe personal injury

DANGER!

Risk of bursting in pressure equipment.

Control valves and pipelines are pressure equipment. Improper opening can lead to valve components bursting.

➔ Before starting any work on the control valve, depressurize all plant sections concerned and the valve.

➔ Drain the process medium from all the plant sections concerned as well as the valve.

➔ Wear personal protective equipment.

1.2 Notes on possible personal injury

WARNING!

Crush hazard arising from moving parts.

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

➔ Do not insert hands or finger into the yoke while the valve is in operation.

➔ While working on the control valve, disconnect and lock the pneumatic air supply as well as the control signal.

Risk of personal injury when the actuator vents.

While the valve is operating, the actuator may vent during closed-loop control or when the valve opens or closes.

➔ Install the control valve in such a way that the actuator does not vent at eye level.

➔ Use suitable silencers and vent plugs.

➔ Wear eye protection when working in close proximity to the control valve.

Risk of personal injury due to preloaded springs.

Valves in combination with pneumatic actuators with preloaded springs are under tension. These control valves with SAMSON pneumatic actuators can be identified by the long bolts protruding from the bottom of the actuator.

➔ Before starting any work on the actuator, relieve the compression from the preloaded springs (see associated actuator documentation).

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

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

➔ If possible, drain the process medium from all the plant sections concerned and the valve.

➔ Wear protective clothing, gloves, and eyewear.

WARNING!

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

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

➔ Allow components and pipelines to cool down or heat up.

➔ Wear protective clothing and gloves.

1.3 Notes on possible property damage

NOTICE

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

The plant engineering company is responsible for cleaning the pipelines in the plant.

➔ Flush the pipelines before start-up.

➔ Observe the maximum permissible pressure for valve and plant.

Risk of valve damage due to unsuitable medium properties.

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

➔ Only use the process medium specified for sizing the valve.

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

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

➔ Observe the specified tightening torques (▶ WA 0029).

NOTICE

Risk of valve damage due to the use of unsuitable tools.

Certain tools are required to work on the valve.

➔ Only use tools approved by SAMSON (▶ WA 0029).

Risk of valve damage due to the use of unsuitable lubricants.

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

➔ Only use lubricants approved by SAMSON (see parts list).

2 Markings on the control valve

2.1 Valve nameplate

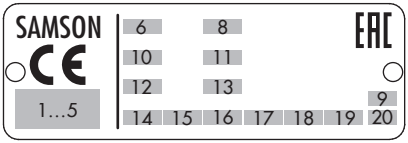


Fig. 1: *Valve nameplate*

1…5	PED (Pressure Equipment Directive), "Art. 3, Abs. 3" ID of the notified body, fluid group, and category
6	Type designation
8	Material
9	Year of manufacture
10	Valve size: DIN: DN · ANSI: NPS · JIS: DN … A/B
11	Pressure rating: DIN: PN · ANSI: CL · JIS: K
12	Order no. with modification index For after-sales service orders: AA prefix
13	Position in order For after-sales service orders: configuration ID
14	Flow coefficient: DIN: K_{VS} · ANSI: C_V · JIS: C_V
15	Characteristic: %: equal percentage · Lin: linear · NO/NC: quick opening
16	Seat/plug seal: ME: metal (see section 3.3) HA: carbide metal ST: Stellite® facing KE: ceramic PT: soft seal with PTFE PK: soft seal with PEEK
17	Seat code (trim material) · On request
18	Pressure balancing: DIN: D · ANSI: B · JIS: B
19	Flow divider: 1: St I · 3: St III AC trims: AC-1 to AC-3
20	Country of origin

The nameplate (80) is affixed to the yoke of the valve (see Fig. 2).

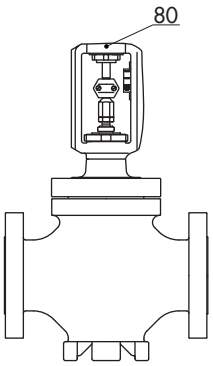


Fig. 2: *Location of the nameplate*

2.2 Actuator nameplate

See associated actuator documentation.

2.3 Material number

The seat and plug of the valves have an article number written on them. Specifying this article number, you can contact us to find out which material is used. Additionally, a seat code is used to identify the trim material. This seat code is specified on the nameplate (17). For more details on the nameplate, see section 2.1.

3 Design and principle of operation

The single-seated Type 3251 Globe Valve is preferably combined with a SAMSON Type 3271 or Type 3277 Pneumatic Actuator (see Fig. 3). It can also be combined with other actuators.

The seat (4) and plug with plug stem (5) are assembled in the body (1). The plug stem is connected to the actuator stem (A7) by the stem connector clamps (A26) and is sealed by a spring-loaded V-ring packing (15). The springs in the pneumatic actuator (A) are located either above or below the diaphragm (A4) depending on the selected fail-safe action (see section 3.1). A change in the signal pressure acting on the diaphragm causes the plug to move. The actuator size is determined by the diaphragm area.

The medium flows through the valve in the direction indicated by the arrow. A rise in signal pressure causes the force acting on the diaphragm in the actuator to increase. The springs are compressed. Depending on the selected direction of action, the actuator stem retracts or extends. As a result, the plug position in the seat changes and determines the flow rate through the valve.

3.1 Fail-safe positions

The fail-safe position depends on the actuator used.

Depending on how the compression springs are arranged in the pneumatic actuator, the valve has two different fail-safe positions:

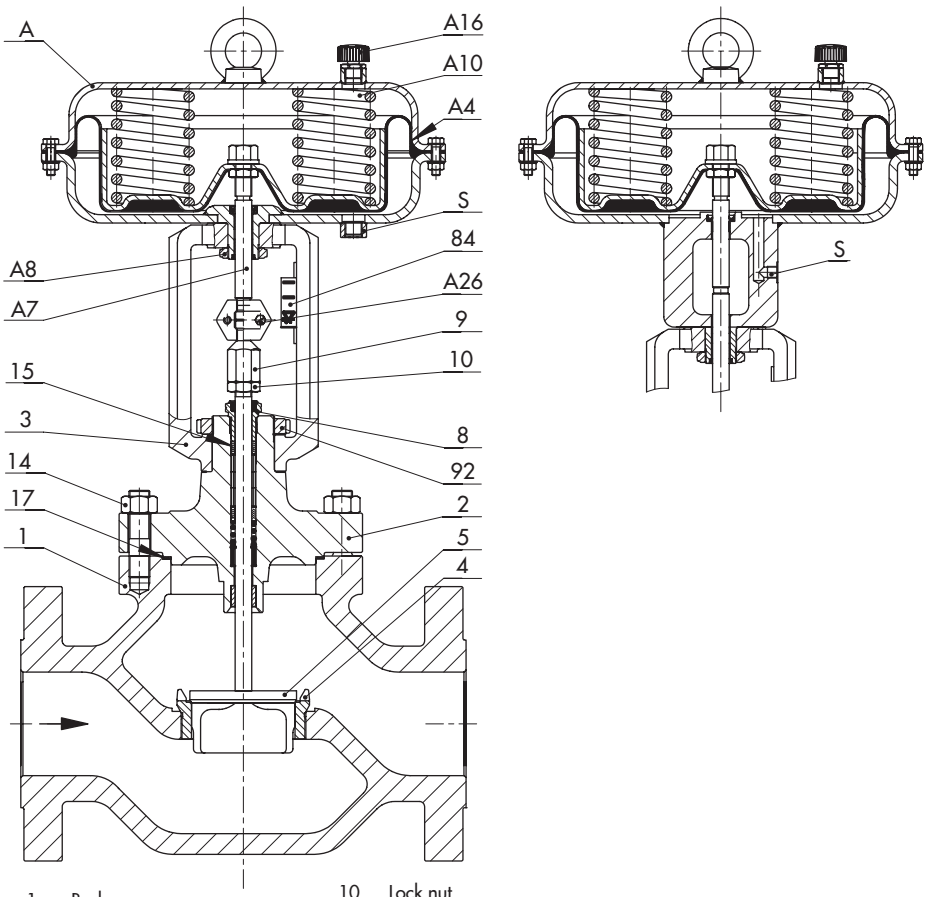
Actuator stem extends (FA)

When the signal pressure is reduced or the air supply fails, the springs move the actuator stem downward and close the valve. The valve opens when the signal pressure is increased enough to overcome the force exerted by the springs.

Actuator stem retracts (FE)

When the signal pressure is reduced or the air supply fails, the springs move the actuator stem upwards and open the valve. The valve closes when the signal pressure is increased enough to overcome the force exerted by the springs.

Tip:
The actuator's direction of action can be reversed, if required. Refer to the mounting and operating instructions of the pneumatic actuator:
▶ *EB 8310-X for Type 3271 and Type 3277*



1	Body	10	Lock nut	A7	Actuator stem
2	Bonnet	14	Nut	A8	Ring nut
3	Yoke	15	Packing	A10	Spring
4	Seat	17	Body gasket	A16	Vent plug
5	Plug (with plug stem)	84	Travel indicator scale	A26	Stem connector clamps
8	Threaded bushing (packing nut)	92	Castellated nut	S	Signal pressure connection
9	Stem connector nut	A	Actuator		
		A4	Diaphragm		

Fig. 3: *Type 3251 Valve with Type 3271 Pneumatic Actuator (left) and Type 3277 Pneumatic Actuator (right)*

3.2 Versions

The modular design allows an insulating section or metal bellows to be fitted to the standard valve version.

Actuators

In these instructions, the preferable combination with a Type 3271 or Type 3277 Pneumatic Actuator is described. The pneumatic actuator (with or without handwheel) can be replaced by another pneumatic actuator in a different size, but with the same travel.

➔ Observe the maximum permissible actuator force.

Note:
If the travel range of the actuator is larger than the travel range of the valve, the spring assembly in the actuator must be preloaded so that the travel ranges match. See associated actuator documentation.

