

APV DELTA SI2

SAFETY VALVE

FORM NO.: H170706 REVISION: UK-6

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



EU Declaration of Conformity for Valves and Valve Manifolds

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

**APV double seal and double seat valves of the series
SD4, SDT4, SDU4, SDMS4, SDMSU4, SDTMS4, SWcip4, DSV,
DA4, D4 SL, D4, DA3, DA3SLD, DE3, DEU3, DET3, DKR2, DKRT2, DKRH2**
in the nominal diameters DN 25 - 150, ISO 1" – 6" and 1 Sh5 - 6 Sh5

APV butterfly valves of the series SV1 and SVS1F, SVL and SVSL
in the nominal diameters DN 25 - 100, DN 125 - 250 and ISO 1" – 4"

APV ball valves of the series KHI, KHV
in the nominal diameters DN 15 - 100

**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, VRA/H**
in the nominal diameters DN 10 - 150, ISO 1/2" – 4" and 1 Sh5 - 6 Sh5

and the valve manifolds installed thereof

meet the requirements of the Directives 2006/42/EC (superseding 89/392/EEC
and 98/37/EC) and ProdSG (superseding GPSG - 9.GPSGV).

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 correspond with
the basic requirements on safety and health, incl. an analysis of the risks,
as well as an operating manual with safety instructions.

The conformity of the valves and valve manifolds is guaranteed.

Authorised person for the documentation:
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May 2018

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APV

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1. General Terms

This instruction manual has to be read carefully and observed by the competent operating and service personnel.

We have to 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.

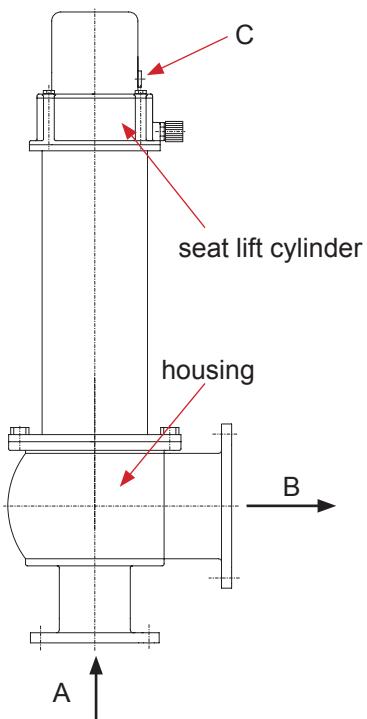
2. Safety Instructions

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.
- Depressurize the line and cleaning system before any maintenance work.
- Risk of injury by sudden valve operation
- Observe Service Instructions to ensure safe maintenance of the valve.
- Do not remove the lead seal (malfunction of valve and loss of guarantee).

3. Intended Use / Mode of Operation



The component-tested SI2 safety valve is used in those plant sections which have to be protected against excessive pressure.

In the beverage and food industry as well as in pharmaceutical applications, the valve protects tanks and other containers against inadmissible excess pressure.

The SI2 safety valve prevents exceeding of the allowed operating pressure by more than 10 %.

If the adjusted response pressure after opening falls below max. 10% with gases and max. 20% with liquids, the valve closes.

The flow direction is always from **A** → **B**.

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

4. Auxiliary Equipment

The valve can optionally be equipped with manual seat lift or seat lift actuator.

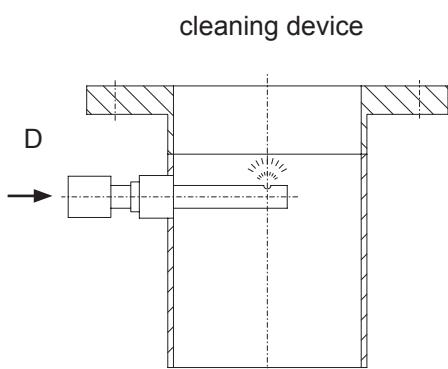
Reconstruction can be undertaken during operation without greater efforts.

- **Seat lift actuator**

The SI2 valve can be equipped with a seat lift actuator if necessary for reasons of cleanability and / or remote function control. (see chapter 5)

- **Valve feedback**

A proximity switch to signal the closed or open position of the valve seat (ON/OFF) can be mounted on the seat lift actuator (C) if required.



We recommend using one of our APV standard types.

Operating distance: 5 mm / diameter: 1 mm / length: 30 mm.

If the customer decides to use a valve feedback other than APV type, we cannot take over any liability for a faultless function.

