

APV DELTA SW4 DN25-100, 1"-4"

SINGLE SEAT AND CHANGE-OVER VALVE

SAFETY AGAINST EXPLOSION - FOR SPECIFIC ATEX-APPLICATIONS



FORM NO.: H330045 REVISION: UK-0-ATEX

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



Scan for SW4 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 single seat valves of the series SW4 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.

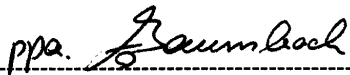
The conformity of the valves is guaranteed.

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

Authorised person for the documentation:
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November 2017



Frank Baumbach
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 Spare parts list DN and Inch design Actuator SW4	 RN ATEX 054.805 RN 01.054.86

1. General Terms

This instruction manual applies for DELTA SW4 single seat and change-over 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).



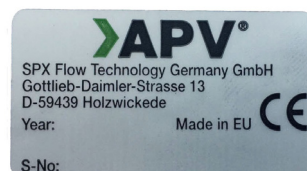
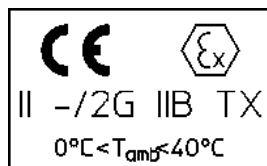
Conductive connection to the pipeline must be provided. The integration into the internal potential equalisation must be guaranteed!

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

$$0^{\circ}\text{C} \leq T_{\text{amb}} \leq 40^{\circ}\text{C}$$

- Temperature classes TX (according to table 3.2)

3.2. Temperature classes and permissible temperatures

Media temperature	$\leq 75^{\circ}\text{C}$	$\leq 95^{\circ}\text{C}$	$\leq 130^{\circ}\text{C}$	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 Responsibilities

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 SW4 single seat and change-over valves 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.

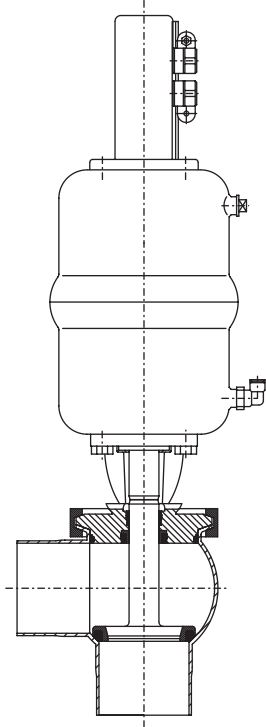
Authorizations and External Evaluations

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

Single seat valve



5.1. General terms

Single seat and change-over valves DELTA SW4 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 SW4 valve is to shut off and to change over line sections.

- 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.
- The SW4 valve is equipped with a valve position indicator.

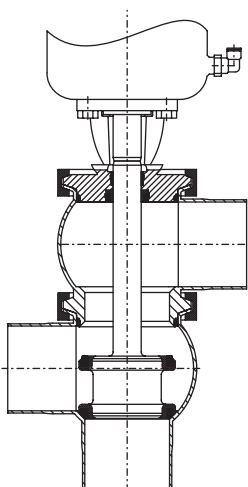
The proximity switches to signal the final position of the valve disc can be mounted to the proximity switch holder (PSH).



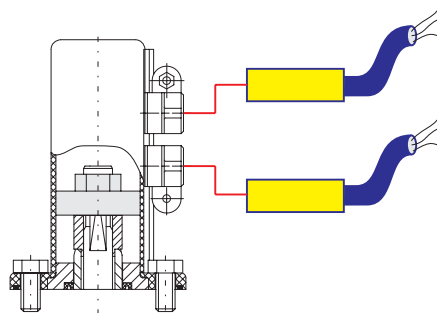
The use of valve position indicators which are approved for the application in explosive atmosphere is compulsory.

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

Change-over valve



Valve position indication



6. Cleaning

6.1. Cleaning recommendation

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

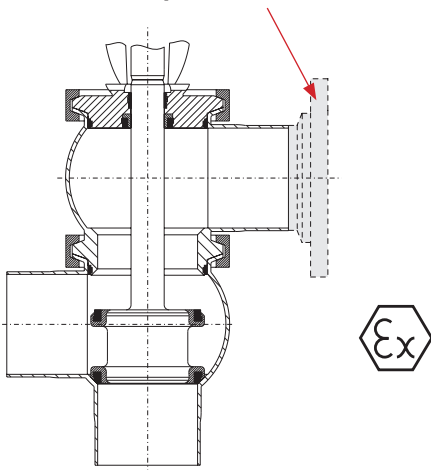
7.1. General terms

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

fig. 7.

Change-over valve

Separate connection



- **Single seat valve:**

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

- **Change-over valve:**

The upper housing is connected with the pipeline via a flange or clamp connection in detachable manner (see fig. 7.).

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

Shut-off valve:

- Before welding of the valve, the valve insert must be dismantled from the housing. Careful handling to avoid damage to the parts is necessary.

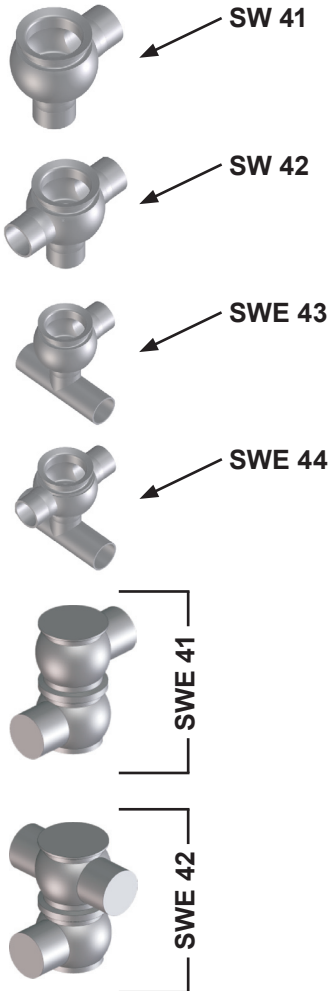
Change-over valve:

- Before welding of the valves, the valve insert must be dismantled from the housing. The lower housing seal must be removed. 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.

