

APV DELTA SD4 DN25-100, 1"-4"

DOUBLE SEAL VALVE

SAFETY AGAINST EXPLOSION - FOR SPECIFIC ATEX-APPLICATIONS



FORM NO.: H330126 REVISION: UK-0-ATEX

READ AND UNDERSTAND THIS MANUAL PRIOR TO OPERATING OR SERVICING THIS PRODUCT.



Scan for SD4 Valve
Maintenance Video





EU Declaration of Conformity for Valves and Valve Manifolds

SPX Flow Technology Germany GmbH
Gottlieb-Daimler-Str. 13, D-59439 Holzwickede
herewith declares that

APV double seal valves of the series SD4 ATEX design
in the nominal diameters DN 25 – 100, 1“ – 4“

meet the requirements of:

Machinery Directive 2006/42/EC
(superseding 89/392/EEC and 98/37/EC)
Equipment and Product Safety Act GPSG - 9.GPSGV
and

Directive on the Protection against Explosion 2014/34/EU ATEX (superseding 94/9/EC)
for Equipment Category -/2G IIB TX

For official inspections, SPX FLOW presents
a technical documentation according to Appendix VII of the Machinery Directive,
this documentation consisting of documents of the development and construction,
description of measures taken to meet the conformity and to comply with
the basic requirements on safety and health, incl. an analysis of the risks,
an analysis of ignition hazards as well as an instruction manual with safety instructions.

The conformity of the valves is guaranteed.

An ATEX documentation is lodged at the notified body DEKRA EXAM GmbH
in Bochum, Germany (No. 0158).

Authorised person for the documentation:
Frank Baumbach

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November 2017



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Spare parts list DN and Inch design	RN ATEX 054.62
Actuator SW4	RN 01.054.86
Leakage valves SD4	RN 01.054.67

1. General Terms

This instruction manual applies for DELTA SD4 double seal valves in the nominal dimensions DN25-100, 1"-4" for use in specific ATEX applications (according to Directive 2014/34/EU).

The valve must only be assembled, disassembled and reassembled by persons who have been trained in APV valves or by SPX FLOW service team members. If necessary, contact your local SPX FLOW representative.

This instruction manual must be read and observed by the responsible operating and maintenance personnel.

We point out that we will not accept any liability for damage or malfunctions resulting from the non-compliance with this instruction manual.

Descriptions and data given herein are subject to technical changes.

1.1. Symbols



This symbol draws your attention to important directions which have to be observed with regard to the operation in explosive areas.



This technical safety symbol draws your attention to important directions for operating safety. You will find it wherever the activities described are bearing health hazards or risks for persons or material assets.

1.2. Responsibility for ATEX certification - scope of supply

SPX FLOW will be held responsible only for the valves supplied and selected according to the operating conditions indicated by the customer or end user and as stated in the order confirmation. If in doubt, contact your local supplier.

All other assembled equipment and devices must have a separate certification of at least the same or higher grade of protection as the valve, provided by the supplier(s) of that equipment and devices. The complete unit must be certified separately by the final assembling manufacturer and must have a separate name plate supplied by the unit manufacturer.

2. Safety Instructions

**Danger!**

Do not touch the open valve or the yoke!

Risk of injury due to sudden valve operation.

Risk of injury in dismantled valve state due to sudden valve operation.

- Regular maintenance including the replacement of all seals and bearing bushes must be scheduled in order to prevent leakages and discharge of liquids.
- Before any maintenance work the line system must be depressurized and drained if possible.
- Separate all electric and pneumatic connections.
- Observe the following Service Instructions to ensure safe maintenance of the valve.

**Danger!**

Welded actuators are preloaded by spring force.

**Opening of the actuators is strictly forbidden.
Danger to life!**

Actuators which are no longer used or defective must be disposed in professional manner.

Defective actuators must be returned to your SPX FLOW representative for their professional disposal and free of charge for you.

Please address to your local SPX FLOW representative.

2. Safety Instructions

Installation, connection, start-up, maintenance and repair work must only be carried out by qualified personnel.

The following aspects must be observed:

- The instructions of this manual together with all relevant instructions for the components, equipment and installations installed.
- Warnings and installations fixed to the components.
- The specific regulations for and requirements to the system in which the valve is installed.
- The currently valid regional, national and international regulations.
- Any special requirement and national legislation relative to the use of flammable liquids or tools, e.g. the risk of ignition in case of spark formation, must be observed.



It must be ensured that the group, the category and the temperature class of the valve complies with the minimum requirements of the operating environment!



Inflammable gas mixtures or dust concentrations in connection with hot, operational and movable parts of the valve can lead to serious or fatal injury!



Before start of assembly the operator must make sure that an explosive atmosphere does not exist (detection/measurement of potential concentration of hazardous substances).



Conductive connection to the pipeline must be provided. The integration into the internal potential equalisation must be guaranteed!



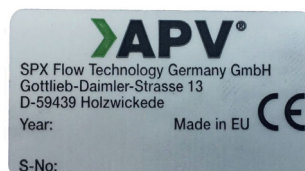
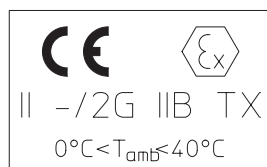
If the valve is used for inflammable liquids, it must be observed that every operating process is combined with an operating leakage. This operating leakage liquid must be discharged in a closed system. The operator must consider this during the examination and classification of explosive atmospheres in the outside area.

The APV CU2, CU3 and CU4 Control Units are not suited for use in ATEX environments!

3. Identification of valves, Temperature classes, Responsibilities

3.1. Identification of valves for use in ATEX environment

ATEX identification:



- Equipment group II
- Equipment category outside 2G
 inside no equipment
- Explosion subcategory IIB

Ambient temperature for the operation

$$0\text{ °C} \leq T_{\text{amb}} \leq 40\text{ °C}$$

- Temperature classes TX (according to table 3.2)

3.2. Temperature classes and permissible temperatures

Media temperature	≤ 75 °C	≤ 95 °C	≤ 130 °C	up to 140 °C = T _{max} .
Safety addition	+ 5 °C	+ 5 °C	+ 5 °C	+ 5 °C
Temperature class	T6	T5	T4	T3

Under standard operating conditions the highest surface temperature will be comparably as high as the temperature of the medium plus a safety addition for local temperature increases. The valve must be completely free to the environment in order to provide for sufficient heat release.

All data (temperature classes) refer to an ambient temperature of 0°C to 40°C. If the ambient temperature is above 40°C, the temperature difference must be adjusted. In all cases, contact your responsible SPX FLOW representative!

3. Identification of valves, Temperature classes, Responsibilities

3.3. Responsibilites

It is within the operator`s responsibility to ensure that the specified product temperatures are not exceeded and that regular inspections and maintenance are carried out to provide for proper function of the valve.

4. Intended Use

The intended use as field of application of the DELTA SD4 double seal valve is the shut-off of line sections, especially in beverage and food installations.

Its use is permissible only within the admissible pressure and temperature margins and under consideration of chemical and corrosive influences.

Any use exceeding the margins and specifications set forth, is considered to be not intended.

Any damage resulting therefrom is not within the responsibility of the manufacturer.

The user will bear the full risk.



Attention!

Improper use of the valve leads to:

- damage
- leakage
- destruction.

Failures in the production process are possible.



Warning!

The valve is suitable for use in hazardous areas as identified on the valve according to Directive 2014/34/EU.

Arbitrary, constructive changes at the valve will influence safety as well as the intended functionality of the valve and are **not** permissible.

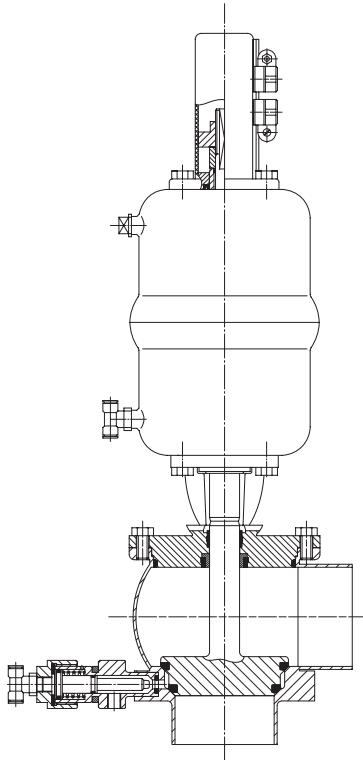
Authorizations and External Evaluations

To view the certifications for this and other innovative SPX FLOW products, visit

<https://www.spxflow.com/en/apv/about-us/certifications/>

5. Mode of Operation

SD4 double seal valve with valve position indication



5.1. General terms

DELTA SD4 double seal valves have been developed for use in the brewing and beverage, dairy and food industries as well as for chemical and pharmaceutical applications.

The valves are designed for universal applications and stand out for their increased mechanical reliability and absolute ease of service.

The field of application of the DELTA SD4 double seal valves is to shut off line sections which are separated from one another by two seat seals. A leakage chamber is arranged between the seals, the leakage chamber being forcibly closed by the two leakage valves or opened to the atmosphere.

- Operation by pneumatic actuator with air connection, reset by spring force.
- The inner parts of the actuator need not be serviced.
- To avoid pressure hammers, the valve is to be closed against the flow direction of the fluid.
- The SD4 valve is equipped with a valve position indication.

The proximity switches to signal the final position of the valve disc can be mounted to the proximity switch holder (PSH).