The basic pneumatic actuator can be replaced by a pneumatic actuator with additional handwheel or by an electric actuator.

3.3 Technical data

The nameplates on the valve and actuator provide information on the control valve version. See section 2.1 and the associated actuator documentation.

Note:
More information is available in Data Sheet ▶ T 8052.

Compliance

The Type 3251 Valve bears both the CE and EAC marks of conformity.

CE EAC

Temperature range

Depending on the version, the control valve is designed for a temperature range from –10 to +220 °C (14 to 428 °F). The use of an insulating section or bellows seal extends the temperature range from –196 to +550 °C (–325 to +1022 °F).

Leakage class

Depending on the version, the following leakage class applies:

Seal (16 on nameplate)	ME, ST	ME, ST	PT, PK
Pressure balancing (18 on nameplate)	–	D/B	–
Leakage class (according to ANSI/FCI 70-2)	Min. IV	Min. IV	VI

Noise emission

SAMSON is unable to make general statements about noise emission as it depends on the valve version, plant facilities, and process medium. On request, SAMSON can perform calculations according to IEC 60534, Part 8-3 and Part 8-4 or VDMA 24422 (edition 89).

WARNING!
Risk of hearing loss or deafness due to loud noise.
Wear hearing protection when working near the valve.

Dimensions and weights

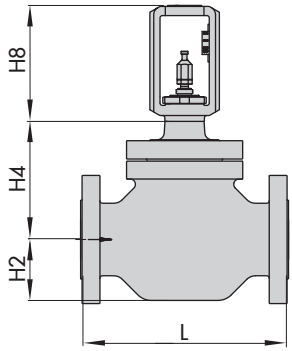
Table 1 to Table 3 provide a summary of the dimensions and weights of the standard version of Type 3251 Valve. The lengths and heights in the dimensional drawings are shown on p. 19.

Table 1: *Dimensions of Type 3251 Valve, up to NPS 6*

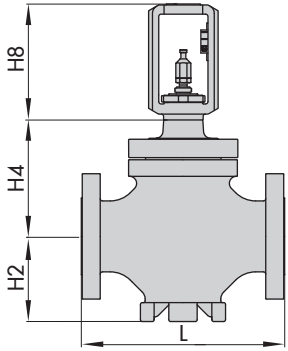
Valve	NPS		½	1	1½	2	3	4	6
	DN		15	25	40	50	80	100	150
Length L (flanges RF and welding ends)	Class 150	in	7.25	7.25	8.75	10.00	11.75	13.88	17.75
		mm	184	184	222	254	298	352	451
	Class 300	in	7.50	7.75	9.25	10.50	12.50	14.50	18.62
		mm	190	197	235	267	318	368	473
	Class 600	in	8.00	8.25	9.88	11.25	13.25	15.50	20.00
		mm	203	210	251	286	337	394	508
	Class 900	in	8.50	10.00	12.00	14.50	15.00	18.00	24.00
		mm	216	254	305	368	381	457	610
	Class 1500	in	8.50	10.00	12.00	14.50	18.50	21.50	27.75
		mm	216	254	305	368	470	546	705
	Class 2500	in	10.38	12.12	15.12	17.75	22.75	26.50	36.00
		mm	264	308	384	451	578	673	914
Height H4	Class 150 to 600	in	5.98	5.98	6.46	8.54	8.74	9.53	12.36
		mm	152	152	164	217	222	242	314
	Class 900	in	7.32	7.32	7.68	9.88	8.74	9.53	12.36
		mm	186	186	195	251	222	242	314
	Class 1500 to 2500	in	7.32	7.32	7.68	9.88	11.34	13.7	18.35
		mm	186	186	195	251	288	348	466
H8 for actuator	350 cm²	in	9.45	9.45	9.45	9.45	9.45	9.45	–
		mm	240	240	240	240	240	240	
	355 cm²	in	9.45	9.45	9.45	9.45	9.45	9.45	16.46
		mm	240	240	240	240	240	240	418
	700 cm²	in	9.45	9.45	9.45	9.45	9.45	9.45	16.46
		mm	240	240	240	240	240	240	418
	750 cm²	in	9.45	9.45	9.45	9.45	9.45	9.45	16.46
		mm	240	240	240	240	240	240	418

Valve	NPS		½	1	1½	2	3	4	6
	DN		15	25	40	50	80	100	150
H8 for actuator	1000 cm²	in	–	–	–	11.61	11.61	11.61	16.46
		mm				295	295	295	418
	1400-60 cm²	in				11.61	11.61	11.61	16.46
		mm				295	295	295	418
	1400-120 cm²	in				18.90	18.90	18.90	19.80
		mm				480	480	480	503
	2800 cm²	in				18.90	18.90	18.90	19.80
		mm				480	480	480	503
	2x2800 cm²	in				18.90	18.90	18.90	19.80
		mm				480	480	480	503
H2 (NPS 4 and larger with foot)	Class 150	in	1.97	2.36	3.05	3.54	3.94	6.3	8.66
		mm	50	60	80	90	100	160	220
	Class 300 to 600	in	2.36	2.76	3.54	3.94	4.72	7.09	9.25
		mm	60	70	90	100	120	180	235
	Class 900	in	2.76	3.05	3.94	4.33	4.72	7.09	9.25
		mm	70	80	100	110	120	180	235
	Class 1500	in	2.76	3.05	3.94	4.33	5.51	8.66	11.22
		mm	70	80	100	110	140	220	285
	Class 2500	in	2.95	3.54	4.33	4.72	6.3	9.33	12.6
		mm	75	90	110	120	160	237	320

Dimensional drawings



Type 3251 up to NPS 3 without foot



Type 3251 in NPS 4 and larger with foot

Table 2: *Dimensions of Type 3251 Valve, NPS 8 and larger*

Valve	NPS		8	10	12	14	16	20
	DN		200	250	300	–	400	500
Length L (flanges RF and welding ends)	Class 150	in	21.38	26.50	29.00	35.00	40.00	On request
		mm	543	673	737	889	1016	
	Class 300	in	22.38	27.88	30.50	36.50	41.62	On request
		mm	568	708	775	927	1057	
	Class 600	in	24.00	29.62	32.25	38.25	43.62	On request
		mm	610	752	819	972	1108	
	Class 900	in	29.00	33.00	38.00	40.50	On request	
		mm	737	838	965	1029		
	Class 1500	in	32.75	39.00	44.50	49.50	On request	
		mm	832	991	1130	1257		
	Class 2500	in	40.25	On request		–		
		mm	1022					
Height H4	Class 150 to 600	in	15.24	17.40 [1]	25.79	25.20	25.20	On request
		mm	387	442 [1]	655	640	640	
	Class 900	in	15.24	20.43 [2]	25.79	On request		
		mm	387	519 [2]	655			
	Class 1500 to 2500	in	22.44	On request		Class 1500 On request		
		mm	570					
H8 for actuator	350 cm²	in	–					
		mm						
	355 cm²	in	–					
		mm						
	700 cm²	in	16.46	16.46	–			
		mm	418	418				
	750 cm²	in	16.46	16.46	–			
		mm	418	418				

Valve	NPS		8	10	12	14	16	20
	DN		200	250	300	–	400	500
H8 for actuator	1000 cm²	in	16.46	On request				
		mm	418					
	1400-60 cm²	in	16.46	On request				
		mm	418					
	1400-120 cm²	in	19.80	19.80	25.59	25.59	25.59	25.59
		mm	503	503 [3]	650	650	650	650
	2800 cm²	in	19.80	19.80	25.59	25.59	25.59	25.59
		mm	503	503 [3]	650	650	650	650
	2x2800 cm²	in	19.80	19.80	25.59	25.59	25.59	25.59
		mm	503	503 [3]	650	650	650	650
H2 (NPS 4 and larger with foot)	Class 150	in	9.84	12.21	14.57	On request	16.34	On request
		mm	250	310	370		415	
	Class 300 to 600	in	10.63	11.82	15.35	On request		
		mm	270	300	390			
	Class 900	in	On request					
		mm						
	Class 1500	in	On request					
		mm						
	Class 2500	in	On request			–		
		mm						

[1] NPS 10, Class 150 to 300: 17.40″ or 442 mm
[2] NPS 10, Class 600 to 900: 20.43″ or 519 mm
[3] H8 = 25.59″ or 650 mm with 250 mm seat bore

Table 3: *Weights for standard version of Type 3251 up to NPS 6*

Valve		NPS	½	1	1½	2	3	4	6
Valve without actuator	Class 150	lbs	26	31	42	66	110	152	342
		kg	12	14	19	30	50	69	155
	Class 300	lbs	33	35	57	95	170	247	694
		kg	15	16	26	43	77	112	315
	Class 600	lbs	33	35	57	95	170	247	694
		kg	15	16	26	43	77	112	315
	Class 900	lbs	33	35	57	95	170	247	694
		kg	15	16	26	43	77	112	315
	Class 1500	lbs	On request	75	126	159	348	496	1235
		kg		34	57	72	158	225	560
	Class 2500	lbs	On request	93	163	238	379	604	2198
		kg		42	74	108	172	274	997

Table 4: *Weights for standard version of Type 3251 in NPS 8 and larger*

Valve		NPS	8	10	12	14	16	20
Valve without actuator	Class 150	lbs	948	1892	2028	On request	3197	3638
		kg	430	858	920		1450	1650
	Class 300	lbs	948	1892	2028	On request	3197	3638
		kg	430	858	920		1450	1650
	Class 600	lbs	1096	1609	2535	On request		
		kg	497	730	1150			
	Class 900	lbs	1157	2844	3263	On request	5732	On request
		kg	525	1290	1480		2600	
	Class 1500	lbs	1949	4630	On request			
		kg	884	2100				
	Class 2500	lbs	3990	On request		–		
		kg	1810					

Note:

Refer to the following data sheets for more dimensions and weights:

- *T 8052 for valves with bellows seal, insulating section or heating jacket*

The associated actuator documentation applies to actuators, e.g. for SAMSON pneumatic actuators:

- *T 8310-1 for Type 3271 and Type 3277 Actuators up to 750 cm² actuator area*
- *T 8310-2 for Type 3271 Actuator with 1000 cm² actuator area and larger*
- *T 8310-3 for Type 3271 Actuator with 1400-60 cm² actuator area*

4 Preparation

After receiving the shipment, proceed as follows:

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

4.1 Unpacking

Note:
Do not remove the packaging until immediately before installing the valve into the pipeline.

