APV
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Operating Manual

DELTA VRA11

Vacuum Valve

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

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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

UK

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1. General Terms

This operating manual has to be read carefully and observed by the competent operating and maintenance 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

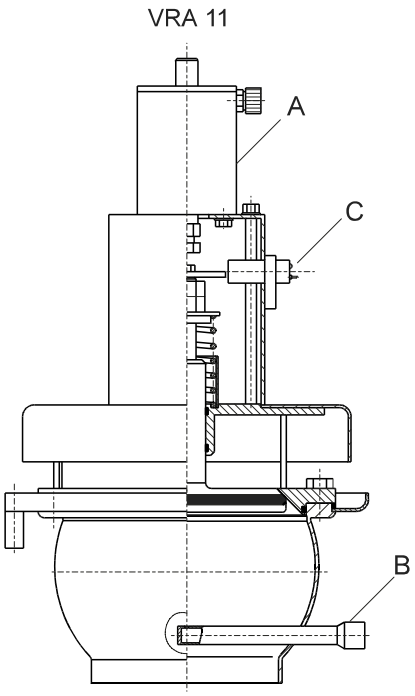
DANGER!

- Before any maintenance of the valve, the line system in which the valve is installed must be depressurized.

ATTENTION!

- Observe service instructions to ensure safe maintenance of the valve.

3. Mode of Operation



The DELTA VRA valve is used in applications in which equipment can be damaged by a vacuum (e.g. on containers or pipelines).

If a vacuum occurs, the valve opens by the valve seat being pulled down against spring force in order to relieve the vacuum in the system. The closing process is only released by the spring force if the vacuum does no longer exist.

4. Auxiliary Equipment

- **Seat lift actuator (standard)**
  The DELTA VRA valve is equipped with a seat lift actuator **(A)** which is used during the cleaning process and / or for remote functional control.

- **Valve feedback**
  A switch to indicate the closed or open position of the valve seat (ON / OFF) can be installed at the valve **(C)** on request.

- **Cleaning device (standard)**
  The valve is equipped with an integrated cleaning nozzle **(B)**.

5. Cleaning

During the cleaning process, the product-wetted parts of the valve can be cleaned by the cleaning nozzle **(B)** in the housing. Additionally, the contact surfaces between the seat seal and the seat can be cleaned by lifting the seat. For this purpose, the seat lift actuator **(A)** is controlled in short intervals during the cleaning process.

6. Installation

The DELTA VRA valve must be installed in upright position as, otherwise, the valve function cannot be guaranteed. Moreover, liquids must be able to drain off the housing and the tray.

The valve housing can be welded in directly as the complete valve insert can be dismantled to the top.

Attention: Observe welding instructions.

6.1 Welding Instructions

VRA

- Before welding of the valve, the valve insert must be dismantled from the housing. A careful handling without damage to the parts must be provided.

- Welding may only be carried out by certified welders (EN 287-1). (Seam quality EN 25817 „B“).

- The welding of the valve housings must be effected in such a way that deformation strain cannot be transfered to the valve body.

6.1 Welding Instructions

- The preparation of the weld seam up to 3 mm thickness must be carried out in butt manner as a square butt joint without air. (Consider shrinkage!)
- TIG orbital welding should be aimed at!
- After welding of the valve housing 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 nonobservance of these welding instructions is not subject to our guarantee.

7. Maintenance

- The maintenance intervals depend on the application of the valve and should be determined by the operator carrying out regular checks of the valve.
- Exchange of seals according to service instructions.
- **All seals must lightly be greased before their installation!!!**

  Recommendation:
  APV-food-grade grease for EPDM, FPM, HNBR and NBR
  (0,75 kg /can - ref. No. 000 70-01-019/93)
  (60 g /tube - ref. No. 000 70-01-018/93)

