

# Operating Manual

# **DELTA SI2**

## Safety Valve



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





## Declaration of Conformity for Valves with Safety Function

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

**safety valves of the series SI2 in the nominal dimensions DN 25 - 100**

**meet the requirements of the Pressure Equipment Directive 97/23/EU.**

Applied procedure of conformity: according to article 10 :

Module	Conformity Evaluation Procedure	EU- design audit No. / certificate No.
B	EU – design audit	07 202 1404 Z 0117 / 7 / D 001
D	QS – system of production	07 202 1404 Z 0118 / 7 / D 001

Applied category: according to article 3 and appendix II : category IV

Certification authority: for Module B and Module D  
TÜV CERT – Zertifizierungsstelle für Druckgeräte der  
TÜV NORD Systems GmbH & Co KG  
D-22525 Hamburg, Große Bahnstr. 31


ID – No.: 0045

Applied standards: AD 2000-Merkblätter A2, A4

For official audits, APV Rosista GmbH presents a technical documentation according to Appendix III of the Pressure Equipment Directive, this documentation consisting 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. analysis of the remaining risks as well as an operating manual with safety instructions.

The conformity of the valves is guaranteed.

D-59425 Unna-Königsborn, 04<sup>th</sup> June 2008, APV Rosista GmbH

  
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Manager Research and Development



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<b>SI2 - RN 01.016 - 2</b>	



## 1. General Terms

This operating 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 operating manual.

Descriptions and data given herein are subject to technical changes.

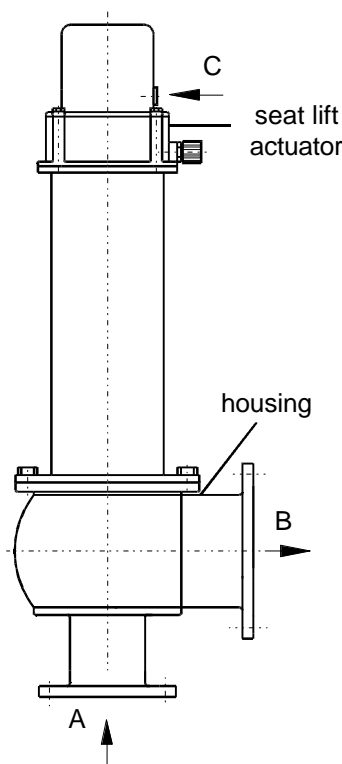
## 2. Safety Instructions



### Danger!

- Before any maintenance work, the line and cleaning system must be depressurized!
- Risk of injury by suddenly actuating valve!
- Observe service instructions to ensure a safe maintenance of the valve.
- Do not remove the lead seal.  
(malfunction of valve and loss of guarantee)

## 3. Mode of Operation



The component-tested safety valve SI2 is used in those plant sections that 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 basins against unacceptable excess pressure.

The SI2 safety valve prevents an 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.

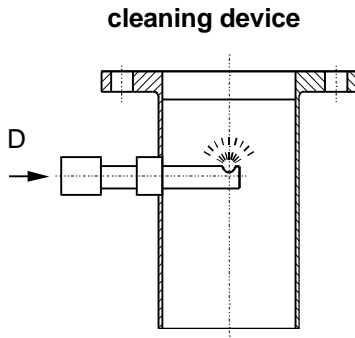
The flow direction is always **A → B**.

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## 4. Auxiliary Equipment

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\* The valve can optionally be equipped with manual seat lift or seat lift actuator. Modification can be undertaken during operation without expenditure.



### - 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 chap. 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**).

We recommend to use 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.

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## 5. Cleaning

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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.

