

APV DELTA SD4

DOUBLE SEAL VALVE

FORM NO.: 176061 REVISION: UK-5

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



Scan for SD4 Valve
Maintenance Video



We,

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declare under our sole responsibility that the

APV double seal and double seat valves of the series
SD4, SDT4, SDU4, SDMS4, SDMSU4, SDTMS4, SWcip4, DSV, DA4, DA4 DPF, D4 SL, DU4
SL, DT4 SL, DP4 SL, D4, DA3, DA3SLD, DE3, DEU3, DET3, DKR2, DKRT2, DKRH2

APV butterfly valves of the series SV1, SVS1F, SV2, SVS2F, SVL, SVSL, SVE, SVSE

APV ball valves of the series BLV1

APV single seat, diaphragm and spring loaded valves of the series
S2, SW4, SWhp4, SW4DPF, SWmini4, SWT4, SWS4, MF4, MS4, MSP4, AP/T1, CPV, RG4,
RG4DPF, RGMS4, RGE4, RGE4DPF, RGEMS4, PR2, PRD2, SI2, UF/R3, UF/R4, VRA/H

and the valve manifolds installed thereof

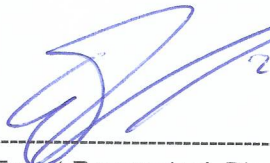
meet the requirements of the Machinery Directive 2006/42/EC
& EN ISO 12100-2010, DIN EN ISO 14159-2008-07, DIN EN 1672-2-2009-07.

Holzwickede, November 2022



Dr.-Ing. Behdad Ariatabar, Design Center Lead - Valves

meet the requirements of the Supply of Machinery (Safety) Regulations 2008 No. 1597
& BS harmonized standards.



Crawley, November 2022

Ewout Roozendaal, Director Global Pricing

Content	Page
1 General Terms	2
2. Safety Instructions	2 - 3
3. Intended Use	3
4. Mode of Operation	4
4.1. General terms	
5. Auxiliary Equipment	5 - 6
5.1. Valve position indication (proximity switches)	
5.2. Control Unit	
5.3. Connections	
6. Cleaning	7 - 8
6.1. Flow chambers	
6.2. Leakage chamber	
6.3. Cleaning recommendation - leakage chamber	
6.4. Hosing of leakage valves	
7. Installation	8 - 9
7.1. General terms	
7.2. Welding instructions	
8. Dimensions / Weights	10 - 11
9. Technical Data	12 - 15
9.1. General data	
9.2. Compressed air quality	
9.3. Closing times SD4	
9.4. Valve stroke / Opening cross section	
9.5. Pneumatic air consumption SD4 standards	
9.6. Pneumatic air consumption SD4 long stroke	
9.7. Product pressures	
9.8. Kvs values	
10. Maintenance	16
11. Service Instructions	17 - 20
11.1. Dismantling from line system	
11.2. Dismantling of wear parts (product-wetted parts)	
11.3. Installation of seals and Assembly of valve	
11.4. Installation of valve	
12. Service Instructions - Leakage valves	21
12.1. Maintenance of leakage valves	
13. Service Instructions - Actuator	22
13.1. Maintenance of actuator	
13.2. Installation of seals and Assembly of actuator	
14. Reconstruction of Actuator / Actuator Size	23
15. Installation of Seat Seal	24 - 25
15.1. Installation of seat seal in valve shaft / Assembly tool	
15.2. Manual installation of seat seal	
16. Trouble Shooting	26
17. Spare Parts Lists	26
Spare parts list DN and Inch design	RN 01.054.62
Actuator SW4	RN 01.054.86
Actuator SW4 long stroke	RN 01.054.90
Leakage valves SD4	RN 01.054.67

1. General Terms

This instruction manual applies for DELTA SD4 double seal valves in the nominal dimensions DN 25-100, 1"-4".

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.

2. Safety Instructions

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 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.



Danger!

Valve design "normally closed" (**NC**): Control the actuator with air before releasing the housing screws.



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.

- During valve operation, operating leakage escapes from the leakage valve.
- 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 electric and pneumatic connections.
- Observe Service Instructions to ensure safe maintenance of the valve.

2. Safety Instructions

**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.

3. 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.

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/>

4. Mode of Operation

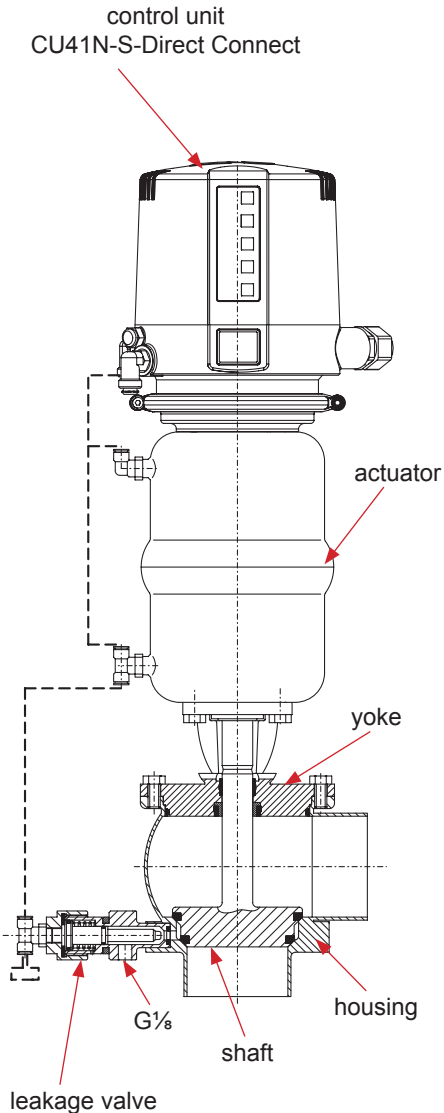
4.1. General terms

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 (open valve) by the two leakage valves or opened to the atmosphere (closed valve).

- Leakage at the seat seals is discharged via the leakage valves to the atmosphere and indicated.
- Operation by pneumatic actuator with air connection, reset by spring force.
- The actuator is generally mounted "normally closed" (NC) .
- 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.
- As standard design, a control unit DELTA CU41N with NOT element is mounted on top of the actuator for the pneumatic control of the valve. The NOT element fulfills the task to increase the closing forces of the closed valve.
- The yellow luminous diodes in the control unit indicate the position of the valve shaft.
- Observe Service Instructions to ensure safe maintenance of the valve.

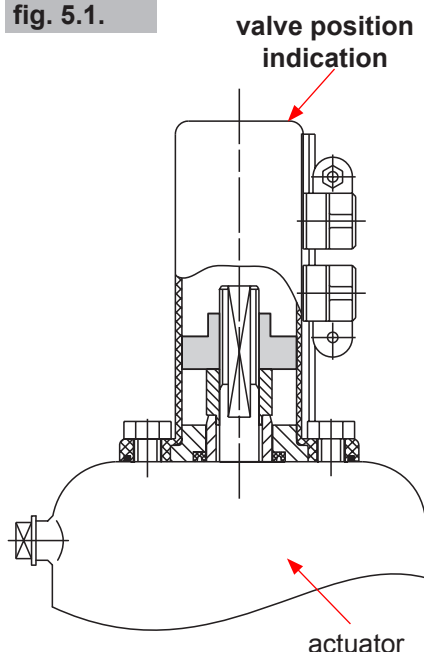


5. Auxiliary Equipment

5.1. Valve position indication

A proximity switch holder (PSH) for the valve position indication can be installed on the actuator (**fig. 5.1.**).

fig. 5.1.



Attention!

If the valve is equipped with a valve position indicator or a control unit without NOT element, the max. closing pressure reduces (see page 14, max. product pressures).

- Proximity switches to signal the limit position of the valve disc can be mounted to the proximity switch holder (PSH) if required.
- We recommend to use one of our APV standard types:
operating distance: 5 mm / diameter: 11 mm.

Operating voltage: 10 - 30 VDC

Outlet: operating voltage pnp positive switching

Connection: moulded cable 5 m length

Protective type: IP 67

Reference number: 08 - 60 - 011/93; H16223

If the operator decides to use valve position indicators other than APV type, we cannot take over any guarantee for a faultless function.

5.2. Control Unit

The assembly of a control unit on the SD4 valve is possible.

