APV
AN SPX BRAND

Operating Manual

DELTA SWS4

Divert Valve

Read and understand this manual prior to operating or servicing this product.

SPX

APV
AN SPX BRAND

UK

CE

Declaration of Conformity for Valves and Valve Manifolds

APV Rosista GmbH, Zechenstr. 49, D-59425 Unna-Königsborn
as manufacturer with sole responsibility declares that the

double seat valves of the series D2, SD4, SDT4, SDM4, SWcip4, DSV, DA3, DE3, DEU3, DET3, DKR2, DKRT2, DKRH2
in the nominal diameters DN 25 - 150, 1" – 6" and 1 Sh5 - 6 Sh5

butterfly valves of the series SV1 and SVS 1 F
in the nominal diameters DN 25 - 100, DN 125 - 250 and 1" – 4"

ball cocks of the series KH, KHV
in the nominal diameters DN 15 - 100

single seat, diaphragm and spring loaded valves of the series S2, SW4, SWmini4, SWT4, M3, MF3, M4, MF4, MP4, MS4, AP1, APT1, CPV, RG4, RGM4, RGE4, RGEM4, PR2, PR3, PR4, SI2, UF3, VRA,VRAH
in the nominal diameters DN 10 - 150, 1/2" – 4" and 1 Sh5 - 6 Sh5

and the valve manifolds installed thereof

meet the requirements of the Directives 89/392/EEC (amendment 93/44/EEC), replaced by 98/37/EC and GSG - 9.GSGV.

For official inspections, APV Rosista GmbH presents a technical documentation according to appendix V of the Machinery Directive, this documentation consisting of documents of the development and construction, description of measures taken to meet the conformity and to correspond with the basic requirements on safety and health, incl. an analysis of the remaining risks as well as an operating manual with safety instructions.

The conformity of the valves and valve manifolds is guaranteed.

D-59425 Unna-Königsborn, June 04, 2008
APV Rosista GmbH

ppa. Baumbach

Manager Research and Development

Table of Contents

		Page
1.	**General Terms**	**2**
2.	**Safety Instructions**	**2**
3.	**Mode of Operation**	**3**
4.	**Auxiliary Equipment**	**4 - 5**
4.1	Valve position indication	
4.2	CONTROL UNIT	
4.3	SW4 variants	
5.	**Installation**	**6 - 7**
5.1	Connections (threaded connections/clamp - flange connections)	
5.2	Welding instructions	
6.	**Dimensions / Weights**	**8 - 9**
6.1	Divert valve *SWS4*	
6.2	Divert valve *SWSE4*	
7.	**Technical Data**	**10 - 12**
7.1	General terms	
7.2	Spezification of compressed air	
7.3	Kvs values in m³/h	
7.4	Product pressure	
7.5	Opening and closing times	
7.6	Valve stroke / Opening cross section in mm	
7.7	Air consumption	
8.	**Maintenance**	**13**
9.	**Service Instructions Divert Valve**	**14 - 15**
9.1	Dismantling from the line system	
9.2	Disassembly of wear parts (product-wetted parts)	
9.3	Installation of seals and assembly of valve	
9.4	Installation of valve	
10.	**Service Instructions Actuator**	**16**
10.1	Maintenance of actuator	
10.2	Installation of seals and assembly of actuator	
10.3	Actuator with valve position feedback	
11.	**Service Instructions**	**19**
	Assembly tool for seat seal	
12.	**Trouble Shooting**	**20**
13.	**Spare Parts Lists**	
	Divert Valve SWS4, SWSE4	
	DN 25 - 100	RN 01.054.819
	Inch 1” - 4”	RN 01.054.819-1
	Actuator	RN 01.054.86

1. General Terms

This operating manual should be read carefully by the competent operating and maintenance personnel.

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

Descriptions and data given herein are subject to technical changes.

2. Safety Instructions

- **DANGER !**
  The technical safety symbol draws your attention to important directions for operating safety. You will find it wherever the activities described are bearing risks of personal injury.

- Separate electric and pneumatic connections.

- **Depressurize** the line system before any maintenance work. Clean the valve if possible and drain residual liquids.

- **Do not reach into the open valve.**
  Risk of injury by suddenly operating valve. In dismantled state there is the risk of bruising at movable parts of the valve.

- 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.

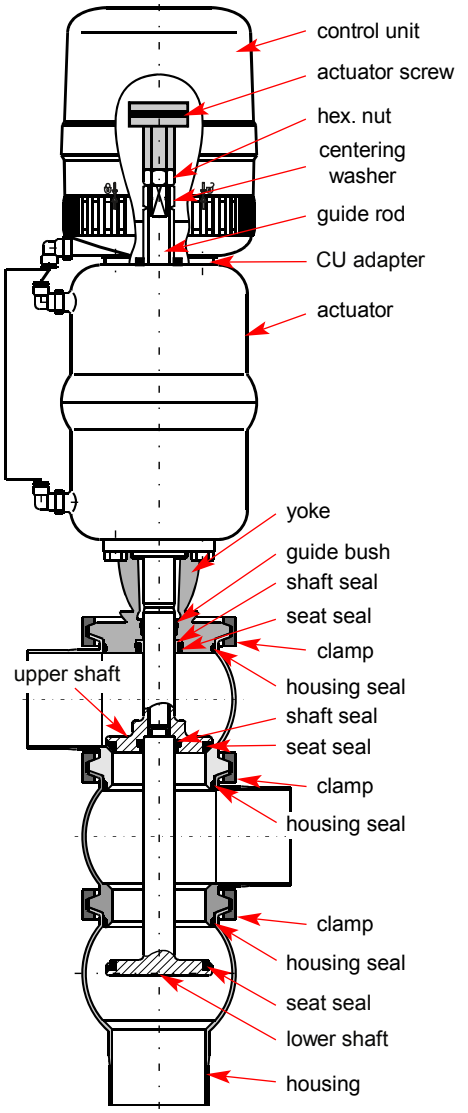
Opening of the actuators is strictly forbidden.
Danger to life!

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

Defective actuators must be returned to your APV Solutions & Services company for their professional disposal and free of charge for you.

Please address to your local APV representative.

3. Mode of Operation



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.

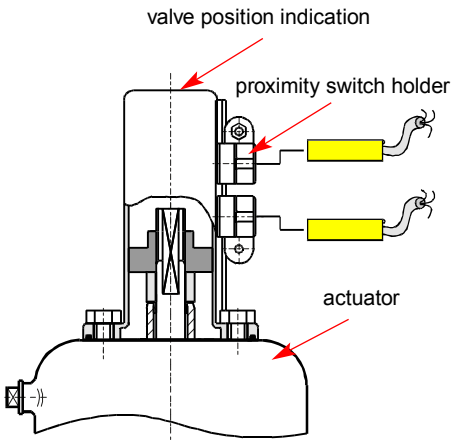
The function of the DELTA SWS4 valve is to shut off and to change over line sections in processes.

- 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.
- The cleaning of the inner valve is undertaken during CIP cleaning of the line system.
- The standard SWS4 valve is equipped with a Control Unit DELTA CU 31.
  The following different variants are possible:
  * Direct Connect
  * AS-Interface
  * DeviceNet
  * Profibus
- The yellow luminous diodes in the Control Unit indicate the position of the valve shaft.

4. Auxiliary Equipment

fig. 4.1



4.1 Valve position indication fig. 4.1

- 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.

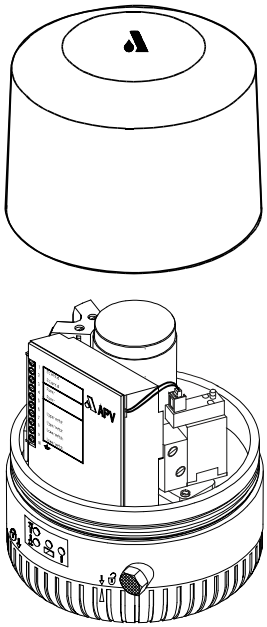
We recommend to use our APV standard type:
Three-wire proximity switch
Operating distance: 5mm / diameter: 11mm
Operating voltage: 10 - 30 V DC
pnp positive switching, closing function
Installation ,,non-flush"
Using a valve position indicator other than APV, we cannot accept any liability for a faultless function.

4.2 CONTROL UNIT fig 4.2

For the start-up as well as assembly and disassembly of the different designs please use the respective manual.