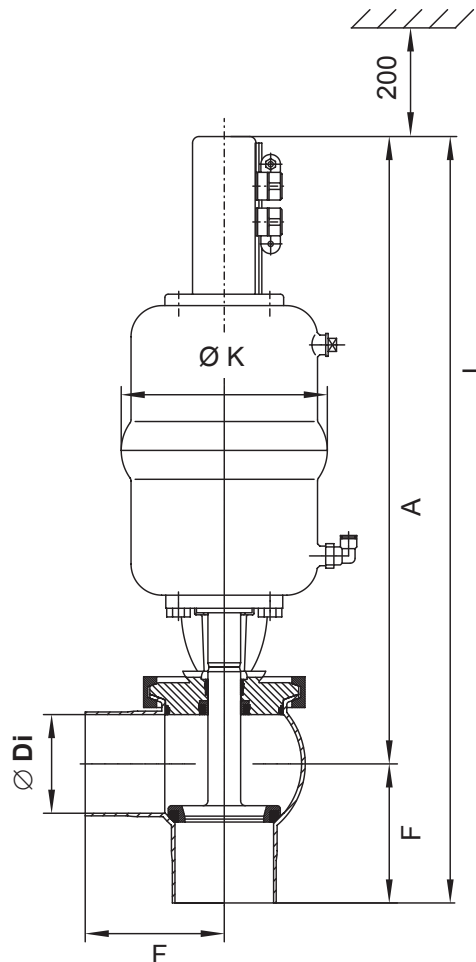
8. Dimensions / Weights

8.1. Single seat valve

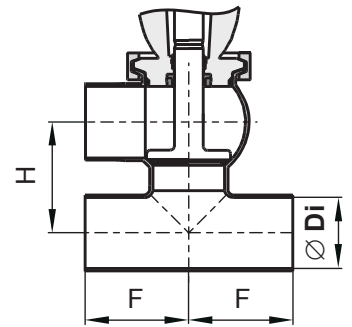
Housing variants



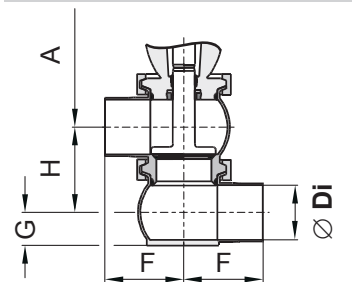
Single seat valve with valve position indication



SWE 43/44



SWE 41/42

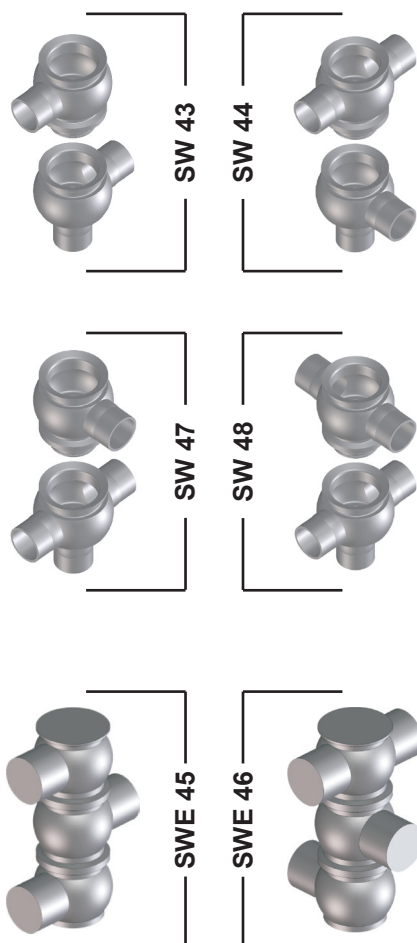


Dimensions in mm								Weights in kg
DN	A	L	Ø Di	F	Ø G	H	Ø K	
25	338	388	26	50	18	54	86	5
40	342	409	38	67	24	66	86	5
50	379	451	50	72	32	78	126	7
65	387	472	66	85	40	94	126	7
80	440	438	81	98	47,5	109	189	13
100	450	561	100	111	57	128	189	15
Inch								
1"	336	386	22,6	50	16,3	50,6	86	5
1,5"	340	407	34,9	67	22,4	62,9	86	5
2"	378	450	47,6	72	30,8	75,6	126	7
2,5"	384	469	60,3	85	37,2	88,3	126	7
3"	435	525	72,9	90	43,5	100,9	189	13
4"	448	559	97,6	111	55,8	125,6	189	15

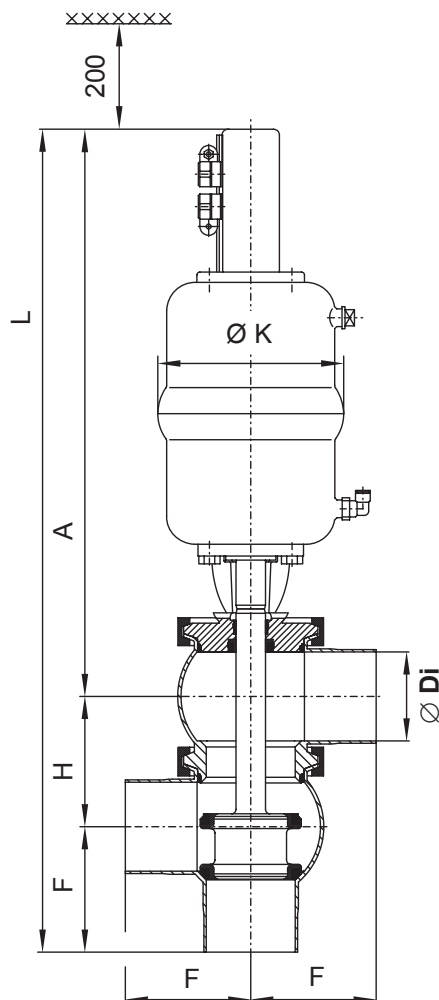
8. Dimensions / Weights

8.2. Change-over valve

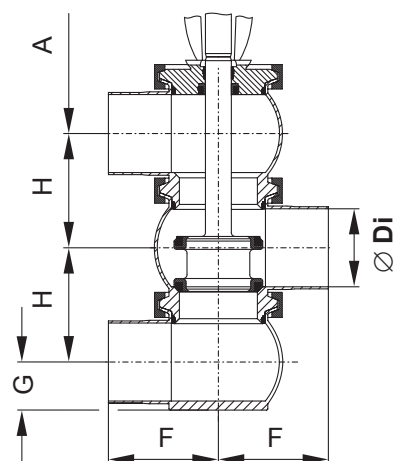
Housing variants



Change-over valve with valve position indication



SWE 45/46



Dimensions in mm								Weight in kg
DN	A	L	Ø Di	F	Ø G	H	Ø K	
25	338	442	26	50	18	54	86	6
40	342	475	38	67	24	66	86	6
50	379	529	50	72	32	78	126	8
65	387	566	66	85	40	94	126	8
80	440	647	81	98	47,5	109	189	15
100	450	689	100	111	57	128	189	17
Inch								
1"	336	437	22,6	50	16,3	50,6	86	6
1,5"	340	470	34,9	67	22,4	62,9	86	6
2"	378	526	47,6	72	30,8	75,6	126	8
2,5"	384	557	60,3	85	37,2	88,3	126	8
3"	435	626	72,9	90	43,5	100,9	189	15
4"	448	685	97,6	111	55,8	125,6	189	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, HNBR
- Max. line pressure: 10 bar
- Operating pressure: depending on actuator
- see pos. 10.6
- 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
- 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 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 mg/m³

The oil applied must be compatible with Polyurethane elastomer materials.