- **Cleaning device**

An adapter with an integrated cleaning nozzle (D) can be flanged below the valve.

5. Cleaning

Lifting of the valve seat during the cleaning process

Rinsing of the contact surface between seat seal and seat and of the housing with the valve outlet port by the cleaning liquid is possible.

Cleaning device below the valve seat

Through an adapter with spraying device the product-wetted part of the valve to the valve seat can be cleaned

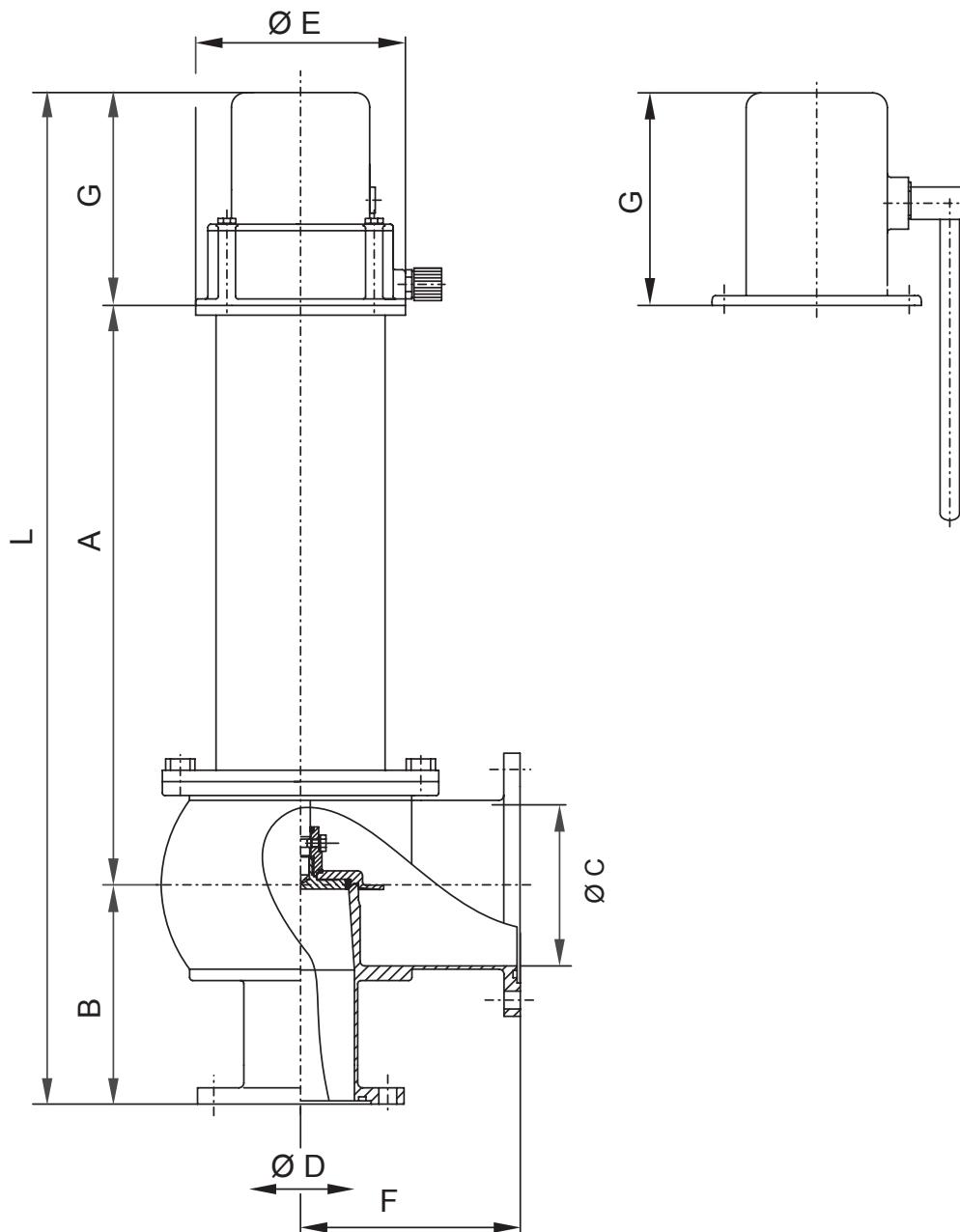
Cleaning device

DN	Welded version	Flanged version
25	H147727	H316650
40	H147330	H316651
50	H147729	H316652
65	H145573	H316653
80	H148830	H316654
100	H148831	H316655

6. Installation

- **Installation must be in vertical position.**
For this fitting position the valve has a component mark of the Technical Supervisory Board and is tested and adjusted accordingly.
- The standard housing is equipped with groove flanges (FN1B - with inspection certificate APZ 3.1). The appropriate mating flanges FG1B are available.
- The response pressure adjusted in our factory must not be changed (lead seal protection).
- The free discharge at the outlet side must always be ensured. For a possible discharge of the liquid, bends and short pipes of the same dimensions may be fitted.