Spraying device below the valve seat

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



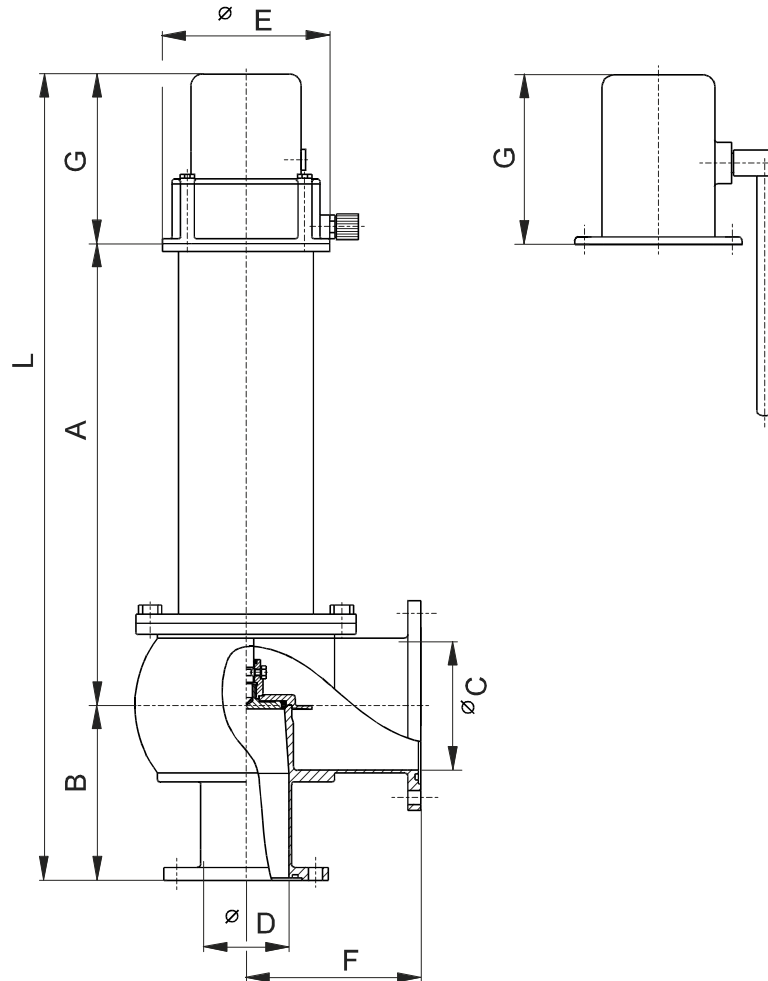
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## 6. Installation

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- Installation must generally be in vertical position.  
For this fitting position the valve has a component mark of the TÜV (German Technical Supervisory Board) and is tested and adjusted accordingly.
- The standard housing is equipped with groove flanges (FN1B - with 3.1.B certificate).  
The appropriate mating flange FG1B (with 3.1.B certificate) is required.
- 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



DN	dimensions in mm								weight
	A	B	Ø C	Ø D	Ø E	F	G	L	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

max. line pressure	=	<b>10 bar</b>
min. operating temperature	=	<b>- 10 °C</b>
max. operating temperature	=	<b>140 °C EPDM</b> <b>135 °C FPM, VMQ, HNBR</b>
sterilization temperature	=	<b>150 °C EPDM</b> <b>140 °C FPM, VMQ, HNBR</b>
discharge figure	=	<b>0,49 for liquids</b> <b>0,44 für steams and gases</b>
air connection (for hose)	=	<b>6x1</b>
air pressure for seat lift actuator	=	<b>max. 10 bar</b> <b>min. 6 bar</b>

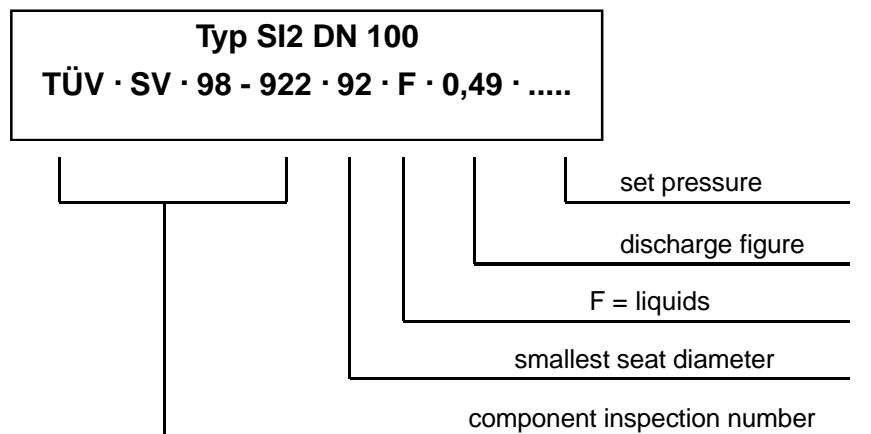
! To provide for a faultless function of the SI2 valve, the valve must not freeze up.