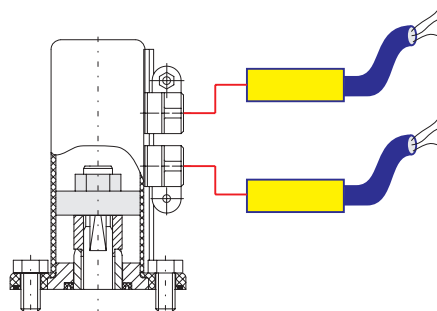
The use of valve position indicators which are approved for the application in explosive atmosphere is compulsory.



The use and operation of valve position indicators shall be evaluated by the operator of the installation!

Assembly, see item 13.3.

Valve position indicator



6. Cleaning

For the cleaning of SD4 valves, distinction is made between two areas.

6.1. The flow chambers

The passages of the valve are cleaned by the cleaning liquid during cleaning of the connected pipelines.

6.2. The leakage chamber (fig. 6.2.)

Cleaning of the leakage chamber is undertaken via the leakage valves. The cleaning liquid is supplied via one leakage valve and discharged to the atmosphere in a closed process via the second leakage valve.

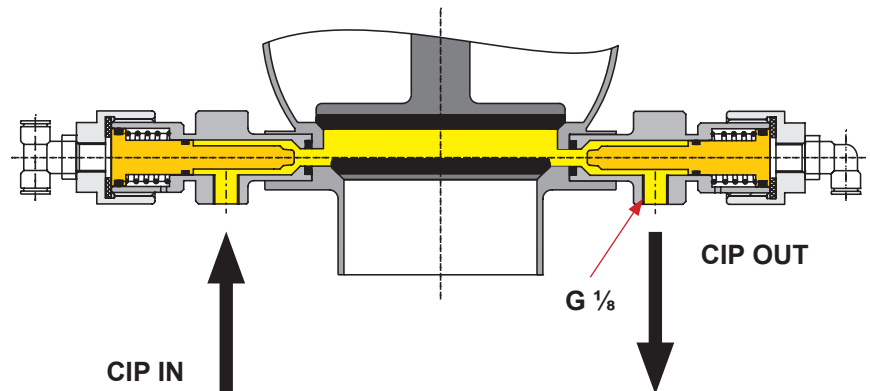


The restraint passage of the cleaning liquid provides for a perfect cleaning of the whole leakage chamber.

- Flushing quantity per CIP cycle: about 1.2 tr / 10 s
- Cleaning pressure at CIP cleaning connection: min. 2 bar
max. 5 bar

Under standard operating conditions, 15 valves DN 25/1" - 100/4" can be cleaned via one spray distribution line DN 25.

fig. 6.2.



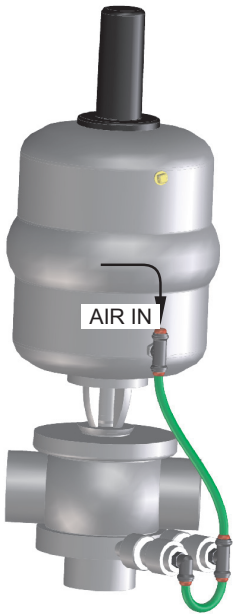
6.3. Cleaning (leakage chamber)

Recommendation of cleaning cycles with standard operating conditions and CIP liquids.

Cleaning steps	CIP-spraying
Pre-flushing	3 x 10 sec.
Caustic flushing 80°C	3 x 10 sec.
Intermediate flushing	2 x 10 sec.
Acid flushing	3 x 10 sec.
Subsequent flushing	2 x 10 sec.

6. Cleaning

fig. 6.4.



- Depending on the degree and substances of soiling, cleaning liquids, times and processes must be scheduled for the individual application.

The compatibility of the individually selected cleaning processes and liquids with the respective seal material must be verified.

6.4. Hosing of leakage valves:

AIR IN : air supply.

7. Installation

7.1. General terms

Installation must be undertaken in such a way that liquids can drain off and should preferably be carried out in vertical position.

The valve housing can be welded direct into the pipeline system (completely dismantable valve insert).

Attention! Observe Welding Instructions 7.2.



Conductive connection to the pipeline must be provided.
The integration into the operational potential equalization must be guaranteed!

7. Installation

7.2. Welding instructions

- Before welding of the valve, the valve insert must be dismantled from the housing. Careful handling to avoid damage to the parts is necessary.
- Welding should only be carried out by certified welders (DIN EN ISO 9606-1). (Seam quality DIN EN ISO 5817).
- The welding of the valve housings must be undertaken in such a way that the valve body is not deformed.
- The preparation of the weld seam up to 3 mm thickness must be carried out as a square butt joint without air. (Consider shrinkage!)
- TIG orbital welding is best!
- After welding of the valve housings or of the mating flanges and after work at the pipelines, the corresponding parts of the installation or pipelines must be cleaned from welding residues and soiling.
If these cleaning instructions are not observed, welding residues and dirt particles can settle in the valve and cause damage.
- Any damage resulting from the non-observance of these welding instructions is not subject to our guarantee.

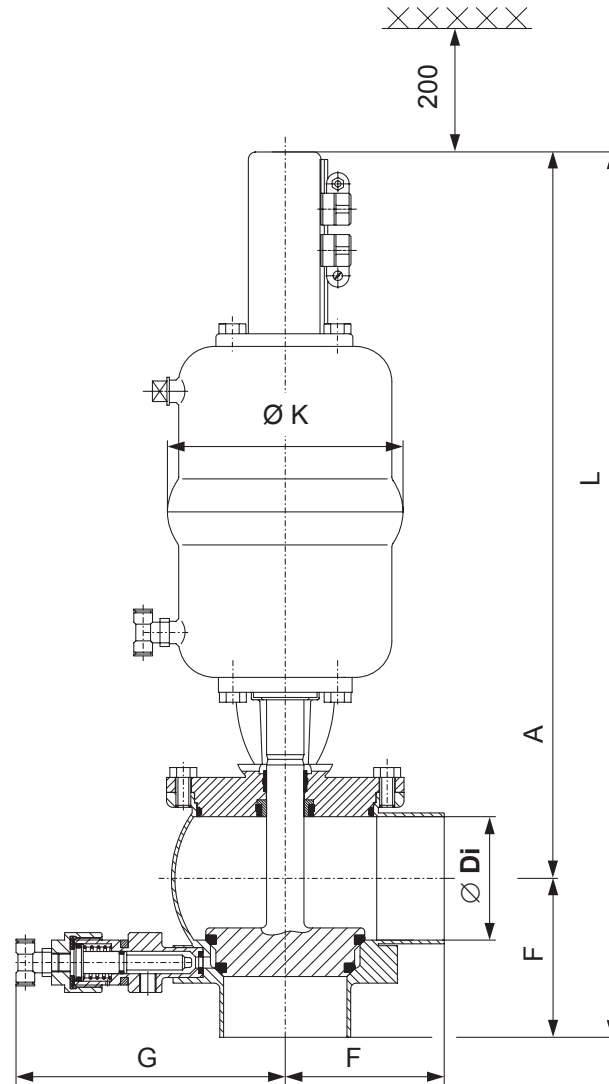
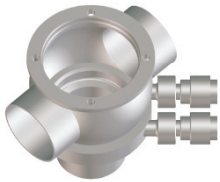
8. Dimensions / Weights

housing variants

SD 41



SD 42

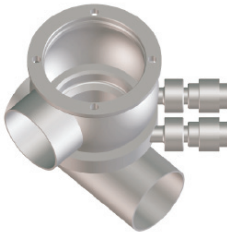


Dimensions in mm							Weight in kg
DN	A	Ø Di	F	G	Ø K	L	
25	337	26	50	126	86	387	5
40	343	38	67	129	86	410	5
50	380	50	72	133	126	452	7
65	388	66	85	145	126	473	7
80	440	81	98	153	189	538	13
100	450	100	111	162	189	561	15
Inch							
1"	335	22,6	50	126	86	385	5
1,5"	341	34,9	67	129	86	408	5
2"	379	47,6	72	133	126	451	7
2,5"	385	60,3	85	142	126	470	7
3"	436	72,9	90	148	189	526	13
4"	448	97,6	111	162	189	559	15

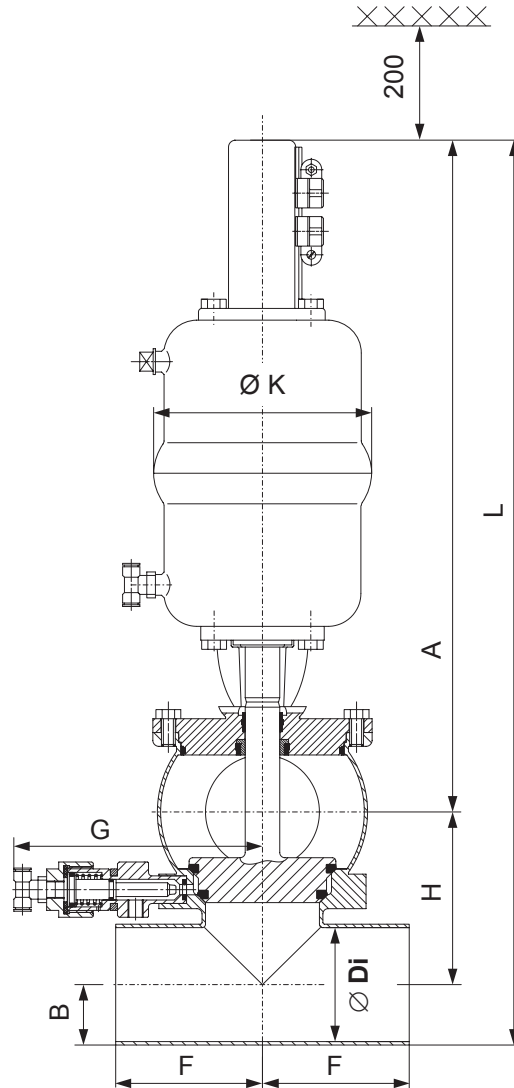
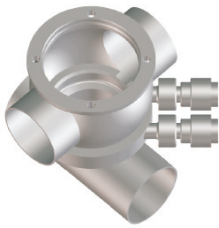
8. Dimensions / Weights

housing variants

SDE 43



SDE 44



Dimensions in mm									Weight in kg
DN	A	B	Ø Di	F	G	H	Ø K	L	
25	337	14,5	26	50	126	60	86	411,5	6
40	343	20,5	38	67	129	72	86	435,5	6
50	380	26,5	50	72	133	84	126	490,5	8
65	388	35	66	85	145	100	126	523,0	8
80	440	42,5	81	98	153	115	189	597,5	15
100	450	52	100	111	162	134	189	636,0	17
Inch									
1"	335	12,5	22,6	50	126	56,6	86	404,1	6
1,5"	341	19,05	34,9	67	129	68,9	86	428,9	6
2"	379	25,4	47,6	72	133	81,6	126	486,0	8
2,5"	385	31,75	60,3	85	142	94,3	126	511,0	8
3"	436	38,08	72,9	98	148	106,9	189	581,7	15
4"	448	50,8	97,6	111	162	131,6	189	630,4	17

