

APV DELTA SWS4

DIVERT VALVE

FORM NO.: H322956 REVISION: UK-1

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

We,

DESIGN CENTER/MANUFACTURER: SPX Flow Technology Germany GmbH
Gottlieb-Daimler-Str. 13, D-59439 Holzwickede

MANUFACTURING FACILITY: SPX Flow Technology Poland sp. z o.o.
Rolbieskiego 2, 85-862 Bydgoszcz, Poland

AUTHORIZED REPRESENTATIVE: SPX Flow Europe Ltd.
(for UKCA) Building A, Compass House, Manor Royal
Crawley, RH10 9PY

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.

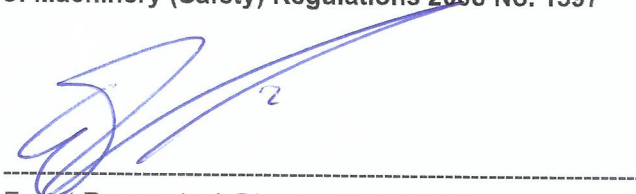
Holzwickede, November 2022



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. Intended Use	3
4. Mode of Operation	4
4.1. General terms	
5. Auxiliary Equipment	5–6
5.1. Valve position indication	
5.2. Control Unit	
5.3. SW4 variants	
6. Cleaning	6
6.1. Cleaning recommendation	
7. Installation	7–8
7.1. Connections	
7.2. Welding instructions	
8. Dimensions / Weights	9–10
8.1. Divert valve SWS4	
8.2. Divert valve SWSE4	
9. Technical Data	11–14
9.1. General terms	
9.2. Specification of compressed air quality	
9.3. DELTA SWS4 kvs values in m ³ /h	
9.4. DELTA SWS4 calculatory product pressures in bar	
9.5. Closing times of SWS4 divert valve	
9.6. Valve stroke / Opening cross section in mm	
9.7. Compressed air consumption in NI	
10. Maintenance	15
11. Service Instructions - Divert valve	16–19
11.1. Dismantling from the line system	
11.2. Disassembly of wear parts (product-wetted parts)	
11.3. Installation of seals and assembly of valve	
11.4. Installation of valve	
12. Service Instructions - Actuator	20
12.1. Maintenance of actuator	
12.2. Installation of seals and assembly of valve	
12.3. Actuator with valve position feedback	
13. Assembly Tool	21
13.1. Installation of seat seal in the valve shaft	
13.2. Assembly tool for seat seal	
14. Trouble Shooting	22
15. Spare Parts Lists	23
 Spare parts lists SWS4, SWSE4 divert valve DN 25–100, Inch 1"-4"	 RN 01.054.819
 Actuator	 RN 01.054.86

1. General Terms

This instruction manual should be read carefully by the competent 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



Gefahr!

- 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.
- Separate electric and pneumatic connections.
- Depressurize the line system before any maintenance work. Drain and clean the valve if possible.



Do not touch the open valve.

- Risk of injury by sudden valve operation. In dismantled state there is the risk of bruising at movable parts.
- Observe Service Instructions to ensure safe maintenance of the valve.

Attention!

Valve design NC (normally closed): Before releasing the housing clamp connection, the valve insert must be relieved by controlling the actuator.

Attention!

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 SW4 single seat and change-over valves is the shut-off of line sections.

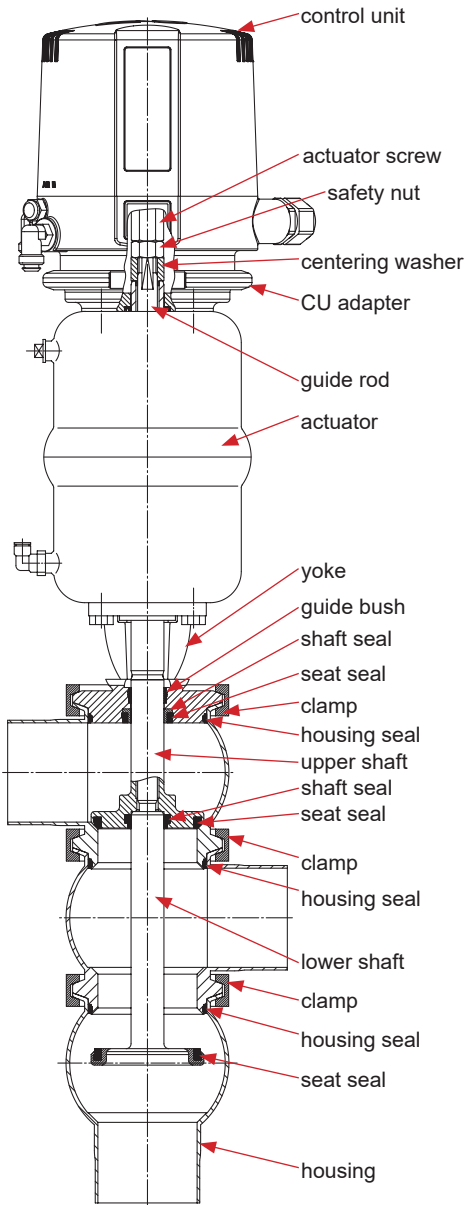
Arbitrary, constructive changes at the valve will influence safety as well as the intended functionality of the valve and are not permissible.

Approvals and External Evaluations:

3-A Sanitary Standards, Inc.

4. Mode of Operation

4.1. General terms



Divert valves DELTA SWS4 have been developed for use in the brewing and beverage industries, in the dairy and food industries as well as in chemical and pharmaceutical applications.

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

The function of the DELTA SWS4 valve is to shut off and to change over line sections in processes.

- Operation by pneumatic actuator with air connection, reset by spring force.
- By different assembly of the actuator, the following designs are possible:
 - **NC**: actuator normally closed / air-to-raise, spring-to-lower
 - **NO**: actuator normally open / air-to-lower, spring-to-raise
- The inner parts of the actuator need not be serviced.
- Cleaning of the inner valve is undertaken during CIP cleaning of the line system.
- The standard SWS4 valve is equipped with a DELTA CU41 Direct Connect control unit.

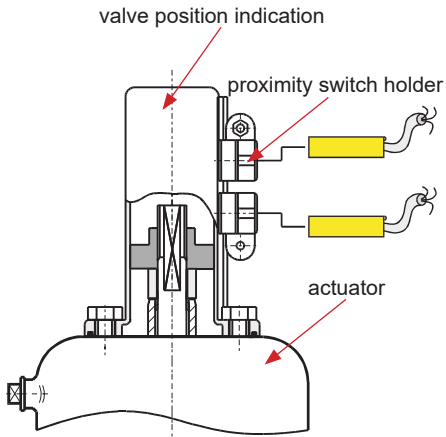
The following different variants are possible:

- * AS-interface
- * DeviceNet
- * Profibus

The yellow luminous diodes in the control unit indicate the position of the valve shaft.

5. Auxiliary Equipment

fig. 5.1.



5.1. Valve position indication

- Alternatively to the control unit, the actuator can be equipped with a proximity switch holder (PSH) to indicate the valve position. Proximity switches to signal the limit position of the valve seats can be mounted to the proximity switch holder if required.

We recommend to use our APV standard type:
 Three-wire proximity switch
 Operating distance: 5 mm / diameter: 11 mm
 Operating voltage: 10 - 30 V DC
 pnp positive switching, closing function
 Installation „non-flush“

Using a valve position indicator other than APV, we cannot accept any liability for a faultless function. If the customer decides to use a different valve position indicator, we cannot take over any guarantee for the faultless function.

5.2. Control Unit

For the start-up as well as assembly and disassembly of the different designs the respective manuals should be used.

The following different designs are available:

fig. 5.2.



	1 solenoid valve
Direct Connect reference No.; ID-No.	CU41-S-Direct Connect 08-45-100/93; H320460
AS-interface extended reference No.; ID-No.	CU41-S-AS-i extended 08-45-110/93; H320467
Device Net reference No.; ID-No.	CU31-Device Net 16-31-240/93; H209422
Profibus reference No.; ID-No.	CU31-Profibus 08-45-001/93; H315495

For the assembly of the control unit on the SWS4 valve an adapter is required.

	Adapter
Designation: reference No.; ID-No	CU3-adapter SW4/M4 08-48-480/93; H315806
Designation: reference No.; ID-No	CU4-S-adapter DN 25–100 / 1"–4" 08-46-600/93; H320474

5. Auxiliary Equipment

5.3. SW4 variants

For the SW4 valve series, the following designs are available:

- DELTA SW4 – DN 125–150
- DELTA SW4 with manual actuation
- DELTA SWT4 – tank outlet valve
- DELTA SW4 – long stroke version
- DELTA SW4 – DPF (with steam chamber)
- DELTA SWR4 (with modulating cone)

Corresponding instruction manuals are available for the different designs.