The following different designs are available :

fig 4.2



	1 solenoid valve (EMV)
Direct Connect Ident-No.:	**CU31 Direct Connect** H 209414
Profibus Ident-No.:	**CU31 Profibus** H 315495
Device Net Ident-No.:	**CU31 Device Net** H 209422
AS-interface Ident-No.:	**CU31 AS-interface 2.1** H 315507

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

	adapter
Designation: Ident-No.:	**CU3 - adapter SW4 / M4** H 315806

4. Auxiliary Equipment

4.3 SW4 variants

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

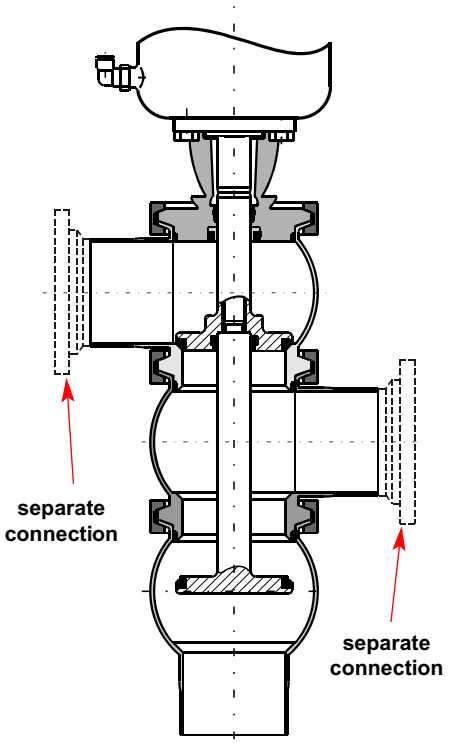
- DELTA SW4 - DN125-150
- DELTA SW4 with manual actuation
- DELTA SWT4 - tank outlet valve
- DELTA SW4 - long-stroke version
- DELTA SW4 -DPF (with steam chamber)
- DELTA SWR4 (with modulating cone)

Corresponding operating manuals are available for the different designs.

5. Installation

fig 5.

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. 5).
  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 5.2)

5.1 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

5. Installation

5.2 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 an careful handling to avoid damage.

- Welding should only be carried out by certified welders (EN 287-1). (Seam quality EN 25817 "B").

- 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!

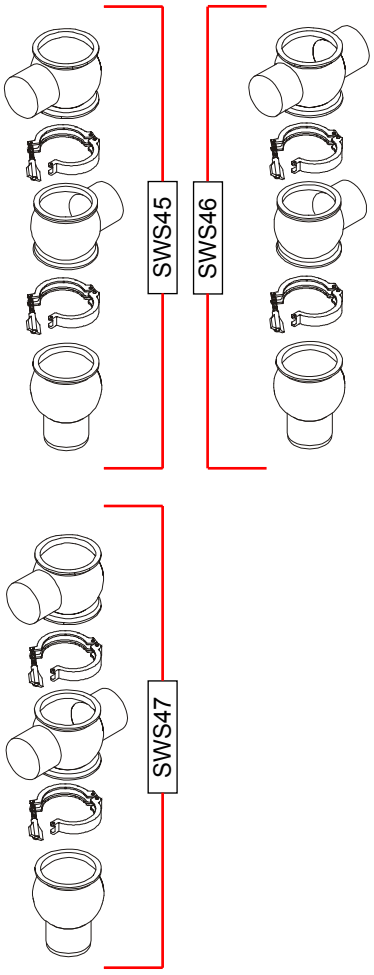
- After welding of the valve housings or of the mating flanges and after work at the pipelines, the corresponding parts of the installation or pipelines must be cleaned from welding residues and soiling. If these cleaning instructions are not observed, welding residues and dirt particles can settle in the valve and cause damage.

- Any damage resulting from the non-observance of these welding instructions is not subject to our guarantee.

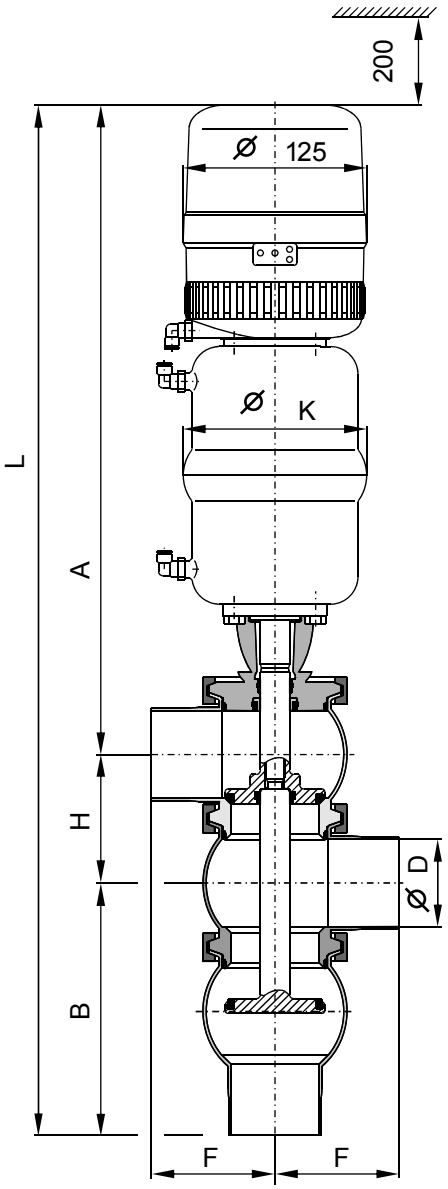
6. Dimensions / Weights

6.1 Divert valve *SWS4*

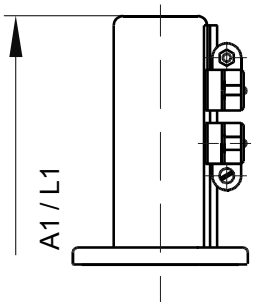
housing design *SWS45-47*



divert valve with control unit



proximity switch holder PSH



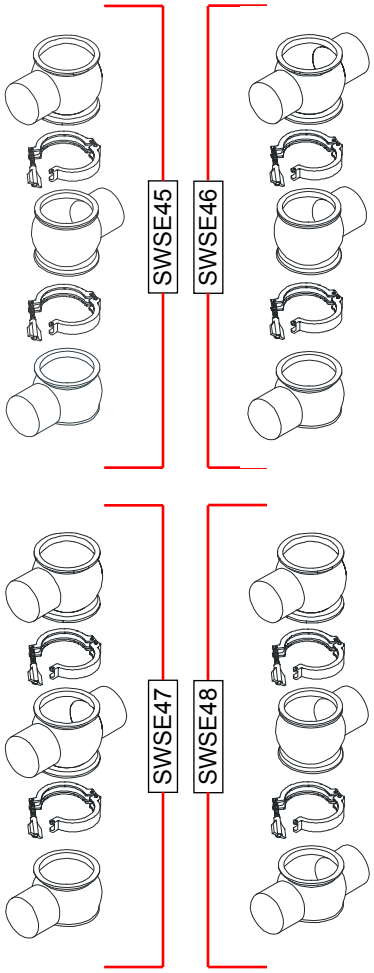
dimensions in mm

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

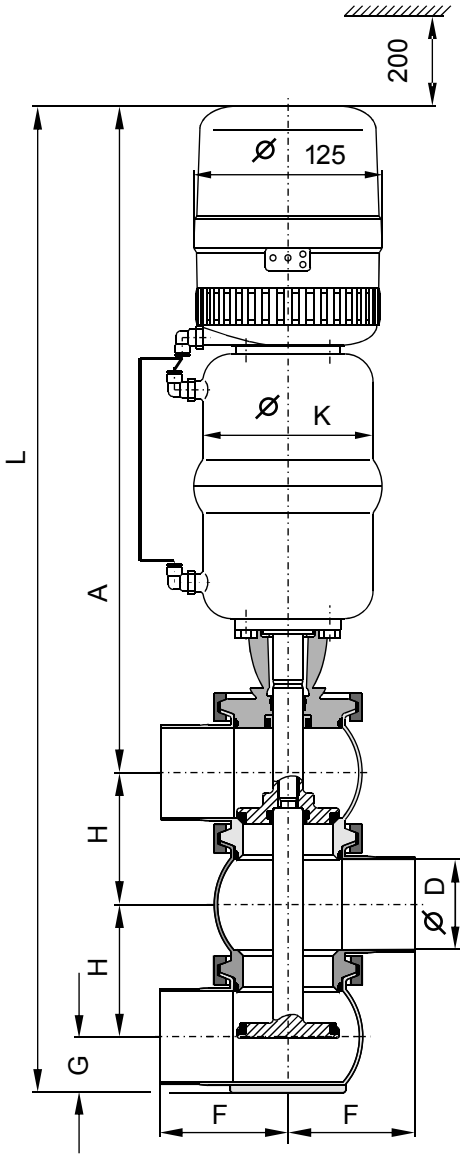
6. Dimensions / Weights

6.2 Divert valve *SWES4*

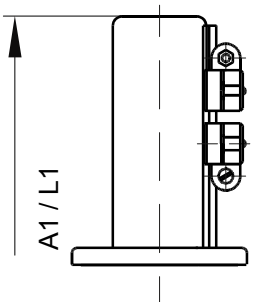
housing design *SWSE45-48*



divert valve with control unit



proximity switch holder PSH



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

7. Technical Data

7.1 General Data

product-wetted parts:		**316 L, 1.4404**
other parts:		**1.4301**
seals:	standard design:	**EPDM**
option:		**FPM, VMQ, HNBR**
max. line pressure:		**10bar**
max. operating pressure:		**135°C EPDM, HNBR** ***FPM, *VMQ**
short-term load:		**140°C EPDM, HNBR** ***FPM, *VMQ** ***(no steam)**
air connection (for hose) **:**		**6x1mm**
max. pneumatic air pressure:		**8 bar**
min. pneumatic air pressure:		**6 bar**