9. Technical Data

9.3. Closing times for single seat and change-over valves

		closing times in sec pneumatic air pressure 6bar	
		hose length 1 m	
DN	Inch	1m	10m
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. Valve stroke SW4

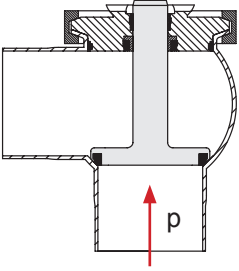
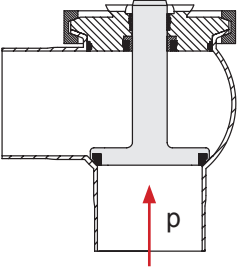
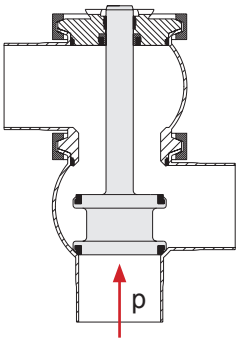
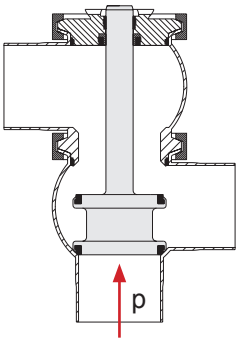
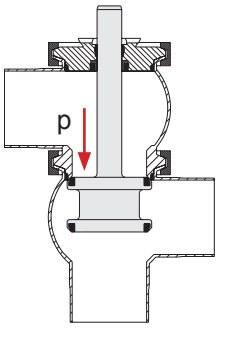
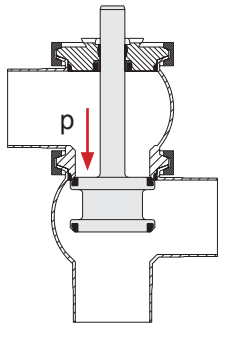
DN	Inch	Single seat valve SW 41, SW 42 SWE41, 42, 43, 44	Change-over valve SW43, SW44 SWE45, 46
25	1"	12	9
40	1,5"	25	22
50	2"	28	25
65	2,5"	28	25
80	3"	28	25
100	4"	28	25

9.5. Pneumatic air consumption at 6 bar control pressure

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

9. Technical Data

9.6. DELTA SW4 calculatory product pressures in (bar) at 6 bar pneumatic air pressure

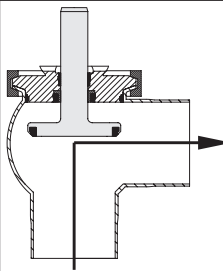
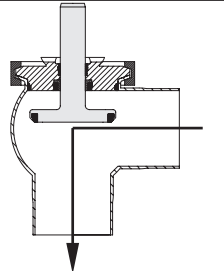
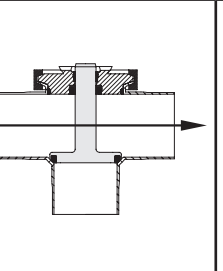
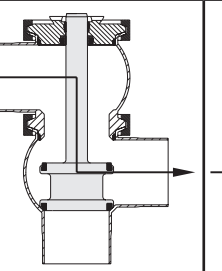
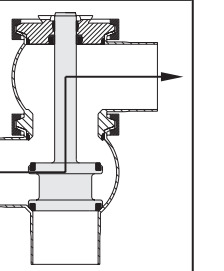
		Single seat valve SW41 NC			Single seat valve SW41 NO with 6 bar air pressure								
													
		Change-over valve SW43 NC lower seat			Change-over valve SW43 NO with 6 bar air pressure			Change-over valve SW43 NC upper seat with 6 bar air pressure			Change-over valve SW43 NO upper seat		
													
		Ø Actuator in mm			Ø Actuator in mm			Ø Actuator in mm			Ø Actuator in mm		
DN	Inch	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			11,2			20,3			21,2		
40	1,5"	5,0	12,5		5,4	11,2		6,9	14,4		6,0	16,0	
50	2"	2,8	7,6	19,6	3,4	7,1	16,8	4,0	8,3	19,5	3,3	8,8	22,8
	2,5"	2,0	5,4	13,8	2,4	5,0	11,9	2,7	5,5	13,1	2,2	6,0	15,3
65		1,7	5,0	11,7	2,0	5,0	10,0	2,2	5,0	10,9	1,8	5,0	12,7
	3"		3,8	9,9		3,6	8,5		3,8	9,1		4,1	10,6
80			3,1	7,9		2,9	6,8		3,0	7,2		3,3	8,4
100	4"		2,1	5,3		1,9	5,0		2,0	5,0		2,1	5,5



standard actuator

9. Technical Data

9.7. DELTA SW4 kvs values in m³/h

	SW41, 42 SWE41, 42 SWE43, 44	SW41, 42 SWE41, 42 SWE43, 44	SW42 SWE42 SW44	SW43, 44 SW47, 48	SW43, 44 SW47, 48
					
DN					
25	20	21	28	14	13
40	45	53	60	33	31
50	92	85	120	58	51
65	159	159	215	100	89
80	201	209	650	160	137
100	302	325	540	245	212
Inch					
1"	16	18	26	10	10
1,5"	38	45	57	30	28
2"	83	77	118	54	49
2,5"	133	133	185	87	76
3"	176	176	300	137	114
4"	292	310	530	225	210

10. Maintenance

Scan for SW4 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
- 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

SW4 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 - Single seat valve

Corresponding spare parts

see Spare parts list RN ATEX 054.805.

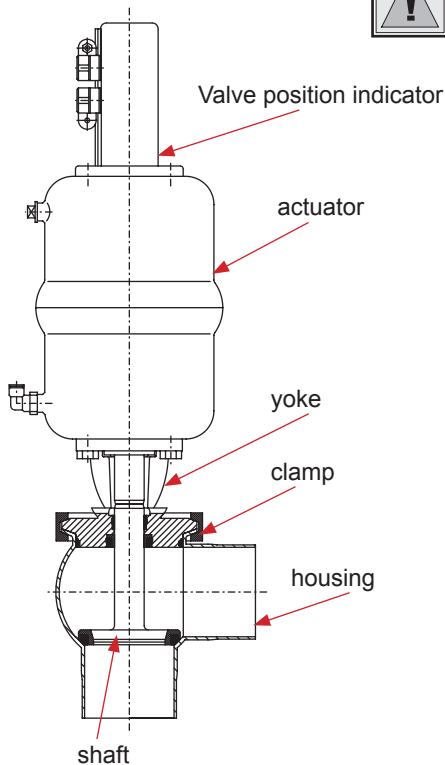
11.1. Dismantling from line system



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

Single seat valve



2. **Valve design NC:** Control actuator with air.