6. Cleaning

6.1. Cleaning recommendation

Flow passages

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

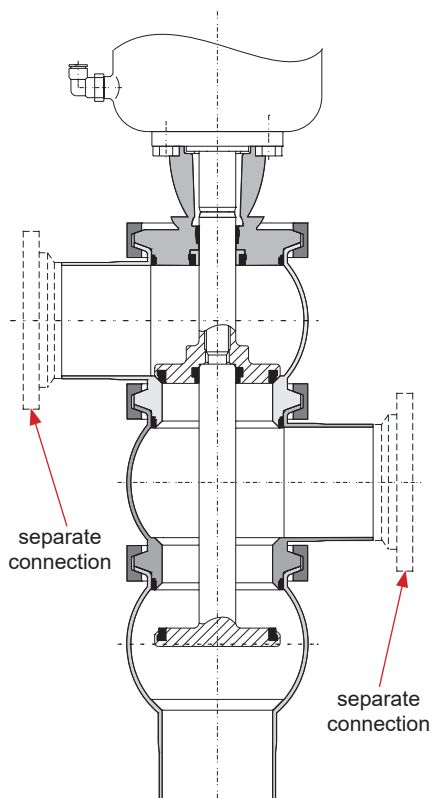
Depending on the degree and substances of soiling, cleaning liquids, times and processes must be scheduled for the individual application.

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

7. Installation

fig. 7

Divert valve



- The installation of the valve must be undertaken in such a manner that fluids can drain off the valve housing and should be provided preferably in vertical position.
- The upper and middle valve housing can be connected with the pipeline in detachable manner through a flange and clamp connection (see fig. 7).
Disassembly of the upper and middle valve housings must be provided. In case of non-compliance, maintenance of the housing and seat seals is not possible.

Attention : Observe welding instructions.
(see chapter 7.2)

7.1. Connections:

Besides the housings with weld ends, the following connections are alternatively available:

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

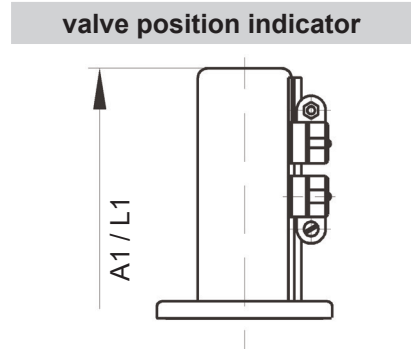
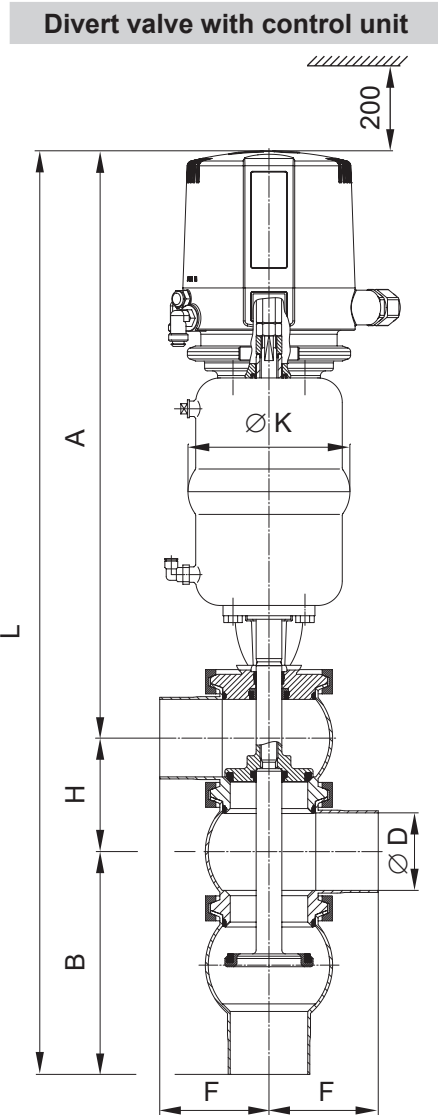
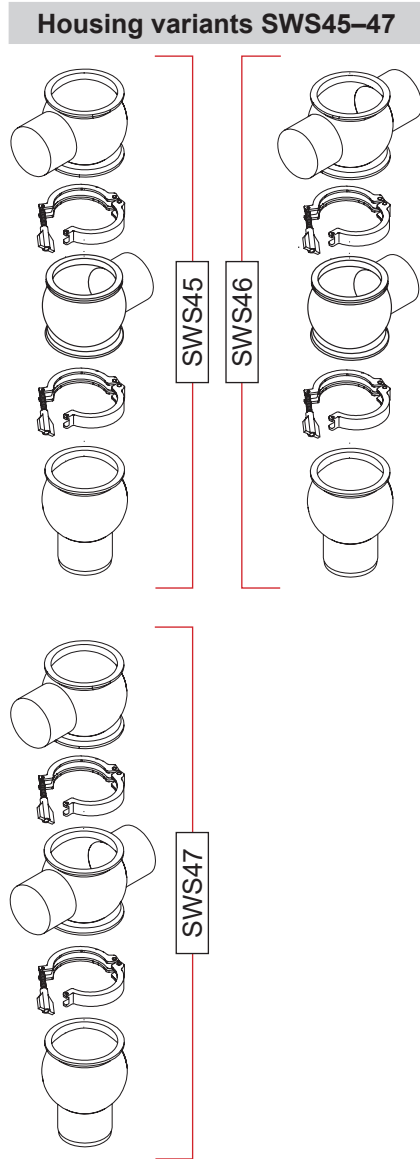
7. Installation

7.2. Welding Instructions

- Before welding of the housing, remove the valve insert from the housing. Dismantle the valve as described in chapter 9. Remove the housing seals from the upper and middle housing. See to a careful handling to avoid damage.
- 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

8.1. SWS4 Divert Valve



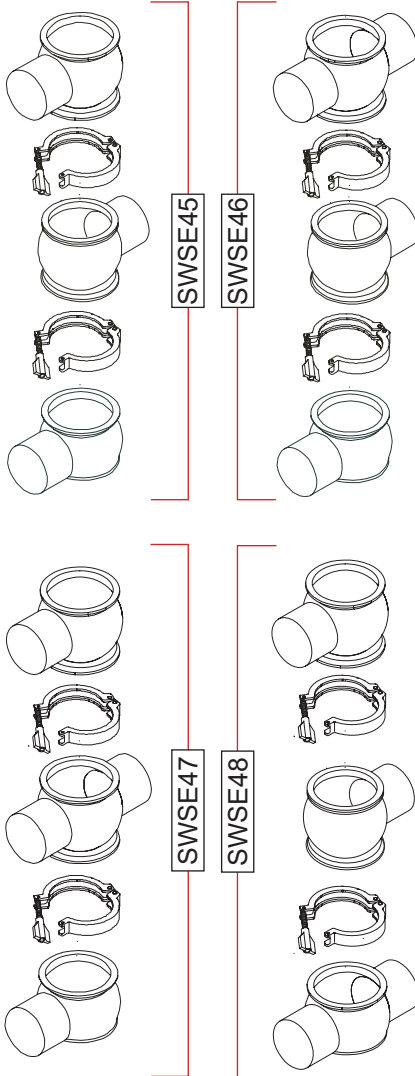
Dimensions in mm

DN	Ø D	A	A1	B	F	Ø K	H	L	L1	Weight in kg
25	26	398	338	104	50	86	54	556	496	7
40	38	402	342	133	67	86	66	601	541	7
50	50	439	379	150	72	126	78	667	607	9
65	66	447	387	179	85	126	94	720	660	9
80	81	500	440	207	98	189	109	816	756	16
100	100	510	450	239	111	189	128	877	817	18
Inch										
1"	22,6	396	336	100,6	50	86	50,6	547,2	487,2	7
1,5"	34,9	400	340	129,9	67	86	62,9	592,8	532,8	7
2"	47,6	438	378	147,6	72	126	75,6	661,2	601,2	9
2,5"	60,3	444	384	173,3	85	126	88,3	705,6	645,6	9
3"	72,9	495	435	190,9	90	189	100,9	786,8	726,8	16
4"	97,6	508	448	236,6	111	189	125,6	870,2	810,2	18