The following different designs are available:

CU4 control unit



	1 solenoid valve with NOT element (standard)
Direct Connect reference No.; ID-No.	CU41N-S-Direct Connect 08 - 45 - 103/93; H320463
AS-interface extended reference No.; ID-No.	CU41N-S-AS-i extended 08 - 45 - 113/93; H320470
DeviceNet reference No.; ID-No.	CU31N-DeviceNet 16 - 31 - 241/93; H209423
Profibus reference No.; ID-No.	CU31N-Profibus 08 - 45 - 002/93; H315496

- For the installation of the control unit on the SD4 valve an adapter is required.

Designation reference No.; ID-No.	CU3 adapter SD4 / SDM4 08-48-415/93; H209430
Designation reference No.; ID-No.	CU4-S adapter complete 08-48-600/93; H320474

5. Auxiliary Equipment

5.3. Connections:

Beside the housings with weld ends, the following designs are alternatively available:

- threaded port according to DIN 11851
- threaded port IDF / ISS according to ISO 2853
- threaded port RJT according to BS 4825-5
- threaded port SMS
- threaded port according to DS 722
- flange connection FGN1 DIN
- flange connection FGN1 Inch
- clamp connection according to DIN 32676
- clamp connection according to ISO 2852

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.)

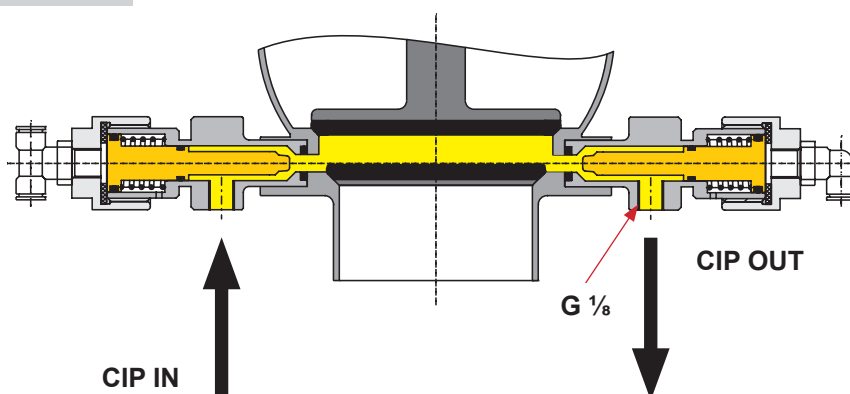
Cleaning of the leakage chamber is undertaken via the leakage valves. The cleaning liquid is supplied via one leakage valve and discharged to the atmosphere in a closed process via the second leakage valve.

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

- Flushing quantity per CIP cycle: about 1.2 ltr / 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 recommendation for leakage chamber

Recommendation of cleaning cycles at 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).

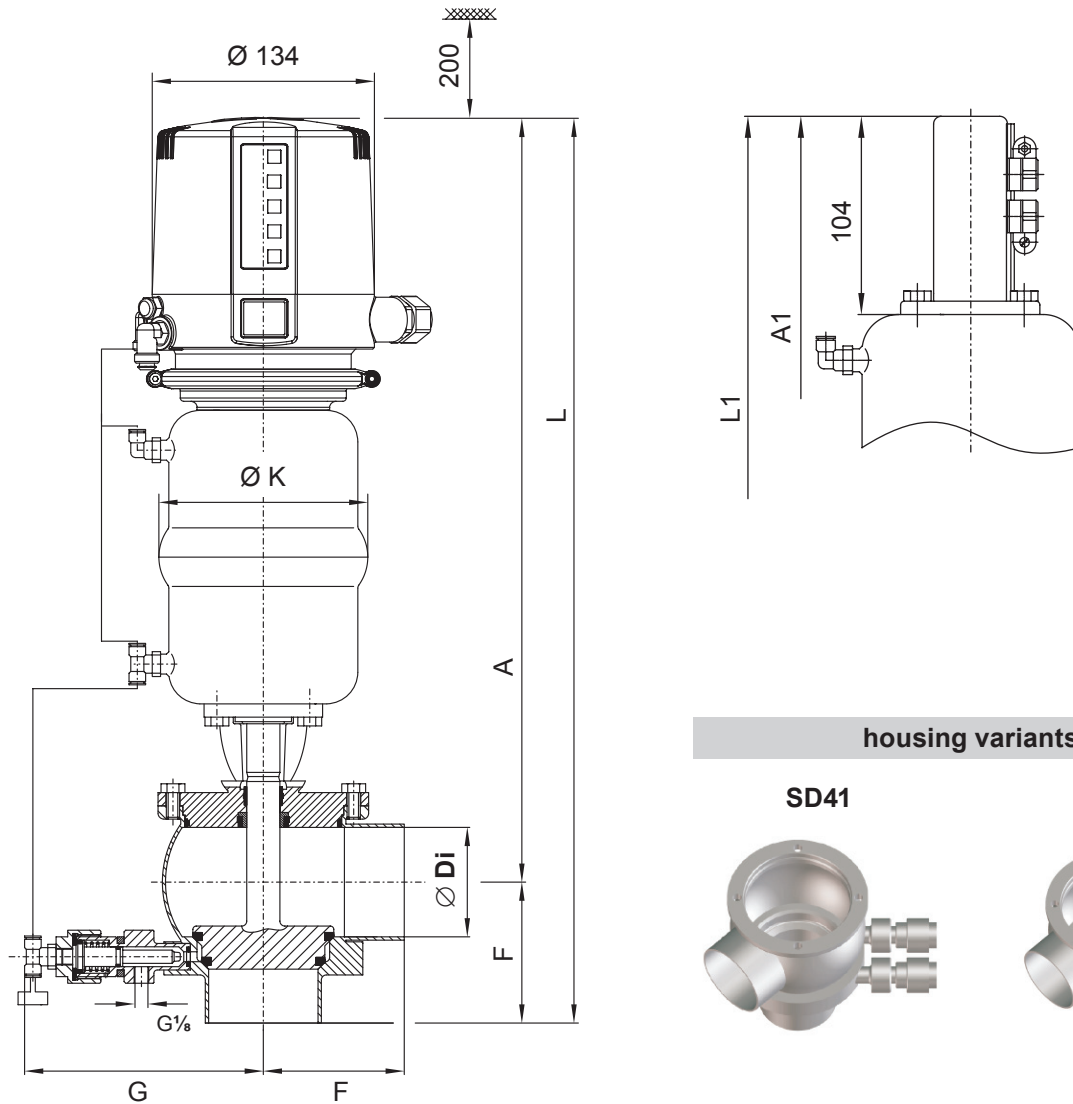
Attention! Observe Welding Instructions 7.2.

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 or be transferred to other parts of the installation and cause damage.
- Any damage resulting from the non-observance of these welding instructions is not subject to our guarantee.
- Welding directives for aseptic applications shall be drawn from the AWS/ANSI Directives and EHEDG Guidelines.

8. Dimensions / Weights

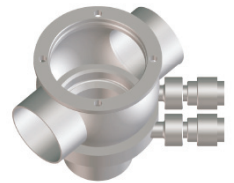


housing variants

SD41

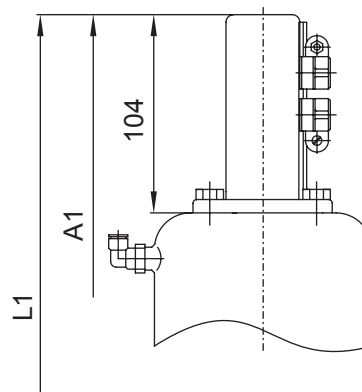
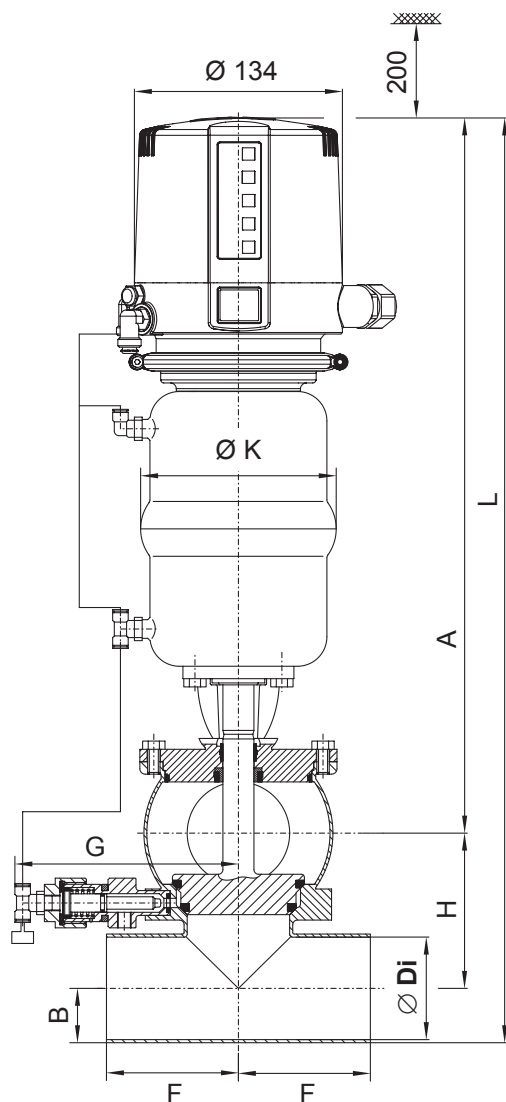