7. Dimensions / Weights



dimensions in mm

DN	A	B	Ø C	Ø D	Ø E	F	G	L	weights in kg
25	241	96	50	26	129	96	131	468	4,8
40	273	109	66	38	129	109	131	513	6,2
50	312	122	81	50	129	122	131	565	8,7
65	356	135	100	66	129	135	131	622	13,1
80	412	154	125	81	129	157	131	697	20,0
100	424	174	150	100	129	177	131	729	24,7

8. Technical Data

8.1. General data

max. line pressure:	10 bar
min. operating temperature:	- 10°C
max. operating temperature:	135° C EPDM, HNBR *VMQ, *FPM
sterilization temperature:	140°C EPDM, HNBR *VMQ, *FPM *(no steam)
discharge figure:	0,49 for liquids 0,44 for steams and gases
air connection (for hose):	6 x 1
pneumatic air pressure for seat lift actuator:	max. 10 bar min. 6 bar

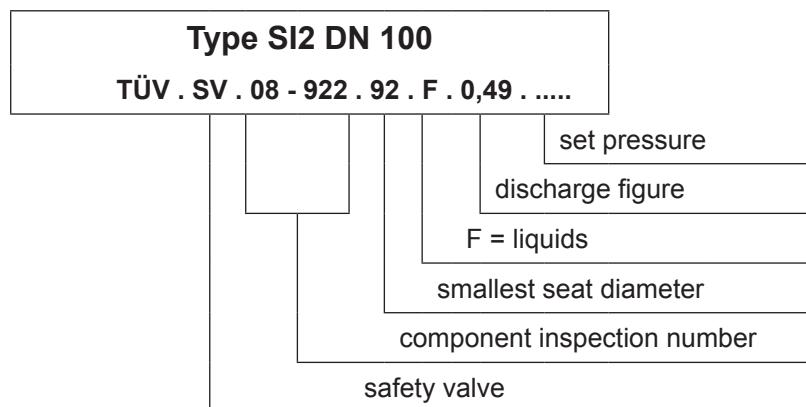


To provide for a faultless function of the SI2 valve, the valve must not freeze.

! For the different pressure ranges, please see catalogue.

- **Type plate:**

e.g.



8. Technical Data

8.2. Compressed air quality:

Quality class acc. to DIN/ISO 8573-1

- **Content of solid particles:** quality class 3, max. size of solid 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. 0,01mg/m³

The oil applied must be compatible with Polyurethane elastomer materials.

9. Materials

housing, housing cover, shafts:	1.4404 /1.4571 (DIN EN 10088)
complete spring cylinder, screws:	1.4301 (DIN EN 10088)
seals standard: options:	EPDM / PTFE VMQ , FPM, HNBR
seat lift actuator, cover:	Vestamid L 1930
air connection:	PA 6.6

10. Maintenance

- The maintenance intervals depend on the application and have to be determined by the operator carrying out regular checks.
- Dismantling and installation of seals according to Service Instructions. Use complete seal kits according to spare parts list.
- **All seals must be provided with a thin layer of grease before their installation**

Recommendation:

APV assembly grease for EPDM, FPM and HNBR

(750 g/ 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

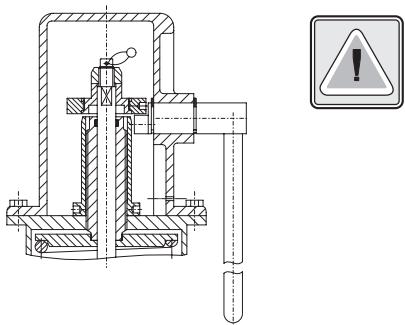
(600 g/ tin - ref.-No. 000 70-01-017/93; 147380)

(60 g/ tube - ref.-No. 000 70-01-016/93; 147379)