Proceed as follows to lift and install the valve:

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

NOTICE
Risk of valve damage due to foreign particles entering the valve.
The protective caps fitted on the valve's inlet and outlet prevent foreign particles from entering the valve and damaging it.
Do not remove the protective caps until immediately before installing the valve into the pipeline.

4.2 Transporting and lifting

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

WARNING!
Risk of lifting equipment tipping and risk of damage to lifting accessories due to exceeding the rated lifting capacity.
– *Only use approved lifting equipment and accessories whose minimum lifting capacity is higher than the weight of the valve (including actuator, if applicable).*
– *Refer to section 3.3 or Data Sheet ▶ T 8052 for weights.*

WARNING!
Risk of personal injury due to control valve tipping.
– *Observe the valve's center of gravity.*
– *Secure the valve against tipping over or turning.*

NOTICE
Risk of valve damage due to incorrectly attached slings.
The welded-on lifting eyelet on SAMSON actuators is only intended for mounting and removing the actuator as well as lifting the actuator without valve. Do not use this lifting eyelet to lift the entire control valve assembly.
- *When lifting the control valve, make sure that the slings attached to the valve body bear the entire load.*
- *Do not attach load-bearing slings to the actuator, handwheel or any other parts.*
- *Observe lifting instructions (see section 4.2.2).*

Tip:
SAMSON's After-sales Service department can provide more detailed transport and lifting instructions on request.

4.2.1 Transporting

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

➔ Leave the control valve in its transport container or on the pallet to transport it.

➔ Observe the transport instructions.

Transport instructions

- Protect the control valve against external influences (e.g. impact).
- Do not damage the corrosion protection (paint, surface coatings). Remove any damage immediately.
- Protect the control valve against moisture and dirt.
- The permissible transportation temperature of standard control valves is –20 to +65 °C (–4 to +149 °F).

Note:
Contact SAMSON's After-sales Service department for the transportation temperatures of other valve versions.

4.2.2 Lifting

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

Lifting instructions

- Secure slings against slipping.
- Make sure the slings can be removed from the valve once it has been installed into the pipeline.

– Prevent the control valve 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.
– Make sure that the additional sling between the lifting eyelet and rigging equipment (hook, shackle etc.) does not bear any load when lifting valves larger than NPS 6. The sling only protects the control valve from tilting while being lifted. Before lifting the control valve, tighten the sling.

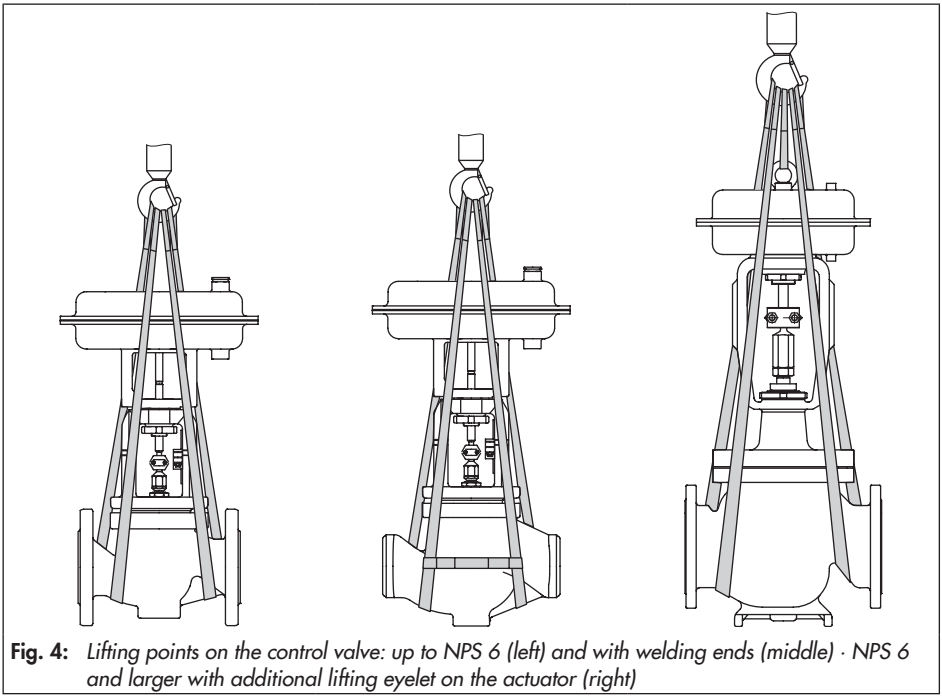


Fig. 4: *Lifting points on the control valve: up to NPS 6 (left) and with welding ends (middle) · NPS 6 and larger with additional lifting eyelet on the actuator (right)*

Version with flanges

1. Attach one sling to each flange of the body and to the rigging equipment (e.g. hook) of the crane or forklift (see Fig. 4).
2. **NPS 6 and larger:** Attach another sling to the lifting eyelet on the actuator and to the rigging equipment.
3. Carefully lift the control valve. Check whether the lifting equipment and accessories can bear the weight.
4. Move the control valve at an even pace to the site of installation.
5. Install the valve into the pipeline (see section 5.2).
6. After installation in the pipeline, check whether the flanges are bolted tight and the valve in the pipeline holds.
7. Remove slings.

Version with welding ends

1. Attach one sling to each welding end of the body and to the rigging equipment (e.g. hook) of the crane or forklift (see Fig. 4).
2. Secure the slings attached to the body against slipping using a connector.
3. **NPS 6 and larger:** Attach another sling to the lifting eyelet on the actuator and to the rigging equipment.
4. Carefully lift the control valve. Check whether the lifting equipment and accessories can bear the weight.
5. Move the control valve at an even pace to the site of installation.
6. Install the valve into the pipeline (see section 5.2).
7. After installation in the pipeline, check whether the weld seams hold.
8. Remove slings.

Tip:
We recommend using a hook with safety latch (see Fig. 4). The safety latch prevents the slings from slipping during lifting and transporting.

4.3 Storage

NOTICE
Risk of valve damage due to improper storage.
– Observe storage instructions.
– Avoid long storage times.
– Contact SAMSON in case of different storage conditions or longer storage times.

Note:
We recommend regularly checking the control valve and the prevailing storage conditions during long storage times.

Storage instructions

– Protect the control valve against external influences (e.g. impact).
– Do not damage the corrosion protection (paint, surface coatings). Remove any damage immediately.
– Protect the control valve 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 control valves is –20 to +65 °C (–4 to +149 °F).

Note:
Contact SAMSON's After-sales Service department for the storage temperatures of other valve versions.

– Do not place any objects on the control valve.

Special storage instructions for elastomers

Elastomer, e.g. actuator diaphragm

– To keep elastomers in shape and to prevent cracking, do not bend them or hang them up.
– We recommend a storage temperature of 15 °C (59 °F) for elastomers.
– Store elastomers away from lubricants, chemicals, solutions, and fuels.

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

4.4 Preparation for installation

Proceed as follows:

➔ Flush the pipelines.

Note:
The plant engineering company is responsible for cleaning the pipelines in the plant.

➔ Check the valve to make sure it is clean.

➔ Check the valve for damage.

➔ Check to make sure that the type designation, valve size, material, pressure rating and temperature range of the valve match the plant conditions (size and pressure rating of the pipeline, medium temperature etc.).

➔ For steam applications, make sure that the pipelines are dry. Moisture will damage the inside of the valve.

➔ Check any mounted pressure gauges to make sure they function.

➔ When the valve and actuator are already assembled, check the tightening torques of the bolted joints (▶ WA 0029). Components may loosen during transport.

5 Mounting and start-up

SAMSON valves are delivered ready for use. In special cases, the valve and actuator are delivered separately and must be assembled on site. The procedure to mount and start up the valve are described in the following.

NOTICE
Risk of valve damage due to excessively high or low tightening torques. Observe the specified torques on tightening control valve components. Excessively tightened torques lead to parts wearing out quicker. Parts that are too loose may cause leakage. Observe the specified tightening torques (▶ WA 0029).

NOTICE
Risk of valve damage due to the use of unsuitable tools.
Only use tools approved by SAMSON (▶ WA 0029).

5.1 Mounting the actuator onto the valve

Proceed as described in the actuator documentation if the valve and actuator have not been assembled by SAMSON:

Versions with V-port plug

Each V-port plug has three V-shaped ports. Depending on the valve size, the size of the symmetrically arranged V-shaped ports varies. The process medium in the valve flows through the V-shaped ports as soon as the plug is lifted out of the seat (i.e. the valve opens).

1. Before mounting the actuator, determine which V-shaped port is uncovered first when the plug is lifted out of the seat.

Tip:
Usually, this is the largest V-shaped port.

2. On mounting the actuator, make sure that the V-shaped port uncovered first faces toward the valve outlet.

NOTICE
Risk of damage to wall of valve body due to incorrectly diverted jet stream. The process medium cannot flow unobstructed through the valve when the V-port plug has been installed incorrectly. This will result in the process medium hitting the body wall, which may lead to severe valve damage.
Make sure the V-port plug is installed correctly.