SD42



Dimensions in mm									weight in kg
DN	A	A1	Ø Di	F	G	Ø K	L	L1	
25	409	337	26	50	126	86	459	387	5,4
40	415	343	38	67	129	86	482	410	6,1
50	452	380	50	72	133	126	524	452	8,3
65	460,5	388	66	85	145	126	545,5	473	10,0
80	512,5	441	81	98	153	189	610	538	16,5
100	522,5	451	100	111	162	189	633,5	561	18,3
Inch									
1"	407	335	22,6	50	126	86	457	385	5,4
1,5"	413	341	34,9	67	129	86	480	408	6,1
2"	451	379	47,6	72	133	126	523	451	8,3
2,5"	457,5	385	60,3	85	142	126	542,5	470	9,5
3"	508,5	436	72,9	90	148	189	598,5	526	15,6
4"	520,5	448	97,6	111	162	189	631,5	559	18,3

8. Dimensions / Weights



housing variants

SDE43



SDE44



Dimensions in mm											weight in kg
DN	A	A1	B	Ø Di	F	G	H	Ø K	L	L1	
25	409	337	14,5	26	50	126	60	86	483,5	411,5	5,8
40	415	343	20,5	38	67	129	72	86	507,5	435,5	6,6
50	452	380	26,5	50	72	133	84	126	562,5	490,5	8,8
65	460,5	388	35	66	85	145	100	126	595,5	523,0	10,5
80	512,5	440	42,5	81	98	153	115	189	670,0	597,5	17,1
100	522,5	450	52	100	111	162	134	189	708,5	636,0	18,9
Inch											
1"	407	335	12,5	22,6	50	126	56,6	86	476,1	404,1	5,8
1,5"	413	341	19,05	34,9	67	129	68,9	86	500,1	428,9	6,6
2"	451	379	25,4	47,6	72	133	81,6	126	558,0	486,0	8,8
2,5"	457,5	385	31,75	60,3	85	142	94,3	126	583,5	511,0	10,0
3"	508,5	436	38,08	72,9	90	148	106,9	189	653,5	581,7	16,2
4"	520,5	448	50,8	97,6	111	162	131,6	189	702,9	630,4	18,9

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)
- CIP connection for leakage valves: G1/8
- Air connection (for hose): 6 x 1mm
- 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 3,
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 mg/m³

The oil applied must be compatible with Polyurethane elastomer materials.

9. Technical Data

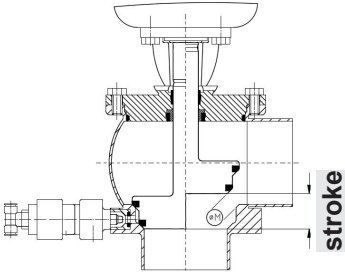
9.3. Closing times SD4

		closing times in sec. pneumatic air pressure 6 bar	
		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.

The opening and closing times can be adjusted via the throttle screw at the solenoid valve.

9.4. Valve stroke / Opening cross section

					
DN	Inch	SD4 standard	Ø M	SD4 long stroke	Ø M
25	1"	15 mm	3,5 mm	-	-
40	1,5"	25 mm	10,5 mm	-	-
50	2"	28 mm	12,5 mm	36 mm	19 mm
65	2,5"	28 mm	12,5 mm	48 mm	30 mm
80	3"	28 mm	12,5 mm	62 mm	43 mm
100	4"	28 mm	12,5 mm	72 mm	53 mm

9.5. Pneumatic air consumption SD4 standard at 6 bar control air pressure

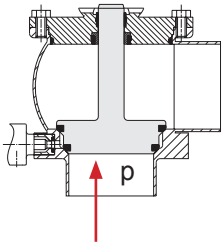
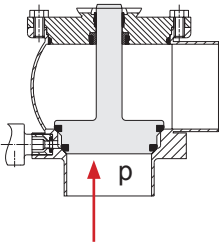
actuator	per stroke NL
Ø 74 mm	1,0
Ø 110 mm	2,1
Ø 165 mm	4,5

9. Technical Data

9.6. Pneumatic air consumption SD4 long stroke

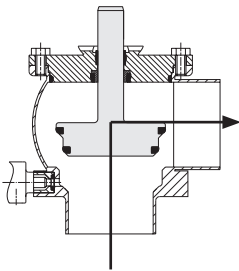
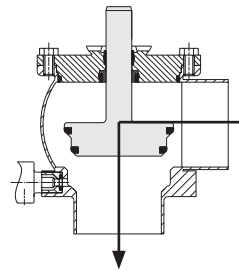
		pneumatic air consumption in standard litre (NL) at 6 bar control air pressure	
DN	Inch	actuator Ø 110	actuator Ø 165
50	2"	3,1	
65	2,5"	3,1	
80	3"		10,5
100	4"		10,5

9.7. DELTA SD4 calculatory max. produce pressure in (bar)

valve normally closed (NC) without NOT element or with compressed air failure					valve normally closed (NC) with NOT element max. product pressure at 17.6 bar limited by seal technology				
									
		Ø actuator in mm					Ø actuator in mm		
DN	Inch	Ø 74	Ø 110	Ø 165	DN	Inch	Ø 74	Ø 110	Ø 165
25	1"	6,4	16,0		25	1"	16,0	16,8	
40	1,5"	3,6	9,6		40	1,5"	12,4	17,6	
50	2"		6,0	11,2	50	2"		17,6	17,6
	2,5"		4,7	11,6		2,5"		14,0	16,0
65			3,5	9,3	65			10,5	17,6
	3"			8,0		3"			17,6
80				6,0	80				17,2
100	4"			4,4	100	4"			12,8

 = standard actuator

9. Technical Data

9.8. 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

The maintenance intervals depend on the corresponding application and should be determined by the operator 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.

10. Maintenance

Scan for SD4 Valve
Maintenance Video



Required tools:

- 1x wrench SW13
- 1x wrench SW17
- 1x wrench SW19
- 1x wrench SW24
- 1 x hexagon socket wrench 6 mm
- assembly tool for seat seal

(see chapter 15.)

(The assembly tool can only be used for the new valve design produced from November 2000.)

Replacement of seals 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).

- **Note:** The seal kits for the old and new valve designs are the same.
- Provide all seals with a thin layer of grease before their installation!

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.

11. Service Instructions

The item numbers refer to the corresponding spare parts list: RN 01.054.62

11.1. Dismantling from the line system

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 (4) and lift valve insert including actuator off the valve housing (1).

4. Shut off compressed air and remove compressed air supply.

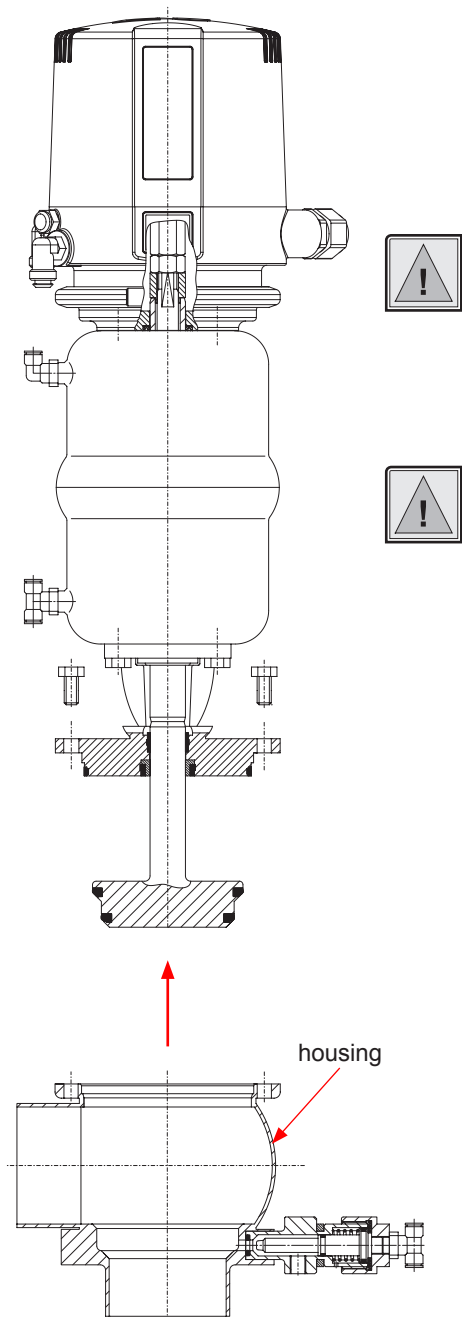
The actuator is supplied with compressed air via the NOT element.