9. Technical Data

9.1. General data

- Product-wetted parts: 316 L, 1.4404 (DIN EN 10088)
- Other parts: 1.4301 (DIN EN 10088)
- Seals: standard design: EPDM
- option: HNBR, VMQ, FPM
- Max. line pressure: 10 bar
- Operating pressure: depending on actuator
- see pos. 9.6
- Max. operating temperature: 135°C EPDM, HNBR
*FPM, *VMQ
- **Short-term load:** **140°C EPDM,**
HNBR *FPM, *VMQ
*(no steam)
- Ambient temperature: 0 - 40 °C
- CIP connection for leakage valves: G1/8
- Air connection (for hose): 6 x 1 mm
- Max. pneumatic air pressure: 8 bar
- Min. pneumatic air pressure: 6 bar

Use dry and clean air, only.

9.2. Compressed air quality

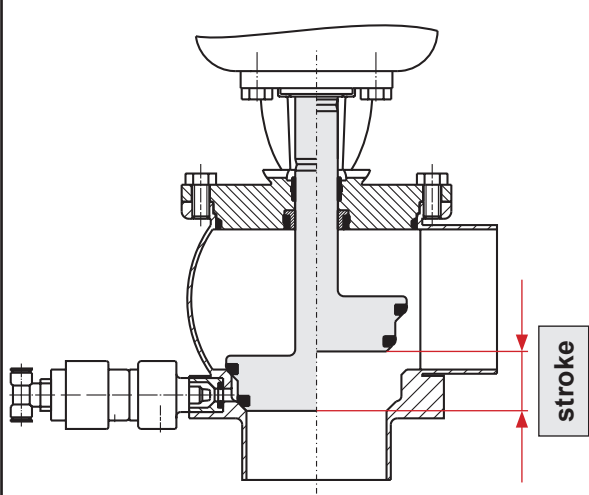
- Compressed air quality: quality class according to ISO 8573-1
- Content of solid particles: quality class 3,
max. number of particles per m³
10000 of 0,5 µm < d ≤ 1,0 µm
500 of 1,0 µm < d ≤ 5,0 µm
- Content of water: quality class 4,
max. dew point temperature - 20 °C
For installations at lower temperatures
or at higher altitudes, additional
measures must be considered to reduce
the pressure dew point accordingly.
- Content of oil: quality class 1,
max. 0,01 µg/m³

The oil applied must be compatible with Polyurethane elastomer materials.

9. Technical Data

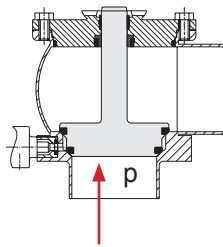
9.3. SD4 Closing times			
		Closing times in sec Pneumatic air pressure 6bar	
		Hose length 1 m	
DN	Inch	1 m	10 m
25	1"	1 sec.	1,5 sec.
40	1,5"	1 sec.	1,5 sec.
50	2"	1 sec.	1,5 sec.
65	2,5"	1 sec.	2,5 sec.
80	3"	1 sec.	3,0 sec.
100	4"	1,2 sec.	3,5 sec.

Times mentioned are only approximate values from sample measurements.

9.4. SD4 Valve stroke		
		
DN	Inch	Stroke
25	1"	12
40	1,5"	25
50	2"	28
65	2,5"	28
80	3"	28
100	4"	28

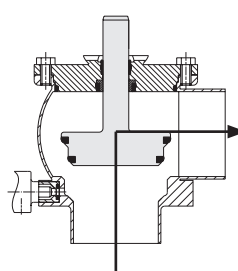
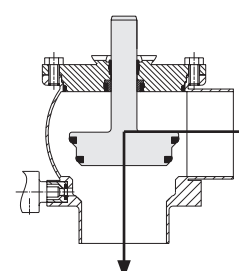
9. Technical Data

9.5. Pneum. air compsuption at 6 bar control pressure	
Actuator	NL per stroke
Ø 74mm	1,0
Ø 110mm	2,1
Ø 165mm	4,5

9.6. DELTA SD4 calculatory product pressures in (bar) at 6 bar control air pressure - valve normally closed (NC) or in case of compressed air failure				
SD 41 - FS				
				
Ø actuator in mm				
DN	Inch	Ø 74	Ø 110	Ø 165
25	1"	6,4	16,0	
40	1,5"	3,6	9,6	
50	2"		6,0	11,2
	2,5"		4,7	11,6
65			3,5	9,3
	3"			8,0
80				6,0
100	4"			4,4

= standard actuator

9. Technical Data

9.7. DELTA SD4 kvs values in m ³ /h		
	SD41, SD42 SDE43, SDE44	SD41, SD42 SDE43, SDE44
		
DN		
25	19	20
40	42	39
50	88	70
65	145	120
80	175	190
100	220	265
Inch		
1"	15	16
1,5"	39	26
2"	79	63
2,5"	124	106
3"	155	150
4"	215	258

10. Maintenance

Scan for SD4 Valve
Maintenance Video



The maintenance intervals depend on the corresponding application and are to be determined by the operator himself carrying out temporary checks.

The valve must not be cleaned with products containing abrasive or polishing material. Especially the valve shaft must not, under any circumstances, be cleaned with such agents. Damage of the valve shaft can lead to leakages.



Required tools:

- 1x wrench SW13
- 1x wrench SW17
- 1x wrench SW19
- 1x wrench SW30
- 1 x hexagon socket wrench 6 mm
- assembly tool for seat seal

(see chapter 15.)



Before start of maintenance and assembly the operator must make sure that an explosive atmosphere does not exist (detection/ measurement of potential concentration of hazardous substances). Alternatively, use spark-resistant tools!

Exchange of seals is done according to Service Instructions. Customer stock keeping of spare seals is recommended. For valve service actions we supply complete seal kits including seal grease (see spare parts lists).



Assembly of the valve and change of the valve design NC or NO according to Service Instructions.

Attention! Use food-grade grease and special greases being suited for the respective seal material, only!

Recommendation:

APV assembly grease for EPDM, FPM, HNBR and NBR
 (0,75 kg/tin - ref.-No. 000 70-01-019/93; H147382)
 (60 g/tube - ref.-No. 000 70-01-018/93; H147381)
 or
 APV assembly grease for VMQ (Silicone)
 (0,6 kg/tin - ref.-No. 000 70-01-017/93; H147380)
 (60 g/tube - ref.-No. 000 70-01-016/93; H147379)

! Do not use grease containing mineral oil for EPDM seals.

! Do not use Silicone-based grease for VMQ seals.

Less suited grease types can influence function and service life.

10. Maintenance



Additionally required maintenance for applications in ATEX environment

SD4 Valve

Valve maintenance for actuator with spring	Note
Functional test, visual inspection of valve stroke and control of abnormal running noise of spring	1 x per year
Change interval of actuator	In case of damage, incomplete actuator movement, considerable running noise of spring as well as after 250,000 cycles* as preventive measure, however, after 10 years at the latest

*complies with about 8 years in 1-shift-operation and 10-15 cycles per hour.

11. Service Instructions

Corresponding spare parts see
Spare parts list: RN ATEX 054.62

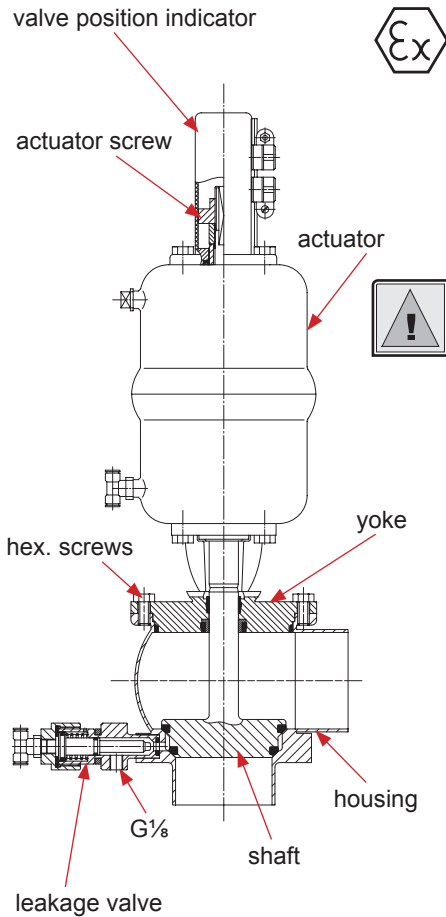
11.1. Dismantling from the line system

Before start of assembly the operator must make sure that an explosive atmosphere does not exist (detection/measurement of potential concentration of hazardous substances).
Alternatively, use spark-resistant tools!