Note:
– Remove the mounted actuator before mounting the other actuator (see associated actuator documentation).
– Preloading the actuator springs increases the thrust of a pneumatic actuator and reduces the travel range of the actuator (see associated actuator documentation).

5.2 Installing the valve into the pipeline

5.2.1 Checking the installation conditions

Pipeline routing

The inlet and outlet lengths vary depending on the process medium. To ensure the control valve functions properly, follow the installation instructions given below:

➔ Observe the inlet and outlet lengths (see Table 5). Contact SAMSON if the valve conditions or states of the medium process deviate.

➔ Install the valve free of stress and with the least amount of vibrations as possible. If necessary, attach supports to the valve.

➔ Install the valve allowing sufficient space to remove the actuator and valve or to perform service and repair work on them.

Mounting position

Generally, we recommend installing the valve with the actuator upright and on top of the valve.

In the following versions, the valve **must** be installed with the actuator on top:
– Valves in NPS 4 and larger
– Valves with insulating section for low temperatures below –10 °C (14 °F)

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

Support or suspension

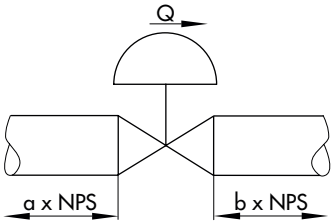
Depending on the valve version and mounting position, the control valve and pipeline must be supported or suspended. The plant engineering company is responsible in this case.

NOTICE
Premature wear and leakage due to insufficient support or suspension.
In the following versions, the control valve must be supported or suspended:
– Valves that are not installed with the actuator upright on top of the valve.
Attach a suitable support or suspension to the valve.

Vent plug

Vent plugs are screwed into the exhaust air ports of pneumatic and electropneumatic devices. They ensure that any exhaust air that forms can be vented to the atmosphere (to avoid excess pressure in the device). Further-

Table 5: *Inlet and outlet lengths*



Q Flow rate
a Inlet length
b Outlet length

State of process medium	Valve conditions	Inlet length a	Outlet length b
Gas	Ma ≤ 0.3	2	4
	0.3 ≤ Ma ≤ 0.7	2	10
Vapor	Ma ≤ 0.3 [1]	2	4
	0.3 ≤ Ma ≤ 0.7 [1]	2	10
	Saturated steam (percentage of condensate > 5 %)	2	20
Liquid	Free of cavitation/w < 10 m/s	2	4
	Cavitation producing noise/w ≤ 3 m/s	2	4
	Cavitation producing noise/3 < w < 5 m/s	2	10
	Critical cavitation/w ≤ 3 m/s	2	10
	Critical cavitation/3 < w < 5 m/s	2	20
Flashing	–	2	20
Multi-phase	–	10	20

[1] No saturated steam

more, the vent plugs allow air intake to prevent a vacuum from forming in the device.

➔ Locate the vent plug on the opposite side to the workplace of operating personnel.

➔ On mounting valve accessories, make sure that they can be operated from the workplace of the operating personnel.

Note:
The workplace of operating personnel is the location from which the valve, actuator and any mounted valve accessories can be accessed to operate them.

5.2.2 Additional fittings

Strainers

We recommend installing a SAMSON strainer upstream of the valve. It prevents solid particles in the process medium from damaging the valve.

Bypass and shut-off valves

We recommend installing a shut-off valve both upstream of the strainer and downstream of the valve and setting up a bypass line. The bypass line ensures that the plant does not need to be shut down for service and repair work on the valve.

Insulation

Only insulate control valves with insulating section or bellows seal up to the bonnet flange of the valve body for medium temperatures below 0 °C (32 °F) and above 220 °C (428 °F).

Do not insulate valves mounted to comply with NACE MR 0175 requirements.

Test connection

Versions with bellows seal fitted with a test connection (G ⅛) at the top flange allow the tightness of the bellows to be monitored.

Particularly for liquids and vapors, we recommend installing a suitable leakage indicator (e.g. a contact pressure gauge, an outlet to an open vessel or an inspection glass).

WARNING!
Risk of personal injury due to components under pressure and process medium escaping under pressure.

Do not loosen the screw of the test connection while the valve is in operation.

Safety guard

To reduce the crush hazard arising from moving parts (actuator and plug stem), a safety guard can be installed.

Noise emission

Trims with flow dividers can be used to reduce noise emission (see ▶ T 8081).

5.2.3 Installing the control valve

Version with flanges

1. Close the shut-off valve in the pipeline while the valve is being installed.
2. Remove the protective caps from the valve ports before installing the valve.
3. Lift the valve using suitable lifting equipment to the site of installation (see section 4.2.2). Observe the flow direction through the valve. The arrow on the valve indicates the direction of flow.
4. Make sure that the correct flange gaskets are used.
5. Bolt the pipe to the valve free of stress.
6. Depending on the field of application, allow the valve to cool down or heat up to reach ambient temperature before start up.
7. Slowly open the shut-off valve in the pipeline after the valve has been installed.

NOTICE
Risk of valve damage due to a sudden pressure increase and resulting high flow velocities.
Slowly open the shut-off valve in the pipeline during start-up.

8. Check the valve to ensure it functions properly.

Version with welding ends

1. Proceed as described for "Version with flanges" (steps 1 to 3).
2. Completely retract the actuator stem to protect the plug from sparks during welding.
3. Weld the valve free of stress into the pipeline.
4. Proceed as described for "Version with flanges" (steps 6 to 8).

5.3 Quick check

SAMSON valves are delivered ready for use. To test the valve's ability to function, the following quick checks can be performed:

Tight shut-off

1. Close the valve.
2. Slowly open the shut-off valve in the pipeline.

NOTICE
Risk of valve damage due to a sudden pressure increase and resulting high flow velocities.
Slowly open the shut-off valve in the pipeline during start-up.

3. Check the valve for leakage to the atmosphere (visual inspection).

Travel motion

The movement of the actuator stem must be linear and smooth.

➔ Open and close the valve, observing the movement of the actuator stem.

➔ Apply the maximum and minimum control signals to check the end positions of the valve.

➔ Check the travel reading at the travel indicator scale.

Fail-safe position

➔ Shut off the signal pressure line.

➔ Check whether the valve moves to the fail-safe position.

Adjustable packing

Tip:
A label on the flange (2) indicates whether an adjustable packing is installed.

1. Tighten the threaded bushing gradually (by turning it clockwise) until the packing seals the valve.

NOTICE
Risk of valve damage due to the threaded bushing tightened too far. Make sure that the plug stem can still move smoothly after the threaded bushing has been tightened.

2. Open and close the valve several times.
3. Check the valve for leakage to the atmosphere (visual inspection).
4. Repeat steps 1 and 2 until the packing completely seals the valve.

Note:
If the adjustable packing does not seal properly, contact SAMSON's After-sales Service department.

Pressure test

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

– Retract the plug stem to open the valve.
– Observe the maximum permissible pressure for valve and plant.

Note:
The plant engineering company is responsible for performing the pressure test. SAMSON's After-sales Service department can support you to plan and perform a pressure test for your plant.

6 Operation

Immediately after completing mounting and start-up (see section 5), the valve is ready for use.

WARNING!
Crush hazard arising from moving parts (actuator and plug stem).
Do not insert hands or finger into the yoke while the valve is in operation.

WARNING!
Risk of personal injury when the actuator vents.
Wear eye protection when working in close proximity to the control valve.

WARNING!
Risk of burn injuries due to hot or 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 gloves.

NOTICE
Operating disturbed by a blocked actuator and plug stem.
Do not impede the movement of the actuator or plug stem by inserting objects into their path.

6.1 Working in manual mode

Valves fitted with actuators with a handwheel can be manually closed or opened in case of supply air failure.

➔ For normal closed-loop operation, move the handwheel to the neutral position.

7 Maintenance

The control valve is subject to normal wear, especially at the seat, plug, and packing. Depending on the operating conditions, check the valve at regular intervals to prevent possible failure before it can occur.

Tip:
SAMSON's After-sales Service department can support you to draw up a maintenance plan for your plant.

We recommend removing the valve from the pipeline or service or repair work (see section 9.2).

DANGER!
Risk of bursting in pressure equipment.
Control valves and pipelines are pressure equipment. Improper opening can lead to bursting of the valve.
- *Before starting any work on the control valve, depressurize all plant sections concerned and the valve.*
- *Drain the process medium from all the plant sections concerned as well as the valve.*
- *Wear personal protective equipment.*

WARNING!
Risk of personal injury due to residual process medium in the valve.
While working on the valve, residual process medium can escape and, depending on its properties, may lead to personal injury, e.g. (chemical) burns.
Wear protective clothing, gloves, and eyewear.

WARNING!
Risk of burn injuries due to hot or cold components and pipeline.
Valve components and the pipeline may become very hot or cold. Risk of burn injuries.
- *Allow components and pipelines to cool down or heat up.*
- *Wear protective clothing and gloves.*

NOTICE
Risk of valve damage due to incorrect maintenance or repair.
Service and repair work must only be performed by trained staff.

NOTICE
Risk of valve damage due to excessively high or low tightening torques.
Observe the specified torques on tightening control valve components. Excessively tightened torques lead to parts wearing out quicker. Parts that are too loose may cause leakage.

Observe the specified tightening torques (▶ WA 0029).

NOTICE
Risk of valve damage due to the use of unsuitable tools.
Only use tools approved by SAMSON (▶ WA 0029).

NOTICE
Risk of valve damage due to the use of unsuitable lubricants.
Only use lubricants approved by SAMSON (see parts list).