Do not touch movable parts!
Risk of injury.

3. Detach clamp and lift valve insert off the housing.
4. Shut off compressed air and remove compressed air supply.
5. Remove valve position indicator.

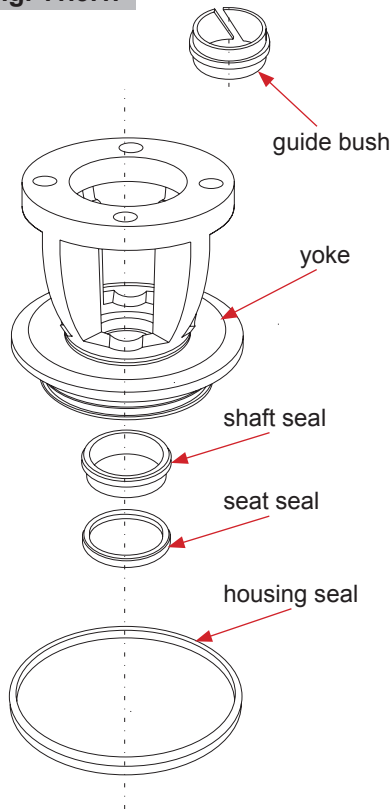
11.2. Dismantling of wear parts (product-wetted parts)

1. Remove housing seal.
2. Release actuator screw from the guide rod while holding up the centering washer. Remove the centering washer.
3. Pull the valve shaft out of the actuator. Remove the seat seal.
4. Unscrew the yoke from the actuator.
5. Detach the seat seal, shaft seal and guide bush.

11. Service Instructions - Single seat valve

11.3. Installation of seals and Assembly of valve

fig. 11.3.1.



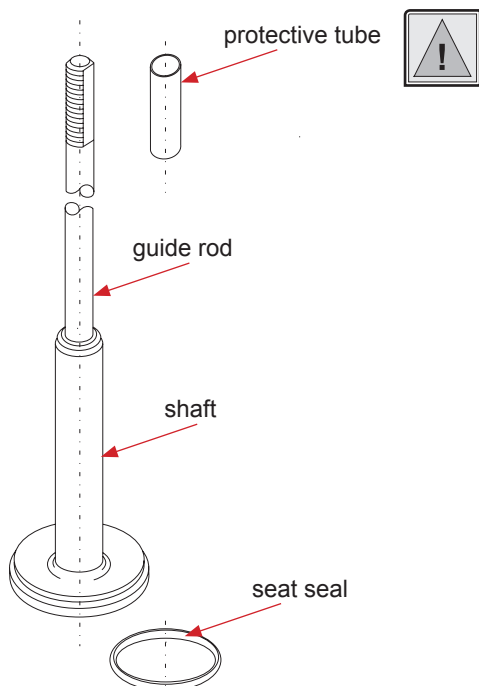
1. Insert the guide bush into the yoke.
Afterwards, insert the shaft seal and press in the slightly greased seat seal (see fig. 11.3.1.).
See to the correct installing position.
2. Install the yoke at the actuator.
3. Insert the seat seal into the shaft. Use the assembly tool to install the seat seal (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. Remove the protective tube. 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 and fasten the clamp.
The housing seal must not be damaged during the installation.
4. **Valve design NC:** Shut off compressed air.
5. Check the basic adjustment of the valve position indication if necessary.

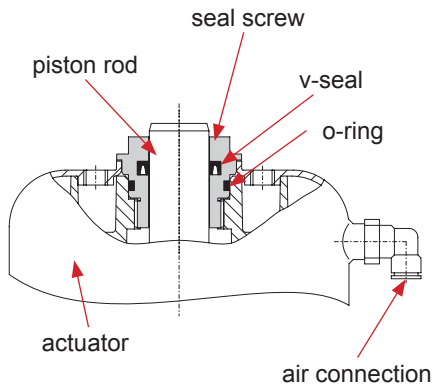


12. Service Instructions - Actuator

Corresponding spare parts

see Spare parts list RN 01.054.86.

fig. 12.1.



12.1. Maintenance of actuator (fig. 12.1.)

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.

12.2. Installation of seals and Assembly of Actuator

1. Install the greased o-rings and v-seals in the seal screws (fig. 12.2). 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. 12.2.

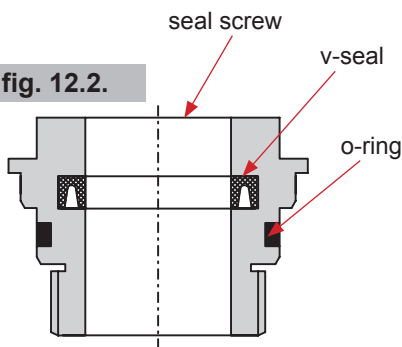
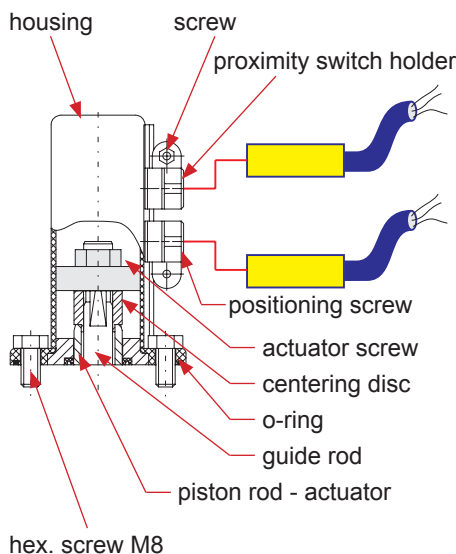


fig. 12.3.



12.3. Actuator with valve position indicator Assembly of holders (fig. 12.3.)

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.

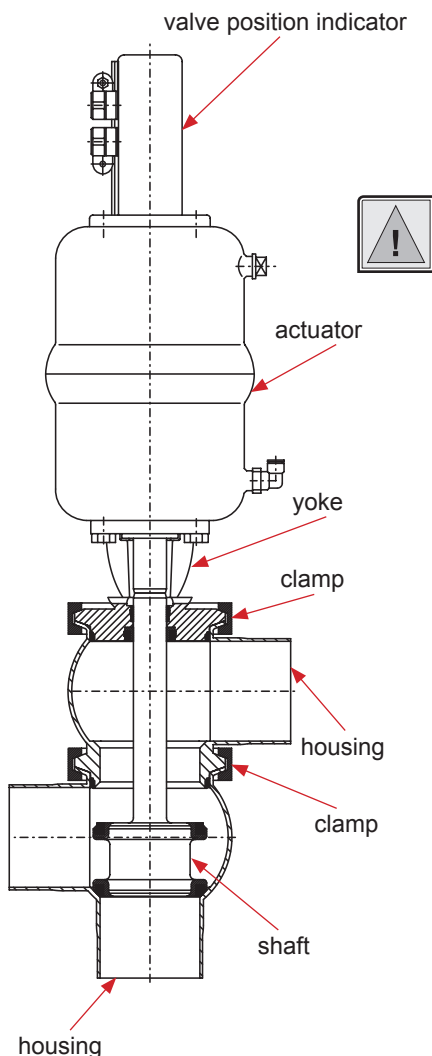
13. Service Instructions - Change-over valve

Corresponding spare parts
see Spare parts list RN ATEX 054.805.