! Use dry and clean air, only.

! Different pressure ranges, see catalogue.

- Type plate:

e.g.



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## 9. Materials

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

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## 10. Maintenance

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- 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 food grade grease for EPDM, FPM and HNBR**

(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**

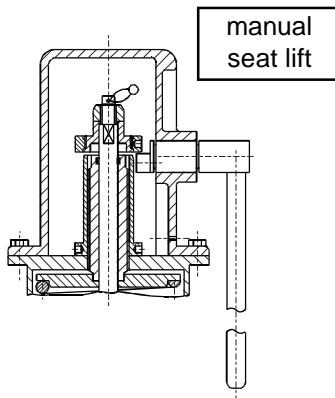
(0,60 kg /tin - ref.-No. 000 70-01-017/93)

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

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

## 11. Service Instructions

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

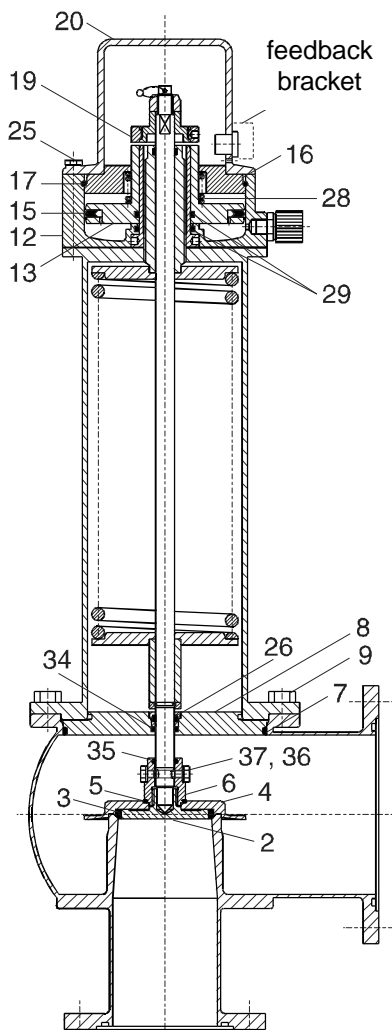


### I. Disassembly from the pipeline

- a. Shut off the line pressure in the product - cleaning line and discharge it if possible.
- b. Remove the control air line.
- c. Release the clamp screw in the feedback bracket and pull off proximity switches.
- d. Remove the flange screws (9).
- e. Lift the valve insert vertically out of the valve housing.  
If the housing cover (8) is stuck, put a screwdriver into the groove and slowly push the insert out.

seat lift actuator

### II. Dismantling of internal parts



- a. Remove the housing seal (7) from the housing cover (8).
- b. Release the hexagon screws (37) and the washers (36) at the guide (6) and take out the complete valve seat.
- c. Separate the guide (6) from the seat (2).
- d. Separate the cap (4) from the seat (2).
- e. Seal rings (5, 35) and seat seal (3) are freely accessible.
- f. 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 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