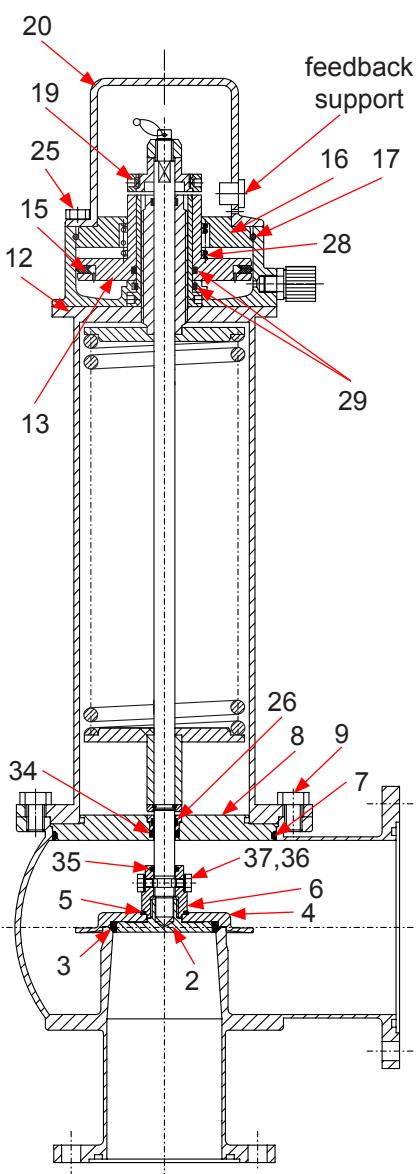
- Use only those greases being suited for the respective seal material.
- Assembly of valve according to Service Instructions.

11. Service Instructions

Delta SI2-H
with manual seat lifting



Delta SI2-A
with seat lift cylinder



The item numbers refer to the spare parts list **RN 01.16 - 2**

11.1. Dismantling from the line system

1. Shut off the line pressure in the product - cleaning line and discharge it if possible.
2. Remove the pneumatic air line.
3. Release the clamp screw in the feedback support and pull off proximity switches.
4. Remove the flange screws (9).
5. If the housing cover (8) is stuck, put a screwdriver into the groove and slowly push the insert out.

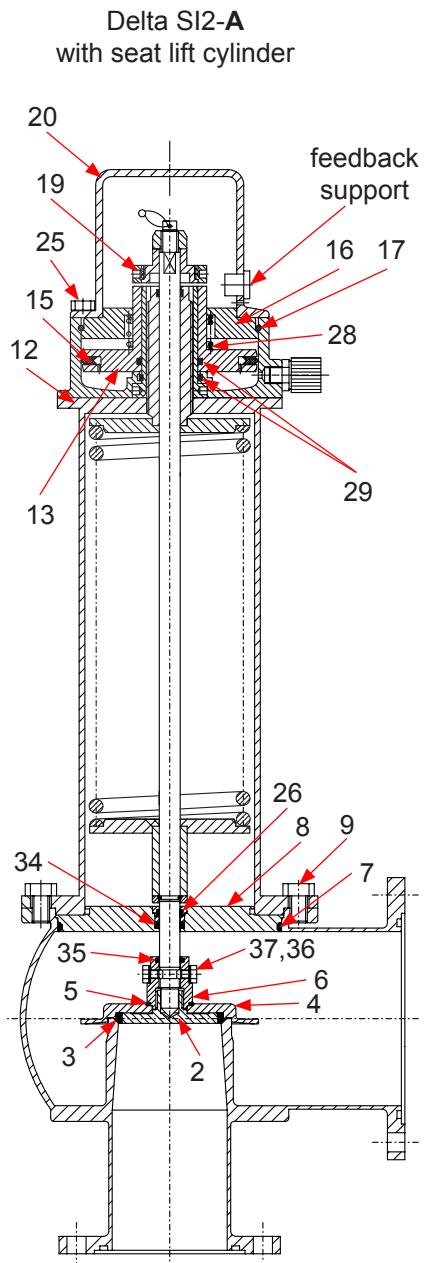
11.2. Dismantling of internal parts

1. Remove the housing seal (7) from the housing cover (8).
2. Release the hexagon screws (37) and the washers (36) at the guide (6) and take out the complete valve seat.
3. Separate the guide (6) from the seat (2).
4. Separate the cap (4) from the seat (2).
5. Seal rings (5, 35) and seat seal (3) are freely accessible.
6. Pull the housing cover (8) from the shaft rod and remove the guide strap (26) and the sliding ring (34).