1. Shut off line pressure and drain lines if possible.
2. **Valve design NC:** Control actuator with air.
Do not touch movable parts!
Risk of injury.
3. Remove hexagon screws and lift valve insert including actuator off the valve housing.
4. Shut off compressed air and remove compressed air supply.
5. Remove valve position indicator.

11.2. Dismantling of wear parts (product-wetted parts)

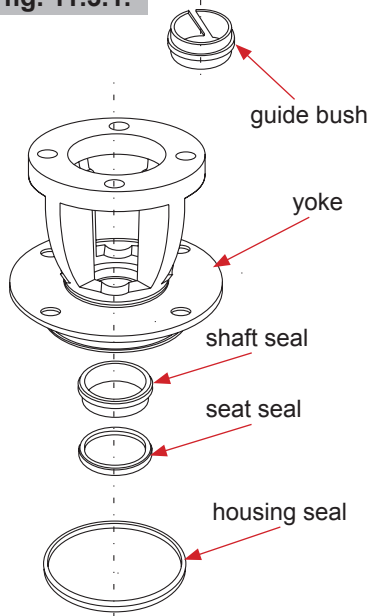
1. Remove housing seal.
2. Release actuator screw from the guide rod.
3. Hold up the centering washer during this process. Remove the centering washer.
4. Pull the valve shaft out of the actuator.
Remove the seat seal.
5. Unscrew the yoke from the actuator.
- Actuator can be maintained.
6. Detach the seat seal, shaft seal and guide bush.
7. Clean the valve housing, yoke, actuator and shaft with a low solution of a cleaning agent. Never use cleaning agents containing abrasive or polishing particles.



11. Service Instructions

11.3. Installation of seals and Assembly of valve

fig. 11.3.1.



1. Insert the guide bush into the yoke. Afterwards, insert the shaft seal and press in the slightly greased seat seal (see fig. 11.3.1.). See to the correct installing position.
2. Install the yoke at the actuator.
3. Insert the seat seal into the shaft. Use the assembly tool to install the lower seat seal (see chapter 15). Grease the seat seal only slightly before its installation. In case of manual installation, vent the seal groove with a thin object between the seal and groove wall.
4. Install the protective tube via the thread of the guide rod. Slide the shaft through the yoke and actuator. Place centering washer and tighten the actuator screw on the guide rod. Hold up the centering washer during this process.
Tightening torque 40 Nm.
5. Slightly grease the housing seal and place it in the groove of the yoke.
6. Fasten the valve position indicator.

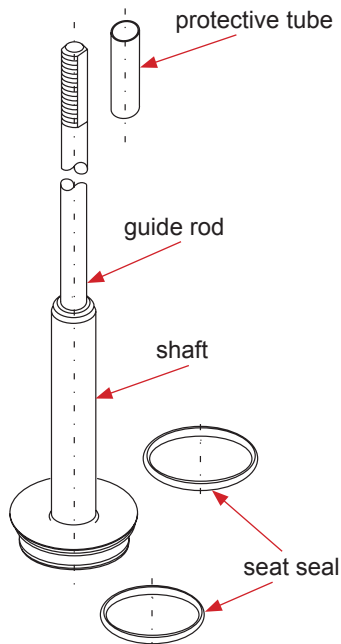
11.4. Installation of valve

1. Connect compressed air supply.
2. **Valve design NC :** Control actuator with air.



Do not touch movable valve parts!
Risk of injury by sudden valve operation.

3. Place the valve insert carefully into the housing. The housing seal must not be damaged during the installation. Tighten the hexagon screws crosswise in the housing flange.
4. **Valve design NC:** Shut off compressed air.
5. Check the basic adjustment of the valve position indication if necessary.

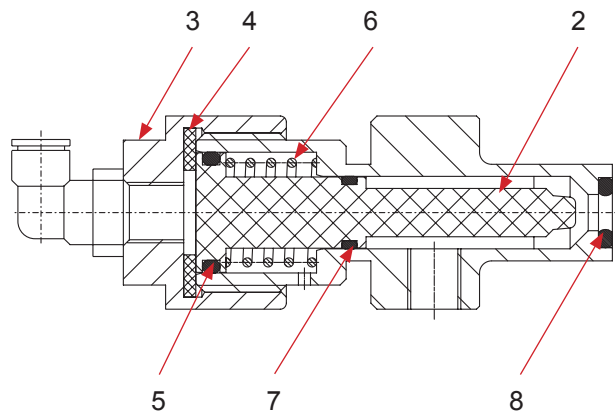


12. Service Instructions - Leakage valves

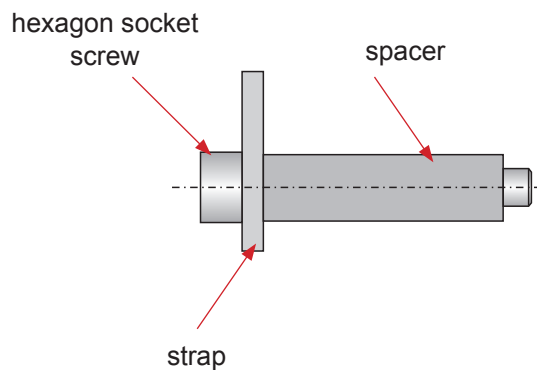
12.1. Maintenance of leakage valves

The item numbers refer to the corresponding spare parts list leakage valves SD4 **RN: 01.054.67**

1. Disconnect the pneumatic air hoses at the two leakage valves.
2. Shut off and discharge the CIP supply line.
3. Remove the CIP supply and discharge lines from the leakage valves.
4. Release the hexagon socket screw and remove the strap. Pull the leakage valves out of the housing flange.
5. Pull out the cap (3), piston (2) and spring (6).
6. Dismantle all seals (5, 7, 8).
7. The assembly is undertaken in reverse order.

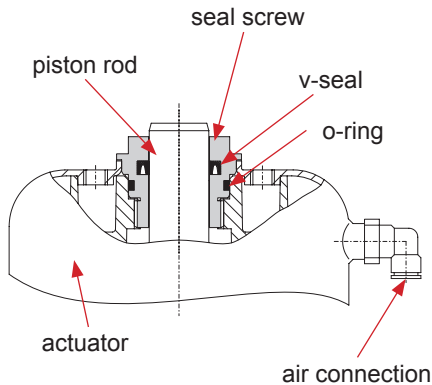


Support for leakage valves



13. Service Instructions - Actuator

fig. 13.1.



Spare parts list: RN01.054.86

13.1. Maintenance of actuator (fig. 13.1.)

1. Remove the air hoses from the actuator.
2. Unscrew the two seal screws with a spanner SW30 while holding up the actuator with a strap wrench.

13.2. Installation of seals and Assembly of Actuator

1. Install the greased o-rings and v-seals in the seal screws (fig. 13.2). See to the correct installing direction of the v-seal.
2. Slide the seal screws over the piston rod at both sides of the actuator and tighten them.
3. Fasten the yoke on the actuator.

Attention: Consider the required valve design NC or NO during the installation of the yoke.

NC = normally closed / air-to-raise, spring-to-lower
 NO = normally open / air-to-lower, spring-to-raise

4. Fasten the air hoses.

fig. 13.2.

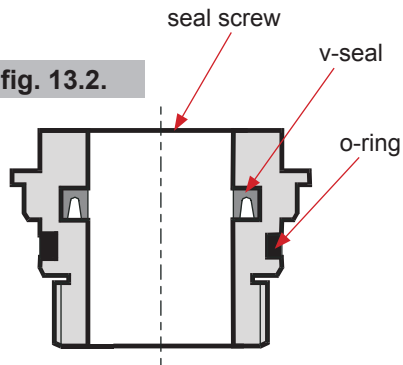
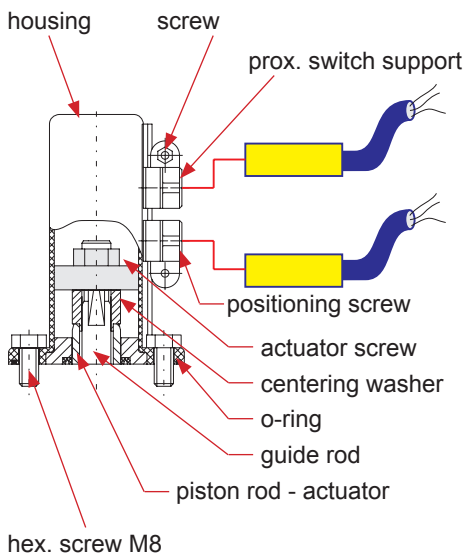


fig. 13.3.



13.3. Actuator with valve position indicator Assembly of holder (fig. 13.3.)

1. Install the actuator screw on the actuator.
2. Provide the housing with the o-ring.
3. Fasten the housing by means of the 4 hex. screws M8 on the actuator.
4. Release the screws at the proximity switch holder and insert the corresponding proximity switches. Then fasten the screws.
5. Place the actuator in one limit position.
6. Place the corresponding proximity switch in the corresponding position. Release the positioning screw and move the holder until the corresponding signal is indicated. Then continue the movement by 2 to 3 mm to secure indication. Fasten the positioning screw.
7. Place the actuator in the other limit position and carry out positioning of the second proximity switch.

14. Reconstruction of Actuator

With SD4 valves, the size of the actuator can be changed.

Observe the respective line pressure, see table 9.6, to increase or decrease the actuator sizes (Ø 74 mm, Ø 110 mm, Ø 165 mm).

14.1. Reconstruction of actuator

Disassembly

Disassembly is carried out as described in chapter 11.