7.2 Spezification of compressed air

compressed air quality: quality class according to DIN/ISO 8573-1

content of solid particles: ***quality class 3***
max. size of solid particles per m³
10000 of 0,5µm <d<1,0µm
500 of 1,0µm <d<5,0µm

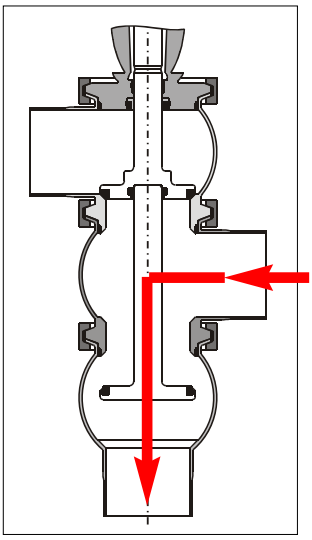
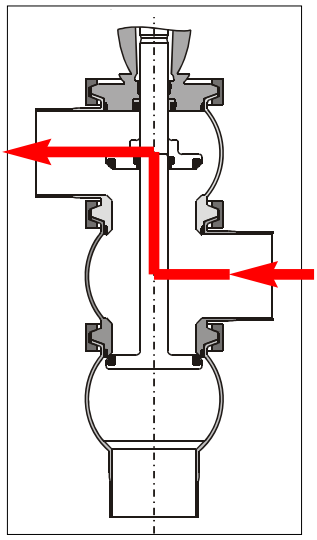
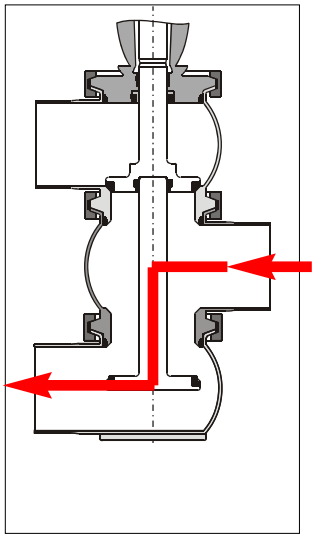
content of water: ***quality class 4***
max. dew point temperature + 3°C
For installations at lower temperatures or at higher altitudes, additional measures must be considered to reduce the pressure dew point accordingly.

content of oil: ***quality class 1***
max. 0,01mg/m3

(**The oil applied must be compatible with Polyurethane elastomer materials.)**

7. Technical Data

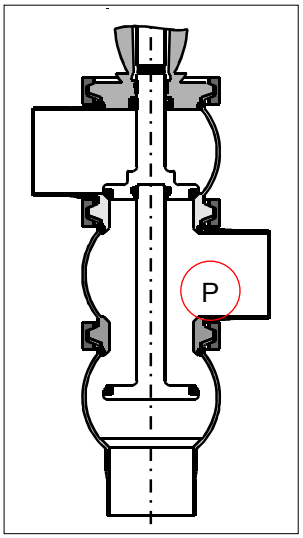
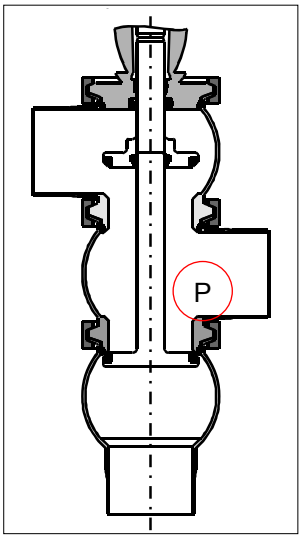
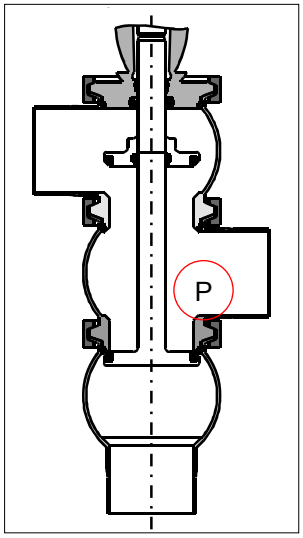
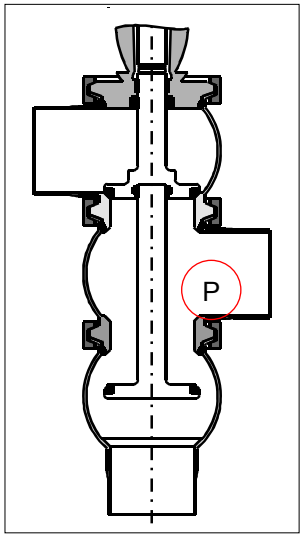
7.3 DELTA SWS4 kvs - values in m3 / h

divert valve *SWS45 NC*	divert valve *SWS45 NO*	divert valve *SWSE45 NC*
		

DN			
25	13	14	14
40	32	33	33
50	55	58	58
65	95	100	100
80	150	160	160
100	230	245	245
inch			
1”	10	10	10
1,5”	29	30	30
2”	53	54	54
2,5”	82	87	87
3”	126	137	137
4”	218	225	225

7. Technical Data

7.4 DELTA SWS4 calculatory product pressure in (bar) at 6 bar air pressure

divert valve *SWS45 NC*	divert valve SWS45 ***FS*** with 6 bar air pressure controlled	divert valve SWS45 ***FH***	divert valve SWS45 ***FH*** with 6 bar air pressure controlled
			

DN / Inch	**Ø actuator in mm** Ø 74	Ø 110	Ø 165
25 / 1”	11,7		
40 / 1,5”	5,0	12,5	
50 / 2”	2,8	7,6	19,6
2,5”	2,0	5,4	13,8
65	1,7	5,0	11,7
3”		3,8	9,9
80		3,1	7,9
100 / 4”		2,1	5,3

Ø actuator in mm Ø 74	Ø 110	Ø 165
20,3		
6,9	14,4	
4,0	8,3	19,5
2,7	5,5	13,1
2,2	5,0	10,9
	3,8	9,1
	3,0	7,2
	2,0	5,0

Ø actuator in mm Ø 74	Ø 110	Ø 165
21,2		
6,0	16,0	
3,3	8,8	22,8
2,2	6,0	15,3
1,8	5,0	12,7
	4,1	10,6
	3,3	8,4
	2,1	5,5

Ø actuator in mm Ø 74	Ø 110	Ø 165
11,2		
5,4	11,2	
3,4	7,1	16,8
2,4	5,0	11,9
2,0	5,0	10,0
	3,6	8,5
	2,9	6,8
	1,9	5,0

7.5 Closing times for divert valve DELTA SWS4

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

closing times in sec. air pressure 6 bar			
		hose length	
DN	**Inch**	**1m**	**10m**
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