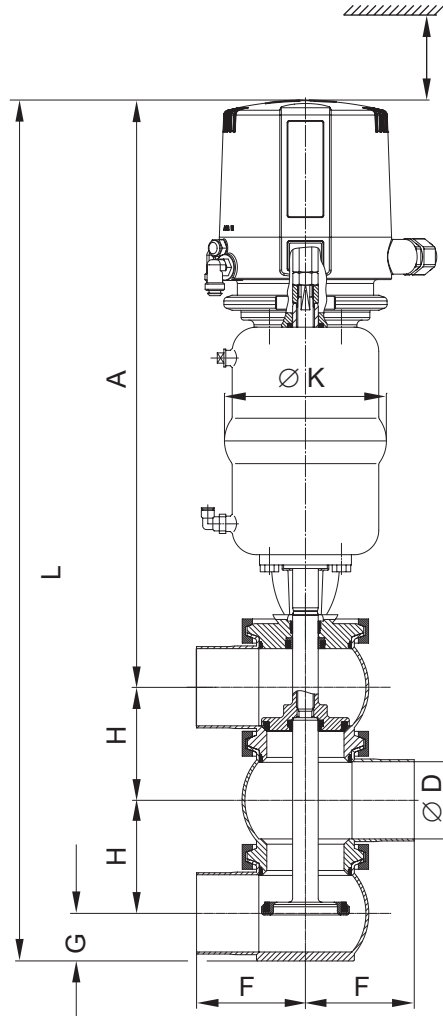
8. Dimensions / Weights

8.2. SWSE4 Divert Valve

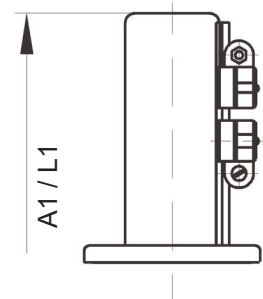
Housing variants SWSE45–48



Divert valve with control unit



valve position indicator



Dimensions in mm

DN	Ø D	A	A1	F	Ø K	G	H	L	L1	Weight in kg
25	26	398	338	50	86	18	54	524	464	7
40	38	402	342	67	86	24	66	558	498	7
50	50	439	379	72	126	32	78	627	567	9
65	66	447	387	85	126	40	94	675	615	9
80	81	500	440	98	189	47,5	109	765,5	705,5	16
100	100	510	450	111	189	57	128	823	763	18
Inch										
1"	22,6	396	336	50	86	16,3	50,6	513,5	453,5	7
1,5"	34,9	400	340	67	86	22,45	62,9	548,25	488,25	7
2"	47,6	438	378	72	126	30,8	75,6	620	560	9
2,5"	60,3	444	384	85	126	37,2	88,3	657,8	597,8	9
3"	72,9	495	435	90	189	43,5	100,9	740,3	680,3	16
4"	97,6	508	448	111	189	55,8	125,6	815	755	18

9. Technical Data

9.1. General Terms

product-wetted parts:	316 L, 1.4404 (DIN EN 10088)
other parts:	1.4301 (DIN EN 10088)
seals:	
standard:	EPDM
option:	FPM, VMQ, HNBR
max. product pressure:	10 bar
max. operating temperature:	135 °C EPDM, HNBR, *FPM, *VMQ
short-term load:	140 °C EPDM, HNBR *FPM, *VMQ *(no steam)
air connection (for hose):	6x 1 mm
max. pneumatic air pressure:	8 bar
min. pneumatic air pressure:	6 bar

9.2. Specification of compressed air quality

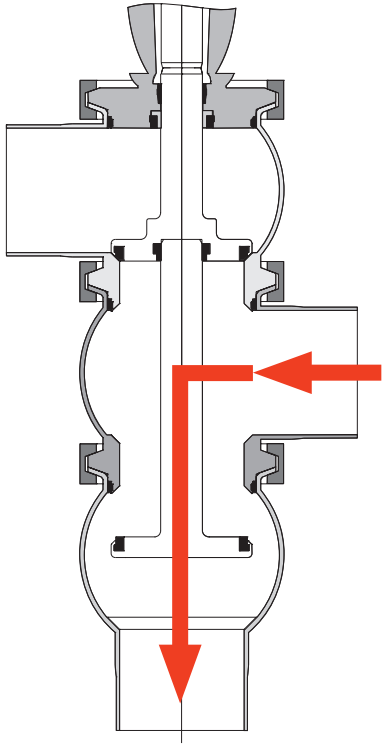
compressed air quality:	quality classe acc. to DIN ISO 8573-1
content of solid particles:	quality class 3 max. size of solid particles per m ³ 10000 of 0,5 µm < d < 1,0 µm 500 of 1,0 µm < d < 5,0 µm
content of water:	quality class 4 max. dew point temperature +3 °C For installations at lower temperatures or at higher altitudes, additional measures must be considered to reduce the pressure dew point accordingly.
content of oil:	Qualitätsklasse 1 max. 0,01 mg/m ³

The oil applied must be compatible with Polyurethane elastomer materials.

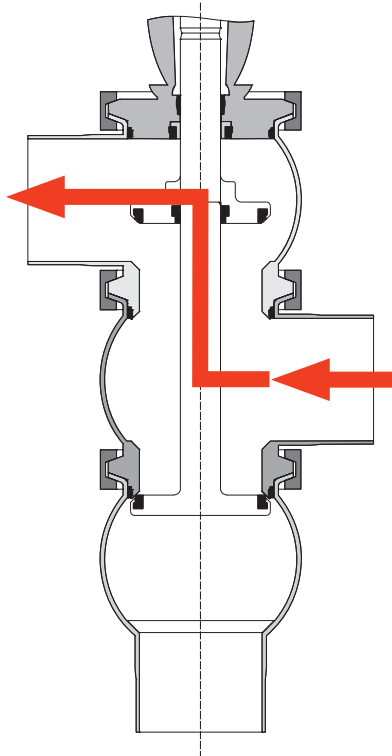
9. Technical Data

9.3. DELTA SWS4 kvs-values in m³/h

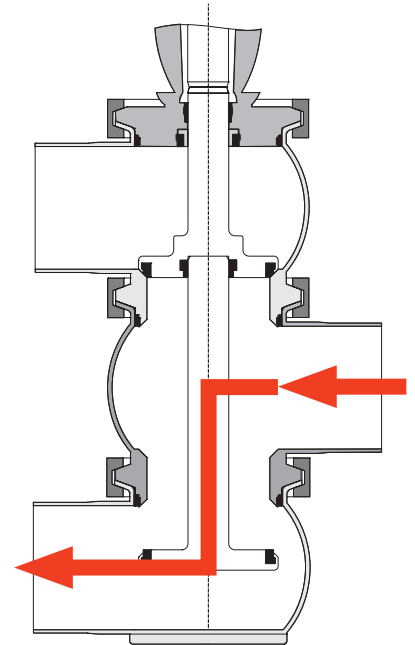
SWS45 NC Divert Valve



SWS45 NO Divert Valve



SWSE45 NC Divert Valve



DN	
25	13
40	32
50	55
65	95
80	150
100	230
Inch	
1"	10
1,5"	29
2"	53
2,5"	82
3"	126
4"	218

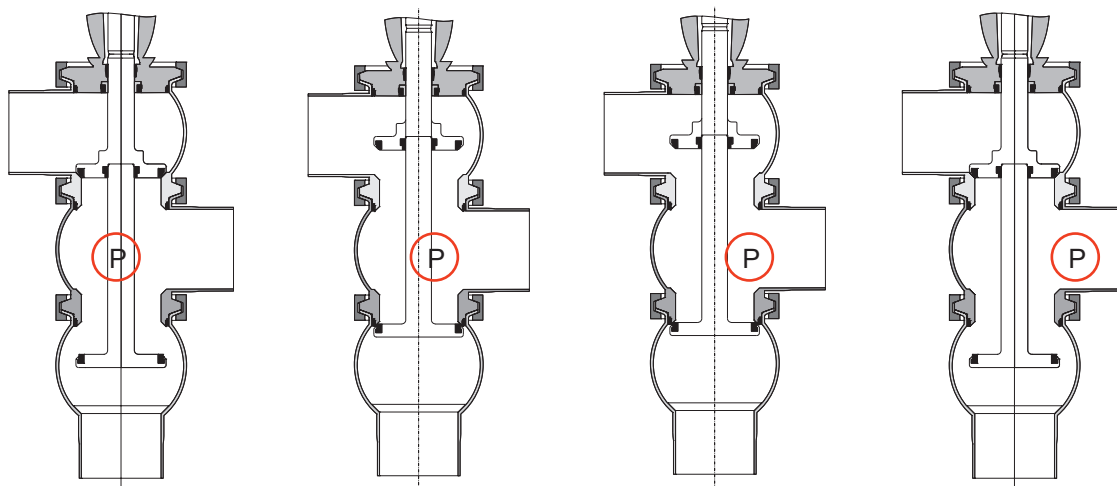
DN	
25	14
40	33
50	58
65	100
80	160
100	245
Inch	
1"	10
1,5"	30
2"	54
2,5"	87
3"	137
4"	225