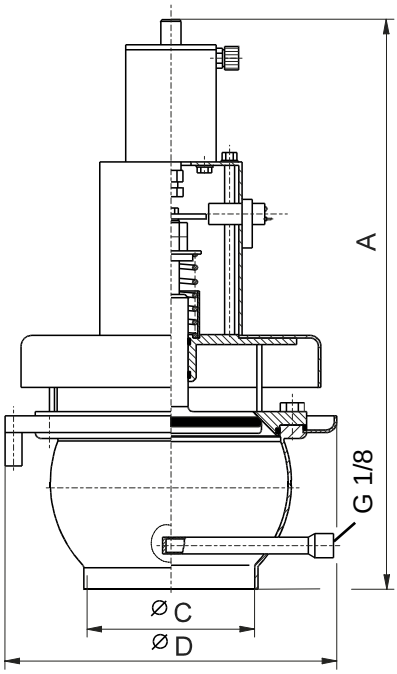
  APV-food-grade grease for VMQ
  (0,6 kg /can - ref. No. 000 70-01-017/93)
  (60 g /tube - ref. No. 000 70-01-016/93)

  ! Do not use grease containing mineral oil for EPDM seals.
  ! Do not use Silicone-based grease for Silicone seals.
- Assembly of the valve according to service instructions.

8. Materials

Product-wetted parts	**:**	**1.4404/1.4571**
Other parts	**:**	**1.4301**
Seals	**:**	**standard** **EPDM / PTFE** **optional** **FPM or VMQ**

9. Dimensions / Weights



DN	dimensions in mm			weight
	A	Ø C	Ø D	kg
50	310	50	127	3,3
100	340	100	198	5,4
150	420	150	277	8,4

10. Technical Data

max. line pressure	**=**	**10 bar**
max. operating temperature	**=**	**135^{O} C EPDM *VMQ, *FPM**
short-term load	**=**	**140^{O} C EPDM *VMQ, *FPM *(no steam)**
response pressure	**=**	**40 mm water column standard adjustable from 35 mm WC to 60 mm WC (change of response pressure see chapt. 11.5)**

Flow rates (m³/h) at a negative pressure of

	100 mm WC	200 mm WC
DN 50	39	80
DN 100	215	317
DN 150	324	943

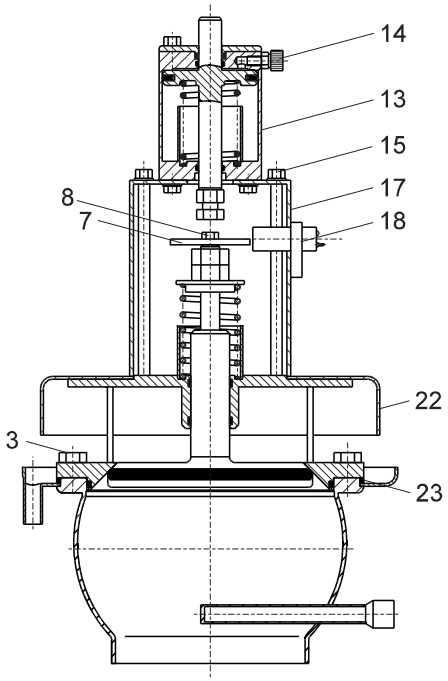
11. Service Instructions

The item numbers refer to the spare parts drawing **RN 01.113.**

11.1 Dismantling from the line system

a. Shut off line pressure (product and cleaning line).

Do not reach for movable parts!
Risk of injury by suddenly actuating valve.



b. Remove pneumatic air for the seat lift actuator **(13)** at the connection **(14)**.

c. Loosen clamp of feedback support and pull off proximity switch **(18)**.

d. Loosen hexagon nuts **(15)** by means of a wrench SW 8 and lift the protective cover **(17)** with the seat lift actuator and the spray sheet **(22)**.