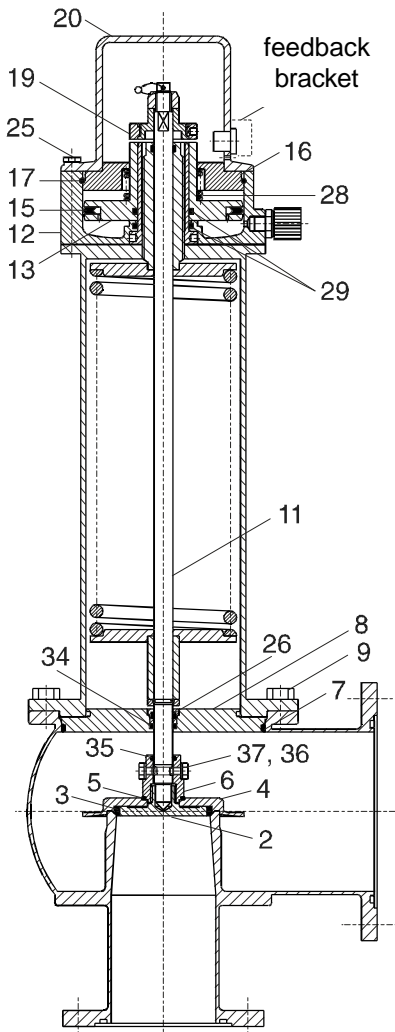


fig. 1

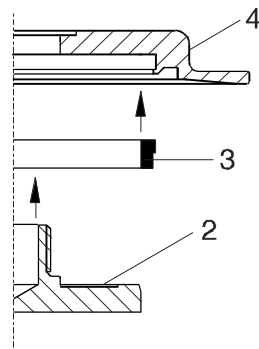
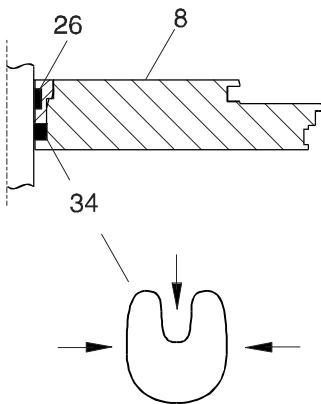


fig. 2

### III. Assembly of the seat lift actuator

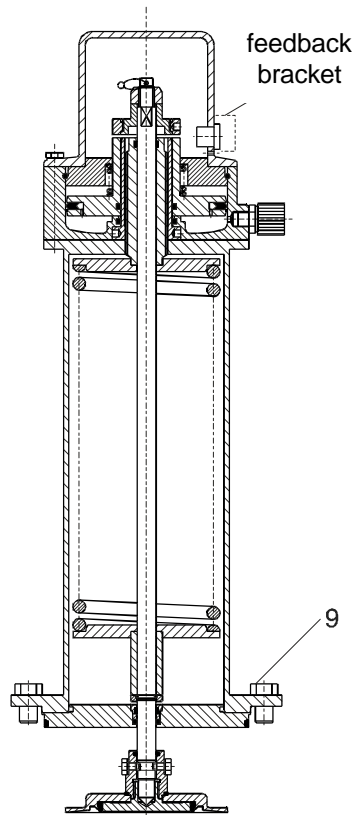
- a. Insert the slightly greased seal rings (15, 29).
- b. Push the piston (13) into the actuator (12).
- c. Place the pressure spring (28) and the cover (16) and fix it with the retaining ring (17).
- d. Push the complete seat lift actuator on the valve and tighten it with the ring (19) until it stops.
- e. Fix the cover (20) with the screws (25).

### IV. Installation of seals and assembly of valve

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

## 11. Service Instructions

### V. Installation of valve



- a. Put the complete valve insert carefully in the valve housing **(1)**.
- b. Turn in the screws **(9)** and tighten them crosswise.
- c. Connect the control air line - SI2 with seat lift actuator.
- d. Installation of valve feedback.

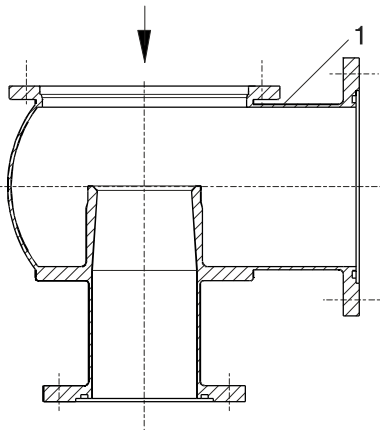
#### Fine adjustment:

By slight shifting motion of the proximity switch the shift point can be adjusted more precisely if necessary. During this adjustment observe the luminous diodes in the feedback.

Fix the feedback with clamp screws.

### VI. Reconstruction of seat lift from manual to pneumatic design

- a. Release the screws **(38)** and remove the cover **(42)** with handle **(39)**.
- b. Unscrew the ring (41 /  $\varnothing$  50 mm).
- c. Place the seat lift actuator **(12)** and tighten the ring (19 /  $\varnothing$  42 mm).
- d. Tighten the cover **(20)** of the seat lift actuator with the screws **(25)**.
- e. Mount the air connection and the valve feedback.