13.1. Dismantling from the line system



Change-over valve



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. Release connection between the upper housing globe and the connected line.
3. **Valve design NC:** Control actuator with air.

Do not touch movable valve parts!
Risk of injury.

4. Remove the lower clamp.
5. Lift the valve insert together with the upper housing off the lower housing.
6. **Attention:** **Valve design NC:**
Shut off compressed air and remove compressed air supply.
7. Remove the valve position indicator.

13.2. Dismantling of product-wetted parts

1. **Attention:** **Valve design NO:**
Control valve with compressed air.

2. Unscrew the actuator screw while holding up the centering washer. Remove the centering washer.

- **Attention:** **Valve design NO:**
Shut off valve with compressed air.

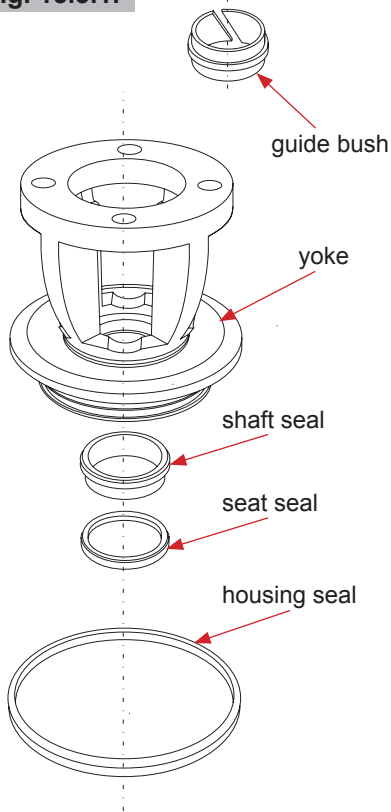
3. Take the shaft out of the actuator and remove the seat seals.
4. Detach the upper clamp and upper housing.
Remove the two housing seals.
5. Unscrew the yoke from the actuator.
6. Take off seat seals, shaft seal and guide bush.

Service of actuator, see paragraph 12.1.

13. Service Instructions - Change-over valve

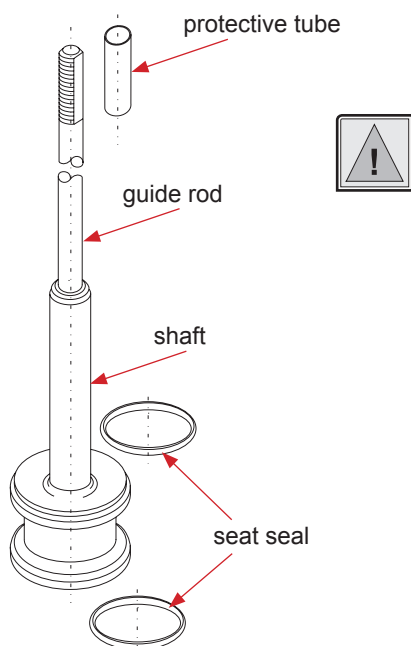
13.3. Installation of seals and Assembly of valve

fig. 13.3.1.



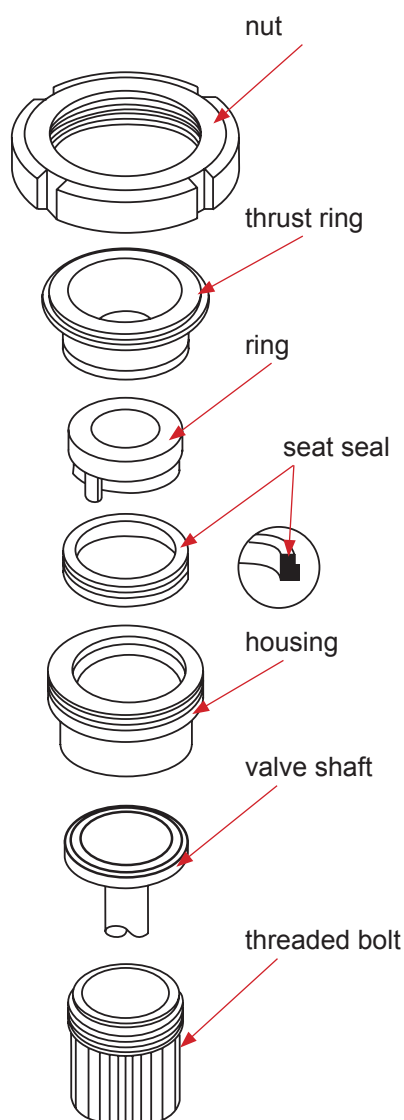
1. Insert the guide bush into the yoke. Then place the shaft seal and press in the slightly greased seat seal. (see fig. 13.3.1.). **See to the correct installing position.**
 2. Install the yoke at the actuator.
 3. Insert the seat seal in the shaft. Use the APV assembly tool to install the seat seal, see chapter 14. Grease the seat seal only slightly before its installation. In case of manual installation, vent the seal groove with a thin object between seal and groove wall.
 4. Slightly grease the housing seals and install them in the grooves of the yoke and of the upper housing. Fasten the upper housing at the yoke by means of the clamp.
- Attention: Valve design NO: Control the valve with air.**
5. Slide the protective tube over the thread of the guide rod. Slide the shaft through the upper housing, yoke and actuator. Remove the protective tube. Place the centering washer and tighten the actuator screw on the guide rod. Hold up the centering washer during this process. **Tightening torque 40 Nm.**
 6. **Attention: Valve design NO: Shut off compressed air.**
 7. Fasten the valve position indicator.

13.4. 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 lower housing and fasten the lower clamp. The housing seals must not be damaged during the installation.
 4. **Valve design NC:** Shut off compressed air.
 5. Check the basic adjustment of the valve position indicator if necessary.

14. Assembly Tool



The assembly tool consists of:

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

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.
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:

14.1. Assembly tool for seat seal			
DN	Inch	Reference No.	ID No.
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

15. Reconstruction of Actuator

With SW4 valves, the size of the actuator can be changed.

Observe the respective line pressure, see table 10.6, to increase or decrease the actuator sizes (Ø 74 mm, Ø 110 mm, Ø 165 mm).