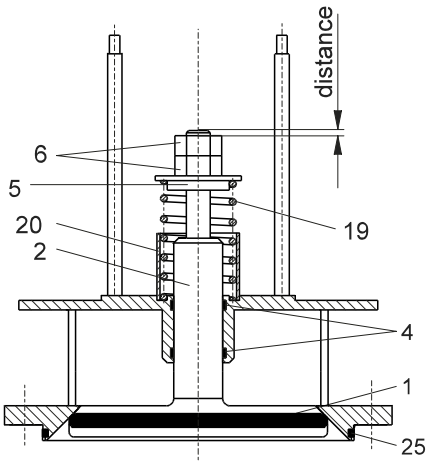
e. Loosen the hexagon screws **(3)** by means of a wrench SW 13 or 17 and lift the valve insert.

11.2 Dismantling of wear parts

a. Pull off O-ring **(25)**.

b. Remove O-ring **(23)**.

c. Loosen hexagon screw **(8)** by means of a wrench SW 8 and remove the disc **(7)**.



d. Before loosening the hexagon nuts **(6)** by means of two wrenches SW 17, the exact distance from the upper edge of the shaft to the nut must be measured. This distance must be kept exactly during the installation in order not to change the preset response pressure.

e. Remove spring plate **(5)**, spring **(19)** and bush **(20)**.

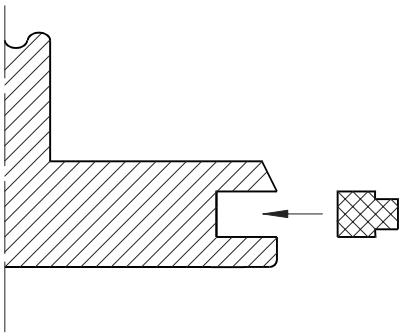
f. Push off shaft **(2)**.

g. Stick into the seat seal **(1)** with a peaked object and pull it off.

h. Dismantle guide rods **(4)**.

11. Service Instructions

11.3 Installation of seals and assembly of valve

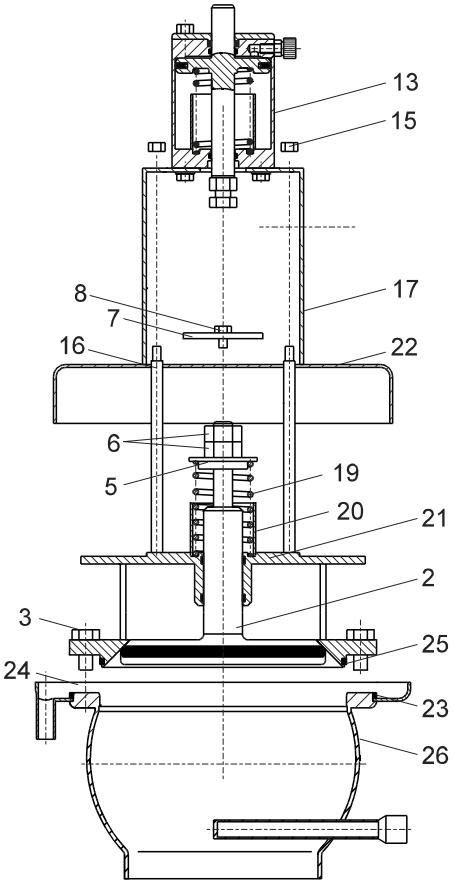


a. Press the guide rods **(4)** into the yoke.

b. Before assembly of the valve shaft **(2)**, the seat seal **(1)** must be inserted. Press the slightly greased seal at four spots, the wide side to the front, into the groove. At the four loops sticking out, the seal must be inserted into the groove, e.g. by means of a thin blunt screwdriver and strongly pressed into the groove by thumb. To ensure a uniform fit, the four loops are to be worked upon alternatively. Finally, the seal is smoothed by exerting strong pressure, e.g. by the handle of a screwdriver. The groove is vented by sticking between the groove edge and the seal inside down to the groove base by means of a thin blade. The correct fit of the seal must be checked after the installation.

c. Push the shaft **(2)** through the yoke **(21)**.

d. Insert spring **(19)**, bush **(20)** and spring plate **(5)**.



e. Screw on hexagon nuts **(8)** and tighten them against one another. Observe distance of installation (see **11.2.e**).

f. Fix the disc **(7)** with the hexagon screw **(8)** at the shaft.

g. Place the spray sheet **(22)** and protective cover **(17)** together with the seat lift actuator **(13)** on the spacer **(16)** and tighten the parts by the discs **(12)** and hexagon nuts **(15)**.

h. Insert O-ring **(23)** in the outlet **(24)** and the O-ring **(25)** in the yoke groove.