7. Technical Data

fig. 7.6

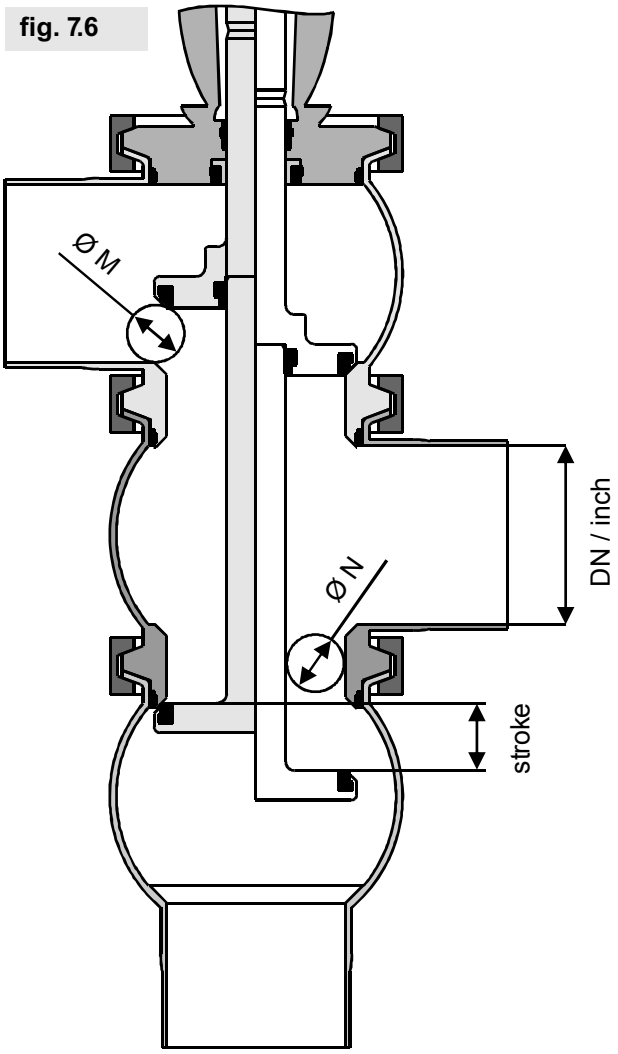


fig. 7.6 valve stroke / opening cross section in mm

	Divert Valve *SWS4* *SWSE4*		
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

7.7 **DELTA SWS4 - divert valve**
air consumption in normal liter / Nl
at 6 bar air pressure

actuator Ø 74	**1Nl**
actuator Ø 110	**2,1Nl**
actuator Ø 165	**4,5 Nl**

8. 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
- 1x strap wrench
- Assembly tool for seat seal (see chapter 11.)

- 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.

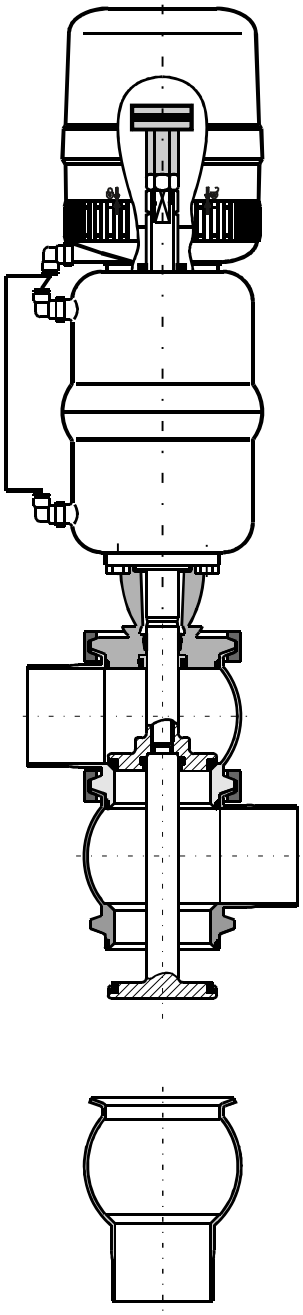
- **Slightly grease all seals before their installation ! !!!!!**

  APV food-grade-grease for EPDM, HNBR, FPM and NBR
  (0,75 kg/tin - ref.-No. 000 70-01-019/93)
  (60 g/tube - ref.-No. 000 70-01-018/93)
  or
  APV food-grade-grease for VMQ
  (0,6 kg/tin - ref.-No. 000 70-01-017/93)
  (60 g/tube - ref.-No. 000 70-01-016/93)

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

9. Service Instructions

Divert valve
DELTA SWS4



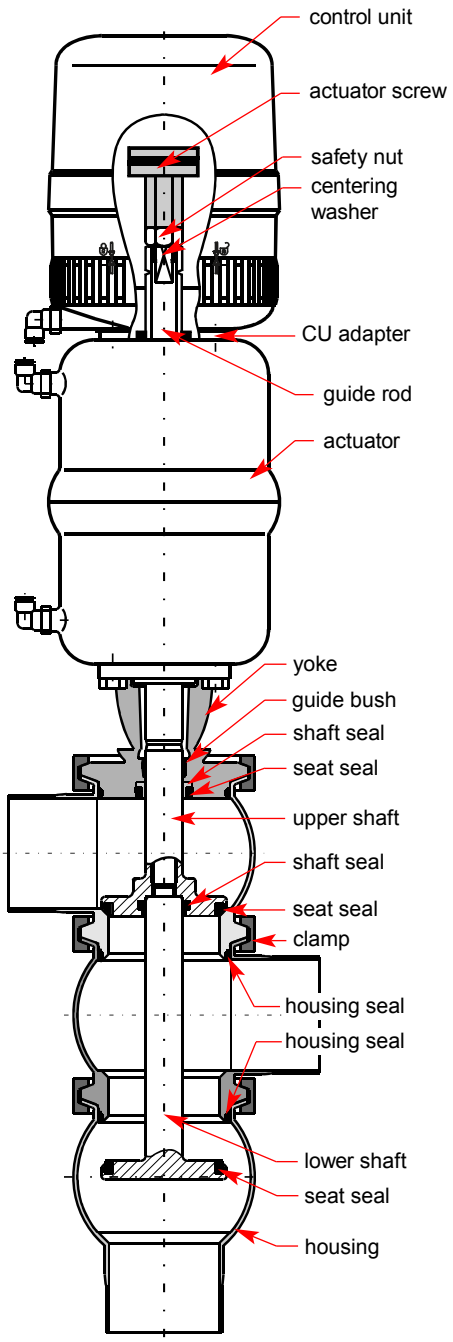
9.1. Dismantling from the line system

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.

9. Service Instructions

9.2. Dismantling of product-wetted parts

divert valve



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.

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

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

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

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

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

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

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

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

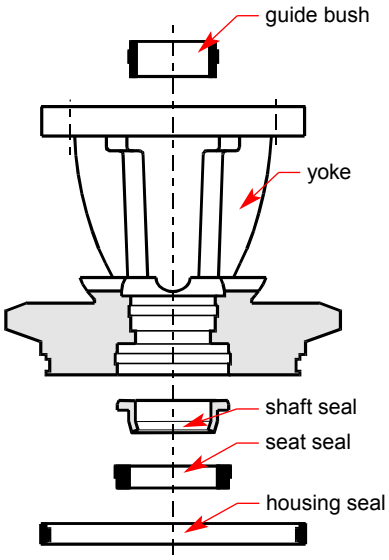
10. Dismantle the upper shaft from the yoke.
Remove the shaft seal and the seat seal.

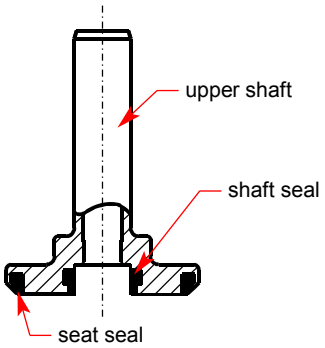
11. Unscrew the yoke from the actuator.

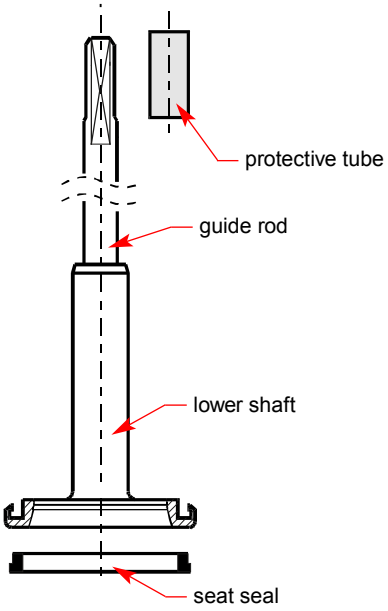
12. Remove the seat seal, shaft seal and guide bush.

Maintenance of actuator, see chapter 10.1

9. Service Instructions







9.3. 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.

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

7. Insert the upper valve shaft in the yoke.

8. Insert the yoke with actuator and upper valve shaft into the upper housing and fasten the assembly with the clamp.

9. **Attention:**  ***Version FS (NC):***
   Cut off compressed air.

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

11. 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.