15.1. Reconstruction of actuator

Disassembly

Disassembly is carried out as described in chapter 11. for single seat valves and in chapter 13. for change-over valves.

To change the actuator size, the respective guide rod (4) 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.

15.2. 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.

16. Trouble Shooting

Failure	Remedy
Valve closed and pressure in upper housing	
Valve is untight.	Replace seat seals. Check line pressure: Permissible line pressure see chapter 9.
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 bush.
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.

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:

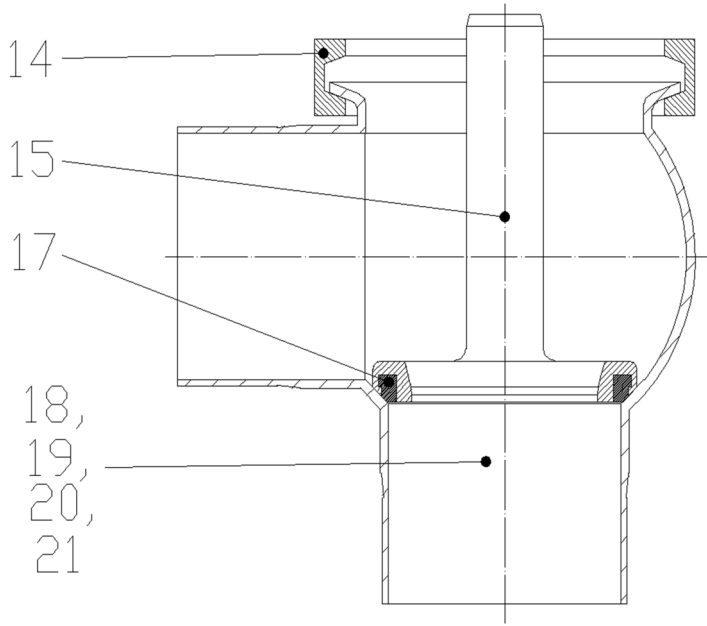
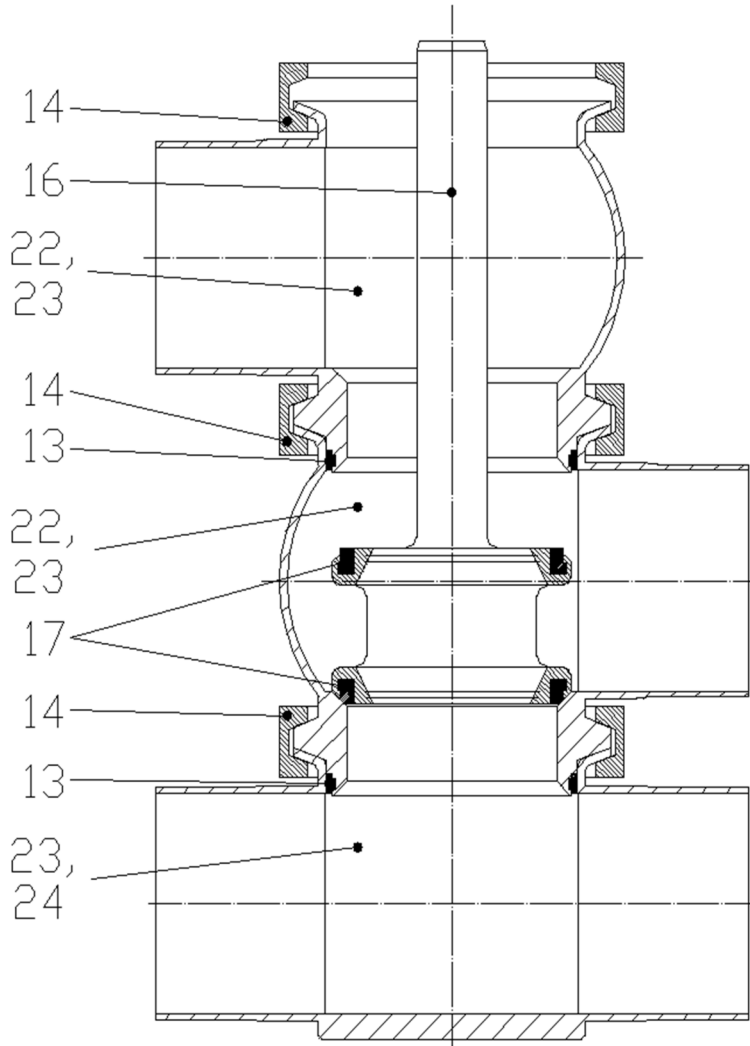
- number of required parts
- reference number
- designation

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Ersatzteilliste: spare parts list

Ventil SW4, SWE4 mit VSM, DN 25 - 100 ; 1 " - 4" - Ex II -/2G IIB TX
Valve SW4, SWE4 with VSM, DN 25 - 100; 1" - 4" - Ex II -/2G IIB TX