Valve with seat lift actuator

- Release the screws (25) and lift off the cover (20).
- Unscrew the ring (19) and lift off the seat lift actuator (12).
- Press down the cover (16) and take out the retaining ring (17).
- Remove the pressure spring (28).
- Take the piston (13) out of the cylinder.
- Seal rings (15, 29) are freely accessible.

11. Service Instructions

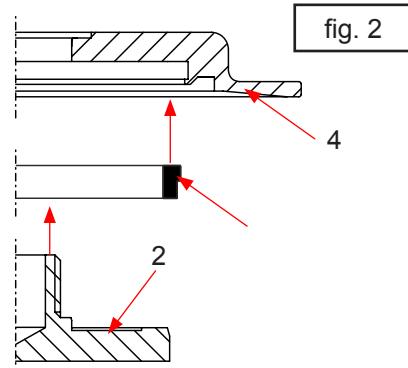
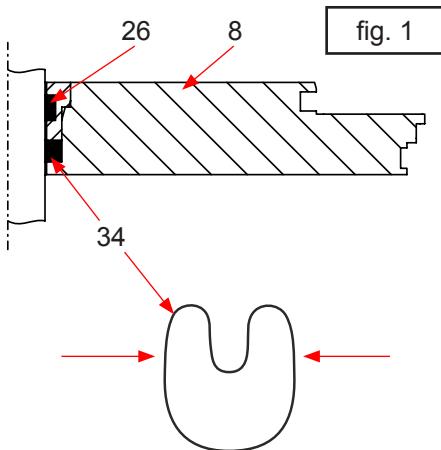


11.3. Assembly of seat lift actuator

1. Insert the slightly greased seal rings (15, 29).
2. Push the piston (13) into the cylinder (12).
3. Insert the pressure spring (28) and fix the cover (16) with the retaining ring (17).
4. Push the complete seat lift cylinder on the valve and tighten the ring (19) until it stops.
5. Fix the cover (20) with the screws (25).

11.4. Installation of seals and assembly of valve

1. Place the guide strap (26) and the o-ring of the sliding ring (35) in the housing cover (8).
2. Press the sliding ring (34) into reniform shape and put it into the groove of the housing cover onto the o-ring (fig. 1).
3. Slide the housing cover (8) onto the pressure rod (11).
4. Before mounting the complete valve seat, insert the seat seal (3) (fig. 2).
5. Place the seat seal (3) in the cap (4) and press it into the seat (2).
6. Insert the seal ring (5, 35) into the guide (6).
7. Screw guide (6) and seat (2) firmly together.
8. Put the complete valve seat onto the pressure rod (11) and fix it with the hexagon screws (37) and washers (36).
9. Install the slightly greased housing seal (7) in the housing cover (8).



11. Service Instructions

11.5. Installation of valve

1. Put the complete valve insert carefully in the valve housing (1).
2. Turn in the screws (9) and tighten them crosswise.
3. Connect the pneumatic air line at the SI2 with seat lift actuator
4. Installation of valve feedback.

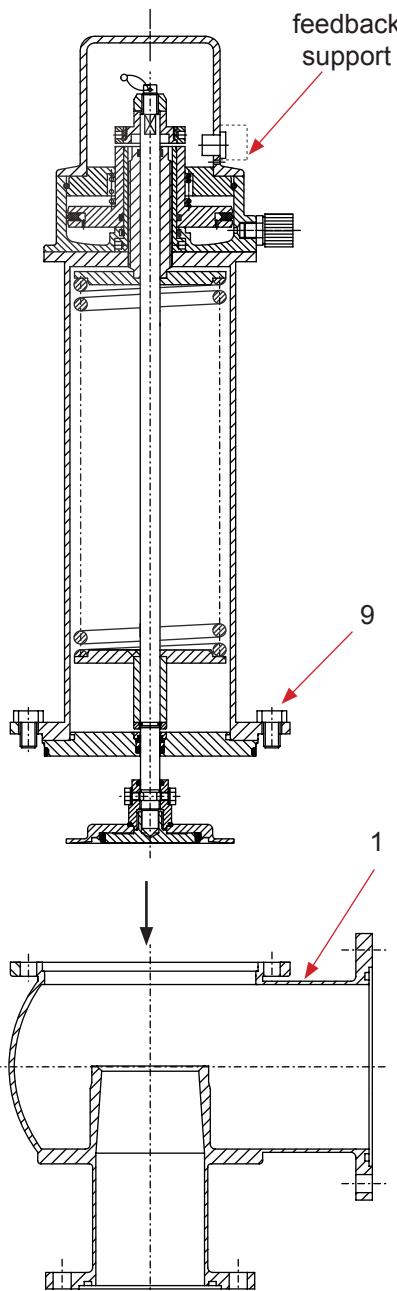
Fine adjustment:

By slight backward movement of the proximity switch the shift point can be adjusted more precisely if necessary.
Observe the luminous diodes in the feedback during the adjustment.