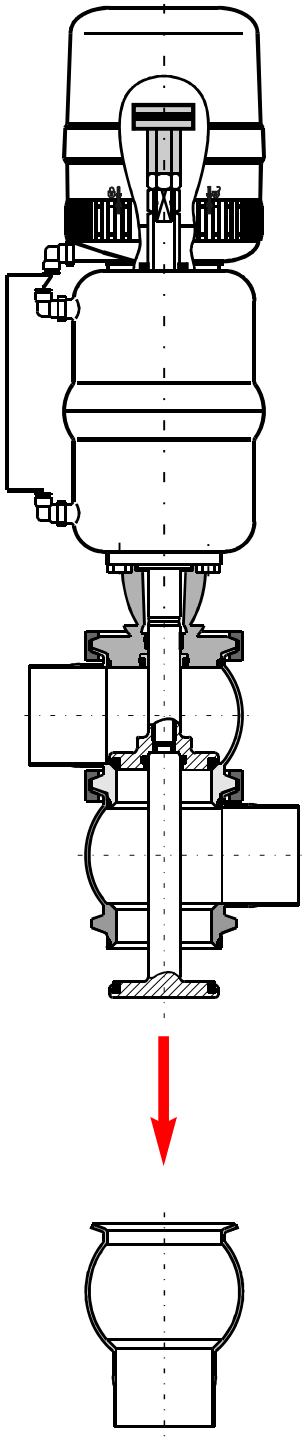
9. Service Instructions

9.3. Installation of seals and assembly of valve

12. Attention: 

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

13. 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.



9.4. Installation of the valve

1. Place the control unit on the adapter and secure it with the ring.

2. Connect the compressed air supply.

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

4. 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.

10. Service Instructions for Actuator

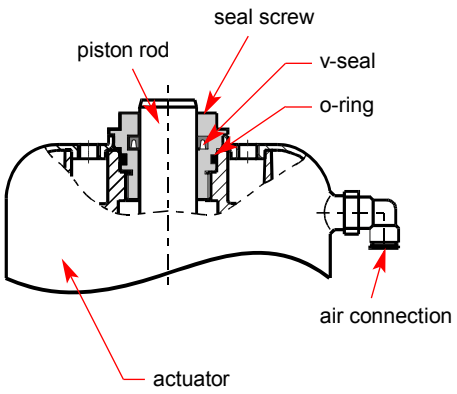
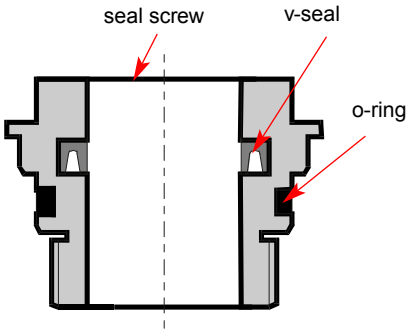
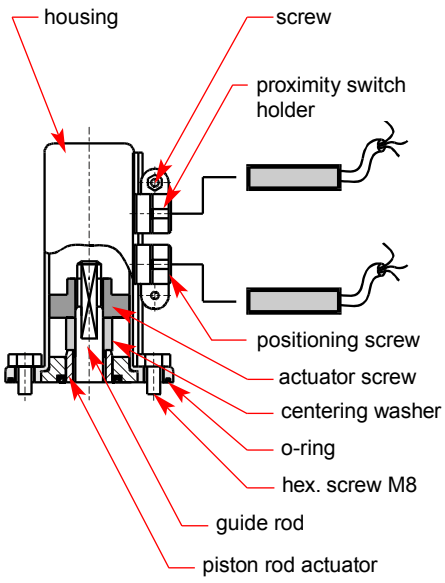


fig. 10.2





10.1. 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.

10.2. 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.

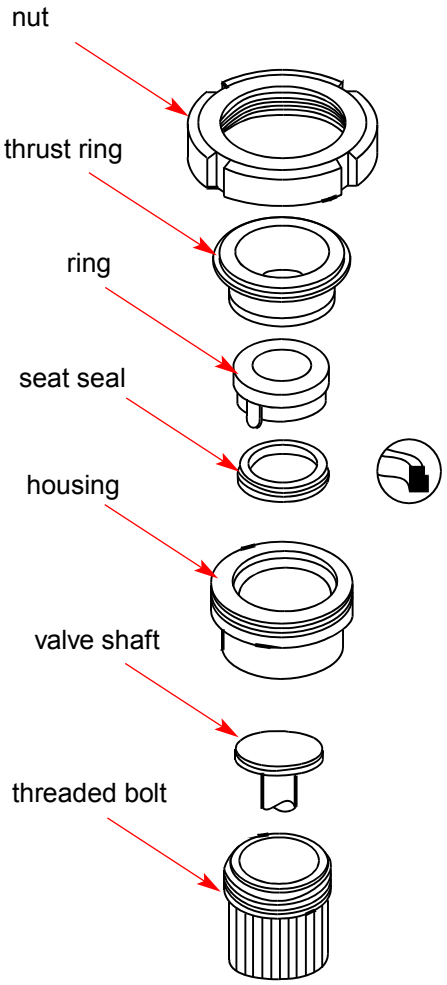
   Attention: **Observe the position of the adapter.**

   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.

10.3. 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 swith 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 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.

11. Assembly Tool



The assembly tool consists of:

- **nut**
- **thrust ring**
- **ring with venting sheet**
- **housing**
- **threaded bolt.**

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 food-grade grease. Insert the seal with the venting sheet (see sketch). The venting sheet must be inserted into the groove ground 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 stops.
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.

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

Assembly Tool SW4		
DN	Inch	Reference numbers:
25	1”	51-13-110/17
40	1,5	51-13-111/17
50	2”	51-13-112/17
	2,5”	51-13-120/17
65		51-13-113/17
	3”	51-13-121/17
80		51-13-114/17
100	4”	51-13-115/17

12. Trouble Shooting

T r o u b l e	*R e m e d y*
Valve in closed position and pressure in the upper housing	
Valve does not seal.	**Replace seat seals.** **Check line pressure:** **adm. line pressure see chapter 7**
Leakage in the area of the clamps	**Replace housing seals.**
Leakage at the upper valve shaft in the area of the valve yoke	**Replace shaft seal, seat seal** **and guide bush.**
Actuator	
Air escaptes from the actuator rod	**Change complete seal screw** **for actuator.**
Actuator does not work (air escapes permanently from the vent plug).	**Replace complete actuator.**
Valve position indication	
No feedback.	**Carry out fine adjustment.**

13. 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.

Data are subject to change.

Please use the corresponding ordering sheet if you intend to place an order for complete SW4 valves.

DELTA SW4 - VALVE PROGRAM
Ordering sheet for SW4 valves with fitting

BA SWS4 000002
ID-No.: H 3 2 2 9 5 6

UK

Translation of original manual

rev. 0

WHERE IDEAS MEET INDUSTRY

Your local contact:

APV
Zechenstraße 49
D-59425 Unna

Phone: +49(0) 23 03/ 108-0 Fax: +49(0) 23 03 / 108-210

For more information about our worldwide locations, approvals, certifications, and local representatives, please visit www.apv.com.

02/94

Ersatzteilliste: spare parts list:

Ventil SWS4, SWSE4 -FS-CU und VSM
Valve SWS4, SWSE4 -FS-CU and PSH
DN25-100

Besteht aus 1 Blatt Blatt 3

	Datum	Name
Gezeichnet	24.01.08	Trytko
Geprüft	20.02.08	Splieth
Normgepr.		