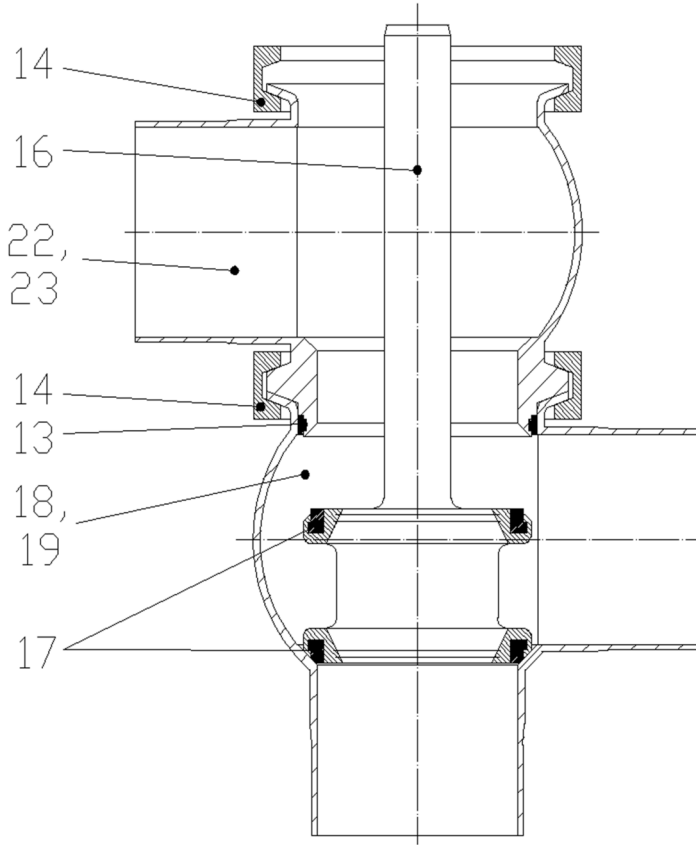
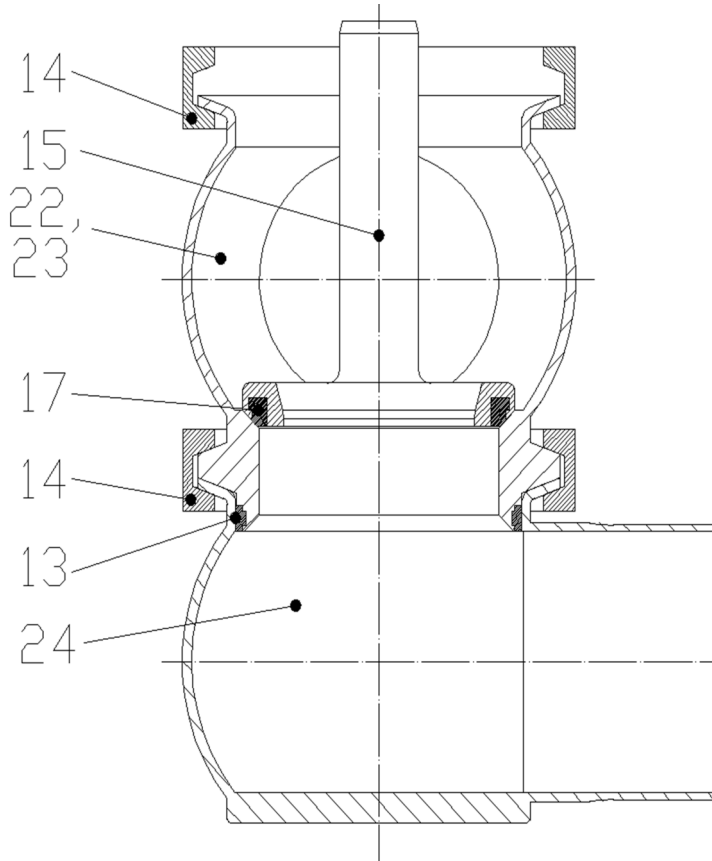
Datum: 09/12		Blatt 2 von 11	
Name: RAP		RN ATEX 054.805	
Geprüft:			
Datum:			
Name:			
Geprüft:			



Ersatzteilliste: spare parts list

Ventil SW4, SWE4 mit VSM, DN 25 - 100 ; 1 " - 4" - Ex II -/2G IIB TX
Valve SW4, SWE4 with VSM, DN 25 - 100; 1" - 4" - Ex II -/2G IIB TX

		SPX Flow Technology Rosista GmbH D-59425 Umma Germany	
Datum:	09/12	Blatt	3
Name:	RAP	von	11
Geprüft:		RN ATEX 054.805	



SW43
Pos. 22, 18



SW44
Pos. 23, 18



SW47
Pos. 22, 19



SW48
Pos. 23, 19



SWE41
Pos. 22, 24



SWE42
Pos. 23, 24



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Ersatzteilliste: spare parts list

Ventil SW4, SWE4 mit VSM, DN 25 - 100 ; 1 "- 4" - Ex II -/2G IIB TX
Valve SW4, SWE4 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"
			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.
1	1	VSM Gehäuse-SW4 Proximity switch holder housing SW4	VESTAMID			15-33-932/93 H173931			
2	1	Schaltnocke Operating cam	1.4523	08-52-290/97 H173086			08-52-291/97 H173087		
3	1	Zentrierscheibe Centering nut	1.4301				15-28-940/12 H170196		
4	4	Skt. Schraube Hex. Screw	A2-70			65-01-081/15 H78772			
5	1	O-Ring O-ring	NBR			58-06-297/83 H173930			
6	1	Steuerkopf Actuator		15-32-050/17 H171378			----- -----		
	1	Steuerkopf Actuator		----- -----				15-32-051/17 H171379	
7	1	Laterne Yoke	1.4404	15-40-960/47 H171382		15-40-961/47 H171383		15-40-962/47 H171384	
8	4	Skt. Schraube Hex. Screw	A2-70			65-01-081/15 H78772			
9	1	Zugstange Guide rod	1.4305	15-23-850/12 H171061				15-23-851/12 H171062	
10	1	Führungsbuchse Bushing	PTFE + 25% Kohle			08-01-178/23 H207154			
11	1	Schaftdichtung Shaft seal	Turcon MF6			58-33-150/26 H323082			
12	1	Tellerdichtung Seat seal	VQM			58-33-293/13 H77440			
	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			

Datum:	09/12				
Name:	RAP				
Geprüft:					

Datum:					11
Name:					
Geprüft:					

RN ATEX 054.805



Ersatzteilliste: spare parts list

Ventil SW4, SWE4 mit VSM, DN 25 - 100 ; 1 "- 4" - Ex II -/2G IIB TX
Valve SW4, SWE4 with VSM, DN 25 - 100; 1" - 4" - Ex II -/2G IIB TX

Ersatzteilliste: spare parts list

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RN ATEX 054.805

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0	2"		
Nr.	WS-Nr.		
O.	ref.-no.		
in HNBR			
58-34-732/00 H205908			
58-34-732/01 H175840			
58-34-732/02 H177396			
58-34-732/06 H175846			
in HNBR			
58-34-746/00 H325412			
58-34-746/01 H203755			
58-34-746/02 -----			
58-34-746/06 H325411			

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Ersatzteilliste: spare parts list

Ventil SW4, SWE4 mit VSM, DN 25 - 100 ; 1 "- 4" - Ex II -/2G IIB TX
Valve SW4, SWE4 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"	Datum: 09/12			Blatt 8 von 11		
										Name: RAP			RN ATEX 054.805		
			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.	Geprüft:					
1	1	VSM Gehäuse-SW4 Proximity switch holder housing SW4	VESTAMID			15-33-932/93 H173931									
2	1	Schaltnocke Operating cam	1.4523			08-52-291/97 H173087									
3	1	Zentrierscheibe Centering nut	1.4301			15-28-940/12 H170196									
4	4	Skt. Schraube Hex. Screw	A2-70			65-01-081/15 H78772									
5	1	O-Ring O-ring	NBR			58-06-297/83 H173930									
6	1	Steuerkopf Actuator		15-32-051/17 H171379											
	1	Steuerkopf Actuator		----- -----			15-32-052/17 H171380								
7	1	Laterne Yoke	1.4404	15-40-963/47 H171385	15-40-964/47 H171388	15-40-966/47 H171386	15-40-965/47 H171389		15-40-967/47 H171387						
8	4	Skt. Schraube Hex. Screw	A2-70	65-01-081/15 H78772			65-01-083/15 H78776								
9	1	Zugstange Guide rod	1.4305	15-23-851/12 H171062			15-23-852/12 H171063								
10	1	Führungsbuchse Bushing	PTFE + 25% Kohle			08-01-178/23 H207154									
11	1	Schaftdichtung Shaft seal	Turcon MF6			58-33-150/26 H323082									
12	1	Tellerdichtung Seat seal	VQM			58-33-293/13 H77440									
	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									