Fix the feedback with clamp screws.

11.6. Reconstruction of seat lift from manual to pneumatic design

1. Release the screws (38) and remove the cover (42) with handle (39).
2. Unscrew the ring (41 / Ø 50 mm).
3. Place the seat lift cylinder (12) and tighten the ring (19 / Ø 42 mm).
4. Tighten the cover (20) of the seat lift cylinder with the screws (25).
5. Mount the air connection and the valve feedback.



12. Trouble Shooting

Failure	Remedy
Operating position: closed Leakage at the discharge side.	Replace seat ring (3). Check control of seat lift actuator.
Leakage between housing flange and flange of spring cylinder.	Check housing seal (7) and shaft seal (34), replace damaged seal.
Seat lift cylinder does not work	Check whether ring (19, 41) is stuck. Replace piston seal (15).
Valve feedback does not work or is unprecise.	Carry out fine adjustment. Check whether ring (19, 41) is stuck.

The item numbers comply with the spare parts lists. The replacement of seals must be carried out according to Service Instructions (see chapter 11).

- ! If damaged seals are replaced, generally all seals should be changed. Complete seal kits for the valve service are available (see spare parts lists).**

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.

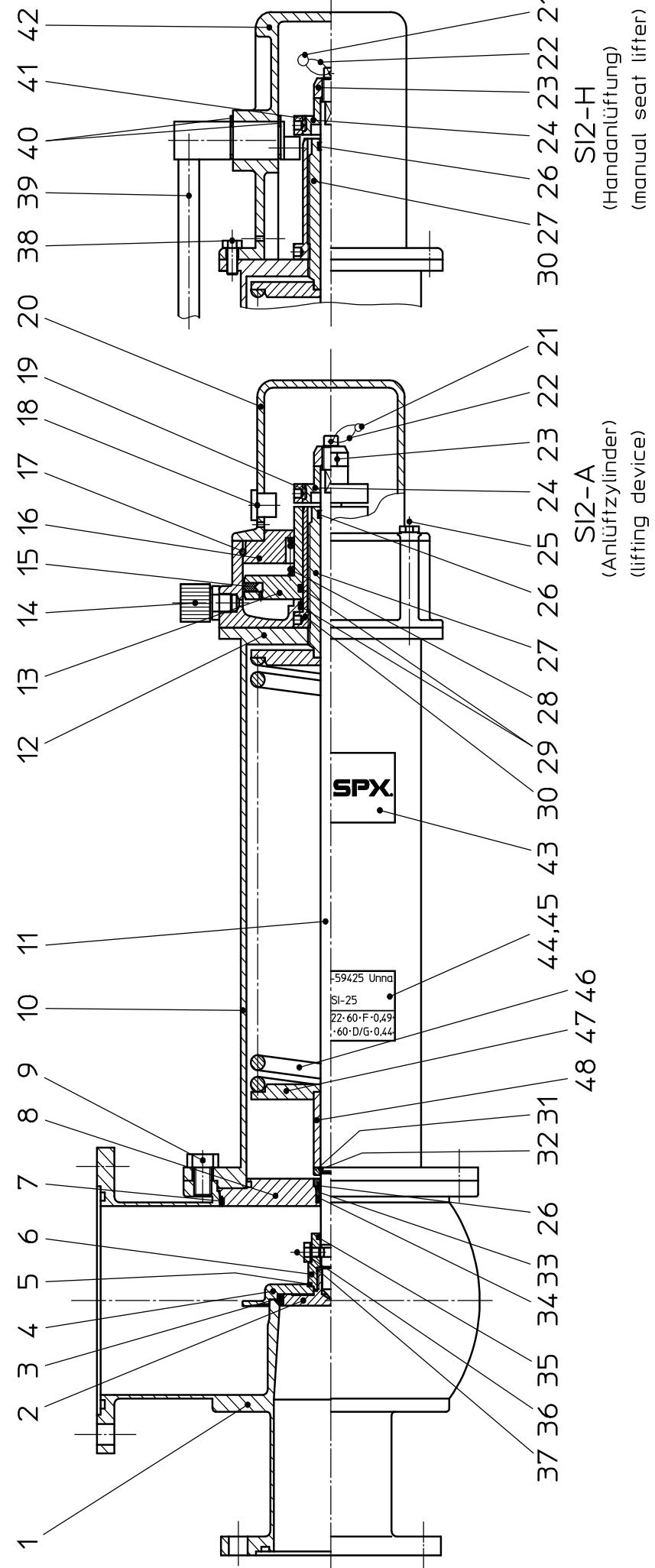
Data are subject to change

Ersatzteilliste: spare parts list

Sicherheitsventil SI2 TÜV-geprüft 12FN1B

Entlastung pneumatisch / handbetätigt

Safety valve SI2 TÜV-tested 12FN1B pneumatically / manually relieved
DN 25-100



Ersatzteilliste: spare parts list

Sicherheitsventil SI2 TÜV-geprüft 12FN1B

Entlastung pneumatisch / handbetägt

Safety valve SI2 TÜV-tested 12FN1B pneumatically / manually relieved

DN 25-100

		Datum:		29.10.14				>APV	
		Name:		Trytko				SPX Flow Technology Rosista GmbH	
		Geprüft:						D-59425 Unna Germany	
		Datum:		Blatt		16-30-532/17		16-30-632/17	
		Name:		2		H123445		H143244	
		Geprüft:		von		5		21-87-635/12	
				RN 01.16-2				H143245	
pos.	item	Beschreibung	Material	DN25	DN40	DN50	DN65	DN80	DN100
quantity	item	description	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	Gehäuse Housing	SI2 1+2FN1B	1.4404	31B 21-85-278/47 H136789	31B 21-85-428/47 H136790	31B 21-85-478/47 H136791	31B 21-85-528/47 H136792	31B 21-85-628/47 H136793