Note:
The control valve was checked by SAMSON before it left the factory.
- *Certain test results (seat leakage and leak test) certified by SAMSON lose their validity when the valve body or actuator housing is opened.*
- *The product warranty becomes void if maintenance or repair work not described in these instructions is performed without prior agreement by SAMSON's After-sales Service department.*
- *Only use original spare parts by SAMSON, which comply with the original specifications.*

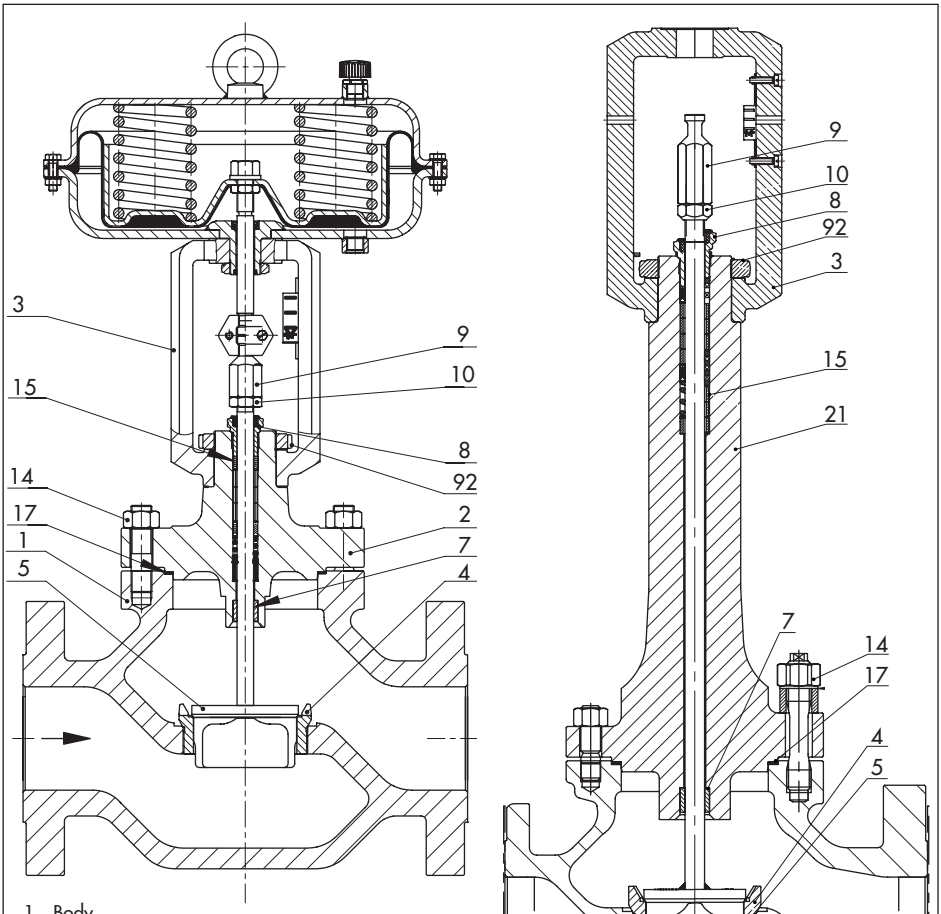
7.1 Replacing the gasket

NOTICE
Risk of control valve damage due to incorrect service or repair.
The gasket can only be replaced when all the following conditions are met:
- *The valve size is ≤NPS 4.*
- *The valve does not have a balanced plug.*
- *The valve does not have a flow divider.*

To replace the gasket in other valve versions, contact SAMSON's After-sales Service department.

7.1.1 Standard version

1. Remove the actuator from the valve. See associated actuator documentation.
2. Undo the body nuts (14) gradually in a criss-cross pattern.
3. Lift the flange (2) and plug with plug stem (5) off the body (1).
4. Remove gasket (17). Carefully clean the sealing faces in the valve body (1) and on the flange (2).
5. Insert a new gasket (17) into the body.
6. Place the flange (2) onto the body. **Version with V-port plug:** place the flange (2) onto the valve body, making sure that the largest V-shaped port of the V-port plug faces toward the valve outlet. See section 5.1.



1 Body
2 Flange
3 Yoke
4 Seat
5 Plug (with plug stem)
7 Guide bushing
8 Threaded bushing (packing nut)
9 Stem connector nut
10 Lock nut
14 Nut
15 Packing
17 Body gasket
21 Insulating section
92 Castellated nut

Fig. 5: *Standard version of Type 3251 with Type 3271 Actuator (left) and Type 3251 in version with insulating section (right)*

7. Press the plug (5) firmly into the seat (4), while fastening down the flange (2) with the body nuts (14). Tighten the nuts gradually in a criss-cross pattern. Observe tightening torques.
8. Mount actuator. See associated actuator documentation.
9. Adjust lower or upper signal bench range. See associated actuator documentation.

7.1.2 Version with insulating section or bellows seal

1. Remove the actuator from the valve. See associated actuator documentation.
2. Undo the body nuts (14) gradually in a criss-cross pattern.
3. Lift the insulating section (21) and plug with plug stem (5) off the body (1).
4. Remove gasket (17). Carefully clean the sealing faces in the valve body (1) and on the insulating section (21).
5. Insert a new gasket (17) into the body.
6. Place the insulating section (21) onto the body.
   Version with V-port plug: place the insulating section (21) onto the valve body, making sure that the largest V-shaped port of the V-port plug faces toward the valve outlet. See section 5.1.
7. Press the plug (5) firmly into the seat (4), while fastening down the insulating section (21) with the body nuts (14). Tighten the nuts gradually in a criss-cross pattern. Observe tightening torques.
8. Mount actuator. See associated actuator documentation.
9. Adjust lower or upper signal bench range. See associated actuator documentation.

7.2 Replacing the packing

NOTICE

Risk of control valve damage due to incorrect service or repair.

The packing can only be replaced when all the following conditions are met:

- *The valve size is ≤NPS 4.*
- *The valve does not have a balanced plug.*
- *The valve does not have a bellows seal.*
- *The standard or ADSEAL packing is installed in the valve.*

To replace the packing in other valve versions, contact SAMSON's After-sales Service department.

7.2.1 Standard version

Standard packing (PTFE)

1. Remove the actuator from the valve. See associated actuator documentation.
2. Unscrew castellated nut (92) and lift the yoke (3) off the flange (2).
3. Undo the body nuts (14) gradually in a criss-cross pattern.
4. Lift the flange (2) and plug with plug stem (5) off the body (1).

5. Unthread the stem connector nut (9) and lock nut (10) from the plug stem.
6. Unscrew the threaded bushing (8).
7. Pull the plug with plug stem (5) out of the flange (2).
8. Pull all the packing parts out of the packing chamber using a suitable tool.
9. Renew damaged parts. Clean the packing chamber thoroughly.
10. Apply a suitable lubricant to all the packing parts and to the plug stem (5).
11. Slide the plug with plug stem (5) into the flange (2).
12. Place the flange (2) together with the plug stem and plug (5) onto the body. **Version with V-port plug:** place the flange (2) onto the valve body, making sure that the largest V-shaped port of the V-port plug faces toward the valve outlet. See section 5.1.
13. Carefully slide the packing parts over the plug stem into the packing chamber using a suitable tool. Make sure to observe the proper sequence (see Fig. 6).
14. Press the plug (5) firmly into the seat (4), while fastening down the flange (2) with the body nuts (14). Tighten the nuts gradually in a criss-cross pattern. Observe tightening torques.
15. Screw in the threaded bushing (8) and tighten it. Observe tightening torques.
16. Place yoke (3) on the flange (2) and fasten tight using the castellated nut (92).
17. Loosely screw the lock nut (10) and stem connector nut (9) onto the plug stem.
18. Mount actuator. See associated actuator documentation.
19. Adjust lower or upper signal bench range. See associated actuator documentation.

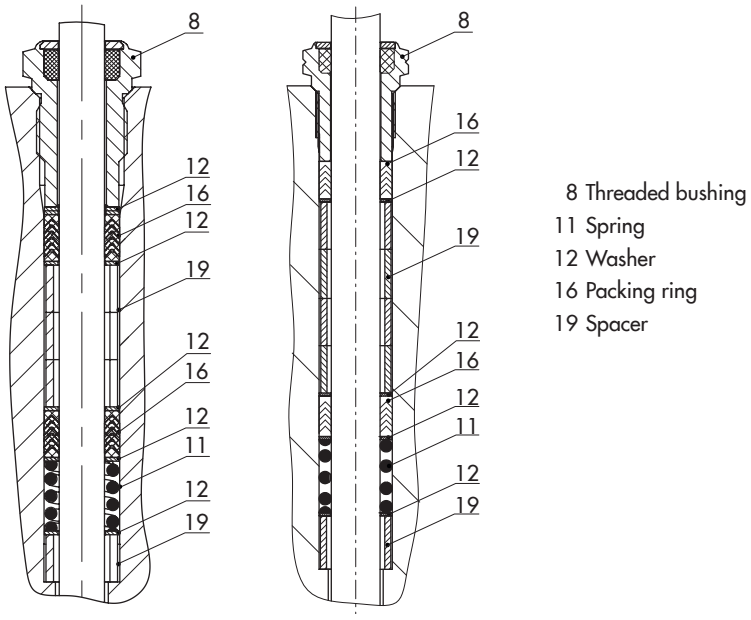
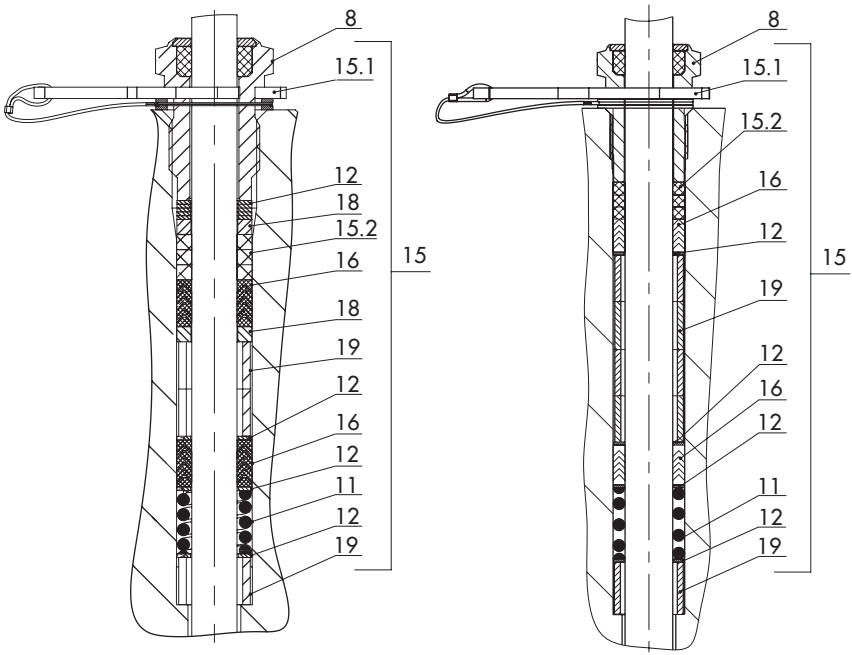