11.4 Installation of valve

a. Place the complete valve insert into the valve housing **(26)** and tighten it by the screws **(3)**.

b. Install the pneumatic air line and the valve feedback.

11. Service Instructions

11.5 Change of response pressure

- The standard adjustment of the set pressure amounts to 40 mm WC.

a. Loosen the hexagon nut **(15)** and dismantle the protective cover **(17)** together with the seat lift actuator **(13)**.

b. Loosen the hexagon nuts **(6)**:

- By turning the lower nut **(6)** to the right, the response pressure can be reduced to max. 65 mm WC.

- By turning the lower nut **(6)** to the left, the response pressure can be reduced to min. 35 mm WC.

c. After re-adjustment, tighten the nuts **(6)** against one another and install the protective cover with the seat lift actuator.

12. Trouble Shooting

The item numbers refer to the spare parts drawing RN **01.113**.
Removal of failures see chapt. 11, Service Instructions.

- Leakage between housing and mating flange (lower outlet)	:	replace O-ring **(25)**.
- Leakage at the outlet	:	replace O-ring **(23)**.
- Leakage at the valve seat	**:**	replace seat seal **(1)**.
- Seat lifting impossible	:	check function of seat lift actuator or replace it completely.
- Valve does not work	:	check smooth running of the shaft, replace damaged parts.

13. Spare Parts List

(see annex)

BA VRA11 00002
ID-No.: H 1 7 0 7 9 2

UK

Translation of original manual

rev. 2

WHERE IDEAS MEET INDUSTRY

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

02/94

Ersatzteilliste: spare parts list:
Vakuumventil VRA11-IHP2
mit Anlüftzylinder und Ventilstellungsmeldung
Vacuum valve VRA11-IHP2
with lifting device and proximity switch

Besteht aus 3 Blatt Blatt 1

	Datum	Name
Gezeichnet	20.7.92	Trytko
Geprüft	29.7.92	Goe/WB
Normgepr.		