To change the actuator size, the respective guide rod must be replaced:

Attention!

Clamp the valve disc in a vice.

The valve disc must not be damaged (use protective cheeks or cleaning rags).

Even inferior damage at the shaft rod can lead to leakages.

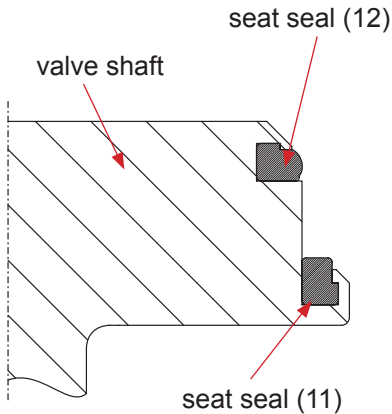
Turn the guide rod out of the shaft by means of the centering washer and a wrench SW17.

14.2. Assembly of actuator

1. Turn the respective guide rod into the shaft to the actuator.
Tightening torque 40 Nm
2. Further assembly is undertaken in reverse order.

15. Installation of Seat seal

fig. 15.



By means of the assembly tool, the seat seal (11) can be installed, only (see fig. 15). At first, this seat seal must be mounted onto the valve shaft.

Afterwards, the seat seal (12) must be manually inserted into the groove, see item 15.2.

The assembly tool (fig. 15.1) consists of:

- nut
- thrust ring
- ring with venting nose
- housing
- threaded bolt

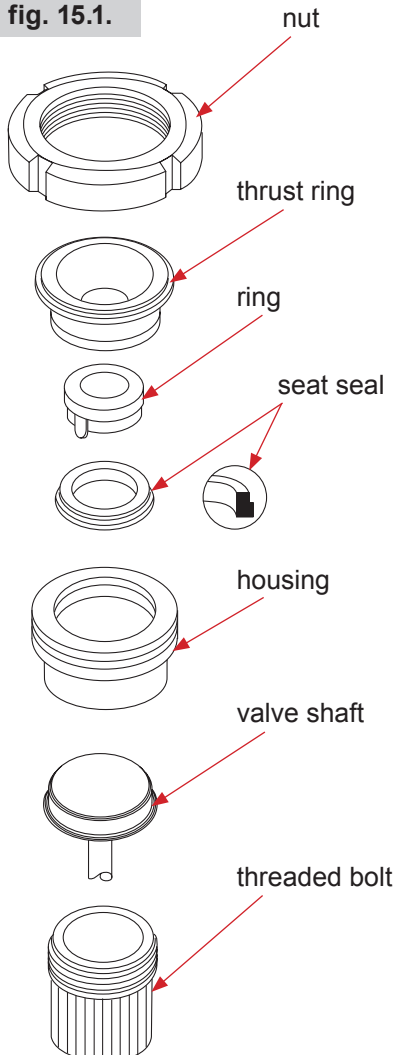
15.1 Installation of seat seal in the valve shaft

1. Insert the valve shaft into the housing in such a way that the seal groove is in the housing.
2. Clamp the shaft into the housing by means of the threaded bolt. Clamp the housing into a vice.
3. Slightly grease the seat seal with APV assembly grease. Then install the seal on the ring with the venting nose until it stops.
4. Introduce the ring with the installed seat seal into the housing and press it down until it stops sensibly.
5. Insert the thrust ring into the housing. Screw on the nut and tighten it with a hook spanner until it stops.
6. Release the nut. Take ring and thrust ring off the housing.
7. Take housing out of the vice, take off the threaded bolt. Detach the valve shaft from the housing.

Check the even fit of the seat seal.

To simplify the installation of the seat seal, the following assembly tools are available:

fig. 15.1.



Assembly tool for seat seal

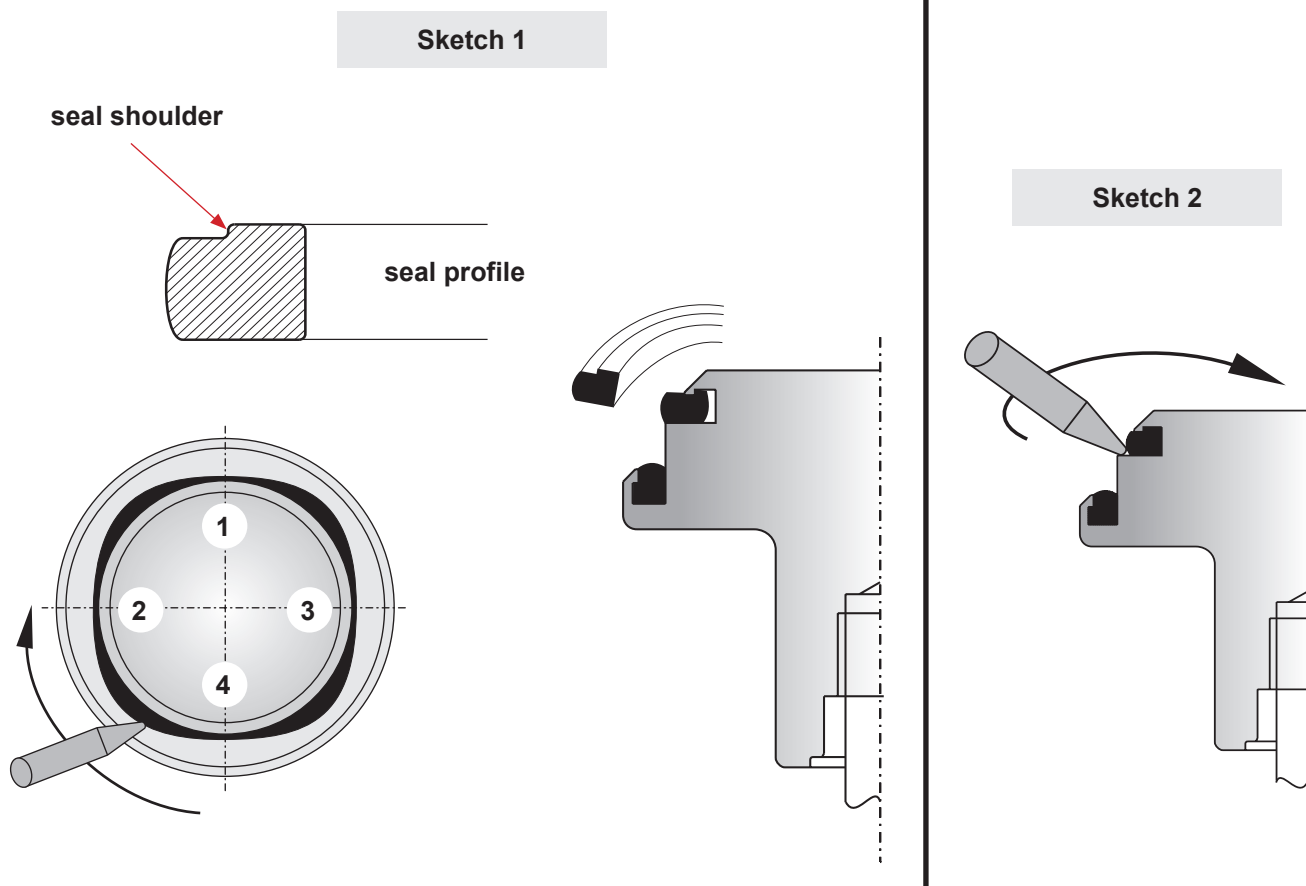
DN	Inch	Reference No.	ID No.
25	1"	000 51-13-200/17	H203861
40	1,5"	000 51-13-201/17	H203862
50	2"	000 51-13-202/17	H203863
	2,5"	000 51-13-203/17	H203864
65		000 51-13-204/17	H203865
	3"	000 51-13-205/17	H203866
80		000 51-13-206/17	H203867
100	4"	000 51-13-207/17	H203868

15. Installation of Seat seal

15.2. Manual installation of seat seal (pos. 12)

1. Before assembly, the seat seal must be provided with a thin layer of grease. The receiving groove for the seat seal must not be greased.
2. Clamp the valve shaft in a vice.

The valve shaft must not be damaged.
Use protective braces.
3. Press the slightly greased seal at four spots with the wide side to the front into the receiving groove (**see sketch 1**).
4. Use the assembly tool (or screwdriver with rounded edges) to press the seal at four opposite spots **1-2, 3-4** into the groove (**see sketch 1**).
5. Press the seal step by step into the groove. Work alternately at opposite spots. See to an even fit of the seat seal.
6. At the end, place the assembly tool between the seal shoulder and the groove wall. Work all around the circumferences of the groove. The groove bottom is vented and the seal shoulders are locked in place by this process (**see sketch 2**).



16. Trouble Shooting

Failure	Remedy
Valve is untight, leakage via leakage valves	Replace seat seal. Check line pressure: Admissible line pressure see chapter 9.
Leakage at leakage valve cylinder	Replace o-rings. see RN 01.054.67 Check cleaning liquid supply.
Leakage between housing and yoke flange	Replace housing seals.
Actuator	
Air escapes at the actuator rod.	Replace complete seal screw for actuator.
Actuator does not work (air escapes permanently from the venting plug).	Replace the complete actuator.
Valve position indication	
No feedback.	Carry out fine adjustment.

17. Spares Parts Lists

The reference numbers of the spare parts for the different valve designs and sizes are included in the attached spare parts drawings with corresponding lists.