DN	
25	14
40	33
50	58
65	100
80	160
100	245
Inch	
1"	10
1,5"	30
2"	54
2,5"	87
3"	137
4"	225

9. Technical Data

9.4. DELTA SWS4 calculatory product pressure in bar at 6 bar air pressure

SWS45 NC Divert Valve	SWS45 NC Divert Valve controlled with 6 bar air pressure	SWS45 NO Divert Valve	SWS45 NO Divert Valve controlled with 6 bar air pressure
----------------------------------	---	----------------------------------	---



DN	Zoll	Ø actuator in mm			Ø actuator in mm			Ø actuator in mm			Ø actuator in mm		
		Ø 74	Ø 110	Ø 165	Ø 74	Ø 110	Ø 165	Ø 74	Ø 110	Ø 165	Ø 74	Ø 110	Ø 165
25	1"	11,7			20,3			21,2			11,2		
40	1,5"	5,0	12,5		6,9	14,4		6,0	16,0		5,4	11,2	
50	2"	2,8	7,6	19,6	4,0	8,3	19,5	3,3	8,8	22,8	3,4	7,1	16,8
	2,5"	2,0	5,4	13,8	2,7	5,5	13,1	2,2	6,0	15,3	2,4	5,0	11,9
65		1,7	5,0	11,7	2,2	5,0	10,9	1,8	5,0	12,7	2,0	5,0	10,0
	3"		3,8	9,9		3,8	9,1		4,1	10,6		3,6	8,5
80			3,1	7,9		3,0	7,2		3,3	8,4		2,9	6,8
100	4"		2,1	5,3		2,0	5,0		2,1	5,5		1,9	5,0

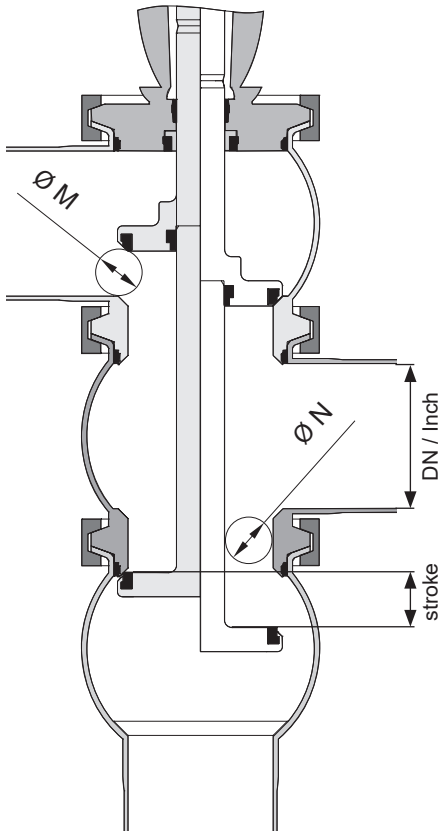
9.5. Closing times for SWS4 divert valves

The opening and closing times of the valves with control unit can be fixed by adjusting the throttle screw at the solenoid valve.

Closing times in sec. control air pressure 6 bar			
		hose length	
DN	Inch	1 m	10 m
25	1"	1	2
40	1,5"	1	2
50	2"	3	4
65	2,5"	3	4
80	3"	5	6
100	4"	5	6

9. Technical Data

fig. 9.6.



9.6. Valve stroke / opening cross section in mm

SWS4 SWSE4 Divert Valve			
DN	stroke	Ø M	Ø N
25	9	4	5,5
40	22	17	9
50	25	20	15
65	25	20	23
80	25	20	30,5
100	25	20	40
Inch			
1"	9	4	5,5
1,5"	22	17	9
2"	25	20	15
2,5"	25	20	23
3"	25	20	30,5
4"	25	20	40

9.7. Control air consumption in normal liter / NI DELTA SWS4 divert valve

Control air consumption in normal liter / NI at 6 bar control air pressure	
actuator Ø 74	1 NI
actuator Ø 110	2,1 NI
actuator Ø 165	4,5 NI

10. Maintenance

- 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
- Assembly tool for seat seal (see chapter 13.)
- Exchange of seals is carried out according to Service Instructions.
A customer stock keeping of spare seals is recommended.
For the valve service 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.

! Slightly grease all seals before their installation!

APV assembly grease for EPDM, HNBR, FPM 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
(0,6 kg/tin - ref.-No. 000 70-01-017/93; H147380)
(60 g/tube - ref.-No. 000 70-01-016/93; H147379)

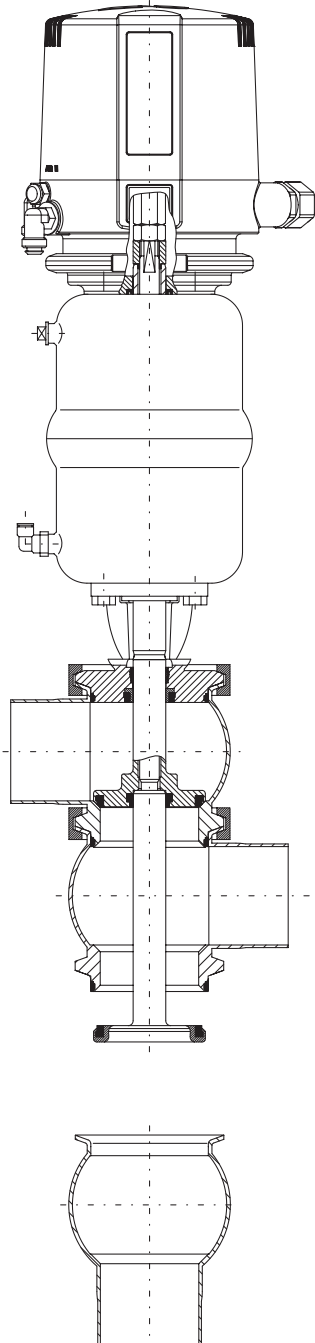
**!!! Do not use grease containing mineral oil for EPDM seals.
!!! Do not use Silicone-based grease for VMQ seals.**

Less suited grease types can influence function and lifetime.

11. Service Instructions - Divert valve

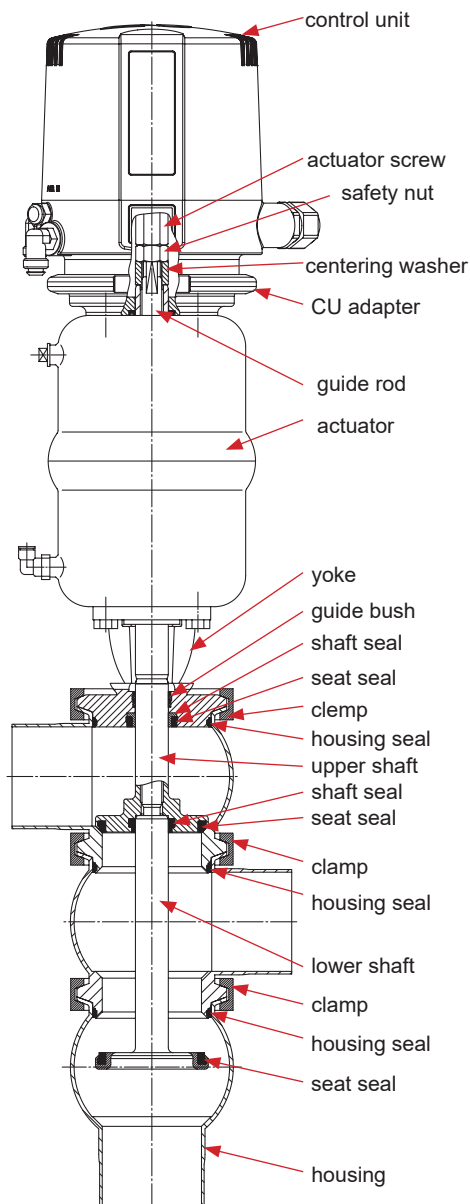
11.1. Dismantling from line system

1. Shut off the line pressure and discharge the lines if possible.
2. Release the separate connections of the upper and middle housing ports and the connected lines.
3. Remove the lower clamp.
4. Take the valve insert together with the upper and middle housing off the lower housing.



11. Service Instructions - Divert Valve

Change-over valve



11.2. Dismantling of product-wetted parts

1. Dismantle the control unit from the actuator. (Turn the ring in anti-clockwise direction). Release the actuator screw from the guide rod. Dismantle the adapter for the control unit.