2	1	Teller für Hubglocke Plate for stroke cover		1.4404	21-87-279/42 H148396	21-87-379/42 H145777	21-87-429/42 H142715	21-87-479/42 H142707	21-87-529/42 H143247
1	1	Tellerdichtung Seat seal			EPDM FDA-konform	58-33-243/93 H136203	58-33-093/93 H77415	58-33-143/93 H77421	58-33-568/93 H77561
1	1	Tellerdichtung Seat seal			FPM FDA-konform	58-33-243/73 H136204	58-33-093/73 H77414	58-33-143/73 H77420	58-33-568/73 H77560
3	1	Tellerdichtung Seat seal			HNBR FDA-konform	58-33-243/33 H170179	58-33-093/33 H170014	58-33-143/33 H170016	58-33-568/33 H166679
1	1	Tellerdichtung Seat seal			VIMQ FDA-konform	58-33-243/13 H136202	58-33-093/13 H77413	58-33-143/13 H77419	58-33-568/13 H77559
4	1	Hubglocke Stroke cover		1.4404	21-87-277/42 H148398	21-87-377/42 H142719	21-87-427/42 H142713	21-87-527/42 H142706	21-87-627/42 H143248
5	1	O-Ring O-ring	NBR		58-06-070/83 19x1.8	58-06-070/83 H76939		58-06-079/83 20.3x2.4	58-06-079/83 H76944
6	1	Führungsstück für Hubglocke Guide for stroke cover		1.4404	21-87-278/42 H148397	21-87-378/42 H145776	21-87-428/42 H142717	21-87-478/42 H142709	21-87-528/42 H143246
1	1	Gehäusedichtung Housing seal			EPDM FDA-konform	58-33-442/93 H77488	58-33-492/93 H77512	58-33-542/93 H77543	58-33-692/93 H77608
7	1	Gehäusedichtung Housing seal			FPM FDA-konform	58-33-442/73 H77487	58-33-492/73 H77511	58-33-542/73 H77542	58-33-692/73 H77607
1	1	Gehäusedichtung Housing seal			HNBR FDA-konform	58-33-442/33 H168714	58-33-492/33 H168759	58-33-642/33 H170075	58-33-692/33 H172125
8	1	Gehäusedeckel Housing cover		1.4404	31B 15-00-280/42 H123149	31B 15-00-380/42 H123207	31B 15-00-480/42 H123420	31B 15-00-530/42 H136988	31B 15-00-630/42 H123442
9		Skt. Schraube Hex. Screw	DIN EN 24017-A2-70	1.4301	65-01-079/15 4xM8x14 H78768	65-01-130/15 4xM10x16 H78806		65-01-131/15 8xM10x15 H78807	
10	1	Federhaube Spring cover		1.4301	16-30-282/17 H123183	16-30-432/17 H123224	16-30-482/17 H136995	16-30-532/17 H123445	16-30-632/17 H143244
11	1	Druckstange Pressure bar		1.4301	21-87-285/12 H141244	21-87-435/12 H141246	21-87-485/12 H141247	21-87-635/12 H143245	21-87-635/12 H143246

