

# Operating Manual

# **DELTA RGE4 - HR + HK**

## Modulating Valve



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



## **Manufacturer Declaration** to be applied to the Pressure Equipment Directive 97/23 EC

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

**double seat valves of the series**

D2, DFplus2, SD4, SDM4, DA3, DE3, DEU3, DET3, DKR2, DKRT2, DKRH2

**butterfly valves of the series**

SV1, SVS1F

**ball cocks of the series**

KH, KHV

**single seat valves of the series**

S2, SW4, SWmini4, SWT4, M3, MF3, M4, MP4, MS4

**process valves of the series**

RG4, RGE4, PR2, PR3, PR4, CPV, UF3, RUF3, VRA, VRAH


**comply with the requirements of the Pressure Equipment Directive 97/23 EC.**

Due to the application of the a.m. valves in the beverage and food technology as well as in the pharmaceutical industry, the products are classified according to Article 9 Paragraph 2.2 of the Fluid Group 2 (gases/liquids).

For the classification of the valves into categories, in these cases diagrams 2 and 4 of Annex II are applied:

- The valves are either subject to Paragraph 3 according to Article 3 (Technical Requirements), are designed and manufactured by good engineering practice and have a manufacturer mark and must not have the CE-mark as mentioned in Article 15;
- Or would the a.m. valves at most be classified into Category I according to Article 9 and do not come under the scope of application of the Pressure Equipment Directive 97/23/EC due to Article 1 Paragraph 3.6. Therefore, a CE-mark attached to these valves is not the result of a conformity assessment according to DGRL, but of a different CE Directive (e.g. of the Machinery Directive 89/392/EEC).

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

  
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Manager Research and Development



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<b>Table of Contents</b>		<b>Page</b>
<b>1.</b>	<b>General Terms</b>	<b>2</b>
<b>2.</b>	<b>Safety Instructions</b>	<b>2</b>
<b>3.</b>	<b>Mode of Operation</b>	<b>2</b>
<b>4.</b>	<b>Installation</b>	<b>3</b>
<b>4.1</b>	<b>Welding Instructions</b>	<b>3</b>
<b>5.</b>	<b>Maintenance</b>	<b>4</b>
<b>6.</b>	<b>Materials</b>	<b>4</b>
<b>7.</b>	<b>Dimensions</b>	<b>5</b>
<b>8.</b>	<b>Technical Data</b>	<b>6</b>
<b>9.</b>	<b>Service Instructions</b>	<b>7 - 9</b>
<b>10.</b>	<b>Trouble Shooting</b>	<b>9</b>
<b>11.</b>	<b>Spare Parts List</b>	
	<b>RGE4 - HR (handwheel) / RGE4 - HK (crank) DN design                      RN    01.170.4</b>	
	<b>RGE 4 - HR (handwheel) / RGE4 - HK (crank) inch design                      RN    01.170.5</b>	



## 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.

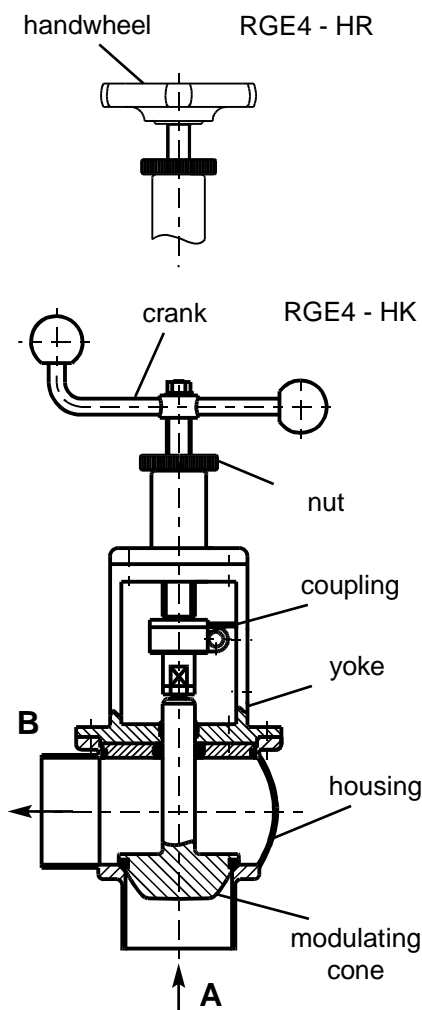
## 2. Safety Instructions



### DANGER!

- Before valve disassembly (e.g. for seal replacement or others) make sure that the product line is depressurized.

## 3. Mode of Operation



- The hygienic modulating valve DELTA RGE4 - HR / HK is applicable for the manual regulation of element flows in the beverage and food industries, the chemical and pharmaceutical industries. Flows as well as pressures of fluids and gases can be modulated.
  - In its basic construction, the DELTA RGE4 - HR/HK valve is designed as on/off valve, therefore realizing a favourable diversion of flows. The flow direction is from **A** to **B**.
  - The housing being free of dead spaces proves an optimum cleanability. Crevice-free sealing of the individual housing parts by profile seal - no sources of infection.
  - The modulating valve can be equipped with a cone in linear or equal-percentage design.
  - Beside the characteristics, kvs values can be changed in valves of the dimensions DN 25, 40, 1" and 1,5" (**see 8**).
  - The modulating valve in the dimensions DN 25, 40, 1" and 1,5" is equipped with a handwheel (**HR**).
- From dimensions DN 50, 2" upwards, the valve is equipped with a crank (**HK**).

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## 4. Installation

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- The DELTA RGE4 valve is installed in such a manner that the product or cleaning liquid can drain off the valve housing. A vertical installation is preferred to any other position of installation.
- **Attention:** Observe welding instructions.