Attention! **Version NO (FH):**
Control the actuator with air.

2. Unscrew the safety nut while holding up the centering washer. Detach the centering washer.

Attention! **Version NO (FH):**
Cut off compressed air and remove the compressed air supply.

3. Pull the lower shaft with guide rod off the actuator and remove the seat seal.

4. Dismantle the middle clamp and remove the housing seal.

Attention! **Version NC (FS):**
Control the actuator with air.

Dismantle the upper clamp and pull the actuator with yoke and upper shaft off the housing. Remove the housing seal.

Attention! **Version NC (FS):**
Cut off compressed air and remove the compressed air supply.

5. Dismantle the upper shaft from the yoke. Remove the shaft seal and the seat seal.

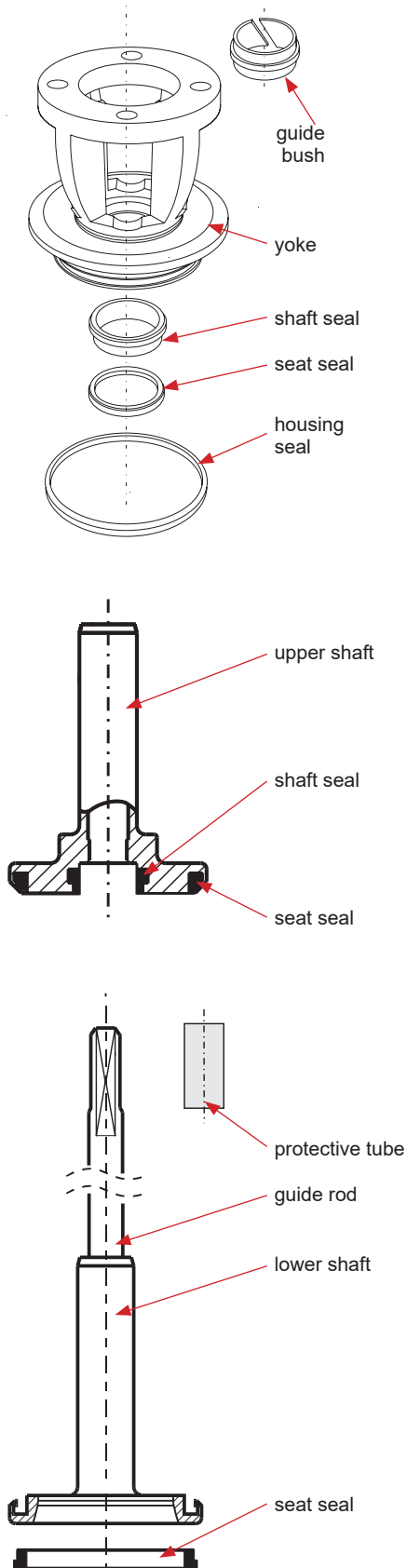
6. Unscrew the yoke from the actuator.

7. Remove the seat seal, shaft seal and guide bush.

Maintenance of actuator, see chapter 12.1.

11. Service Instructions - Divert Valve

11.3. Installation of seals and assembly of valve



1. Insert the guide bush in the yoke. Afterwards insert the shaft seal, push in the slightly greased seat seal.
Observe the correct installing position.
2. Mount the yoke at the actuator.
3. **Installation of shaft and seat seal in the upper shaft**
Slightly grease the seals before its installation. Install the inner shaft seal in the groove. Use the APV assembly tool, see chapter 11, to install the outer seat seal. In case of manual installation, vent the seal groove between the seal and the groove wall with a thin object.
4. **Install the seat seal in the lower shaft**
Use the APV assembly tool, see chapter 11, to install the seat seal. Grease the seat seal only slightly before its installation. In case of manual installation, vent the seal groove between the seal and the groove wall with a thin object.
5. Slightly grease the housing seals and install them in the groove of the yoke and of the upper and middle housing. Fasten the upper housing with the clamp at the middle housing. See to a careful handling to avoid damage to the housing seal.
**Attention! Version NC (FS):
Control actuator with air.**
6. Insert the upper valve shaft in the yoke.
7. Insert the yoke with actuator and upper valve shaft into the upper housing and fasten the assembly with the clamp.
**Attention! Version NC (FS):
Cut off compressed air.**
8. Slide the protective tube over the thread of the guide rod.
Push the lower shaft from the bottom through the middle housing, the upper shaft, yoke and actuator. Remove the protective tube. Place the centering washer and fasten the safety nut. Hold up the safety washer during this process.
Tightening torque: 40 Nm
**Attention! Version NO (FH):
Cut off compressed air and
remove the compressed air supply.**
9. Assemble the adapter for the control unit. Apply a drop of a screw locker (e.g. type: Loctite - semi-solid) in the area of the threaded bore of the actuator screw. Screw the actuator screw on the guide rod.

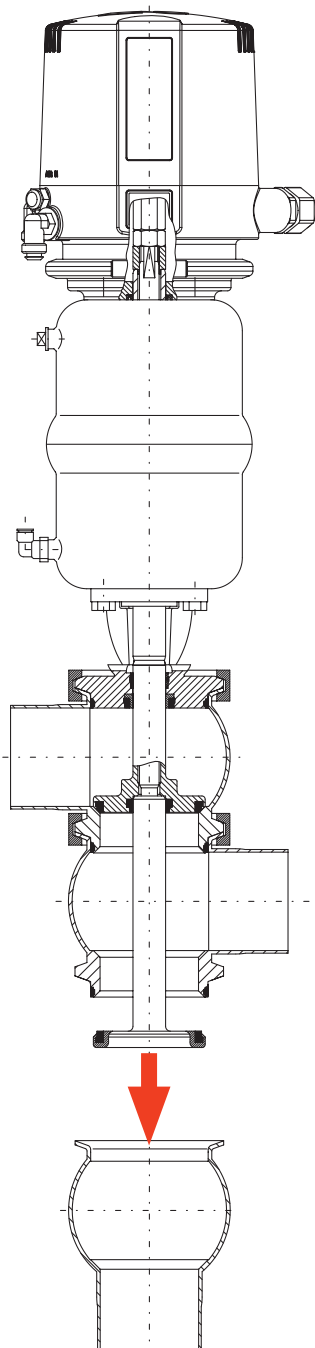
11. Service Instructions - Divert Valve

11.4. Installation of valve

1. Place the control unit on the adapter and secure it with the ring.
2. Connect the compressed air supply.

Carefully place the valve insert in the lower housing and fasten the lower clamp.
The housing seals must not be damaged during the installation..

3. **Check the basic adjustment of the valve position indication.**
Operate the valve by means of the manual actuation.
Control the valve position indication.
- The shift points can be adjusted by turning of the positioning screw in the control unit.



12. Service Instructions - Actuator

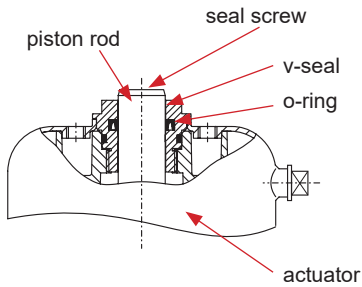
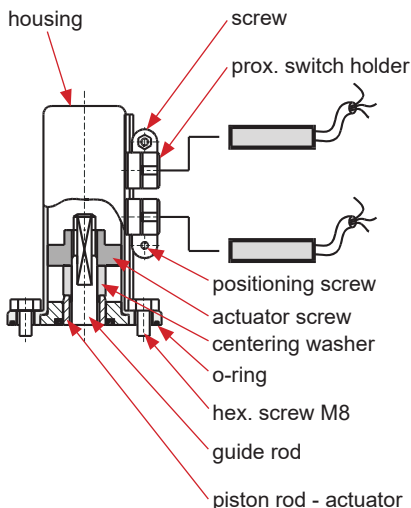
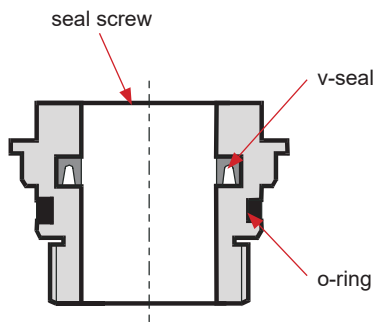


fig. 10.2.



12.1. Maintenance of actuator

1. Remove the air hoses from the actuator.
2. Remove the inner hex. screws from the adapter of the control unit.
3. Unscrew the two seal screws with a wrench SW 30, while holding up the actuator with a strap wrench.