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## 12. Trouble Shooting

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The item numbers refer to the spare parts drawing.  
Failure repair see chap. 11, service instructions.

- operating position: closed  
leakage at the discharge side : - replace seat seal **(3)**.  
  
- check control of seat lift actuator.
- leakage between housing  
and yoke flange : - check housing seal **(7)** and  
shaft seal **(34)**, replace  
damaged seal.
- seat lift actuator  
does not work : - check whether ring **(19, 41)**  
is stuck, replace piston seal **(15)**.
- valve feedback does not work  
or is unprecise : - undertake fine adjustment.  
check whether ring **(19, 41)**  
is stuck.

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

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## 13. Spare Parts Lists

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(see annex)





BA SI2 0000002  
ID-No.: H 1 7 0 7 0 6  
Translation of original manual



rev. 4



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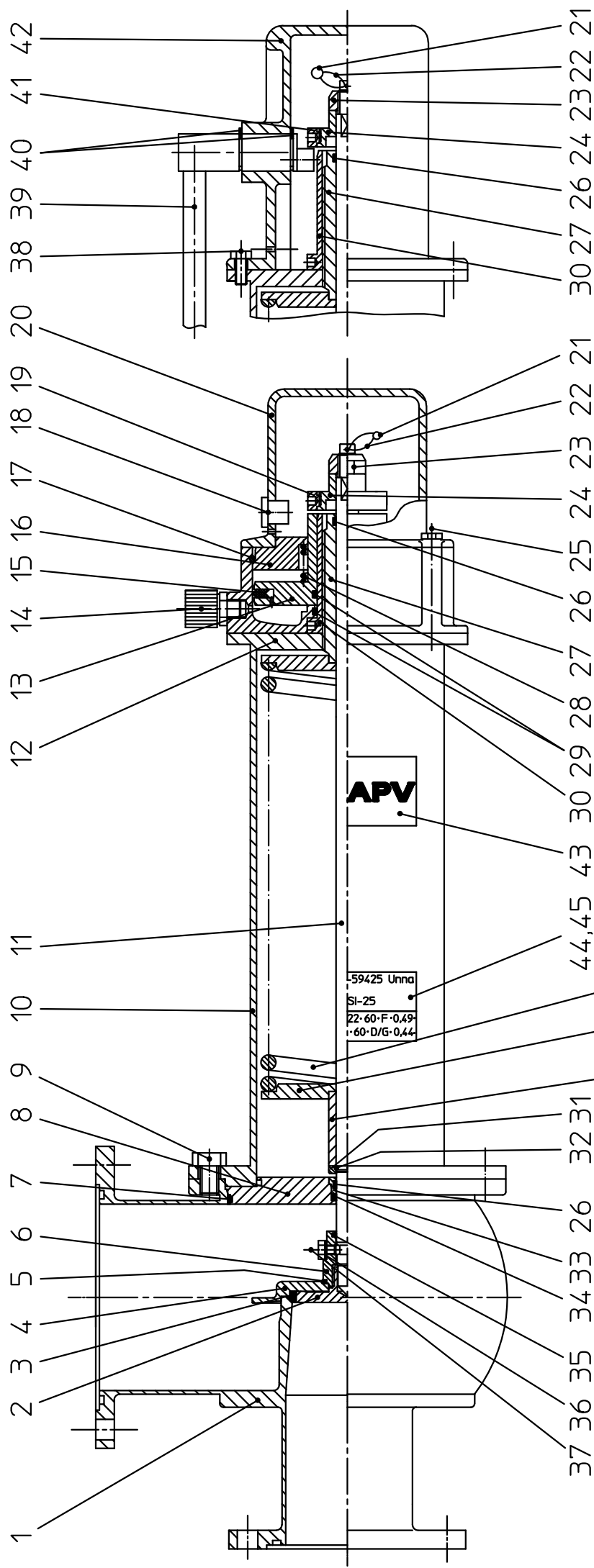
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02/94