5. **Design with control unit:**

Detach control unit.

Design with valve position indication:

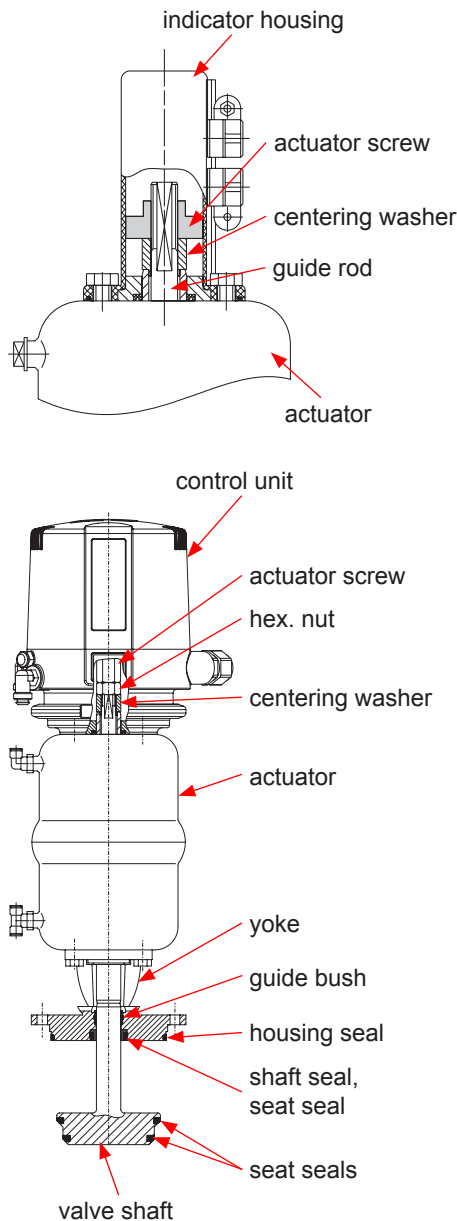
Detach proximity switches. Take the indicator housing (proximity switch holder) off the actuator.



11. Service Instructions

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

fig. 11.2.1.



1. CU design:

Unscrew and remove actuator screw. Unscrew hex. screw (21) while holding up the centering washer (20). Remove the centering washer.

- Design with valve position indicator:

Unscrew and remove actuator screw (25) while holding up the centering washer (20). Remove the centering washer. (fig. 11.2.1.).

2. Pull valve shaft (2) with guide rod out of the actuator (18). Remove seat seals (12, 11/11.1).

! Valve shaft changed from 11.2000, see accepting groove for seat seal (fig. 11.2.2.) (assembly, see 11.3.3.- 4.)

3. Unscrew yoke (5) from actuator (18).

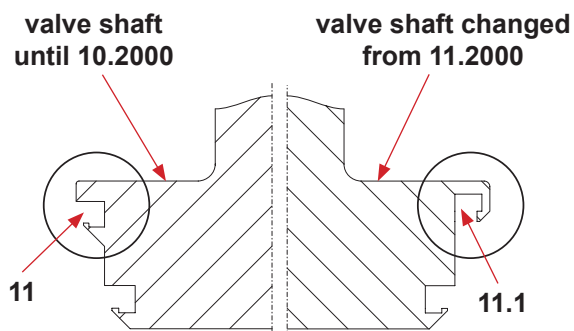
- The actuator can be maintained. (see 13. Service Instructions - Actuator)

4. Remove seat seal (10), shaft seal (9), guide bush (8) and housing seal (3).

(assembly, see 11.3.1. and 11.3.5.)

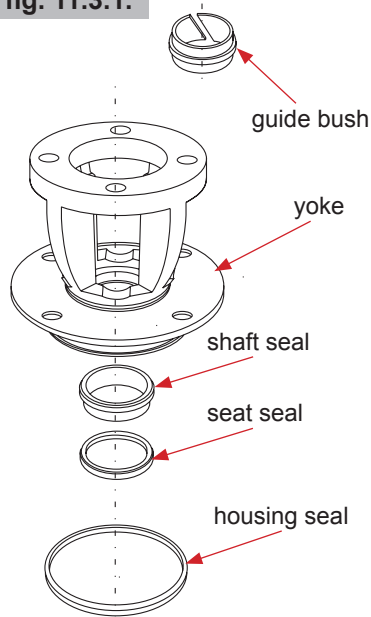
5. Clean the valve housing, yoke, actuator and shaft with a low solution of a cleaning agent. Never use cleaning agents containing abrasive or polishing particles..

fig. 11.2.2.



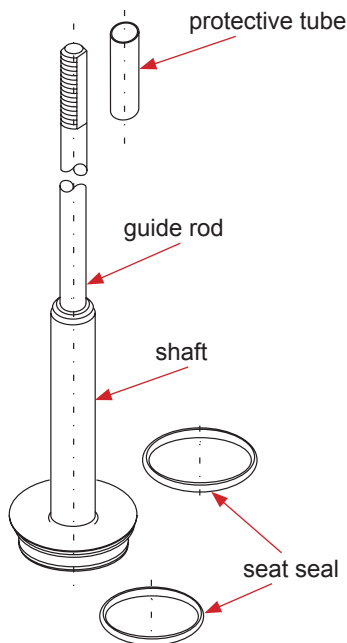
11. Service Instructions

fig. 11.3.1.



11.3. Installation of seals and Assembly of valve

1. Insert the guide bush (8) into the yoke (5). Afterwards, insert the shaft seal (9) and press in the slightly greased seat seal (10) (see fig. 11.3.1.). See to the correct installing position.
2. Install the yoke (5) at the actuator (18).
3. Insert the seat seal (11/11.1, 12) into the shaft. Slightly grease the seat seals before their installation. During the installation the seal groove should be vented between the seal and the groove wall with a thin object. See to an even fit of the seals. For the modified design of the seat seal 11.1 the assembly tool should be used to install the seal (see page 24).
4. Slide the protective tube via the thread of the guide rod. Slide the shaft (2) through the yoke (5) and the actuator (18), place the centering washer (20) and fasten the actuator screw (25) or hex. nut (21). Hold up the centering washer during this process. Tightening torque: 40 Nm. CU design: Screw on the actuator screw and fasten it.
5. Slightly grease the housing seal (3) and install it in the groove of the yoke.



11. Service Instructions

11.4. Installation of valve

1. Valve with control unit:

Fasten the adapter **(19)** on the actuator.
Place the control unit on the adapter and secure it.

- **Valve with position indicator:** Fasten the valve position indicator housing **(23)**.

2. For the installation of the valve insert in the design NC (normally closed), observe the following:

- Control the actuator (NC design) with pneumatic air min. 6 bar.
Insert the valve insert carefully into the valve housing.
The housing seal **(3)** must not be damaged during the installation into the housing. Tighten the hex. screws crosswise into the housing flange.



Attention! Do not touch movable parts!
Risk of injury.

- ! Design NC (normally closed) : Shut off air.

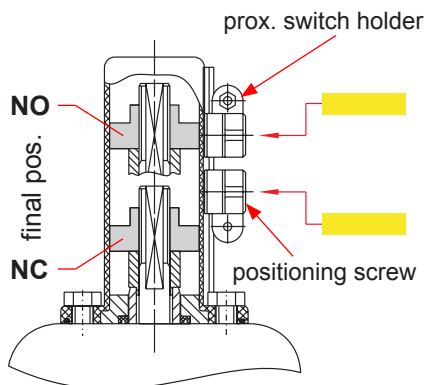
3. Check the basic adjustment of the valve position indication.

- By turning the positioning screw in the control unit, the shift points can be adjusted.

- Design with valve position indication:

Plug the proximity switches and fasten them.
Readjust the proximity switches if necessary.

fig. 11.4.1.