12.2. Installation of seals and assembly of actuator

1. Install the slightly greased o-ring and the v-seals in the seal screws (fig. 10.2).
Observe the correct installing position of the v-seal.
2. Slide the seal screws over the piston rod at both sides of the actuator and fasten them.
3. Fix 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 as well as of the yoke, observe the required valve design FS (NC) or FH (NO)

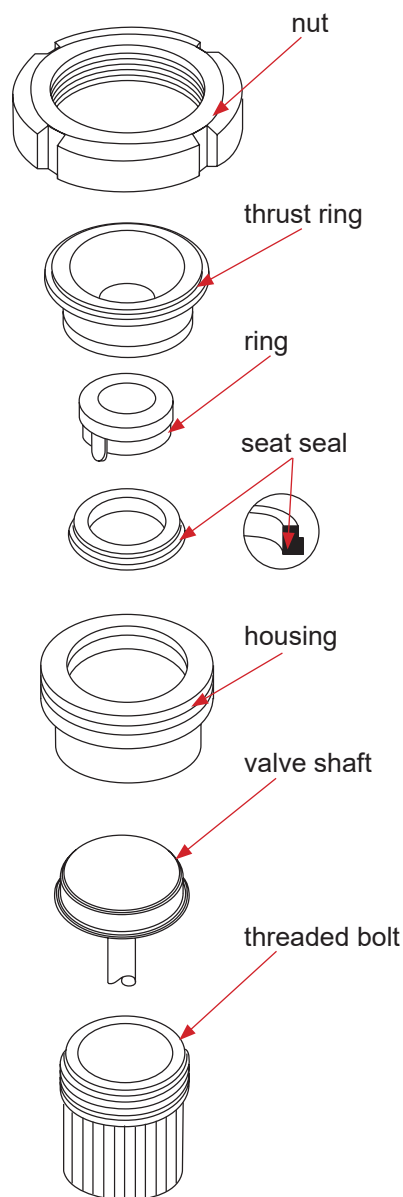
NC: actuator normally closed /
air-to-raise, spring-to-lower
NO: actuator normally open /
air-to-lower, spring-to-raise

4. Fasten the air hoses.

12.3. Actuator with valve position indication Assembly of support

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

13. Assembly Tool



The assembly tool consists of:

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

13.1. Installation of the 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 valve 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. Install the seal on the ring with venting nose until it stops.
4. Introduce 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 stop
6. Release the nut. Take the ring and thrust ring off the housing.
7. Take the housing out of the vice, turn off the threaded bolt. Detach the valve shaft from the housing.

Check the even fit of the seat seal.

13.2. Assembly tool for seat seal

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

DN	Inch	Reference number	ID number
25	1"	000 51-13-110/17	H179465
40	1,5"	000 51-13-111/17	H179466
50	2"	000 51-13-112/17	H179467
	2,5"	000 51-13-120/17	H179468
65		000 51-13-113/17	H179469
	3"	000 51-13-121/17	H179470
80		000 51-13-114/17	H179471
100	4"	000 51-13-115/17	H179472

14. Trouble Shooting

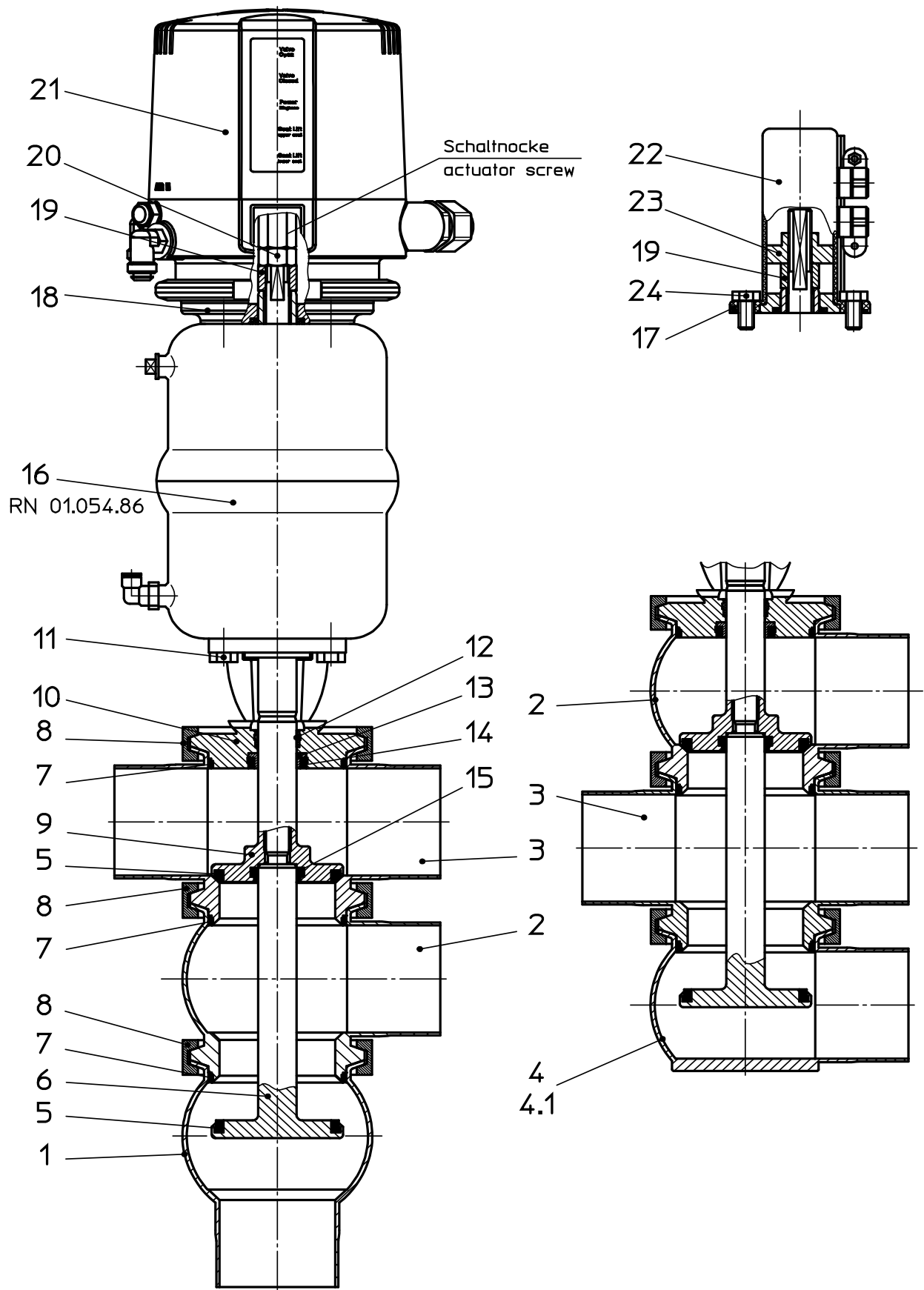
<i>Trouble</i>	<i>Remedy</i>
Valve closed and pressure in upper housing	
Valve is untight.	Replace seat seals. Check line pressure: Permissible line pressure see chapter 7.
Leakage in the area of the clamp.	Replace housing seals.
Leakage at upper shaft in the yoke area.	Replace shaft seal, seat seal and guide bushing.
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 complete actuator.
Valve position indication	
No feedback.	Carry out fine adjustment.

15. 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



Weitergabe sowie Vervielfältigung dieser Unterlage, Verwertung und Mitteilung ihres Inhalts nicht gestattet, soweit nicht schriftlich zugestanden. Versiois verpflichtet zum Schadensersatz und kann strafrechtliche Folgen haben (Paragraph 18 UW/G, Paragraph 106 UrhG). Eigentum und alle Rechte, auch für Patenterteilung und Gebrauchsmustereintragung, vorbehalten. SPX Flow Technology Rosista GmbH.

Datum:	05.11.13	18.09.14	23.03.16								
Name:	Trytko	Trytko	Trytko								
Geprüft:											

Ersatzteilliste: spare parts list

Ventil SWS4, SWSE4 -FS-CU und VSM
Valve SWS4, SWSE4 -FS-CU and PSH
DN25-100 ; 1-4 zoll / inch

APV

SPX Flow Technology Rosista GmbH
D-59425 Unna Germany

Blatt 1 von 7


RN 01.054.819

Weitergabe sowie Vervielfältigung dieser Unterlage, Verwertung und Mitteilung ihres Inhalts nicht gestattet, soweit nicht schriftlich zugestanden. Verstoß verpflichtet zum Schadensersatz und kann strafrechtliche Folgen haben (Paragraf 18 UWG, Paragraf 106 UrhG). Eigentum und alle Rechte, auch für Patentierung und Gebrauchsmustereintragung, vorbehalten. SPX Flow Technology Rosista GmbH.