Please indicate the following data to place an order for spare parts:

- number of required parts
- reference number
- designation

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Ersatzteilliste: spare parts list

Ventil SD4, SDE4 mit VSM, DN 25 - 100 ; 1" - 4" - Ex II -/2G IIB TX
Valve SD4, SDE4 with VSM, DN 25 - 100; 1" - 4" - Ex II -/2G IIB TX

Datum: 09/12
 Name: RAP
 Geprüft:

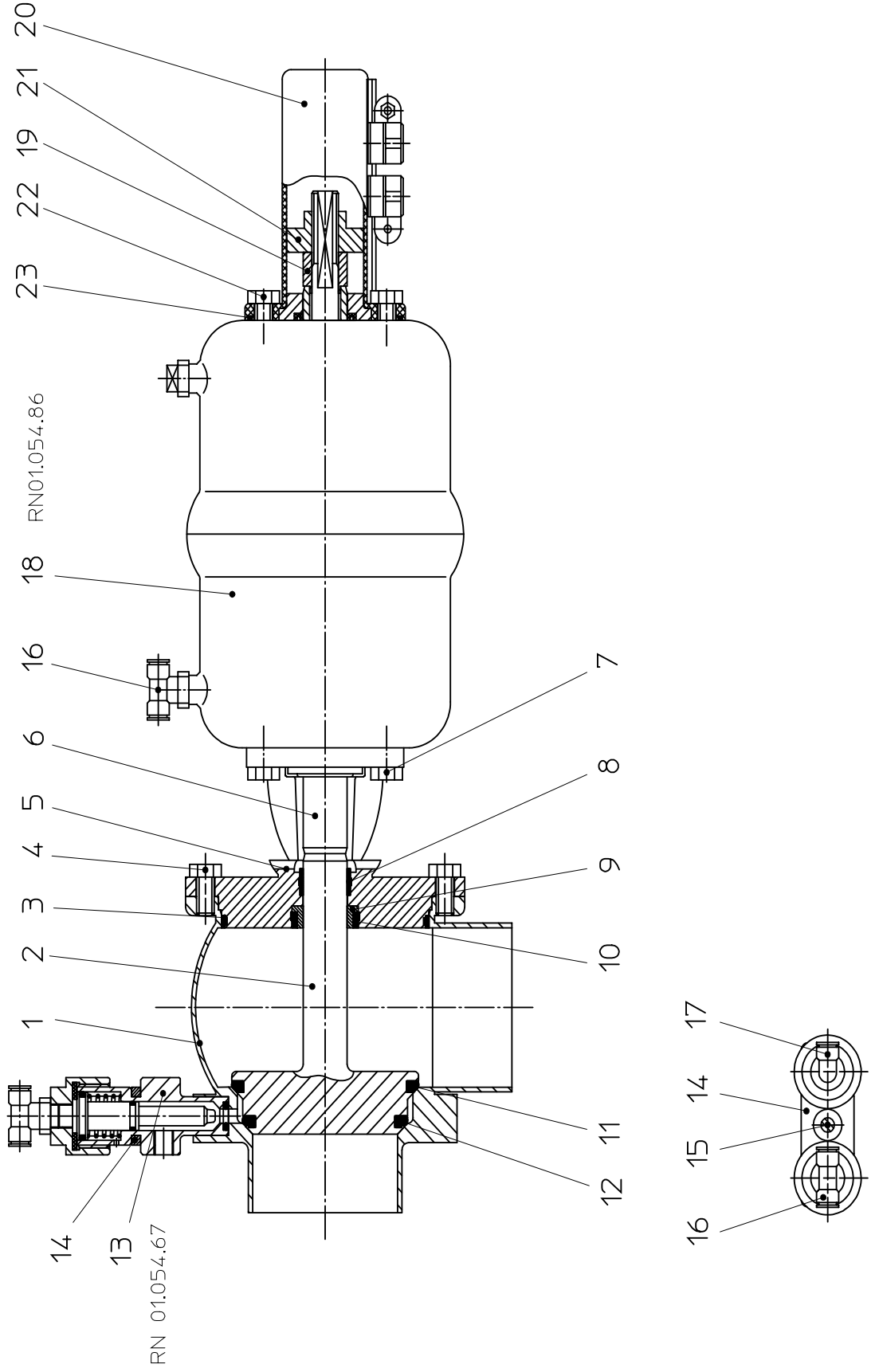
Datum:
 Name:
 Geprüft:

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RN 01.054.67

RN01.054.86

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Ersatzteilliste: spare parts list

Ventil SD4, SDE4 mit VSM, DN 25 - 100 ; 1" - 4" - Ex II -/2G IIB TX
Valve SD4, SDE4 with VSM, DN 25 - 100; 1" - 4" - Ex II -/2G IIB TX

pos. item	Menge quantity	Beschreibung description	Material	DN25	1"	DN40	1,5"	DN50	2"	Datum: 09/12			Blatt 2 von 7
										WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.	
										Geprüft:			
										Datum:			
										Name:			
										Geprüft:			
1	1	Gehäuse Housing SD41 1+2S	1.4404	15-54-285/47 H173487	15-54-310/47 H173493	15-54-385/47 H173488	15-54-410/47 H173494	15-54-435/47 H173489	15-54-460/47 H173495				
	1	Gehäuse Housing SD42 1+2+3S	1.4404	15-55-285/47 H173501	15-55-310/47 H173507	15-55-385/47 H173502	15-55-410/47 H173508	15-55-435/47 H173503	15-55-460/47 H173509				
	1	Gehäuse Housing SDE43 1+2+3S	1.4404	15-77-276/47 H174839	15-77-301/47 H175083	15-77-376/47 H174840	15-77-401/47 H175455	15-77-426/47 H174841	15-77-451/47 H175456				
	1	Gehäuse Housing SDE44 1+2+3+4S	1.4404	15-78-276/47 H175077	15-78-301/47 H175459	15-78-376/47 H175078	15-78-401/47 H175460	15-78-426/47 H175079	15-78-451/47 H175461				
2	1	Schaft Valve shaft	1.4404	15-25-291/42 H173369	15-25-316/42 H173375	15-25-391/42 H173370	15-25-416/42 H173376	15-25-441/42 H173371	15-25-466/42 H173377				
3	1	Gehäusedichtung Housing seal	VMQ	58-33-292/13 -----	58-33-292/13 -----	58-33-392/13 -----	58-33-392/13 -----	58-33-442/13	58-33-442/13				
	1	Gehäusedichtung Housing seal	HNBR	58-33-292/33 H170017	58-33-292/33 H170018	58-33-392/33 H170018	58-33-392/33 H170018	58-33-442/73 H168714	58-33-442/73 H168714				
	1	Gehäusedichtung Housing seal	FPM	58-33-292/73 H77438	58-33-292/73 H77463	58-33-392/73 H77463	58-33-392/93 H77464	58-33-442/73 H77487	58-33-442/93 H77488				
	1	Gehäusedichtung Housing seal	EPDM	58-33-292/93 H77439	58-33-292/93 H77439	58-33-392/93 H77464	58-33-392/93 H77464	58-33-442/93 H77488	58-33-442/93 H77488				
4	4	Skt. Schraube Hex. Screw	A2-70	65-01-081/15 H78772	65-01-081/15 H78772	65-01-081/15 H78772	65-01-081/15 H78772	65-01-081/15 H78772	65-01-081/15 H78772				
5	1	Laterne Yoke	1.4404	15-40-287/47 H173344	15-40-287/47 H173344	15-40-387/47 H173345	15-40-387/47 H173345	15-40-437/47 H173346	15-40-437/47 H173346				
6	1	Zugstange Guide rod	1.4305	15-23-850/12 H171061	15-23-850/12 H171061	15-23-850/12 H171061	15-23-850/12 H171061	15-23-851/12 H171062	15-23-851/12 H171062				
7	4	Skt. Schraube Hex. Screw	A2-70	65-01-081/15 H78772	65-01-081/15 H78772	65-01-081/15 H78772	65-01-081/15 H78772	65-01-081/15 H78772	65-01-081/15 H78772				
8	1	Führungsbuchse Bushing	PTFE + 25% Kohle	08-01-178/23 H207154	08-01-178/23 H207154	08-01-178/23 H207154	08-01-178/23 H207154	08-01-178/23 H207154	08-01-178/23 H207154				
9	1	Schafdichtung Shaft seal	Turcon MF6	58-33-150/26 H323082	58-33-150/26 H323082	58-33-150/26 H323082	58-33-150/26 H323082	58-33-293/13 H77440	58-33-293/13 H77440				
10	1	Tellerdichtung Seat seal	VQM	58-33-293/13 H77440	58-33-293/13 H77440	58-33-293/13 H77440	58-33-293/13 H77440	58-33-293/13 H77440	58-33-293/13 H77440				



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Ersatzteilliste: spare parts list

Ventil SD4, SDE4 mit VSM, DN 25 - 100 ; 1" - 4" - Ex II -/2G IIB TX
Valve SD4, SDE4 with VSM, DN 25 - 100; 1" - 4" - Ex II -/2G IIB TX

pos. item	Menge quantity	Beschreibung description	Material	DN25	1"	DN40	1,5"	DN50	2"
				WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.
10	1	Tellerdichtung Seat seal	HNBR			58-33-293/33 H170176			
	1	Tellerdichtung Seat seal	FPM			58-33-293/73 H77441			
	1	Tellerdichtung Seat seal	EPDM			58-33-293/93 H77442			
11	1	Tellerdichtung Seat seal	VMQ	58-33-393/13 H77465		58-33-443/13 H77489		58-33-109/13 H170664	
	1	Tellerdichtung Seat seal	HNBR	58-33-393/33 H166676		58-33-443/33 H166085		58-33-109/33 H170658	
	1	Tellerdichtung Seat seal	FPM	58-33-393/73 H77466		58-33-443/73 H77490		58-33-109/73 H170663	
	1	Tellerdichtung Seat seal	EPDM	58-33-393/93 H77467		58-33-443/93 H77491		58-33-109/93 H170662	
12	1	Tellerdichtung Seat seal	VMQ	58-33-294/13 H77443		58-33-394/13 H77468		58-33-444/13 H77492	
	1	Tellerdichtung Seat seal	HNBR	58-33-294/33 H172173		58-33-394/33 H172175		58-33-444/33 H165709	
	1	Tellerdichtung Seat seal	FPM	58-33-294/73 H77444		58-33-394/73 H77469		58-33-444/73 H77493	
	1	Tellerdichtung Seat seal	EPDM	58-33-294/93 H77445		58-33-394/93 H77470		58-33-444/93 H77494	
13	2	Leckageventil Leakage valve	HNBR			20-37-068/29 H176614			
	2	Leckageventil Leakage valve	EPDM			20-37-068/59 H173482			
	2	Leckageventil Leakage valve	FPM			20-37-068/69 H203844			
14	1	Lasche Bracket	1.4301			08-17-002/12 H173071			
15	2	Zylinderschraube Cyl. Screw	A2-70			65-05-124/13 H173569			65-05-126/13 H175438