4. Adjustment of proximity switches: (fig. 11.4.)

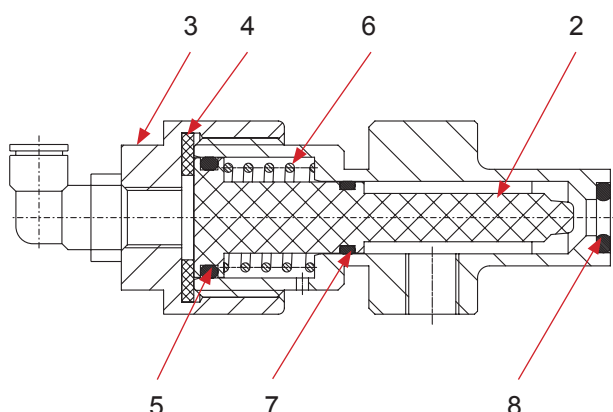
- Place the actuator into one limit position.
- Move the corresponding proximity switch into the corresponding position. For this purpose, release the positioning screw and move the holder until the corresponding signal is indicated. Afterwards continue the movement by 2 to 3 mm in order to secure the indication. Fasten the positioning screw.
- Place the actuator into the other limit position and carry out the positioning of the second proximity switch.
- Upper valve position indication: valve "normally open" NO
Lower valve position indication: valve "normally closed"

12. Service Instructions - Leakage Valves

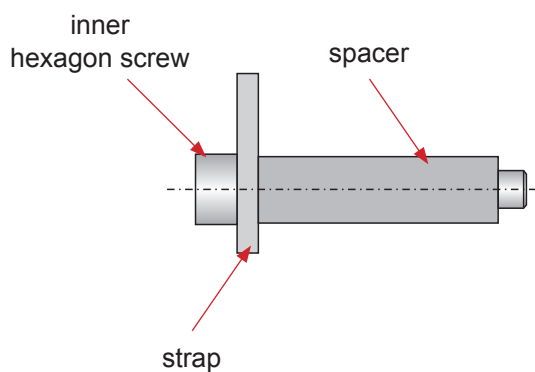
12.1. Maintenance of leakage valves

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.

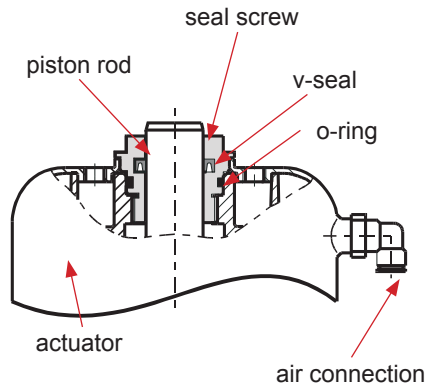


holder for leakage valves



13. Service Instructions - Actuator

fig. 13.1.



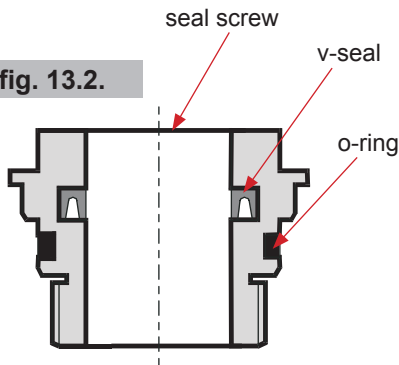
Spare parts list: RN01.054.86

13.1. Maintenance of actuator (fig. 13.1.)

1. Detach the air hoses from the actuator.
2. Undo the hexagon socket screws from the adapter of the control unit. - Remove the adapter.
3. Unscrew the two seal screws by means of a spanner SW30, while holding up the actuator with a strap wrench.
4. Remove o-rings and v-seals.

13.2. Installation of seals and assembly of actuator

fig. 13.2.



1. Install the slightly greased o-rings and v-seals into the seal screws. (**fig. 13.2.**)
See to the correct installation position of the v-seal.

2. Slide the seal screws at both sides of the actuator over the piston rod and fasten them.
3. Fasten the adapter for the control unit and the yoke on the actuator.

Attention: Observe the position of the adapter.

Attention: During the assembly of the adapter and of the yoke, observe the required valve design NC or NO.

NC (FS) =	normally closed
	air-to-raise, spring-to-lower
NO (FH) =	normally open
	air-to-lower, spring-to-raise

4. Fasten the air hoses.

14. Reconstruction of Actuator

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

To increase or decrease the actuator sizes (Ø 74 mm, Ø 110 mm, Ø 165 mm), the corresponding line pressures must be considered, see table page 9.6.

14.1. Reconstruction of actuator

Dismantling

Dismantling is carried out as described in chapter 11.1. and 11.2.

To change the actuator size, the guide rod **(6)** must be replaced as follows:

Attention!

Clamp the valve seat in a vice.

See to the valve seat not being damaged. Use protective jaws or cleaning rags.

The slightest damage at the shaft rod can lead to leakages.

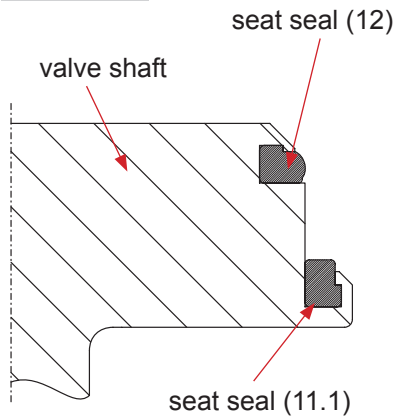
The guide rod can be turned out of the shaft by means of the centering washer (20) and a spanner SW17.

14.2. Assembly of actuator

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

15. Installation of Seat Seal

fig. 15.



By means of the assembly tool only the seat seal (11.1) can be installed (see fig. 15.). This seat seal must be mounted to the valve shaft, at first.

Afterwards, manually install the seat seal (12) in the groove, see item 15.2.

The assembly tool (fig. 15.1) consists of:

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

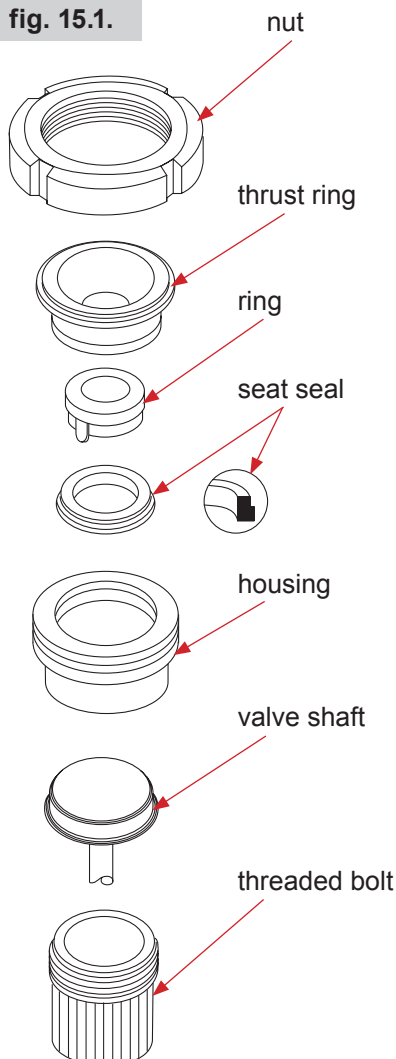
15.1. Installation of seat seal in valve shaft

1. Insert valve shaft into the housing in such a manner that the seal groove is in the valve housing.
2. Mount the shaft in the housing by means of the threaded bolts. Clamp the housing in the vise.
3. Slightly grease seat seal with APV assembly grease. Place the seal on the ring with the venting nose until it stops.
4. Insert the ring with the installed seat seal into the housing and press it down until it stops.
5. Introduce the thrust ring into the housing. Screw on the nut and tighten it with a hook spanner until it stops.
6. Release the nut. Pull the ring and thrust ring out of the housing.
7. Take the housing out of the vise, remove the threaded bolts. Take the valve shaft out of the housing.

Check the even fit of the seat seal.

In order to simplify the installation of the seat seal, the following assembly tools are available:

fig. 15.1.