Ersatzteilliste: spare parts list

**Ventil SWS4, SWSE4 -FS-CU und VSM
Valve SWS4, SWSE4 -FS-CU and PSH
DN25-100 ; 1-4 Zoll / inch**

Datum:	05.11.13	18.09.14	23.03.16
Name:	Trytko	Trytko	Trytko
Geprüft:			
Datum:			
Name:			
Geprüft:			

 SPX Flow Technology Rosista GmbH D-59425 Umma Germany															
												Blatt	2	von	7
												RN 01.054.819			

pos. item	Menge quantity	Beschreibung description	Material	DN25		1"		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.	WS-Nr. ref.-no.	WS-Nr. ref.-no.		
1	1	Kugeling Ball ring	1.4404	15-60-090/47 H311357	15-60-083/47 H311353	15-60-091/47 H311358	15-60-084/47 H311354	15-60-092/47 H311359	15-60-085/47 H207498				
2	1	Gehäuse Oberteil Housing upper	1.4404	15-62-001/47 H168564	15-62-010/47 H168678	15-62-002/47 H171395	15-62-011/47 H171400	15-62-003/47 H168601	15-62-012/47 H168753				
3	1	Gehäuse Oberteil Housing upper	1.4404	15-63-001/47 H172466	15-63-010/47 H172476	15-63-002/47 H172467	15-63-011/47 H172477	15-63-003/47 H172468	15-63-012/47 H172478				
4	1	Gehäuse Unterteil Housing lower	1.4404	15-60-100/47 H172763	15-60-110/47 H172711	15-60-101/47 H172765	15-60-111/47 H172712	15-60-102/47 H172687	15-60-112/47 H172713				
4.1	1	Gehäuse Unterteil Housing lower	1.4404	15-65-281/47 H311363	15-65-306/47 H311367	15-65-381/47 H311364	15-65-406/47 H202852	15-65-431/47 H311365	15-65-456/47 H311368				
	2	Tellerdichtung Seat seal	EPDM FDA-konform	58-33-293/93 H77442	58-33-293/93 H77467	58-33-393/93 H77467	58-33-393/93 H77467	58-33-443/93 H77491					
	2	Tellerdichtung Seat seal	HNBR FDA-Konform	58-33-293/33 H170176	58-33-293/33 H166676	58-33-393/33 H166676	58-33-393/33 H166676	58-33-443/33 H166085					
5	2	Tellerdichtung Seat seal	FPM FDA-konform	58-33-293/73 H77441	58-33-293/73 H77441	58-33-393/73 H77466	58-33-393/73 H77466	58-33-443/73 H77490					
	2	Tellerdichtung Seat seal	VMQ FDA-konform	58-33-293/13 H77440	58-33-293/13 H77440	58-33-393/13 H77465	58-33-393/13 H77465	58-33-443/13 H77489					
6	1	Schaft unten Upper valve shaft	1.4404	15-25-240/42 H316828	15-25-250/42 H314377	15-25-241/42 H316830	15-25-251/42 H316835	15-25-242/42 H316832	15-25-252/42 H316837				
	3	Gehäusedichtung Housing seal	EPDM FDA-konform	58-33-267/93 H136432	58-33-267/93 H172124	58-33-292/93 H77439	58-33-292/93 H77439	58-33-124/93 H170665					
7	3	Gehäusedichtung Housing seal	HNBR FDA-konform	58-33-267/73 H136431	58-33-267/73 H136431	58-33-292/73 H77438	58-33-292/73 H77438	58-33-124/73 H170666					
8	3	Gelenkklemme Clamp	1.4301	42-40-287/12 H126263	42-40-287/12 H126263	42-40-387/12 H126264	42-40-387/12 H126264	42-40-437/12 H126265					
9	1	Schaft oben Upper valve shaft	1.4404	15-25-230/42 H316757	15-25-258/42 H314376	15-25-231/42 H316758	15-25-259/42 H316760	15-25-232/42 H316759	15-25-260/42 H316761				
10	1	Laterne Yoke	1.4404	15-40-960/47 H171382	15-40-960/47 H171382	15-40-961/47 H171383	15-40-961/47 H171383	15-40-962/47 H171384					

Weitergabe sowie Vervielfältigung dieser Unterlage, Verwertung und Mitteilung ihres Inhalts nicht gestattet, soweit nicht schriftlich zugestanden. Verstöß verpflichtet zum Schadensersatz und kann strafrechtliche Folgen haben (Paragraf 18 UWG, Paragraf 106 UrhG). Eigentum und alle Rechte, auch für Patenterteilung und Gebrauchsmustererteilung, vorbehalten. SPX Flow Technology Rosista GmbH.

Ersatzteilliste: spare parts list

**Ventil SWS4, SWSE4 -FS-CU und VSM
Valve SWS4, SWSE4 -FS-CU and PSH
DN25-100 ; 1-4 Zoll / inch**

Datum:	05.11.13	18.09.14	23.03.16
Name:	Trytko	Trytko	Trytko
Geprüft:			
Datum:			
Name:			
Geprüft:			

Blatt 3 von 7	
RN 01.054.819	


 SPX Flow Technology Rosista GmbH D-59425 Umma Germany	
---	--

pos. item	Menge quantity	Beschreibung description	Material	DN25	1"	1,5"	DN50	2"
			material	WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.
11	4	Skt. Schraube Hex. screw DIN EN 24017-A2-70	1.4301					
12	1	Führungsbuchse Bushing	PTFE + 25% Kohle					
13	1	Schafldichtung Shaft seal	Turcon MF6					
14	1	Tellerdichtung Seat seal	EPDM	58-33-293/93 H77442				
	1	Tellerdichtung Seat seal	HNBR	58-33-293/33 H170176				
	1	Tellerdichtung Seat seal	FPM	58-33-293/73 H77441				
	1	Tellerdichtung Seat seal	VMQ	58-33-293/13 H77440				
15	1	Schafldichtung Shaft seal	EPDM					58-33-019/94 H331328
	1	Schafldichtung Shaft seal	HNBR					58-33-019/33 H331339
	1	Schafldichtung Shaft seal	FPM					58-33-019/74 H331338
16	1	Steuerkopf Actuator	1.4301		15-32-050/17 H171378		15-32-051/17 H171379	
17	1	O-Ring O-ring	NBR					58-06-297/83 H173930
18	1	CU4-S-Adapter CU4-S-adapter	PA6.6 GF30 schwarz					08-48-600/93 H320474
19	1	Zentrierscheibe Centering washer.	1.4301					15-28-940/12 H170196
20	1	Skt. Mutter Hex. Nut DIN EN ISO 10511-M12-A2	1.4301					65-50-101/15 H79298
21	1	Control-Unit CU Control-Unit CU	PA6.6 GF30 schwarz					siehe Betriebsanleitung CU see manual CU

Ersatzteilliste: spare parts list

**Ventil SWS4, SWSE4 -FS-CU und VSM
Valve SWS4, SWSE4 -FS-CU and PSH
DN25-100 ; 1-4 Zoll / inch**

Datum:	05.11.13	18.09.14	23.03.16
Name:	Trytko	Trytko	Trytko
Geprüft:			
Datum:			
Name:			
Geprüft:			

	
SPX Flow Technology Rosista GmbH D-59425 Umma Germany	
Blatt	5 von 7
RN 01.054.819	