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Ersatzteiliste: spare parts list

Sicherheitsventil SI2 TÜV-geprüft 12FN1B

Entlastung pneumatisch / handbetägt

Safety valve SI2 TÜV-tested 12FN1B pneumatically / manually relieved

DN 25-100

		Beschreibung		Material		DN25		DN40		DN50		DN65		DN80		DN100	
pos. item Nr.	Menge quantity	description	material	WS-Nr. ref.-no.													
12	1	Unterteil für Anlüftzylinder Base for seat lift actuator	Vestamid														
13	1	Kolben Anlüftzylinder Piston for seat lift actuator	Hostaform natur														
14	1	Verschraubung Union	EG 6x1 G1/8"	Kunststoff													
15	1	Kolbendichtung Piston seal	PKK1-102	NBR													
16	1	Deckel für Anlüftzylinder Cover for seat lift actuator	Hostaform natur														
17	1	Sprengring Retainer ring	Aø106	1.4301													
18	1	Verschlussstopfen Lock plug	Kunststoff														
19	1	Hubring für Anlüftzylinder Stroke ring for seat lift actuator	1.4301														
20	1	Haube für Anlüftzylinder Cover for seat lift actuator	Vestamid														
21	1	Bleiplombe Lead seal	Blei														
22	1	Nylon Faser Nylon wire	ø0,3x50	Nylon													
23	1	Skt. Mutter mit Klemmteil Retainer nut	DIN EN ISO 7040	1.4301													
24	1	Gewinde ring Threaded ring		1.4308													
25	4	Skt. Schraube Hex. screw	DIN EN 24014	1.4301													
26	2	Führungsband PTFE driving band	3,9x1,55x40														
27	1	Federreinstellschraube Setting screw for spring	RG7														



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D-59425 Unna Germany

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Ersatzteilliste: spare parts list

Sicherheitsventil SI2 TÜV-geprüft 12FN1B

Entlastung pneumatisch / handbetägt

Safety valve SI2 TÜV-tested 12FN1B pneumatically / manually relieved

DN 25-100

		Beschreibung		Material		DN25		DN40		DN50		DN65		DN80		DN100	
pos.	item	quantity	description	material	WS-Nr. ref.-no.												
28	1	Druckfeder	Pressure spring	1.4310													
29	2	O-Ring O-ring	OR 32,2x3	NBR													
30	1	Hülse Sleeve		1.4301													
31	1	Druckstück		1.4057													
32	1	Spacer															
32	1	Sprengring		1.4310													
33	1	Retainer ring	DIN 9045														
33	1	Buchse		1.4404													
33	1	Bushing															
34	1	Turcon-Double 12 Delta	GS 55403-0120-109 112	PTFE-109/ NBR-8													
35	1	Quadrинг	12,37x2,62 Q4112-N7004	NBR													
36	2	Sicherungsscheibe	M5	Nyltite-Siegel													
37	2	Lock washer															
37	2	Skt. Schraube		1.4301													
38	4	Hex. Screw	DIN EN 24017	3.4301													
39	1	Skt. Schraube															
39	1	Hex. Screw															
39	1	Hebel für Handlüftung															
39	1	Lever for manual seat lifter		1.4301													
40	2	Sicherungsscheibe															
40	2	Lock washer		1.4122													
41	1	Hubring für Handlüftung															
41	1	Stroke ring for manual seat lifter		1.4301													
42	1	Haube für Handlüftung															
42	1	Cover for manual seat lifter		Vestamit L1930 schwarz													
43	1	SPX Firmen Logo															
43	1	SPX company logo		Klebefolie transparent													



SPX Flow Technology Rosita GmbH
D-59425 Unna Germany

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Ersatzteilliste: spare parts list

Sicherheitsventil SI2 TÜV-geprüft 12FN1B

Entlastung pneumatisch / handbetägt

Safety valve SI2 TÜV-tested 12FN1B pneumatically / manually relieved

DN 25-100

APV DELTA SI2

SAFETY VALVE

SPX FLOW

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 and should not be relied upon unless confirmed in writing. Please contact your local sales representative for product availability in your region.

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