Fig. 6: *Standard packing: NPS ½ to 1½ (left) and NPS 2 to 4 (right)*

ADSEAL packing

1. Proceed as described in "Standard packing (PTFE)", steps 1 to 12.
2. Carefully slide the packing parts over the plug stem into the packing chamber using a suitable tool. Make sure to observe the proper sequence (see Fig. 7).
3. Slide the seals (15.2) over the plug stem. Insert the wire of the red spacer ring (15.1) into the groove of the retaining ring.
   Slide the retaining ring over the plug stem.
4. Insert the red spacer ring (15.1) between the threaded bushing (8) and retaining ring. See Fig. 7.
5. Proceed as described in "Standard packing (PTFE)", steps 14 to 19.



8 Threaded bushing
11 Spring
12 Washer
15 Packing (entire)
15.1 Shim with retaining ring
15.2 Seal
16 Packing ring
18 Bushing
19 Spacer

Fig. 7: *ADSEAL packing: NPS ½ to 1½ (left) and NPS 2 to 4 (right)*

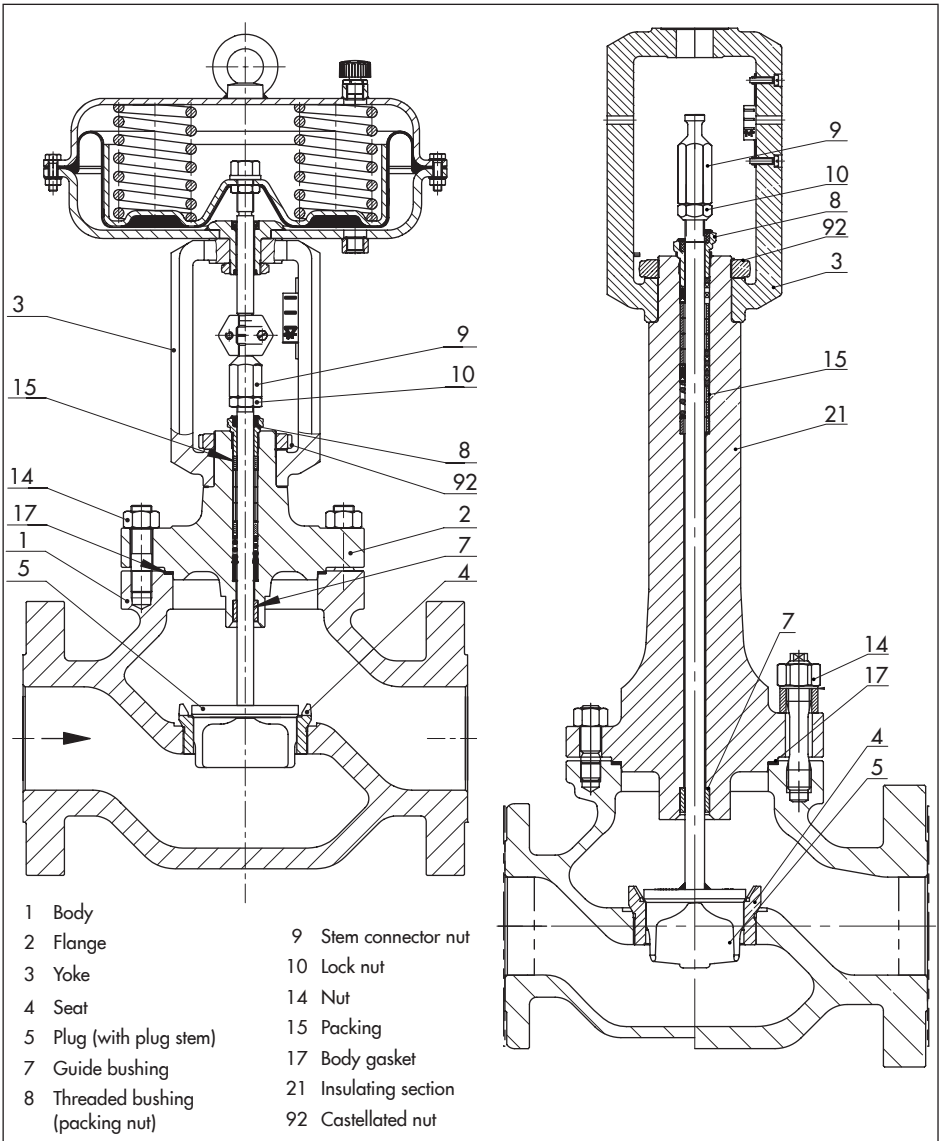
7.2.2 Version with insulating section

Standard packing (PTFE)

1. Remove the actuator from the valve. See associated actuator documentation.
2. Unscrew castellated nut (92) and lift the yoke (3) off the insulating section (21).
3. Undo the body nuts (14) gradually in a criss-cross pattern.
4. Lift the insulating section (21) and plug with plug stem (5) off the body (1).
5. Unthread the stem connector nut (9) and lock nut (10) from the plug stem.
6. Unscrew the threaded bushing (8).
7. Pull the plug with plug stem (5) out of the insulating section (21).
8. Pull all the packing parts out of the packing chamber using a suitable tool.
9. Renew the damaged parts and carefully clean the packing chamber.
10. Apply a suitable lubricant to all the packing parts and to the plug stem (5).
11. Slide the plug with plug stem (5) into the insulating section (21).
12. Place the insulating section (21) together with the plug stem and plug (5) onto the body.
    Version with V-port plug: place the insulating section (21) onto the valve body, making sure that the largest V-shaped port of the V-port plug faces toward the valve outlet. See section 5.1.
13. Carefully slide the packing parts over the plug stem into the packing chamber using a suitable tool. Make sure to observe the proper sequence (see Fig. 6).
14. Press the plug (5) firmly into the seat (4), while fastening down the insulating section (21) with the body nuts (14). Tighten the nuts gradually in a criss-cross pattern. Observe tightening torques.
15. Screw in the threaded bushing (8) and tighten it. Observe tightening torques.
16. Place yoke (3) on the insulating section (21) and fasten tight using the castellated nut (92).
17. Loosely screw the lock nut (10) and stem connector nut (9) onto the plug stem.
18. Mount actuator. See associated actuator documentation.
19. Adjust lower or upper signal bench range. See associated actuator documentation.

ADSEAL packing

1. Proceed as described in "Standard packing (PTFE)", steps 1 to 12.
2. Carefully slide the packing parts over the plug stem into the packing chamber using a suitable tool. Make sure to observe the proper sequence (see Fig. 7).
3. Slide the seals (15.2) over the plug stem. Insert the wire of the red spacer ring (15.1) into the groove of the retaining ring.
   Slide the retaining ring over the plug stem.



1 Body
2 Flange
3 Yoke
4 Seat
5 Plug (with plug stem)
7 Guide bushing
8 Threaded bushing (packing nut)
9 Stem connector nut
10 Lock nut
14 Nut
15 Packing
17 Body gasket
21 Insulating section
92 Castellated nut

Fig. 8: *Standard version of Type 3251 with Type 3271 Actuator (left) and Type 3251 in version with insulating section (right)*

4. Insert the red spacer ring (15.1) between the threaded bushing (8) and retaining ring. See Fig. 7.
5. Proceed as described in "Standard packing (PTFE)", steps 14 to 19.

7.3 Replacing the seat and plug

NOTICE
Risk of control valve damage due to incorrect service or repair.
Seat and plug can only be replaced when all the following conditions are met:
– The valve size is ≤NPS 4.
– The valve does not have a balanced plug.
– The valve does not have a bellows seal.
– The valve does not have a flow divider.
– The valve does not have a AC trim.
– The standard or ADSEAL packing is installed in the valve.
To replace seat and plug in other valve versions, contact SAMSON's After-sales Service department.

NOTICE
Risk of damage to the facing of the seat and plug due to incorrect service or repair.
Always replace both the seat and plug.

Tip:
When replacing the seat and plug, we also recommend replacing the packing. See section 7.2.

7.3.1 Standard version

1. Remove the actuator from the valve. See associated actuator documentation.
2. Unscrew castellated nut (92) and lift the yoke (3) off the flange (2).
3. Undo the body nuts (14) gradually in a criss-cross pattern.
4. Lift the flange (2) and plug with plug stem (5) off the body (1).
5. Replace gasket as described in section 7.1.1.
6. Unthread the stem connector nut (9) and lock nut (10) from the plug stem.
7. Unscrew the threaded bushing (8).
8. Pull the plug with plug stem (5) out of the flange (2).
9. Pull all the packing parts out of the packing chamber using a suitable tool.
10. Make sure that the guide bushing (7) is not damaged. If necessary, replace the guide bushing using a suitable tool.
11. Unscrew the seat (4) using a suitable tool.
12. Apply a suitable lubricant to the thread and the sealing cone of the new seat.
13. Screw in the seat (4). Observe tightening torques.