<b>Ersatzteilliste: spare parts list:</b> Sicherheitsventil SI2-25-100 TÜV-geprüft 12FN1B Entlastung pneumatisch/handbetätigt Safety valve SI2-25-100 TÜV-tested 12FN1B pneumatically/manually relieved		Besteht aus <u>4</u> Blatt Blatt <u>1</u>	Gezeichnet 11.8.93 Geprüft 12.8.93 Normgepr. 12.8.93	Datum 11.8.93 Datum 12.8.93 Datum 12.8.93	Name Trytko Name Knö/WB Name Plümper
Datum	8/93	7/96			
Name	Trytko	Trytko			
APV Rosista GmbH D-59425 Unna Germany RN 01.16-2					



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48

SI-25  
 22-60-F-0.49  
 1-60-D/G-0.44  
 -59425 Unna

SI2-A  
 (Anlüftzylinder)  
 (lifting device)

SI2-H  
 (Handanlüftung)  
 (manual seat lifter)

Gehäuseichtung /housing seal  
 Bei Silikon wird die EPDM-Gehäuseichtung eingesetzt.  
 For silicon take the EPDM-housing seal.

\*Dichtungswerkstoff: material seals:  
 ..13-Silikon/silicon  
 ..73-Viton  
 ..93-EPDM

Es stehen verschiedene Werkstoffe zur Verfügung.  
 Bitte WS-Nr. ergänzen  
 The following materials are available (fill in last two digits of ref.-no.)













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Ersatzteilliste: spare parts list:  
 Sicherheitsventil S12-25-100 TÜV-geprüft 12FN1B  
 Entlastung pneumatisch/handbetätigt  
 Safety valve S12-25-100 TÜV-tested 12FN1B  
 pneumatically/manually relieved

Blatt 4

Gezeichnet	11.8.93	Trytko	
Geprüft	12.8.93	Knö/WB	
Normgepr.	12.8.93	P/ümper	
Datum	8/93	7/96	2/98
Name	Trytko	Trytko	Trytko

RN 01.16-2

APV Rosista GmbH  
 D-58425 Unna  
 Germany

Pos. / Item	Benennung / description	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.
41	Hubring Handanlüftung Stroke ring for manual seat lifter	08-39-201/12	=	=	=	=	=	=	=
42	Haube für Handanlüftung Cover for manual seat lifter	21-52-060/93	=	=	=	=	=	=	=
43	APV M.-Firmen-Logo APV company logo	08-29-162/93	=	=	08-29-163/93	=	=	=	=
44	Transferkleber Transfer sticker	08-29-060/93	=	=	=	=	=	=	=
45	Typenschild Name plate	08-29-234/13	08-29-235/13	08-29-236/13	08-29-237/13	08-29-238/13	08-29-239/13		
		08-29-240/13	08-29-241/13	08-29-242/13	08-29-243/13	08-29-244/13	08-29-245/13		
46	Druckfeder Pressure spring	> unterschiedliche WS-Nr. je nach Druckbereich different ref.-numbers depending on pressure range							
47	Federteiler Spring plate								
48	Distanzhülse Spacer bushing	08-07-150/42	=	=	=	=	=	=	=
1	Dichtungssatz Seal kit	58-34-650/00	58-34-651/00	58-34-652/00	58-34-653/00	58-34-654/00	58-34-655/00		
1	Dichtungssatz Seal kit	58-34-650/01	58-34-651/01	58-34-652/01	58-34-653/01	58-34-654/01	58-34-655/01		
1	Dichtungssatz Seal kit	58-34-650/02	58-34-651/02	58-34-652/02	58-34-653/02	58-34-654/02	58-34-655/02		
1	Anlüftzylinder-Komplett Lifting device complete	15-31-100/93	=	=	=	=	=		
1	Handanlüftung-Komplett Manual seat lifter complete	15-27-100/93	=	=	=	=	=		

Der Austausch der Positionen: 10,11,21,22,23,24,26,27,30,31,32,44,45,46,47,48 darf nur durch den Hersteller erfolgen, da sonst die Haftung für dieses Produkt entfällt.  
 The replacement of parts: 10,11,21,22,23,24,26,27,30,31,32,44,45,46,47,48 can only be undertaken by the manufacturer, otherwise the product liability expires.

ACHTUNG!  
 ATTENTION!