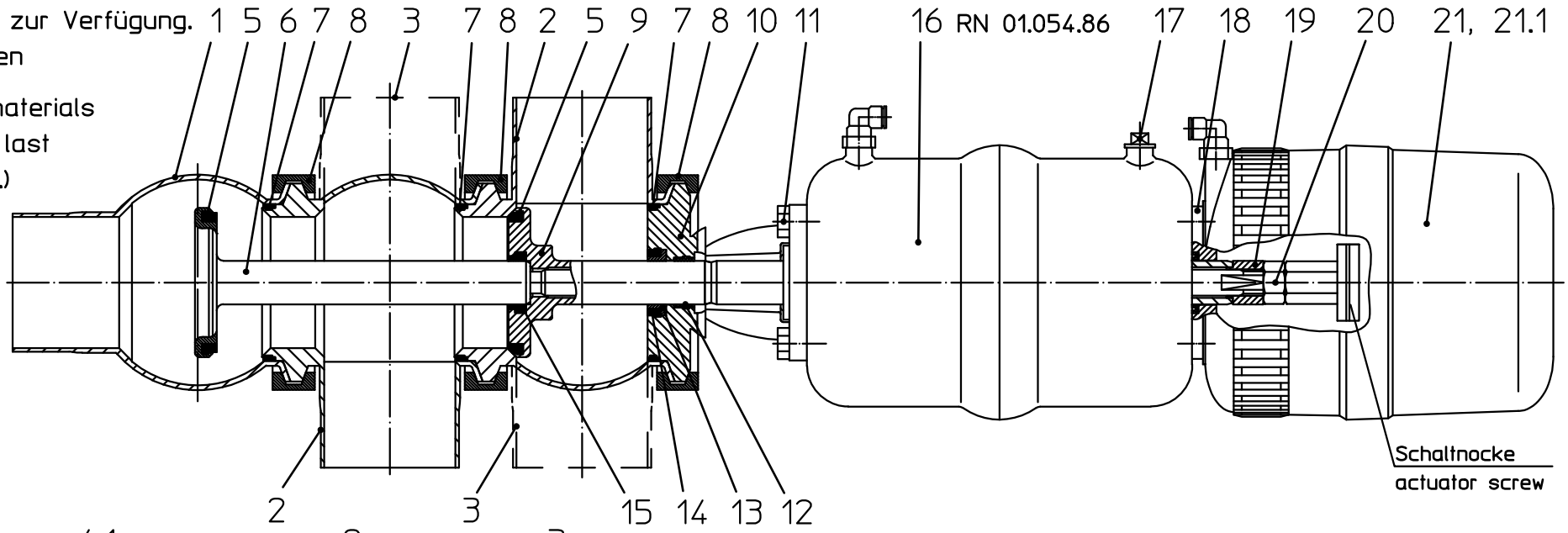
Datum	01/08
Name	Trytko

APV Rosista GmbH
D-59425 Unna
Germany

RN 01.054.819

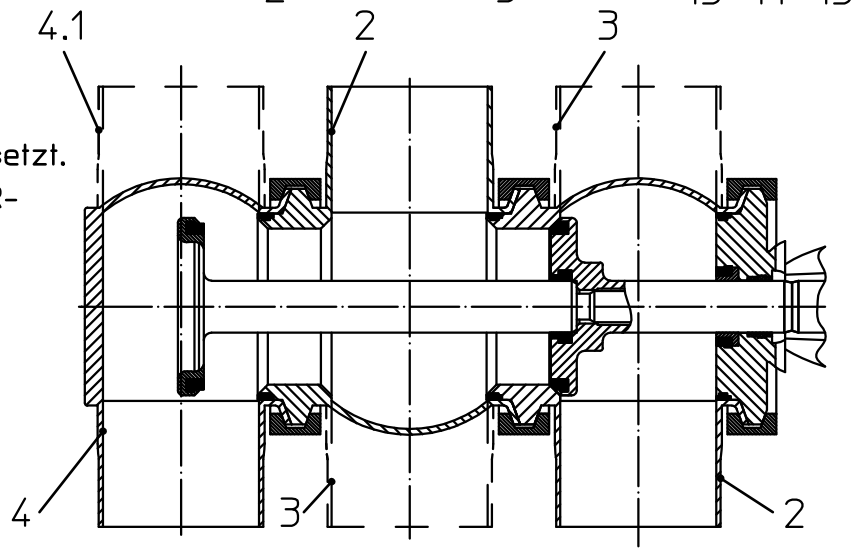
Es stehen verschiedene Dichtungswerkstoffe zur Verfügung. Bitte WS-Nr. ergänzen

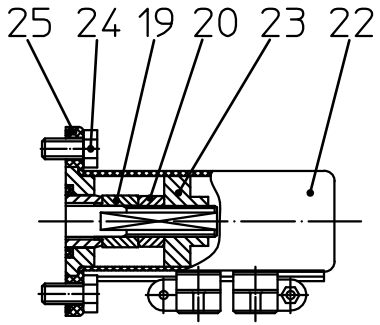
The following seal materials are available (fill in last two digits of ref.-no.)



* Dichtungswerkstoff:
material seals:
../13-VMQ
../33-HNBR
../73-FPM
../93-EPDM

Gehäusedichtung
/housing seal
Bei VMQ wird die HNBR-Gehäusedichtung eingesetzt.
For VMQ take the HNBR-housing seal.





Ersatzteilliste: spare parts list:

Ventil SWS4, SWSE4 -FS-CU und VSM
Valve SW41, SW42 SWE4-FS-CU and PSH
DN 25-100

Blatt 2

	Datum	Name
Gezeichnet	24.01.08	Trytko
Geprüft	21.02.08	Splieth
Normgepr.		
Datum	01/08	
Name	Trytko	

APV Rosista GmbH
D-59425 Unna
Germany

RN 01.054.819

Pos. item	Menge quantity	Benennung description	DN 25	40	50	65	80	100	125	150
			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	Kugelring SW41 ball ring	15-60-090/47	15-60-091/47	15-60-092/47	15-60-043/47	15-60-044/47	15-60-045/47		
2	1	Gehäuse Oberteil -1 Stutzen SW43 housing upper part -1 port	15-62-001/47	15-62-002/47	15-62-003/47	15-62-004/47	15-62-005/47	15-62-006/47		
3	1	Gehäuse Oberteil -2 Stutzen SW44 housing upper part -2 ports	15-63-001/47	15-63-002/47	15-63-003/47	15-63-004/47	15-63-005/47	15-63-006/47		
4	1	Gehäuse Unterteil -1 Stutzen SWE41 housing lower part -1 port	15-60-100/47	15-60-101/47	15-60-102/47	15-60-103/47	15-60-104/47	15-60-105/47		
4.1	1	Gehäuse Unterteil -2 Stutzen SWE48 housing lower part -2 ports	15-65-281/47	15-65-381/47	15-65-431/47	15-65-481/47	15-65-531/47	15-65-631/47		
5	2	Tellerdichtung * seat seal	58-33-293/	58-33-393/	58-33-443/	58-33-493/	58-33-543/	58-33-643/		
6	1	Schaft unten lower valve shaft	15-25-240/42	15-25-241/42	15-25-242/42	15-25-243/42	15-25-244/42	15-25-245/42		
7	3	Gehäusedichtung * housing seal	58-33-267/	58-33-292/	58-33-124/	58-33-442/	58-33-492/	58-33-127/		
8	3	Gelenkklemme clamp	42-40-287/17	42-40-387/17	42-40-437/17	42-40-487/17	42-40-537/17	42-40-637/17		
9	1	Schaft oben upper valve shaft	15-25-230/42	15-25-231/42	15-25-232/42	15-25-233/42	15-25-234/42	15-25-235/42		
10	1	Laterne yoke	15-40-960/47	15-40-961/47	15-40-962/47	15-40-963/47	15-40-966/47	15-40-967/47		
11	4	Skt. Schraube hex. screw	DIN EN 24017-M8x16-A2-70				DIN EN 24017-M8x20-A2-70			
12	1	Führungsbuchse bushing	08-01-178/23	=	=	=	=	=		
13	1	Schaftdichtung shaft seal	58-33-150/26	=	=	=	=	=		
14	1	Tellerdichtung * seat seal	58-33-293/	=	=	=	=	=		
15	1	Schaftdichtung shaft seal		58-33-020/93	=	=	=	=		
16	1	Steuerkopf actuator	15-32-050/17	=	15-32-051/17	=	15-32-052/17	=		
17	1	Entlüftungsstopfen G 1/8 venting plug	08-60-005/93	=	=	=	=	=		
18	1	CU-Adapter CU-adapter	08-48-480/93	=	=	=	=	=		
19	1	Zentrierscheibe centering washer	15-28-940/12	=	=	=	=	=		

Ersatzteilliste: spare parts list:

Ventil SWS4, SWSE4 -FS-CU und VSM
Valve SWS4, SWSE4 -FS-CU and PSH
DN 25-100

Blatt 3

	Datum	Name
Gezeichnet	24.01.08	Trytko
Geprüft	20.02.08	Spliethoff
Normgepr.		