Assembly tool for seat seal SD4

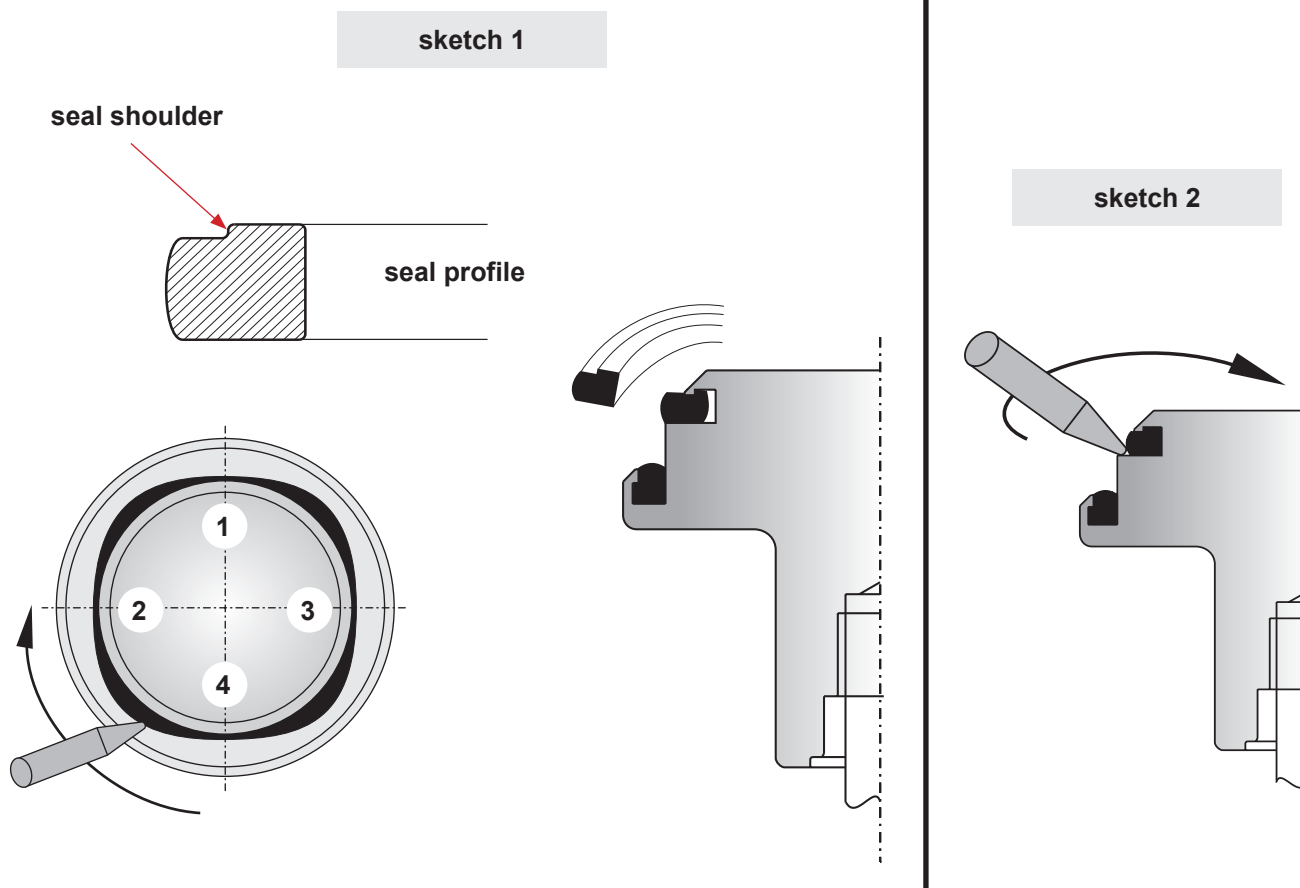
DN	Inch	Reference number	ID-No.
25	1"	000 51-13-200/17	H203861
40	1,5"	000 51-13-201/17	H203862
50	2"	000 51-13-202/17	H203863
	2,5"	000 51-13-203/17	H203864
65		000 51-13-204/17	H203865
	3"	000 51-13-205/17	H203866
80		000 51-13-206/17	H203867
100	4"	000 51-13-207/17	H203868

15. Installation of Seat Seal

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

1. Provide the seat seal with a thin layer of grease before its installation.
The accepting groove for the seat seal must not be greased.
2. Clamp the valve shaft in a vice.

The valve shaft must not be damaged during this process.
Use protective jaws.
3. Press the slightly greased seal at four spots, the wide side to the front, into the groove
(**see sketch 1**).
4. Press the seal at four opposite spots **1-2, 3-4** into the groove by means of an assembly tool
(screwdriver with round edges can be used) (**see sketch 1**).
5. Press the seal into the groove step by step. Work alternately at the opposite spots.
See to an even fit of the seat seal.
6. Afterwards, introduce the assembly tool between the seal shoulder and the groove wall. Work
around the complete circumferences of the groove. The groove bottom is vented and the seal
shoulder locks in place during this process. (**see sketch 2**).



16. Trouble Shooting

Trouble	Remedy
Valve is untight, leakages via the leakage valves.	Replace the seat seals. Check the line pressure: perm. line pressure, see chapter 9
Leakages at the cylinder of the leakage valves.	Replace the o-rings. see RN 01.054.67 Check the cleaning liquid supply.
Leakage between housing and yoke flange.	Replace the housing seal.
Actuator	
Air escapes from the actuator rod.	Replace the complete seal screw for the actuator.
Actuator does not work (air escapes permanently from the venting plug).	Replace the complete actuator.
Valve position indication	
Feedback is missing.	Carry out fine adjustment.

17. Spare 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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Spare parts list:

Valve SD4, SDE4 FS-CU4 and PSH DN 25 - 100 ; 1" - 4"
Standard Valve

Date:	22.03.13	29.08.23				SPX FLOW
Name:	Trylko	Shreshth				
Approved by:	Schulz	C. Keil				
Date:					Page 1 of 13	RN 01.054.62
Name:						
Approved by:						



SD41



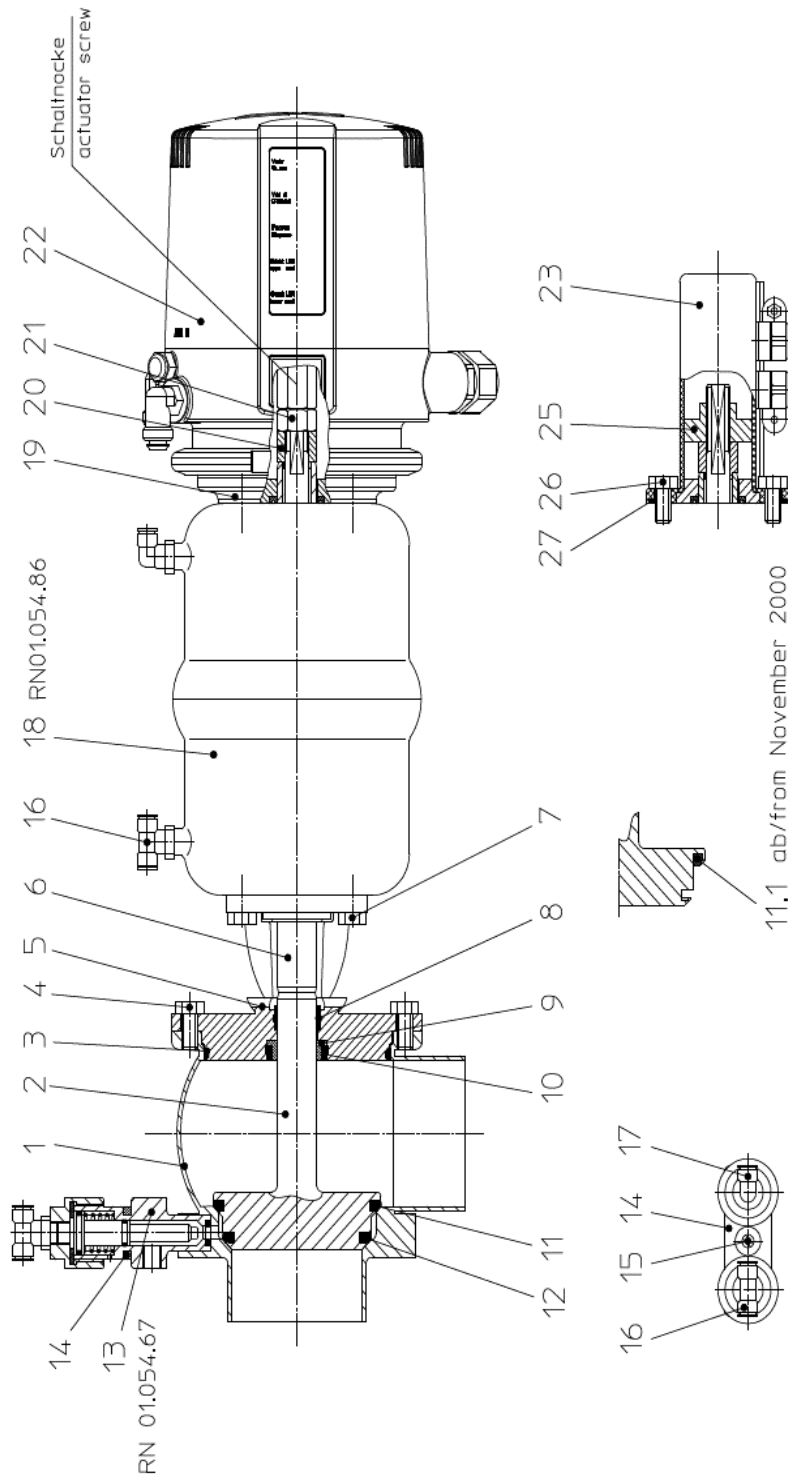
SD42



SDE43



SDE44



11.1 ab/from November 2000

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**Valve SD4, SDE4 FS-CU4 and PSH DN 25 - 100 ; 1" - 4"
DN 25**