pos. item	Menge quantity	Beschreibung description	Material	DN65	2.5"	3"	DN80	DN100	4"
				WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.	
1	1	Kugeling Ball ring	1.4404	15-60-043/47 H312999	15-60-086/47 H311355	15-60-087/47 H207499	15-60-044/47 H314632	15-60-045/47 H314645	15-60-088/47 H311356
2	1	Gehäuse Oberteil Housing upper	1.4404	15-62-004/47 H168649	15-62-013/47 H168767	15-62-014/47 H168787	15-62-005/47 H168638	15-62-006/47 H168660	15-62-015/47 H168809
3	1	Gehäuse Oberteil Housing upper	1.4404	15-63-004/47 H172469	15-63-013/47 H172479	15-63-014/47 H172480	15-63-005/47 H172470	15-63-006/47 H172471	15-63-015/47 H172481
4	1	Gehäuse Unterteil Housing lower	1.4404	15-60-103/47 H172688	15-60-113/47 H172714	15-60-114/47 H172715	15-60-104/47 H172689	15-60-105/47 H172690	15-60-115/47 H172716
4.1	1	Gehäuse Unterteil Housing lower	1.4404	15-65-481/47 H201534	15-65-506/47 H207429	15-65-556/47 H311369	15-65-531/47 H201935	15-65-631/47 H311366	15-65-656/47 H3113700
	2	Tellerdichtung Seat seal	EPDM FDA-konform	58-33-493/93 H77515	58-33-109/93 H170662	58-33-568/93 H77561	58-33-543/93 H77546	58-33-643/93 H77586	
	2	Tellerdichtung Seat seal	HNBR FDA-konform	58-33-493/33 H166678	58-33-109/33 H170658	58-33-568/33 H166679	58-33-543/33 H166681	58-33-643/33 H166682	
5	2	Tellerdichtung Seat seal	FPM FDA-konform	58-33-493/73 H77514	58-33-109/73 H170663	58-33-568/73 H77560	58-33-543/73 H77545	58-33-643/73 H77785	
	2	Tellerdichtung Seat seal	VMQ FDA-konform	58-33-493/13 H77513	58-33-109/13 H170664	58-33-568/13 H77559	58-33-543/13 H77544	58-33-643/13 H77584	
6	1	Schaft unten Upper valve shaft	1.4404	15-25-243/42 H312997	15-25-253/42 H201201	15-25-254/47 H201202	15-25-244/42 H314659	15-25-245/42 H314660	15-25-255/42 H316839
	3	Gehäusedichtung Housing seal	EPDM FDA-konform	58-33-442/93 H77488	58-33-125/93 H170667	58-33-126/93 H170669	58-33-492/93 H77512	58-33-127/93 H170671	
7	3	Gehäusedichtung Housing seal	HNBR FDA-konform	58-33-442/33 H168714	58-33-125/33 H170655	58-33-126/33 H170656	58-33-492/73 H168759	58-33-127/33 H170657	
	3	Gehäusedichtung Housing seal	FPM FDA-konform	58-33-442/73 H77487	58-33-125/73 H170668	58-33-126/73 H170670	58-33-492/73 H77511	58-33-127/73 H170672	
8	3	Gelenkklemme Clamp	1.4301	42-40-487/12 H126266	42-40-487/12 H126266	42-40-537/12 H126267	42-40-637/12 H126268	42-40-637/12 H126268	
9	1	Schaft oben Upper valve shaft	1.4404	15-25-233/42 H312994	15-25-261/42 H201111	15-25-262/42 H201109	15-25-234/42 H314657	15-25-235/42 H314658	15-25-263/42 H316762
10	1	Laterne Yoke	1.4404	15-40-963/47 H171385	15-40-964/47 H171388	15-40-965/47 H171389	15-40-966/47 H171386	15-40-967/47 H171387	

Weitergabe sowie Vervielfältigung dieser Unterlage, Verwertung und Mitteilung ihres Inhalts nicht gestattet, soweit nicht schriftlich zugestanden. Verstöß verpflichtet zum Schadensersatz und kann strafrechtliche Folgen haben (Paragraf 18 UWG, Paragraf 106 UrhG). Eigentum und alle Rechte, auch für Patenterteilung und Gebrauchsmustereintragung, vorbehalten. SPX Flow Technology Rosista GmbH.

Ersatzteilliste : spare parts list

**Ventil SWS4, SWSE4 -FS-CU und VSM
Valve SWS4, SWSE4 -FS-CU and PSH
DN25-100 ; 1-4 Zoll / inch**

pos. item	Menge quantity	Beschreibung description	Material	DN65	2,5"	3"	DN80	DN100	Datum:			4"
									WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.	
11	4	Skt. Schraube Hex. screw	1.4301	65-01-081/15 M8x16 H78772	65-01-083/15 M8x20 H78776	3"	DN80	DN100	4"	Trytko	Trytko	Trytko
12	1	Führungsbuchse Bushing	PTFE + 25% Kohle									
13	1	Schafdichtung Shaft seal	Turcon MF6									
14	1	Tellerdichtung Seat seal	EPDM									
	1	Tellerdichtung Seat seal	FDA-konform									
	1	Tellerdichtung Seat seal	HNBR									
	1	Tellerdichtung Seat seal	FPM									
15	1	Tellerdichtung Seat seal	VMQ									
	1	Tellerdichtung Seat seal	FDA-konform									
	1	Schafdichtung Shaft seal	EPDM									
	1	Schafdichtung Shaft seal	FDA-konform									
16	1	Schafdichtung Shaft seal	HNBR									
	1	Schafdichtung Shaft seal	FDA-konform									
	1	Schafdichtung Shaft seal	FPM									
	1	Schafdichtung Shaft seal	FDA-konform									
17	1	Steuerkopf Actuator	1.4301	15-32-051/17 H171379							15-32-052/17 H171380	
18	1	O-Ring O-ring	NBR									
19	1	CU4-S-Adapter CU4-S-adapter	PA6.6 GF30 schwarz									
20	1	Zentrierscheibe Centering washer.	1.4301									
21	1	Skt. Mutter Hex. Nut	1.4301									
21	1	Control-Unit CU	PA6.6 GF30 schwarz									
		Control-Unit CU										siehe Betriebsanleitung CU see manual CU



Blatt 6 von 7
RN 01.054.819

Ersatzteilliste: spare parts list

**Steuerkopf SW4
Actuator SW4**

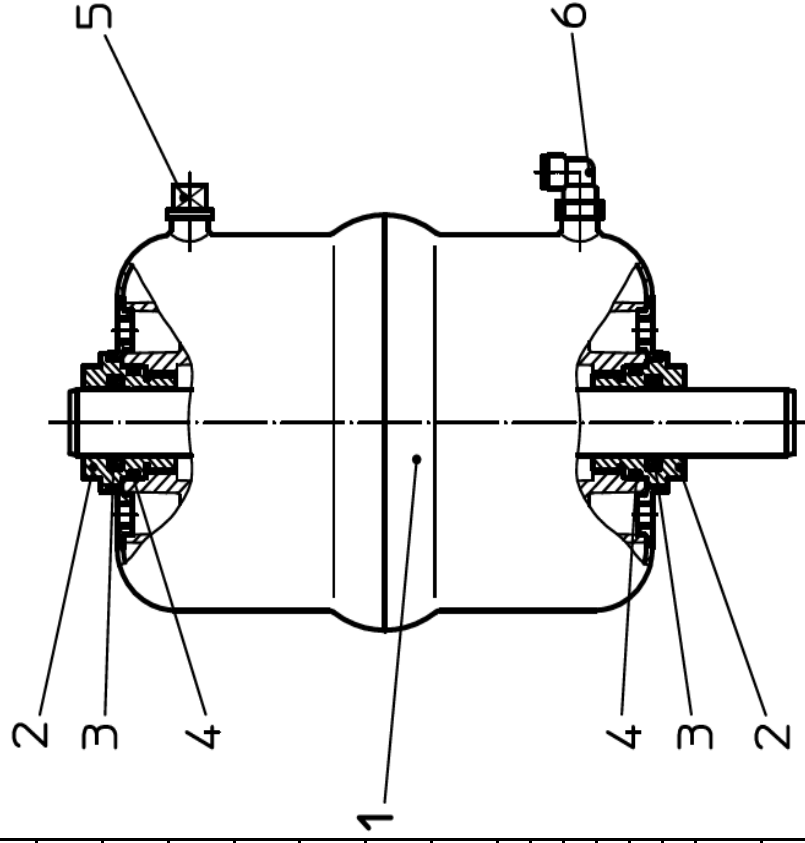
Datum:	11/08	12/09	27.01.15	10.7.17
Name:	Peters	Peters	Trytko	Keil
Geprüft:				



Datum:	Blatt	1	von	1
Name:				
Geprüft:				

RN 01.054.86

pos.	Menge quantity	Beschreibung description	Ø 74	Ø 110	Ø 165
item			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	



APV DELTA SWS4

DIVERT VALVE

SPXFLOW

SPX FLOW

Design Center

Gottlieb-Daimler-Straße 13
D-59439 Holzwickede, Germany
P: (+49) (0) 2301-9186-0
F: (+49) (0) 2301-9186-300

SPX FLOW

Production

Stanisława Jana Rolbieskiego 2
PL- Bydgoszcz 85-862, Poland
P: (+48) 52 566 76 00
F: (+48) 52 525 99 09

SPX FLOW reserves the right to incorporate the latest design and material changes without notice or obligation.

Design features, materials of construction and dimensional data, as described in this manual, are provided for your information only and should not be relied upon unless confirmed in writing. Please contact your local sales representative for product availability in your region. For more information visit www.spxflow.com.

ISSUED 01/2017 - Translation of Original Manual

COPYRIGHT ©2017 SPX FLOW, Inc.