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Datum: 09/12
 Name: RAP
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Ersatzteilliste: spare parts list

Ventil SD4, SDE4 mit VSM, DN 25 - 100 ; 1" - 4" - Ex II -/2G IIB TX
Valve SD4, SDE4 with VSM, DN 25 - 100; 1" - 4" - Ex II -/2G IIB TX

pos. item	Menge quantity	Beschreibung description	Material	DN65		2,5"		DN80		3"		DN100		4"
				WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.			
1	1	Gehäuse Housing SD41 1+2S	1.4404	15-54-485/47 H173490	15-54-510/47 H173496	15-54-535/47 H173491	15-54-560/47 H173497	15-54-635/47 H173492	15-54-660/47 H173498					
	1	Gehäuse Housing SD42 1+2+3S	1.4404	15-55-485/47 H173504	15-55-510/47 H173510	15-55-535/47 H173505	15-55-560/47 H173511	15-55-635/47 H173506	15-55-660/47 H173512					
	1	Gehäuse Housing SDE43 1+2+3S	1.4404	15-77-476/47 H174842	15-77-501/47 H175457	15-77-526/47 H174843	15-77-551/47 H174748	15-77-626/47 H174844	15-77-651/47 H175458					
	1	Gehäuse Housing SDE44 1+2+3+4S	1.4404	15-78-476/47 H175080	15-78-501/47 H175462	15-78-526/47 H175081	15-78-551/47 H174401	15-78-626/47 H175082	15-78-651/47 H175463					
2	1	Schaft Valve shaft	1.4404	15-25-491/42 H173372	15-25-516/42 H173378	15-25-541/42 H173373	15-25-566/42 H173379	15-25-641/42 H173374	15-25-666/42 H173380					
3	1	Gehäusedichtung Housing seal	VMQ	58-33-492/13 -----	58-33-492/13 -----	58-33-542/13 -----	58-33-567/13 -----	58-33-642/13 -----	58-33-642/13 -----					
	1	Gehäusedichtung Housing seal	HNBR	58-33-492/33 H168759	58-33-492/33 H168759	58-33-542/33 H170075	58-33-567/33 H170013	58-33-642/33 H170074	58-33-642/33 H170074					
	1	Gehäusedichtung Housing seal	FPM	58-33-492/73 H77511	58-33-492/73 H77511	58-33-542/73 H77542	58-33-567/73 H77557	58-33-642/73 H77582	58-33-642/73 H77582					
	1	Gehäusedichtung Housing seal	EPDM	58-33-492/93 H77512	58-33-492/93 H77512	58-33-542/93 H77543	58-33-567/93 H77558	58-33-642/93 H77583	58-33-642/93 H77583					
4	4	Skt. Schraube Hex. Screw	A2-70	65-01-081/15 H78772	65-01-081/15 H78772	65-01-130/15 H78806	65-01-130/15 H78806	65-01-130/15 H78806	65-01-130/15 H78806					
5	1	Laterne Yoke	1.4404	15-40-487/47 H173347	15-40-487/47 H173347	15-40-537/47 H173349	15-40-562/47 H173348	15-40-637/47 H173350	15-40-637/47 H173350					
6	1	Zugstange Guide rod	1.4305	15-23-851/12 H171062	15-23-851/12 H171062	15-23-852/12 H171063	15-23-852/12 H171063	15-23-852/12 H171063	15-23-852/12 H171063					
7	4	Skt. Schraube Hex. Screw	A2-70	65-01-081/15 H78772	65-01-081/15 H78772	65-01-083/15 H78776	65-01-083/15 H78776	65-01-083/15 H78776	65-01-083/15 H78776					
8	1	Führungsbuchse Bushing	PTFE + 25% Kohle	08-01-178/23 H207154	08-01-178/23 H207154	08-01-178/23 H207154	08-01-178/23 H207154	08-01-178/23 H207154	08-01-178/23 H207154					
9	1	Schafldichtung Shaft seal	Turcon MF6	58-33-150/26 H323082	58-33-150/26 H323082	58-33-150/26 H323082	58-33-150/26 H323082	58-33-150/26 H323082	58-33-150/26 H323082					
10	1	Tellerdichtung Seat seal	VQM	58-33-293/13 H77440	58-33-293/13 H77440	58-33-293/13 H77440	58-33-293/13 H77440	58-33-293/13 H77440	58-33-293/13 H77440					



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Ersatzteilliste: spare parts list

Ventil SD4, SDE4 mit VSM, DN 25 - 100 ; 1" - 4" - Ex II -/2G IIB TX
Valve SD4, SDE4 with VSM, DN 25 - 100; 1" - 4" - Ex II -/2G IIB TX

pos. item	Menge quantity	Beschreibung description	Material	DN65	2,5"	DN80	3"	DN100	4"	Date: 09/12			Blatt 6 von 7
										WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.	
10	1	Tellerdichtung Seat seal	HNBR	58-33-571/13 H77568	58-33-568/13 H77559	58-33-546/13 H77553	58-33-543/13 H77544	58-33-646/13 H77593					
	1	Tellerdichtung Seat seal	FPM	58-33-571/33 H170008	58-33-568/33 H166679	58-33-546/33 H172109	58-33-543/33 H166681	58-33-646/33 H170015					
	1	Tellerdichtung Seat seal	EPDM	58-33-571/73 H77569	58-33-568/73 H77560	58-33-546/73 H77554	58-33-543/73 H77545	58-33-646/73 H77594					
11	1	Tellerdichtung Seat seal	VMQ	58-33-571/93 H77570	58-33-568/93 H77561	58-33-546/93 H77555	58-33-543/93 H77546	58-33-646/93 H77595					
	1	Tellerdichtung Seat seal	VMQ	58-33-494/13 H77516	58-33-194/13 H77428	58-33-544/13 H77547	58-33-569/13 H77561	58-33-644/13 H77587					
12	1	Tellerdichtung Seat seal	HNBR	58-33-494/33 H172178	58-33-194/33 H176687	58-33-544/33 H172180	58-33-569/33 H176688	58-33-644/33 H172183					
	1	Tellerdichtung Seat seal	FPM	58-33-494/73 H77517	58-33-194/73 H77429	58-33-544/73 H77548	58-33-569/73 H77563	58-33-644/73 H77588					
	1	Tellerdichtung Seat seal	EPDM	58-33-494/93 H77518	58-33-194/93 H77430	58-33-544/93 H77549	58-33-569/93 H77564	58-33-644/93 H77589					
13	2	Leckageventil Leakage valve	HNBR										
	2	Leckageventil Leakage valve	EPDM										
	2	Leckageventil Leakage valve	FPM										
14	1	Lasche Bracket	1.4301										
15	2	Zylinderschraube Cyl. Screw	A2-70										




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Ersatzteilliste: spare parts list

**Ventil SD4, SDE4 mit VSM, DN 25 - 100 ; 1 " - 4" - Ex II -/2G IIB TX
Valve SD4, SDE4 with VSM, DN 25 - 100; 1" - 4" - Ex II -/2G IIB TX**

Datum:	09/12		
Name:	RAP		
Geprüft:			
Datum:		Blatt	7 von 7
Name:			
Geprüft:		RN ATEX 054.62	



SPX FLOW
Germany

Blatt 7 von 7

RN ATEX 054.62

pos. item	Menge quantity	Beschreibung description	Material	DN65	2.5"	DN80	3"	DN100	4"
			material	WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.
16	2	T-Verschraubung Tee conector				08-63-370/93 H175301			
17	1	W-Verschraubung Angular union			08-63-350/93 H175300				
18	1	Steuerkopf Actuator		15-32-051/17 H171379					
	1	Steuerkopf Actuator		----- -----		15-32-052/17 H171380			
19	1	Zentrierscheibe Centering nut	1.4301		15-28-940/12 H170196				
20	1	VSM Gehäuse-SW4 Proximity switch holder housing SW4	VESTAMID		15-33-932/93 H173931				
21	1	Schaltnocke Operateing cam	1.4523		08-52-291/97 H173087				
22	4	Skt. Schraube Hex. Screw	A2-70		66-01-081/15 H78772				
23	1	O-Ring O-ring	NBR		58-06-297/83 H173930				
Pos. 3, 8, 9, 10, 11, 12 sowie Pos. 4, 5, 7, 8 vom Leckageventil RN01.054.67 sind nur im kompletten Dichtungssatz erhältlich Item 3, 8, 9, 10, 11, 12 and item 4, 5, 7, 8 of leakage valve RN01.054.67 are available as complete seal kits only									
	1	Dichtungssatz Seal kit	FPM	58-34-754/00 H202832	58-34-753/00 H202825	58-34-756/00 H202833	58-34-755/00 H202824	58-34-757/00 H202834	
	1	Dichtungssatz Seal kit	EPDM	58-34-754/01 H175323	58-34-753/01 H175322	58-34-756/01 H175325	58-34-755/01 H175324	58-34-757/01 H175326	
	1	Dichtungssatz Seal kit	VMIQ	58-34-754/02 H311488	58-34-753/02 H207852	58-34-756/02 H325430	58-34-755/02 H310554	58-34-757/02 H317574	
	1	Dichtungssatz Seal kit	HNBR	58-34-754/06 H175331	58-34-753/06 H175330	58-34-756/06 H175333	58-34-755/06 H175332	58-34-757/06 H175334	