Valve SD4, SDE4 FS-CU4 and PSH DN 25 - 100 ; 1" - 4"
DN 25

Date:	22.03.13	29.08.23	
Name:	Trytko	Shrestha	
Approved by:	Schulz	C. Keil	

SPX FLOW

Date:						Page	2	of	13
Name:						RN 01.054.62			
Approved by:									

Name:		Hyko	Stressing
Approved by:		Schulz	C. Keil

Item	Quantity	Description	Material	Part no.
1	1	Housing	SD41 1+2S	H173487
1	1	Housing	SD42 1+2+3S	H173501
1	1	Housing	SDE42 1+2+3S	
1	1	Housing	SDE43 1+2+3S	H174839
1	1	Housing	SDE44 1+2+3+4S	H175077
2	1	Valve shaft		H173369
				H77439
3	1	Housing seal		H170017
				H77438
				VMQ
4	4	Hex. screw M8x16	DIN EN 24017-A2-70	H78772
5	1	Yoke		H173344
6	1	Guide rod		H171061
7	4	Hex. screw M8x16	DIN EN 24017-A2-70	H78772
8	1	Bushing	PTFE + 25% carbon	H207154
9	1	Shaft seal	Turcon MF6	H323082
			EPDM	H77442
10	1	Seat seal	HNBR	H170176
			FPM	H77441
			VMQ	H77440
			EPDM	H77470
11	1	Seat seal	HNBR	H172175
			FPM	H77469
			VMQ	H77468
			EPDM	H77467
11.1	1	Seat seal	HNBR	H166676
			FPM	H77466
			VMQ	H77465

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Spare parts list:

**Valve SD4, SDE4 FS-CU4 and PSH DN 25 - 100 ; 1" - 4"
1"**

[illegible]

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**Valve SD4, SDE4 FS-CU4 and PSH DN 25 - 100 ; 1" - 4"
DN 40**

Valve SD4, SDE4 FS-CU4 and PSH DN 25 - 100 ; 1" - 4" DN 40

[illegible]

SPX FLOW

Item	Quantity	Description	Material	Part no.
1	1	Housing	SD41 1+2S	H173488
1	1	Housing	SD42 1+2+3S	H173502
1	1	Housing	SDE42 1+2+3S	
1	1	Housing	SDE43 1+2+3S	H174840
1	1	Housing	SDE44 1+2+3+4S	H175078
2	1	Valve shaft		H173370
				H77464
3	1	Housing seal		H170018
				H77463
				VMQ
4	4	Hex. screw M8x16	DIN EN 24017-A2-70	H78772
5	1	Yoke		H173345
6	1	Guide rod		H171061
7	4	Hex. screw M8x16	DIN EN 24017-A2-70	H78772
8	1	Bushing	PTFE + 25% carbon	H207154
9	1	Shaft seal	Turcon MF6	H323082
			EPDM	H77442
10	1	Seat seal	HNBR	H170176
			FPM	H77441
			VMQ	H77440
			EPDM	H77494
11	1	Seat seal	HNBR	H165709
			FPM	H77493
			VMQ	H77492
			EPDM	H77491
11.1	1	Seat seal	HNBR	H166085
			FPM	H77490
			VMQ	H77489

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Valve SD4, SDE4 FS-CU4 and PSH DN 25 - 100 ; 1" - 4" 1,5"

Valve SD4, SDE4 FS-CU4 and PSH DN 25 - 100 ; 1" - 4"
1,5"

Date:	22.03.13	29.08.23	
Name:	Trytko	Shrestha	
Approved by:	Schulz	C. Keil	

SPX FLOW

Date:					Page	5	of	13
Name:								
Approved by:					RN 01.054.62			

Name:		Hyko	Stressing
Approved by:		Schulz	C. Keil

Name:					
Approved by:					
					RN 01.054.62

Item	Quantity	Description	Material	Part no.
1	1	Housing	SD41 1+2S	H173494
1	1	Housing	SD42 1+2+3S	H173508
1	1	Housing	SDE42 1+2+3S	1.4404
1	1	Housing	SDE43 1+2+3S	1.4404
1	1	Housing	SDE44 1+2+3+4S	1.4404
2	1	Valve shaft	1.4404	H173376
			EPDM	H77464
3	1	Housing seal	HNBR	H170018
			FPM	H77463
			VMQ	
4	4	Hex. screw M8x16	DIN EN 24017-A2-70	H78772
5	1	Yoke	1.4301	H173345
6	1	Guide rod	1.4305	H171061
7	4	Hex. screw M8x16	DIN EN 24017-A2-70	H78772
8	1	Bushing	PTFE + 25% carbon	H207154
9	1	Shaft seal	Turcon MF6	H323082
			EPDM	H77442
10	1	Seat seal	HNBR	H170176
			FPM	H77441
			VMQ	H77440
			EPDM	H77494
			HNBR	H165709
11	1	Seat seal	FPM	H77493
		Until November 2000	VMQ	H77492
			EPDM	H77491
11.1	1	Seat seal	HNBR	H166085
		From November 2000	FPM	H77490
			VMQ	H77489

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**Valve SD4, SDE4 FS-CU4 and PSH DN 25 - 100 ; 1" - 4"
DN 50**

**Valve SD4, SDE4 FS-CU4 and PSH DN 25 - 100 ; 1" - 4"
DN 50**

Date:	22.03.13	29.08.23	
Name:	Trytko	Shrestha	
Approved by:	Schulz	C. Keil	

SPX FLOW

Date:					Page	6	of	13
Name:					RN 01.054.62			
Approved by:								

Name:		Hyko	Stressing
Approved by:		Schulz	C. Keil

	Item	Quantity	Description	Material	Part no.
1	1	1	Housing	SD41 1+2S	H173489
	1	1	Housing	SD42 1+2+3S	H173503
	1	1	Housing	SDE42 1+2+3S	
	1	1	Housing	SDE43 1+2+3S	H174841
	1	1	Housing	SDE44 1+2+3+4S	H175079
	2	1	Valve shaft		H173371
					H77488
3	1	1	Housing seal		H168714
				FPM	H77487
				VMQ	
4	4	Hex. screw M8x16	DIN EN 24017-A2-70	1.4301	H78772
5	1	Yoke		1.4404	H173346
6	1	Guide rod		1.4305	H171062
7	4	Hex. screw M8x16	DIN EN 24017-A2-70	1.4301	H78772
8	1	Bushing		PTFE + 25% carbon	H207154
9	1	Shaft seal		Turcon MF6	H323082
10				EPDM	H77442
	1	1	Seat seal	HNBR	H170176
				FPM	H77441
				VMQ	H77440
11				EPDM	H77430
				HNBR	H176687
	1	1	Seat seal	FPM	H77429
				VMQ	H77428
11.1	1	1	Seat seal	EPDM	H170662
				HNBR	H170658
				FPM	H170663
				VMQ	H170664

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Spare parts list:

Valve SD4, SDE4 FS-CU4 and PSH DN 25 - 100 ; 1" - 4"

DN 65

Valve SD4, SDE4 FS-CU4 and PSH DN 25 - 100 ; 1" - 4"
DN 65

[illegible]

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Spare parts list:

Valve SD4, SDE4 FS-CU4 and PSH DN 25 - 100 ; 1" - 4" 2,5"