Datum	01/08
Name	Trytko

APV Rosista GmbH
D-59425 Unna
Germany

RN 01.054.819

Pos. item	Menge quantity	Benennung description	DN 25 WS-Nr. ref.-no.	40 WS-Nr. ref.-no.	50 WS-Nr. ref.-no.	65 WS-Nr. ref.-no.	80 WS-Nr. ref.-no.	100 WS-Nr. ref.-no.	125 WS-Nr. ref.-no.	150 WS-Nr. ref.-no.
20	1	Skt. Mutter hex. nut	DIN EN ISO 10511-M12-A2							
21	1	Control-Unit CU31 Direct-Connect Control-Unit	16-31-232/93	=	=	=	=	=		
21.1	1	Control-Unit CU31 AS-Interface 2.1 Control-Unit	08-45-020/93	=	=	=	=	=		
22	1	VSM SW4 support for proximity switch	15-33-932/93	=	=	=	=	=		
23	1	Schaltnocke operating cam	08-52-290/97	08-52-291/97	=	=	=	=		
24	4	Skt. Schraube hex. screw	DIN EN 24017-M8x16-A2-70							
25	1	O-Ring o-ring	OR 66x2 NBR 70-75 Shore A							
		Dichtungssatz / seal kit Pos. 5, 7, 12, 13, 14, 15, 20 nur im kompletten Dichtungssatz erhältlich item. 5, 7, 12, 13, 14, 15, 20 available es complete seal kits only								
	1	Dichtungssatz FPM seal kit	58-34-880/00	58-34-881/00	58-34-882/00	58-34-883/00	58-34-884/00	58-34-885/00		
	1	Dichtungssatz EPDM seal kit	58-34-880/01	58-34-881/01	58-34-882/01	58-34-883/01	58-34-884/01	58-34-885/01		
	1	Dichtungssatz VMQ seal kit	58-34-880/02	58-34-881/02	58-34-882/02	58-34-883/02	58-34-884/02	58-34-885/02		
	1	Dichtungssatz HNBR seal kit	58-34-880/06	58-34-881/06	58-34-882/06	58-34-883/06	58-34-884/06	58-34-885/06		

02/94

Ersatzteilliste: spare parts list:

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

Besteht aus 1 Blatt Blatt 3

	Datum	Name
Gezeichnet	04.02.08	Trytko
Geprüft		
Normgepr.		

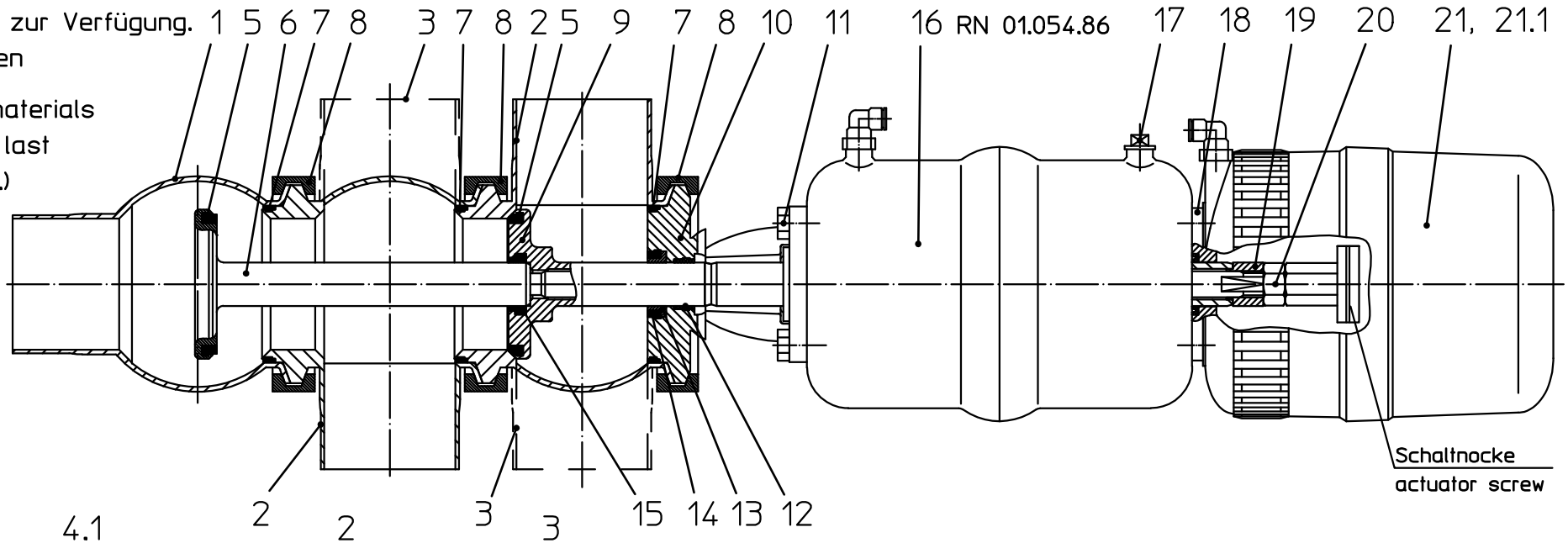
Datum	01/08
Name	Trytko

APV Rosista GmbH
D-59425 Unna
Germany

RN 01.054.819-1

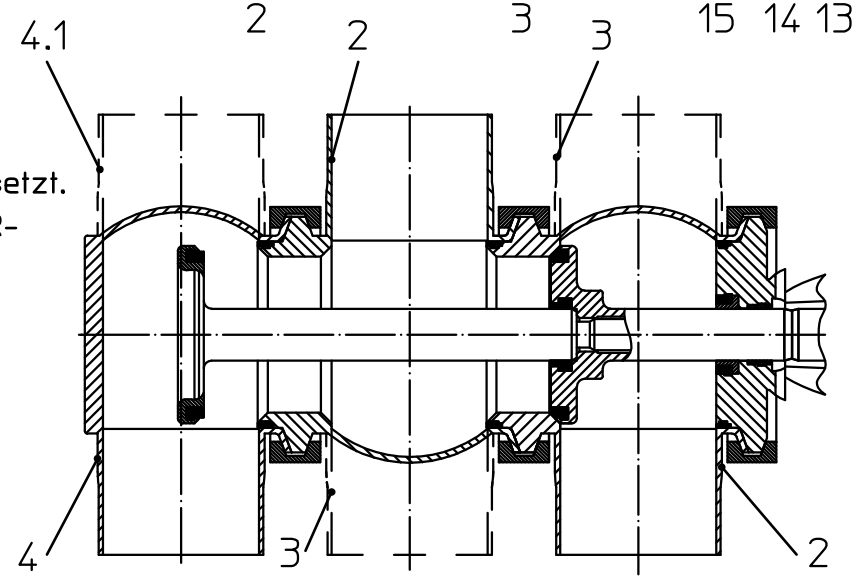
Es stehen verschiedene Dichtungswerkstoffe zur Verfügung. Bitte WS-Nr. ergänzen

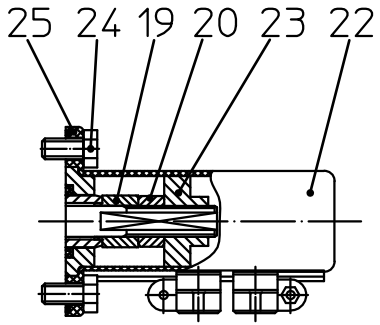
The following seal materials are available (fill in last two digits of ref.-no.)



* Dichtungswerkstoff:
material seals:
../13-VMQ
../33-HNBR
../73-FPM
../93-EPDM

Gehäusedichtung
/housing seal
Bei VMQ wird die HNBR-Gehäusedichtung eingesetzt.
For VMQ take the HNBR-housing seal.





Ersatzteilliste: spare parts list:

Ventil SWS4, SWSE4 -FS-CU und VSM
Valve SW41, SW42 SWE4-FS-CU and PSH
1-4 zoll / inch

Blatt 2

	Datum	Name
Gezeichnet	04.02.08	Trytko
Geprüft	21.02.08	Splieth
Normgepr.		