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Ersatzteilliste: spare parts list

Leckageventil SD4
Leakage valve SD4

Datum: 11/08
 Name: Peters
 Geprüft:

Datum: 11/08
 Name: Peters
 Geprüft:

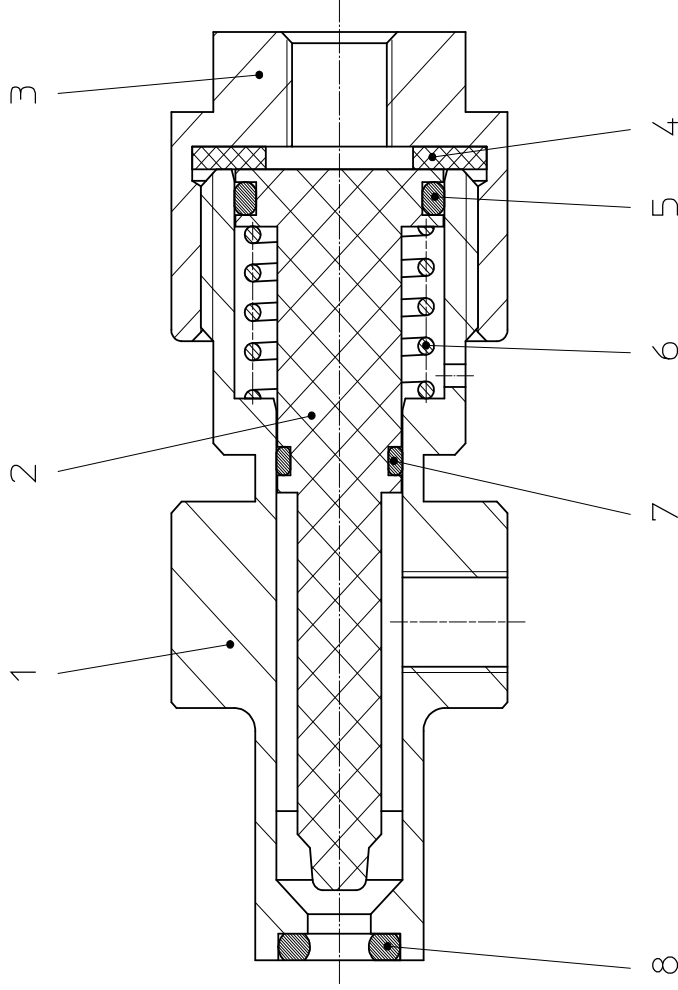
Datum: 11/08
 Name: Peters
 Geprüft:

Datum: 11/08
 Name: Peters
 Geprüft:



Blatt 1 von 1
 RN 01.054.67

pos. item	Menge quantity	Beschreibung description	Material	WS-Nr. ref.-no.
		Leckageventil kpl. mit EPDM Leakage valve cpl. with EPDM	1.4404/EPDM	20-37-068/59 H173482
		Leckageventil kpl. mit HNBR Leakage valve cpl. with HNBR	1.4404/HNBR	20-37-068/29 H176614
		Leckageventil kpl. mit FPM Leakage valve cpl. with FPM	1.4404/FPM	20-37-068/69 H203844
1	1	Gehäusedeckel Leckageventil Housing leakage valve	1.4404	21-08-002/47 H172510
2	1	Kolben Piston	1.4404	15-29-102/93 H173074
3	1	Deckel Leckageventil Cover leakage valve	1.4404	21-20-002/17 H172511
4	1	Dichtung Seal	EPDM	58-01-085/63 H173069
5	1	O-Ring 15,3 x 2,4 O-ring 15,3 x 2,4	EPDM	58-06-052/64 H206007
6	1	Feder leckageventil Spring leakage valve	1.4310	60-07-002/13 H173068
7	1	O-Ring 8,5 x 1,8 O-ring 8,5 x 1,8	HNBR	58-06-025/33 H176616
	1	O-Ring 8,5 x 1,8 O-ring 8,5 x 1,8	EPDM	58-06-025/64 H173459
	1	O-Ring 8,5 x 1,8 O-ring 8,5 x 1,8	FPM	58-06-025/73 H202836
8	1	O-Ring 6,0 x 3,0 O-ring 6,0 x 3,0	HNBR	58-06-016/33 H176615
	1	O-Ring 6,0 x 3,0 O-ring 6,0 x 3,0	EPDM	58-06-016/64 H173458
	1	O-Ring 6,0 x 3,0 O-ring 6,0 x 3,0	FPM	58-06-016/73 H202835



Ersatzteilliste: spare parts list

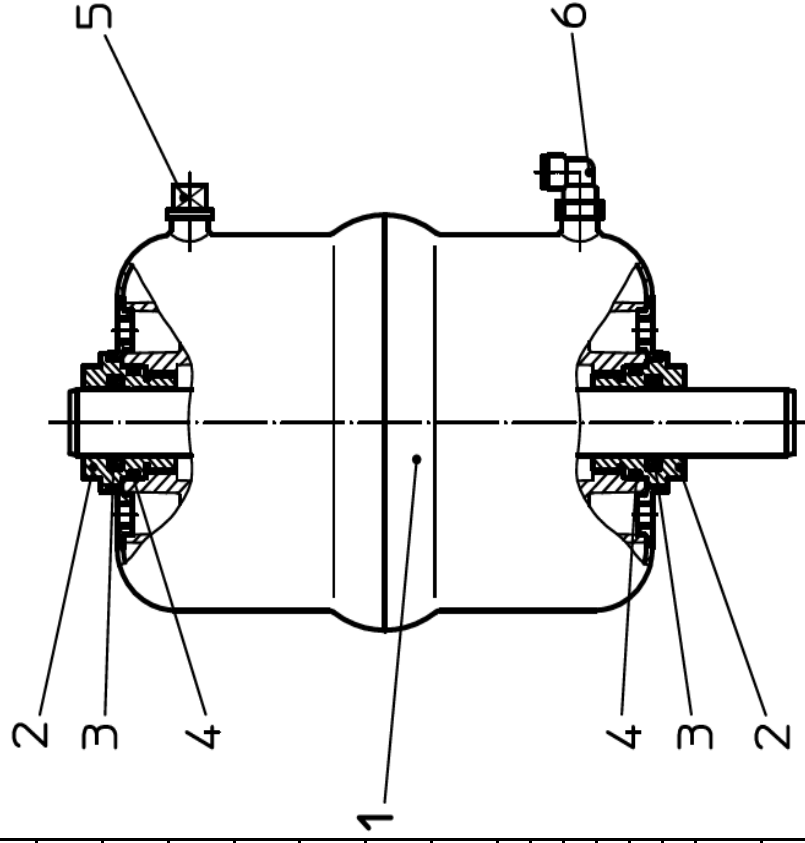
**Steuerkopf SW4
Actuator SW4**

Datum:	11/08	12/09	27.01.15	10.7.17
Name:	Peters	Peters	Trytko	Keil
Geprüft:				

APV
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Germany

Blatt	1	von	1
RN 01.054.86			

pos.	Menge quantity	Beschreibung description	Ø 74	Ø 110	Ø 165
1	1	Steuerkopf kpl. Feder/Luft - matt glänzend Actuator cpl. Spring/air satin finish	WS-Nr. ref.-no. 15-32-050/17 H171378	WS-Nr. ref.-no. 15-32-051/17 H171379	WS-Nr. ref.-no. 15-32-052/17 H171380
	1	Steuerkopf kpl. Feder/Luft - 3A-blank Actuator cpl. Spring/air 3A bright	3A0 15-32-059/13 H208693	3A0 15-32-060/13 H173538	3A0 15-32-061/13 H173524
	1	Steuerkopf kpl. Luft/Luft - matt glänzend Actuator cpl. air/air satin finish	15-32-085/17 H209592	15-32-086/17 H209203	15-32-087/17 H208733
	1	Steuerkopf kpl. Luft/Luft - 3A-blank Actuator cpl. air/air 3A bright	3A0 15-32-057/13 H208690	3A0 15-32-065/13 H208772	3A0 15-32-066/13 H208773
2	2	Schraube Dichtung Seal screw	15-28-840/93 H170200		
3	2	V-Dichtung V-seal	58-32-010/83 H171060		
4	2	O-Ring O-ring	58-06-124/83 H171059		
5	1	Entlüftungstopfen G-1/8" Venting Plug G-1/8"	08-60-005/93 H16218		
6	1	W-Verschraubung G-1/8" 6Ømm schwenkbar W-Union G-1/8" / 6Ømm slewable	08-60-750/93 H208825		
6	1	W-Verschraubung G-1/8"1/4" OD 6Ømm sch. W-Union G-1/8" / 1/4" OD 6Ømm slewable	08-60-811/93 H312732		



SPXFLOW

APV DELTA SD4

DN25-100, 1"-4"

DOUBLE SEAL VALVE



FOR SPECIFIC ATEX-APPLICATIONS

SPX FLOW

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Maintenance Video