Ersatzteilliste: spare parts list										09/12		RAP		Blatt 9 von 11		APV SPX FLOW Germany	
Ventil SW4, SWE4 mit VSM, DN 25 - 100 ; 1 " - 4" - Ex II -/2G IIB TX Valve SW4, SWE4 with VSM, DN 25 - 100; 1" - 4" - Ex II -/2G IIB TX																RN ATEX 054.805	
pos.	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.								
13	1-3	Gehäusedichtung Housing seal	VMQ	58-33-442/13 -----	58-33-125/13 -----	58-33-492/13 -----	58-33-126/13 -----	58-33-127/13 -----									
	1-3	Gehäusedichtung Housing seal	HNBR	58-33-442/33 H168714	58-33-125/33 H170655	58-33-492/33 H168759	58-33-126/33 H170656	58-33-127/33 H170657									
	1-3	Gehäusedichtung Housing seal	FPM	58-33-442/73 H77487	58-33-125/73 H170668	58-33-492/73 H77511	58-33-126/73 H170670	58-33-127/73 H170672									
	1-3	Gehäusedichtung Housing seal	EPDM	58-33-442/93 H77488	58-33-125/93 H170667	58-33-492/93 H77512	58-33-126/93 H170669	58-33-127/93 H170671									
14	1-3	Gelenkklemme Clamp	1.4301	42-40-487/12 H126266		42-40-537/12 H126267		42-40-637/12 H126268									
15	1	Schaft Valve shaft	1.4404	15-25-478/42 H170332	15-25-503/42 H170338	15-25-528/42 H170333	15-25-553/42 H170339	15-25-628/42 H170334	15-25-653/42 H170340								
16	1	Schaft Valve shaft	1.4404	15-25-479/42 H170569	15-25-504/42 H170575	15-25-529/42 H170570	15-25-554/42 H170576	15-25-629/42 H170571	15-25-654/42 H170577								
17	1-2	Tellerdichtung Seat seal	VMQ	58-33-493/13 H77513	58-33-109/13 H170664	58-33-543/13 H77544	58-33-568/13 H77559	58-33-643/13 H77584									
	1-2	Tellerdichtung Seat seal	HNBR	58-33-493/33 H166678	58-33-109/33 H170658	58-33-543/33 H1666681	58-33-568/33 H166679	58-33-643/33 H1666682									
	1-2	Tellerdichtung Seat seal	FPM	58-33-493/73 H77514	58-33-109/73 H170663	58-33-543/73 H77545	58-33-568/73 H77560	58-33-643/73 H77785									
	1-2	Tellerdichtung Seat seal	EPDM	58-33-493/93 H77515	58-33-109/93 H170662	58-33-543/93 H77546	58-33-568/93 H77561	58-33-643/93 H77586									
18	1	Gehäuse Housing	1.4404	15-60-490/47 H168644	15-60-515/47 H168762	15-60-540/47 H168630	15-60-565/47 H168781	15-60-640/47 H161864	15-60-665/47 H168804								
19	1	Gehäuse Housing	1.4404	15-61-490/47 H172431	15-61-515/47 H172437	15-61-540/47 H172432	15-61-565/47 H172438	15-61-640/47 H172433	15-61-665/47 H172439								
20	1	Gehäuse Housing	1.4404	15-66-480/47 H169952	15-66-505/47 H172807	15-66-530/47 H169953	15-66-555/47 H172808	15-66-630/47 H169954	15-66-655/47 H172809								
21	1	Gehäuse Housing	1.4404	15-67-480/47 H172648	15-67-505/47 H172813	15-67-530/47 H173728	15-67-555/47 H172814	15-67-630/47 H173727	15-67-655/47 H172815								
22	1	Gehäuse Housing	1.4404	15-62-004/47 H168649	15-62-013/47 H168767	15-62-005/47 H168638	15-62-014/47 H168787	15-62-006/47 H168660	15-62-015/47 H168809								

APV
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RN ATEX 054.805

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[illegible]

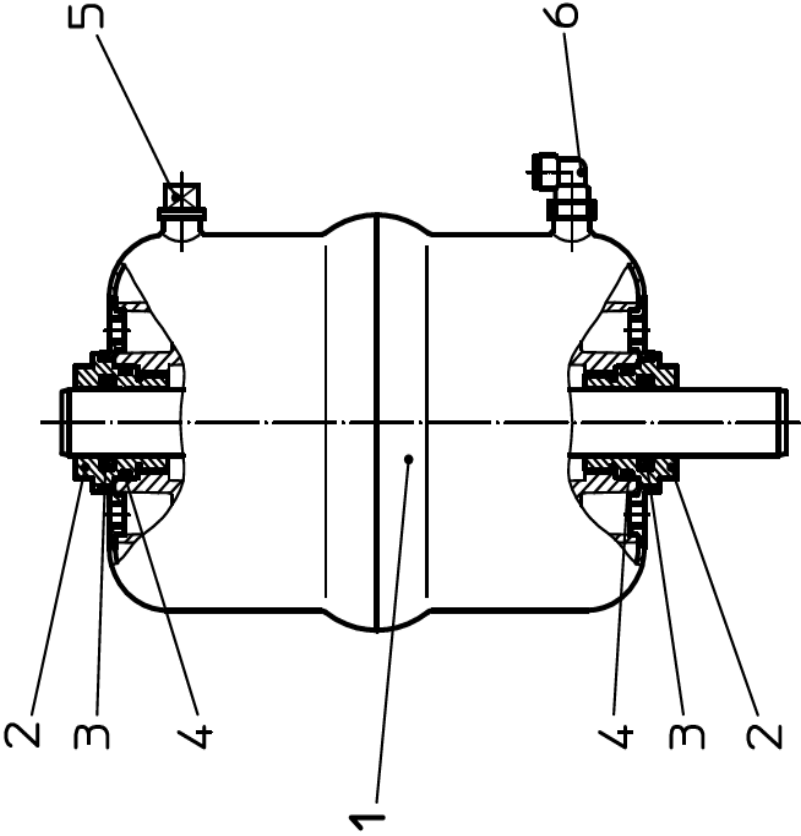
Ersatzteilliste: spare parts list

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
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		



APV DELTA SW4
DN25-100, 1"-4"



SINGLE SEAT AND CHANGE-OVER VALVE

FOR SPECIFIC ATEX-APPLICATIONS

SPXFLOW

SPX FLOW

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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 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 12/2018 - Translation of Original Manual
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Scan for SW4 Valve
Maintenance Video