14. Apply a suitable lubricant to all the packing parts and to the new plug stem (5). We recommend replacing the packing as well. See section 7.2.1.
15. Slide the new plug with plug stem (5) into the flange (2).
16. Place the flange (2) together with the plug stem and plug (5) onto the body (1).
    Version with V-port plug: place the flange (2) onto the valve body, making sure that the largest V-shaped port of the V-port plug faces toward the valve outlet. See section 5.1.
17. Carefully slide the packing parts over the plug stem into the packing chamber using a suitable tool. Make sure to observe the proper sequence (see Fig. 6).
18. Press the plug (5) firmly into the seat (4), while fastening down the flange (2) with the body nuts (14). Tighten the nuts gradually in a criss-cross pattern. Observe tightening torques.
19. Screw in the threaded bushing (8) and tighten it. Observe tightening torques.
20. Place yoke (3) on the flange (2) and fasten tight using the castellated nut (92).
21. Loosely screw the lock nut (10) and stem connector nut (9) onto the plug stem.
22. Mount actuator. See associated actuator documentation.
23. Adjust lower or upper signal bench range. See associated actuator documentation.

7.3.2 Version with insulating section

1. Remove the actuator from the valve. See associated actuator documentation.
2. Unscrew castellated nut (92) and lift the yoke (3) off the insulating section (21).
3. Undo the body nuts (14) gradually in a criss-cross pattern.
4. Lift the insulating section (21) together with the plug stem and plug (5) off the body (1).
5. Replace gasket as described in section 7.1.2.
6. Unthread the stem connector nut (9) and lock nut (10) from the plug stem (5).
7. Unscrew the threaded bushing (8).
8. Pull the plug with plug stem (5) out of the insulating section (21).
9. Pull all the packing parts out of the packing chamber using a suitable tool.
10. Make sure that the guide bushing (7) is not damaged. If necessary, replace the guide bushing using a suitable tool.
11. Unscrew the seat (4) using a suitable tool.
12. Apply a suitable lubricant to the thread and the sealing cone of the new seat.
13. Screw in the seat (4). Observe tightening torques.
14. Apply a suitable lubricant to all the packing parts and to the new plug stem (5). We recommend replacing the packing as well. See section 7.2.2.

15. Slide the new plug with plug stem (5) into the insulating section (21).
16. Place the insulating section (21) together with the plug stem and plug (5) onto the body (1).
    Version with V-port plug: place the insulating section (21) onto the valve body, making sure that the largest V-shaped port of the V-port plug faces toward the valve outlet. See section 5.1.
17. Carefully slide the packing parts over the plug stem extension into the packing chamber using a suitable tool. Make sure to observe the proper sequence (see Fig. 6).
18. Press the plug (5) firmly into the seat (4), while fastening down the insulating section (21) with the body nuts (14). Tighten the nuts gradually in a criss-cross pattern. Observe tightening torques.
19. Screw in the threaded bushing (8) and tighten it. Observe tightening torques.
20. Place yoke (3) on the insulating section (21) and fasten tight using the castellated nut (92).
21. Loosely screw the lock nut (10) and stem connector nut (9) onto the plug stem.
22. Mount actuator. See associated actuator documentation.
23. Adjust lower or upper signal bench range. See associated actuator documentation.

7.4 Preparation for return shipment

Defective valves can be returned to SAMSON for repair.

Proceed as follows to return valves to SAMSON:

1. Put the control valve out of operation (see section 9).
2. Decontaminate the valve. Remove any residual process medium.
3. Fill in the Declaration on Contamination, which can be downloaded from our website at ▶ www.samson.de > Services > Check lists for after sales service > Declaration on Contamination.
4. Send the valve together with the filled-in form to your nearest SAMSON subsidiary. SAMSON subsidiaries are listed on our website at ▶ www.samson.de > Contact.

7.5 Ordering spare parts and operating supplies

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

Spare parts

See section 10.3 for details on spare parts.

Lubricant

Details on suitable lubricants can be found in the parts list.

Tools

Details on suitable tools can be found in the document ▶ WA 0029.

8 Malfunctions

Depending on the operating conditions, check the valve at certain intervals to prevent possible failure before it can occur. Operators are responsible for drawing up a test plan.

Tip:
SAMSON's After-sales Service department can support you to draw up a maintenance plan for your plant.

8.1 Troubleshooting

Malfunction	Possible reasons	Recommended action
Actuator or plug stem does not move on demand.	Actuator is blocked.	Check attachment. Unblock the actuator.
	Signal pressure too low	Check the signal pressure. Check the signal pressure line for leakage.
Actuator or plug stem does not move through the whole range.	Signal pressure too low	Check the signal pressure. Check the signal pressure line for leakage.
The valve leaks to the atmosphere (fugitive emissions).	The packing is defective.	Replace packing (see section 7.2) or contact SAMSON's After-sales Service department.
	Version with adjustable packing [1]: packing not tightened correctly.	See section 5.3, "Adjustable packing". Contact SAMSON's After-sales Service department when it continues to leak.
	Version with bellows seal: the metal bellows seal is defective.	Contact SAMSON's After-sales Service department.
	Flange joint loose or gasket worn out.	Check the flange joint. Replace gasket at the flanged joint (see section 7.1 or contact SAMSON's After-sales Service department).

Malfunction	Possible reasons	Recommended action
Increased flow through closed valve (seat leakage)	Dirt or other foreign particles deposited between the seat and plug.	Shut off the section of the pipeline and flush the valve.
	Valve trim, particularly with soft seat, is worn.	Replace seat and plug (see section 7.3 or contact SAMSON's After-sales Service department).

1) A label on the flange (2) indicates whether an adjustable packing is installed.

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

8.2 Emergency action

Upon supply air or control signal failure, the valve moves to its fail-safe position (see section 3.1).

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

In the event of a valve malfunction:

1. Close the shut-off valves upstream and downstream of the control valve to stop the process medium from flowing through the valve.
2. Check the valve for damage. If necessary, contact SAMSON's After-sales Service department.

Putting the valve back into operation after a malfunction

➔ Slowly open the shut-off valves. Allow the process medium to flow into the valve slowly.

9 Decommissioning and disassembly

DANGER!
Risk of bursting in pressure equipment.
Control valves and pipelines are pressure equipment. Improper opening can lead to bursting of the valve.
– Before starting any work on the control valve, depressurize all plant sections concerned and the valve.
– Drain the process medium from all the plant sections concerned as well as the valve.
– Wear personal protective equipment.

WARNING!
Risk of personal injury due to residual process medium in the valve.
While working on the valve, residual process medium can escape and, depending on its properties, may lead to personal injury, e.g. (chemical) burns.
Wear protective clothing, gloves, and eyewear.

WARNING!
Risk of burn injuries due to hot or cold components and pipeline.
Valve components and the pipeline may become very hot or cold. Risk of burn injuries.
– Allow components and pipelines to cool down or heat up.
– Wear protective clothing and gloves.

9.1 Decommissioning

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

1. Close the shut-off valves upstream and downstream of the control valve to stop the process medium from flowing through the valve.
2. Completely drain the pipelines and valve.
3. Disconnect and lock the pneumatic air supply to depressurize the actuator.
4. If necessary, allow the pipeline and valve components to cool down or heat up.

9.2 Removing the valve from the pipeline

Version with flanges

1. Put the control valve out of operation (see section 9.1).
2. Unbolt the flange joint.
3. Remove the valve from the pipeline (see section 4.2).

Version with welding ends

1. Put the control valve out of operation (see section 9.1).
2. Cut the pipeline in front of the weld seam.
3. Remove the valve from the pipeline (see section 4.2).

9.3 Removing the actuator from the valve

See associated actuator documentation.

9.4 Disposal

➔ Observe local, national, and international refuse regulations.

➔ Do not dispose of components, lubricants, and hazardous substances together with your other household waste.

10 Appendix

10.1 After-sales service

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

E-mail

You can reach the After-sales Service Department at aftersalesservice@samson.de.

Addresses of SAMSON AG and its subsidiaries

The addresses of SAMSON AG, its subsidiaries, representatives, and service facilities worldwide can be found on the SAMSON website, in all SAMSON product catalogs or on the back of these Mounting and Operating Instructions.

Required specifications

Please submit the following details:

- Order number and position number in the order
- Type, model number, nominal size, and valve version
- Pressure and temperature of the process medium
- Flow rate in m^3/h
- Bench range of the actuator (e.g. 0.2 to 1 bar)
- Is a strainer installed?
- Installation drawing

10.2 Certificates

Konformitätserklärung/Declaration of Conformity
Modul/Module H
N° CE-PED-H-SAM 001-13-DEU

Für folgende Produkte/For the following pressure equipment:

Geräte/Devices	Bauart/Series	Typ/Type	Ausführung/Version
Durchgangsventil/Globe Valve	240	3241	DIN, Gehäuse GG/Cast iron-Body ab/from DN150, Gehäuse GGG/Sph. gr. iron-Body ab/from DN100, Fluide/Fluids [1]
			DIN/ANSI, Geh. Stahl u.a./Body Steel etc., alle Fluide/all Fluids
Dreiwegeventil/Three-way Valve	240	3244	DIN, Gehäuse GG ab DN150/Cast iron-Body from DN150; Gehäuse GGG ab DN100/Sph. gr. iron-Body from DN100, Fluide/Fluids [1]
			DIN/ANSI, Geh. Stahl u.a./Body Steel etc., alle Fluide/all Fluids
Tieftemperaturventil/Cryogenic Valve	240	3248	DIN/ANSI, alle Fluide/all Fluids
Durchgangsventil/Globe Valve	250	3251	DIN/ANSI, alle Fluide/all Fluids
Dreiwegeventil/Three-way Valve	250	3253	DIN/ANSI, Geh. Stahl u.a./Body Steel etc., alle Fluide/all Fluids
Durchgangsventil/Globe Valve	250	3254	DIN/ANSI, alle Fluide/all Fluids
Eckventil/Angle Valve	250	3256	DIN/ANSI, alle Fluide/all Fluids
Split-Body-Ventil/Split-Body-Valve	250	3258	DIN, alle Fluide/all Fluids
IG-Eckventil/IG-Angle Valve	250	3259	DIN, alle Fluide/all Fluids
Dampfumformventil/ Steam-converting Valve	280	3281	DIN/ANSI, alle Fluide/all Fluids
		3284	DIN/ANSI, alle Fluide/all Fluids
		3286	DIN/ANSI, alle Fluide/all Fluids
		3288	DIN, alle Fluide/all Fluids
Durchgangsventile/Globe Valve	V2001	3321	DIN, Geh. Stahl u.a./Body Steel etc., alle Fluide/all Fluids
			ANSI, alle Fluide/all Fluids
Dreiwegeventil/Three-way Valve	V2001	3323	DIN, Geh. Stahl u.a./Body Steel etc., alle Fluide/all Fluids
			ANSI, alle Fluide/all Fluids
Schrägsitzventil/Bevel-Valve	---	3353	DIN, Geh. Stahl/Body Steel, alle Fluide/all Fluids
Drosselschalldämpfer/Silencer	3381	3381-1	DIN/ANSI, alle Fluide/all Fluids; Einzeldrosselscheibe mit Anschweißende/Single attenuation plate with welding end
		3381-3	DIN/ANSI, alle Fluide/all Fluids
		3381-4	DIN/ANSI, alle Fluide/all Fluids; Einzeldrosselscheibe mehrstufig mit Anschweißende/Single attenuation plate multi-stage with welding end
Durchgangsventil/Globe Valve	240	3241	ANSI, Gehäuse GG Cl125 ab 5"/Cast iron-Body Cl125 from 5" Fluide/Fluids [1]
Tieftemperaturventil mit Zirkulationssperre/ Cryogenic Valve with Circulation Barrier	240	3246	DIN/ANSI, alle Fluide/all Fluids
Dreiwegeventil/Three-way Valve	250	3253	DIN, Gehäuse GG ab DN200 PN16/Cast iron-Body from DN200 PN16 Fluide/Fluids [1]
Durchgangsventil/Globe Valve	290	3291	ANSI, alle Fluide/all Fluids
Eckventil/Angle Valve	290	3296	ANSI, alle Fluide/all Fluids
Durchgangsventil/Globe Valve	590	3591	ANSI, alle Fluide/all Fluids
Eckventil/Angle Valve	590	3596	ANSI, alle Fluide/all Fluids

[1] Gase nach Artikel 3/Punkt 1.3a zweiter Gedankenstrich//Gases acc. to article 3/chapter 1.3a second line
Flüssigkeiten nach Artikel 3/Punkt 1.3b//Liquids acc. to article 3/chapter 1.3b

wird die Konformität mit nachfolgender Anforderung bestätigt/We declare conformity with the demands of the:

Richtlinie des Rates zur Angleichung der Rechtsvorschriften der Mitgliedsstaaten über Druckgeräte/Pressure Equipment Directive	**97/23/EG 97/23/EC**	**vom/of 29.05.1997**
Angewandtes Konformitätsbewertungsverfahren/ Applied Conformity Assessment Procedure **für Fluide nach Artikel 3 Absatz 1/for fluids acc. to art. 3 para. 1**	**Modul H/Module H**	**durch/by Bureau Veritas 0062**

Das Qualitätssicherungssystem des Herstellers wird von folgender benannten Stelle überwacht/The Manufacturer's Quality Assurance System is monitored by following Notified Body:

Bureau Veritas S. A. nr 0062 67/71, boulevard du Château, 92200 Neuilly-sur-Seine, France

Angewandte technische Spezifikation/Technical Standards used: DIN EN12516-2; DIN EN12516-3; ASME B16.34.

Hersteller/Manufacturer:

SAMSON AG
Weismüllerstraße 3
60314 Frankfurt

Frankfurt, 01.12.2014

ppa.

Eugen Nebel
Zentralabteilungsleiter / Head of Central Department
Entwicklung Stellgeräte / Control Valve Development

i.V.

Stephan Michalik
Zentralabteilungsleiter / Head of Central Department
Qualitätsmanagment / Quality Management

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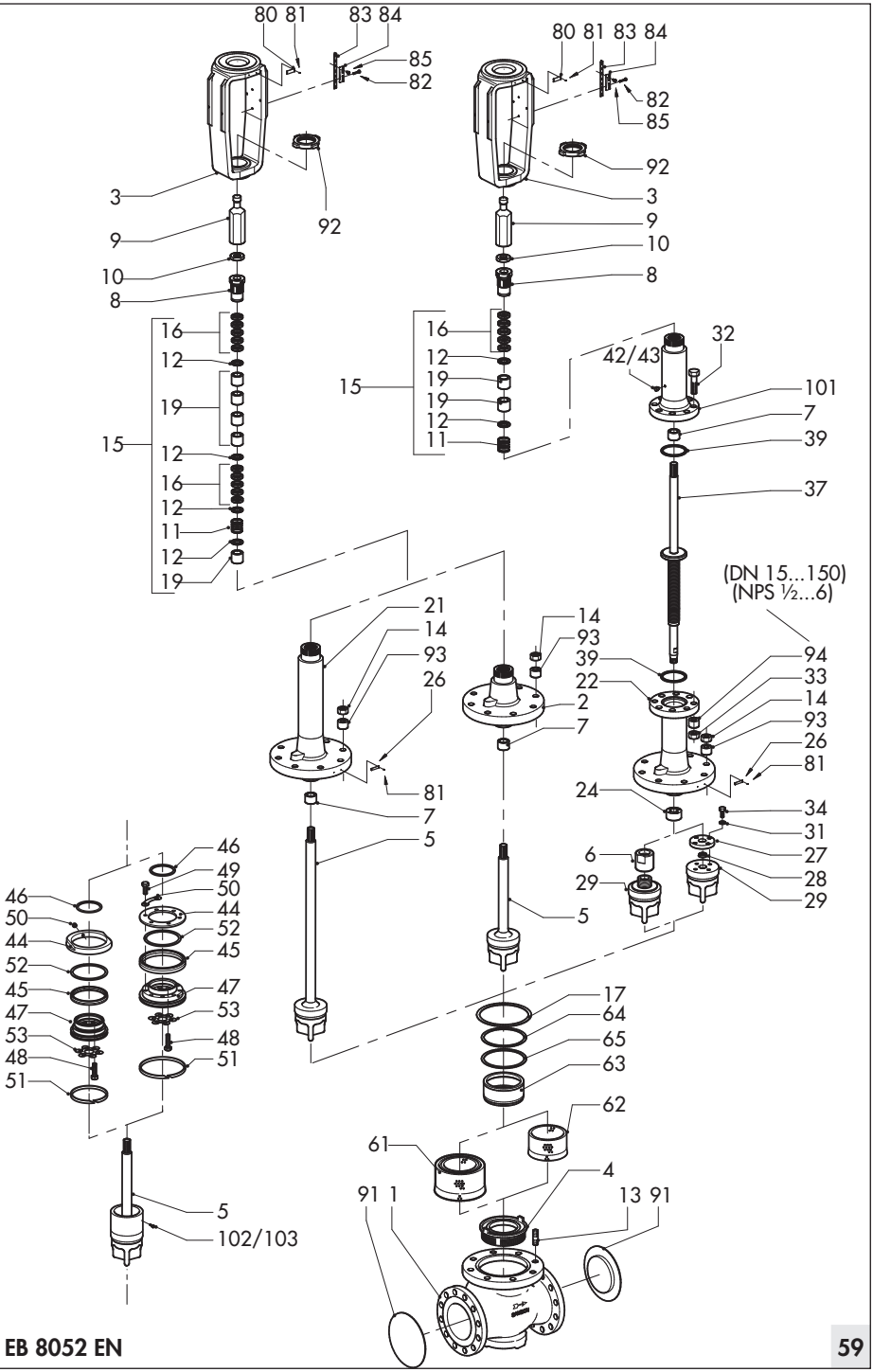
Revision 00

10.3 Spare parts

Legend

1	Body
2	Flange
3	Yoke
4	Seat
5	Plug
6	Bellows nut
7	Guide bushing
8	Threaded bushing (packing nut)
9	Stem connector nut
10	Lock nut
11	Spring
12	Washer
13	Stud bolt
14	Body nut
15	Packing (adjustable)
16	Packing
17	Body gasket
19	Bushing
21	Insulating section
22	Bellows seal
24	Guide bushing
26	Label (bellows seal or insulating section)
27/28 31/34	Fastening parts
29	Plug for version with bellows seal
30	Washers
32	Bolt
33	Nut
37	Plug stem with bellows
39	Gasket
42/43	Screw plug with seal
44	Ring/ring nut [1]
45	Packing ring [1]
46	Gasket [1]
47	Support [1]
48	Hexagon screw [1]
49	Hexagon screw [1]
50	Lock [1]
51	Guide [1] (several guides only for version with graphite seal)
52	Ring [1] (only for version with graphite seal)
53	Snap ring [1]
61	Flow divider II [2]
62	Flow divider I or III [2]
63	Ring [2]
64	Gasket [2]
65	Gasket [2]
80	Nameplate
81	Grooved pin
82	Screw
83	Hanger
84	Travel indicator scale
85	Screw
91	Protective caps
92	Nut
93	Expansion sleeve
94	Expansion sleeve
101	Bellows bonnet
102/103	Screw with snap ring [1] (only for version with bellows seal)

[1] Version with balanced valve plug
[2] Version with flow divider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