Datum	01/08									
Name	Trytko									

APV Rosista GmbH
D-59425 Unna
Germany

RN 01.054.819-1

Pos. item	Menge quantity	Benennung description	1" WS-Nr. ref.-no.	1,5" WS-Nr. ref.-no.	2" WS-Nr. ref.-no.	2,5" WS-Nr. ref.-no.	3" WS-Nr. ref.-no.	4" WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.
1	1	Kugelring ball ring SW41	15-60-083/47	15-60-084/47	15-60-085/47	15-60-086/47	15-60-087/47	15-60-088/47		
2	1	Gehäuse Oberteil -1 Stutzen housing upper part -1 port SW43	15-62-010/47	15-62-011/47	15-62-012/47	15-62-013/47	15-62-014/47	15-62-015/47		
3	1	Gehäuse Oberteil -2 Stutzen housing upper part -2 ports SW44	15-63-010/47	15-63-011/47	15-63-012/47	15-63-013/47	15-63-014/47	15-63-015/47		
4	1	Gehäuse Unterteil -1 Stutzen housing lower part -1 port SWE41	15-60-110/47	15-60-111/47	15-60-112/47	15-60-113/47	15-60-114/47	15-60-115/47		
4.1	1	Gehäuse Unterteil -2 Stutzen housing lower part -2 ports SWE48	15-65-306/47	15-65-406/47	15-65-456/47	15-65-506/47	15-65-556/47	15-65-656/47		
5	2	Tellerdichtung seat seal *	58-33-293/	58-33-393/	58-33-443/	58-33-109/	58-33-568/	58-33-643/		
6	1	Schaft unten lower valve shaft	15-25-250/42	15-25-251/42	15-25-252/42	15-25-253/42	15-25-254/42	15-25-255/42		
7	3	Gehäusedichtung housing seal *	58-33-267/	58-33-292/	58-33-124/	58-33-125/	58-33-126/	58-33-127/		
8	3	Gelenkklemme clamp	42-40-287/17	42-40-387/17	42-40-437/17	42-40-487/17	42-40-537/17	42-40-637/17		
9	1	Schaft oben upper valve shaft	15-25-258/42	15-25-259/42	15-25-260/42	15-25-261/42	15-25-262/42	15-25-263/42		
10	1	Laterne yoke	15-40-960/47	15-40-961/47	15-40-962/47	15-40-964/47	15-40-965/47	15-40-967/47		
11	4	Skt. Schraube hex. screw	DIN EN 24017-M8x16-A2-70				DIN EN 24017-M8x20-A2-70			
12	1	Führungsbuchse bushing	08-01-178/23	=	=	=	=	=		
13	1	Schaftdichtung shaft seal	58-33-150/26	=	=	=	=	=		
14	1	Tellerdichtung seat seal *	58-33-293/	=	=	=	=	=		
15	1	Schaftdichtung shaft seal		58-33-020/93	=	=	=	=		
16	1	Steuerkopf actuator	15-32-050/17	=	15-32-051/17	=	15-32-052/17	=		
17	1	Entlüftungsstopfen venting plug G 1/8	08-60-005/93	=	=	=	=	=		
18	1	CU-Adapter CU-adapter	08-48-480/93	=	=	=	=	=		
19	1	Zentrierscheibe centering washer	15-28-940/12	=	=	=	=	=		

Ersatzteilliste: spare parts list:

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

Blatt 3

	Datum	Name
Gezeichnet	04.02.08	Trytko
Geprüft	20.02.08	Spliethoff
Normgepr.		

Datum	01/08
Name	Trytko

APV Rosista GmbH
D-59425 Unna
Germany

RN 01.054.819-1

Pos. item	Menge quantity	Benennung description	1" WS-Nr. ref.-no.	1,5" WS-Nr. ref.-no.	2" WS-Nr. ref.-no.	2,5" WS-Nr. ref.-no.	3" WS-Nr. ref.-no.	4" WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.
20	1	Skt. Mutter hex. nut	DIN EN ISO 10511-M12-A2							
21	1	Control-Unit CU31 Direct-Connect Control-Unit	16-31-232/93	=	=	=	=	=		
21.1	1	Control-Unit CU31 AS-Interface 2.1 Control-Unit	08-45-020/93	=	=	=	=	=		
22	1	VSM SW4 support for proximity switch	15-33-932/93	=	=	=	=	=		
23	1	Schaltnocke operating cam	08-52-290/97	08-52-291/97	=	=	=	=		
24	4	Skt. Schraube hex. screw	DIN EN 24017-M8x16-A2-70							
25	1	O-Ring o-ring	OR 66x2 NBR 70-75 Shore A							
		Dichtungssatz / seal kit Pos. 5, 7, 12, 13, 14, 15, 20 nur im kompletten Dichtungssatz erhältlich item. 5, 7, 12, 13, 14, 15, 20 available es complete seal kits only								
	1	Dichtungssatz FPM seal kit	58-34-880/00	58-34-881/00	58-34-882/00	58-34-889/00	58-34-890/00	58-34-885/00		
	1	Dichtungssatz EPDM seal kit	58-34-880/01	58-34-881/01	58-34-882/01	58-34-889/01	58-34-890/01	58-34-885/01		
	1	Dichtungssatz VMQ seal kit	58-34-880/02	58-34-881/02	58-34-882/02	58-34-889/02	58-34-890/02	58-34-885/02		
	1	Dichtungssatz HNBR seal kit	58-34-880/06	58-34-881/06	58-34-882/06	58-34-889/06	58-34-890/06	58-34-885/06		

Ersatzteilliste: spare parts list:

Steuerkopf SW4
Actuator SW4

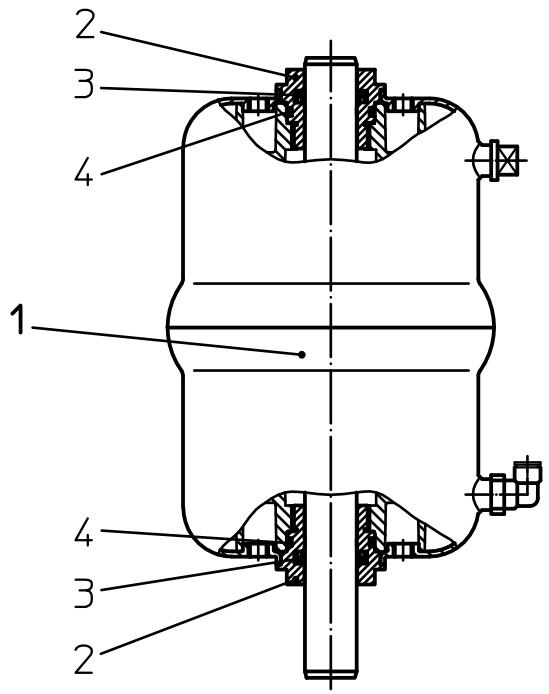
Besteht aus 1 Blatt Blatt 1

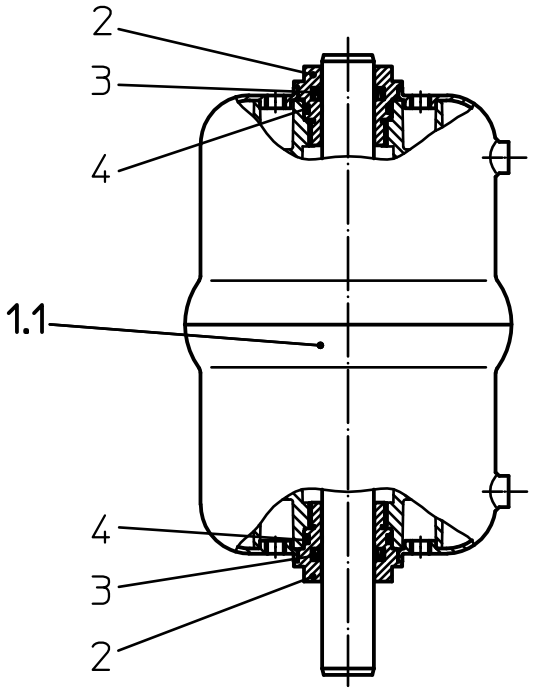
	Datum	Name
Gezeichnet	15.1.98	Trytko
Geprüft	15.1.98	Spliethoff
Normgepr.	19.1.98	Plümper

Datum	1/98	12/03	01/06	06/08					
Name	Trytko	Trytko	Trytko	Trytko					

APV Rosista GmbH
D-59425 Unna
Germany

RN 01.054.86





Pos. item	Menge quantity	Benennung description	ø74 WS-Nr. ref.-no.	ø110 WS-Nr. ref.-no.	ø165 WS-Nr. ref.-no.
1		Steuerkopf kpl Feder/Luft Actuator complete spring/air Ausf. matt-gl. design satin fin.	15-32-050/17	15-32-051/17	15-32-052/17
		Steuerkopf kpl Luft/Luft Actuator complete air/air Ausf. matt-gl. design satin fin.	15-32-085/17	15-32-086/17	15-32-087/17
1.1		Steuerkopf kpl Feder/Luft Actuator complete spring/air Ausf. 3A-blank design 3A-bright fin.	3A0 15-32-059/13	3A0 15-32-060/13	3A0 15-32-061/13
		Steuerkopf kpl Luft/Luft Actuator complete air/air Ausf. 3A-blank design 3A-bright fin.	3A0 15-32-057/13	3A0 15-32-065/13	3A0 15-32-066/13
2	2	Dichtungsschraube Seal screw	15-28-840/93	=	=
3	2	V-Dichtung V-seal 20x28x4	58-32-010/83	=	=
4	2	O-Ring O-ring 29-2,5	58-06-124/83	=	=