Datum	7/92	7/97	04/04	07/07
Name	Trytko	Trytko	Trytko	Trytko

APV Rosista GmbH
D-59425 Unna
Germany

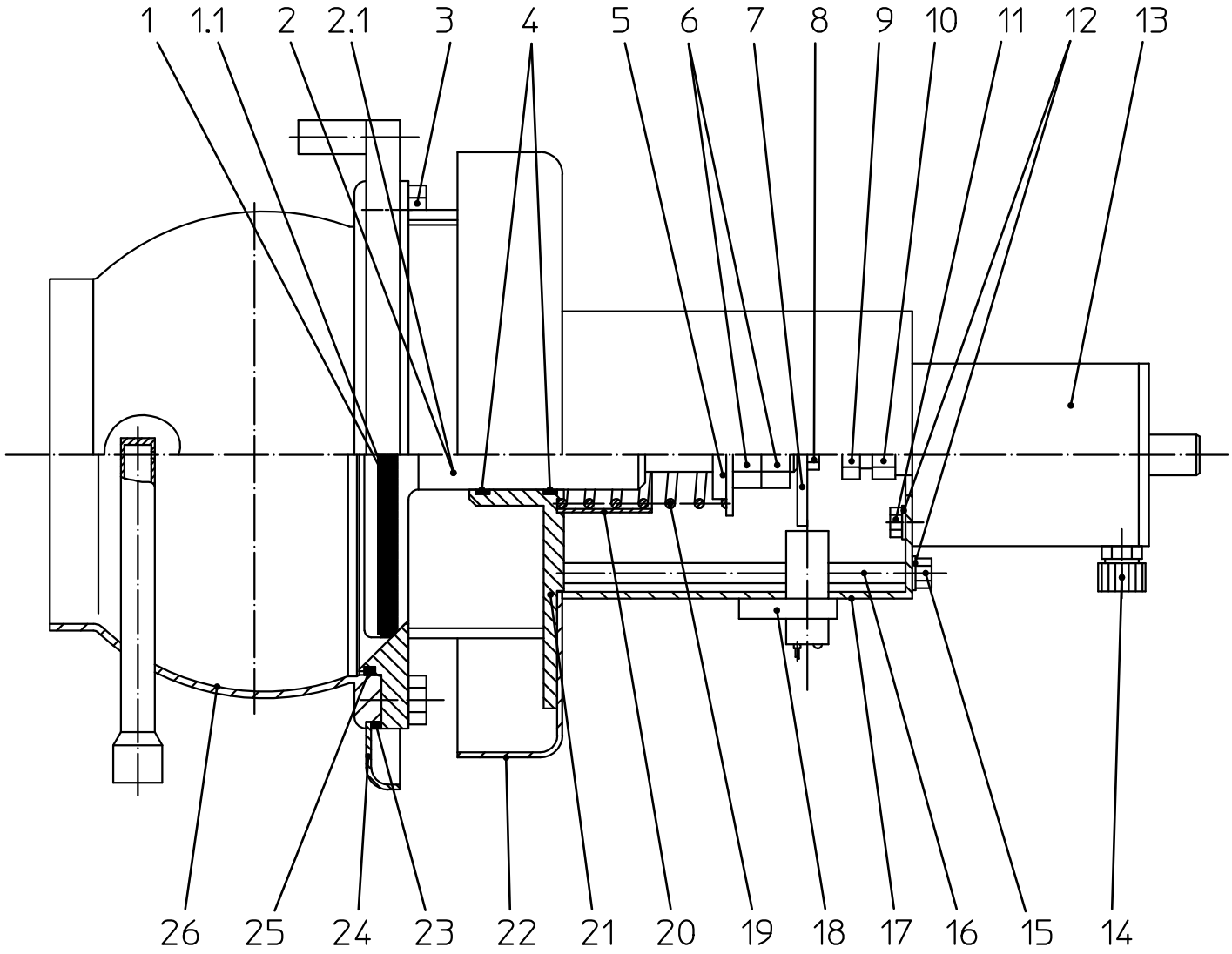
RN 01.113

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

Pos. 1 und 2 nur bei DN 150 gültig bis Juli 2007
item. 1 and 2 only with DN 150 valid until July 2007
Pos. 1.1 und 2.1 nur bei DN 150 gültig ab Juli 2007
item. 1.1 and 2.1 only with DN 150 valid from July 2007



Ersatzteilliste: spare parts list:

Vakuumventil VRA11-IHP2 mit Anlüftzylinder und Ventilstellungsmeldung
Vacuum valve VRA11-IHP2 with lifting device and proximity switch

Blatt 2

	Datum	Name
Gezeichnet	20.7.92	Trytko
Geprüft	29.7.92	Goe/WB
Normgepr.		