**Valve SD4, SDE4 FS-CU4 and PSH DN 25 - 100 ; 1" - 4"
2,5"**

[illegible]

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Spare parts list:

Valve SD4, SDE4 FS-CU4 and PSH DN 25 - 100 ; 1" - 4" 3"

[illegible]

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**Valve SD4, SDE4 FS-CU4 and PSH DN 25 - 100 ; 1" - 4"
DN 80**

Date:	22.03.13	29.08.23				SPX FLOW
Name:		Tryko	Shreshth			
Approved by:		Schulz	C. Keil			
Date:						Page 11 of 13
Name:						RN 01.054.62
Approved by:						

Item	Quantity	Description	Material	Part no.
1	1	Housing	SD41 1+2S	H173491
1	1	Housing	SD42 1+2+3S	H173505
1	1	Housing	SDE42 1+2+3S	1.4404
1	1	Housing	SDE43 1+2+3S	1.4404
1	1	Housing	SDE44 1+2+3+4S	1.4404
2	1	Valve shaft	1.4404	H173373
			EPDM	H77543
3	1	Housing seal	HNBR	H170075
			FPM	H77542
			VMQ	
4	4	Hex. screw M10x16	DIN EN 24017-A2-70	H78806
5	1	Yoke	1.4404	H173349
6	1	Guide rod	1.4305	H171063
7	4	Hex. screw M8x20	DIN EN 24017-A2-70	H78776
8	1	Bushing	PTFE + 25% carbon	H207154
9	1	Shaft seal	Turcon MF6	H323082
			EPDM	H77442
10	1	Seat seal	HNBR	H170176
			FPM	H77441
			VMQ	H77440
			EPDM	H77549
11	1	Seat seal	HNBR	H172180
			FPM	H77548
			VMQ	H77547
			EPDM	H77555
11.1	1	Seat seal	HNBR	H172109
			FPM	H77554
			VMQ	H77553

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Valve SD4, SDE4 FS-CU4 and PSH DN 25 - 100 ; 1" - 4"
DN 100

Date:	22.03.13	29.08.23				SPX FLOW
Name:	Tryko	Shreshth				
Approved by:	Schulz	C. Keil				
Date:					Page 12 of 13	
Name:						
Approved by:						RN 01.054.62

Item	Quantity	Description	Material	Part no.
1	1	Housing	SD41 1+2S	H173492
1	1	Housing	SD42 1+2+3S	H173506
1	1	Housing	SDE42 1+2+3S	
1	1	Housing	SDE43 1+2+3S	H174844
1	1	Housing	SDE44 1+2+3+4S	H175082
2	1	Valve shaft		H173374
				H77583
3	1	Housing seal		H170074
				H77582
				VMQ
4	4	Hex. screw M10x16	DIN EN 24017-A2-70	H78806
5	1	Yoke		H173350
6	1	Guide rod		H171063
7	4	Hex. screw M8x20	DIN EN 24017-A2-70	H78776
8	1	Bushing		H207154
9	1	Shaft seal		H323082
				H77442
10	1	Seat seal		H170176
				H77441
				H77440
				H77589
11	1	Seat seal		H172183
				H77588
				H77587
				H77595
11.1	1	Seat seal		H170015
				H77594
				H77593

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Spare parts list:

Valve SD4, SDE4 FS-CU4 and PSH DN 25 - 100 ; 1" - 4" 4"

[illegible]

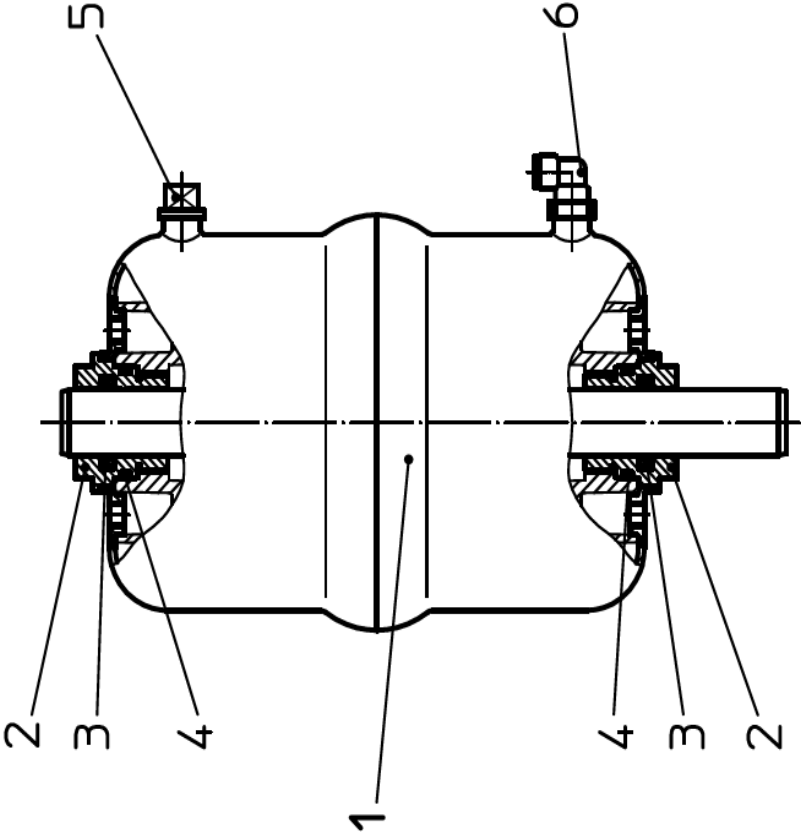
Ersatzteilliste: spare parts list

Steuerkopf SW4
Actuator SW4

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

Blatt	1	von	1
RN 01.054.86			

pos.	Menge quantity	Beschreibung description	Ø 74	Ø 110	Ø 165
			WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.
1	1	Steuerkopf kpl. Feder/Luft - matt glänzend Actuator cpl. Spring/air satin finish	15-32-050/17 H171378	15-32-051/17 H171379	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		



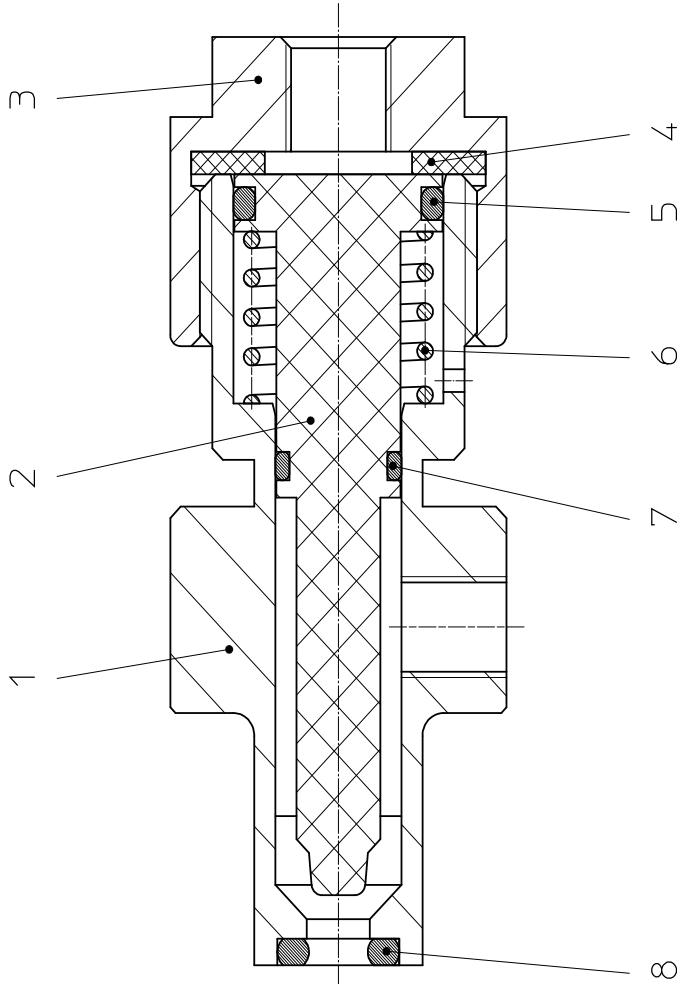
Ersatzteilliste: spare parts list

Leckageventil SD4
Leakage valve SD4

Datum: 11/08				Blatt 1 von 1			
Name: Peters				RN 01.054.67			
Geprüft:							
Datum:							
Name:							
Geprüft:							



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



APV DELTA SD4

DOUBLE SEAL VALVE



SPX FLOW

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Scan for SD4 Valve
Maintenance Video