Datum	7/92	7/97	04/04	07/06	07/07				
Name	Trytko	Trytko	Trytko	Trytko	Trytko				

APV Rosista GmbH
D-59425 Unna
Germany

RN 01.113

Pos. item	Menge quantity	Benennung description	DN 50 WS-Nr. ref.-no.	100 WS-Nr. ref.-no.	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.
		VRA11 -IHP2 1S	20-88-440/	20-88-640/	20-88-740/					
1	1	Sitzdichtung * Seat seal	58-01-420/	58-01-619/	58-01-582/					
1.1	1	Tellerdichtung * Seat seal			58-33-776/					
2	1	Schaft Shaft	15-22-447/42	15-22-647/42	15-22-732/42					
2.1	1	Schaft Shaft			15-22-919/42					
3		Skt. Schraube Hex. screw	4xDIN EN 24017-M8x14-A2-70	6xDIN EN 24017-M8x16-A2-70	6xDIN EN 24017-M10x20-A2-70					
4	2	Führungsband PTFE driving band	08-39-079/93	=	=					
5	1	Federteller Spring plate	21-55-384/12	=	22-55-684/13					
6	2	Skt. Mutter Hex. nut	DIN EN 24032-M10-A2		DIN EN 24032 -M12-A2					
7	1	Scheibe Wascher	08-48-046/12	=	=					
8	1	Skt. Schraube Hex. screw	DIN EN 24017-M5x12-A2-70							
9	1	Skt. Schraube Hex. screw	DIN EN 24017-M8x28-A2-70							
10	1	Skt. Mutter Hex. nut	DIN EN 24032-M8-A2							
11	3	Skt. Schraube Hex. screw	DIN EN 24017-M5x7-A2-70							
12	5	Scheibe Wascher	DIN 125 B5,3							
13	1	Steuerkopf Actuator	15-31-854/17	=	=					
14	1	Verschraubung Union 1511-6/4-M5	08-63-007/93	=	=					
15	2	Skt. Mutter Hex. nut	DIN EN 24032-M5-A2							
16	2	Distanzhalter Spacer	08-49-185/12	=	08-49-186/12					

Ersatzteilliste: spare parts list:
Vakuumventil VRA11-IHP2
mit Anlüftzylinder und Ventilstellungsmeldung
Vacuum valve VRA11-IHP2
with lifting device and proximity switch

Blatt 3

	Datum	Name
Gezeichnet	20.7.92	Trytko
Geprüft	29.7.92	Goe/WB
Normgepr.		

Datum	7/92	7/97	04/04	07/07
Name	Trytko	Trytko	Trytko	Trytko

APV Rosista GmbH
D-59425 Unna
Germany

RN 01.113

Pos. item	Menge quantity	Benennung description	DN 50 WS-Nr. ref.-no.	100 WS-Nr. ref.-no.	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.
17	1	Schutzhaube Cover	15-30-020/14	=	15-30-021/14					
18	1	Rückmeldung VSM komplett Proximity switch complete	15-33-023/33	=	=					
19	1	Feder Spring	60-06-142/13	60-06-145/13	60-06-106/13					
20	1	Distanzhülse Spacer bush	09-89-462/12	09-89-465/12	09-89-474/12					
21	1	Laterne Yoke	15-40-780/47	15-40-783/47	15-40-785/47					
22	1	Spritzblech Sheet	15-30-966/17	15-30-963/17	15-30-968/17					
23	1	O-Ring O-ring	100-3 58-06-490/63	150-3 58-06-690/63	210-3 58-06-822/63					
24	1	Ablaufrinne Outlet	15-30-957/17	15-30-960/17	15-30-962/17					
25	1	O-Ring O-ring	72-3 58-06-330/83	124-3 58-06-588/63	174-3 58-06-785/83					
26	1	Gehäuse VRA11 Housing	21-80-427/47	21-80-627/47	21-80-727/47					
		Pos. 1, 4, 23, 25 nur im kompletten Dichtungssatz erhältlich item. 1, 4, 23, 25 available as complete seal kits only								
	1	Dichtungssatz I FPM Seal kit I	58-33-834/00	58-33-831/00	58-33-833/00					
	1	Dichtungssatz I EPDM Seal kit I	58-33-834/01	58-33-831/01	58-33-833/01					
	1	Dichtungssatz I VMQ Seal kit I	58-33-834/02	58-33-831/02	58-33-833/02					
	1	Dichtungssatz I HNBR Seal kit I	58-33-834/06	58-33-831/06	58-33-833/06					
	1	Dichtungssatz II FPM Seal kit II			58-33-845/00					
	1	Dichtungssatz II EPDM Seal kit II			58-33-845/01					
	1	Dichtungssatz II VMQ Seal kit II			58-33-845/02					
	1	Dichtungssatz II HNBR Seal kit II			58-33-845/06					