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### 4.1 Welding Instructions

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#### RGE 4

- Before welding of the valves, the insert must be dismantled from the valve housing. Careful handling to avoid damage to the parts is necessary.
- 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 transferred from the outside to the valve body.
- 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 is best.
- After welding of the valve housing 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.



## 5. Maintenance

- Dismantling and installation of the valve shaft, see service instructions.
- Dismantling and installation of seals, see service instructions.
- **All seals must be provided with a thin layer of grease before their installation.**

**Recommendation:**

APV food grade grease for EPDM, HNBR and FPM  
 (0,75 kg /can - 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 /can - ref.-No. 000 70-01-017/93)  
 (60 g /tube - ref.-No. 000 70-01-016/93)

Independent of the application, use only those greases being suited for the respective seal material.

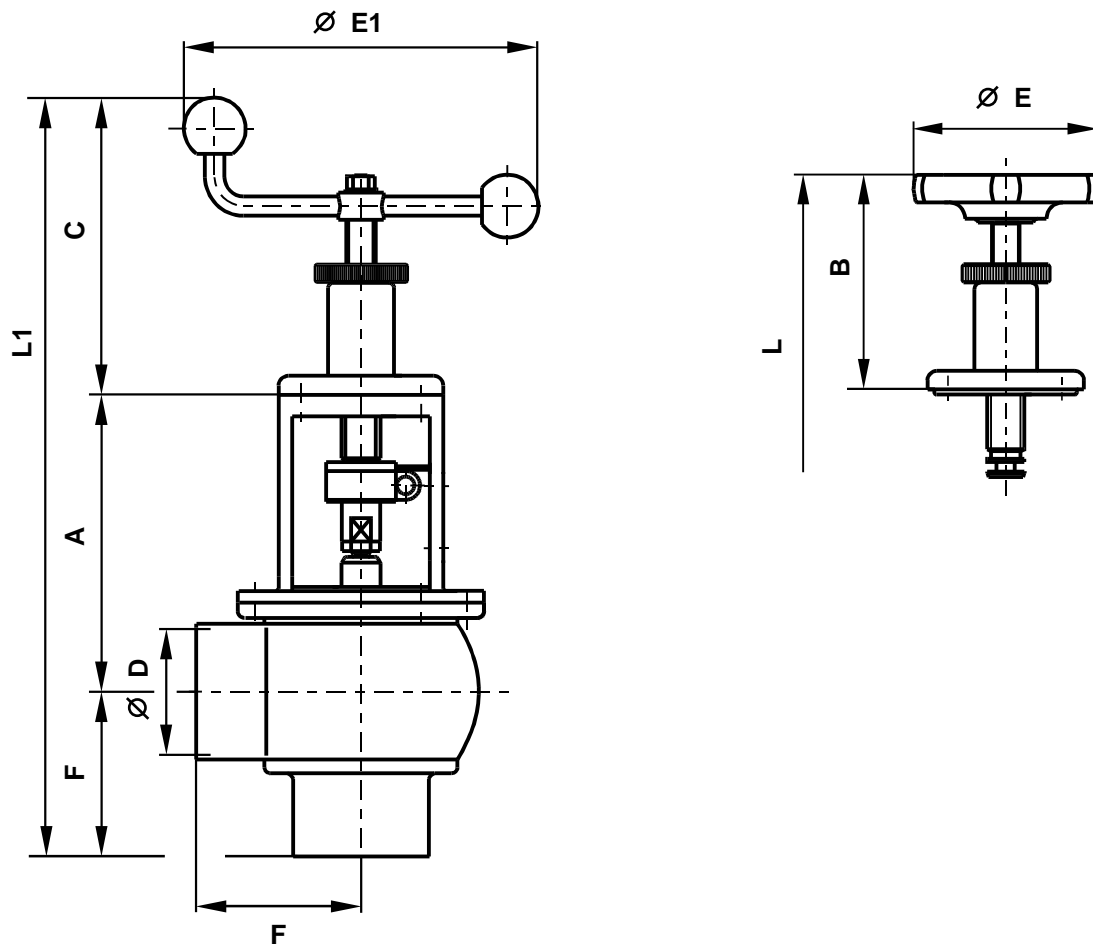
## 6. Materials

- |  |                    |  |
|--|--------------------|--|
| - housing, valve shaft,<br>housing cover |                    | 1.4404 (AISI 316L)                             |
| - valve yoke                             |                    | 1.4308   |
| - coupling (compl.),<br>screws, nuts     |                    | 1.4301   |
| - housing seal                           | standard<br>option | EPDM<br>(FPM, HNBR)                            |
| - seat seal                              | standard<br>option | EPDM<br>(HNBR, VMQ, FPM)                       |
| - shaft seal                             | standard<br>option | PTFE combined<br>with EPDM<br>(HNBR, VMQ, FPM) |
| - guide bush                             |                    | PA 6   |

**Manual operation**

- |               |                                |
|---------------|--------------------------------|
| - head piece  | 1.4301                         |
| - spindle nut | Rg7                            |
| - spindle     | 1.4301                         |
| - handwheel   | synthetics                     |
| - crank       | 1.4301 / synthetics<br>DIN 319 |
| - nut         | 1.4301                         |

## 7. Dimensions



dimensions in mm

DN	A	B max.	C max	$\varnothing D$	$\varnothing E$	$\varnothing E1$	F	L	L1	weight in kg
25	132,5	132		26	100		50	314,5		3,2
40	138,5	132		38	100		67	337,5		3,8
50	144,5		168	50		180	72		384,5	4,4
65	153		168	66		180	85		406	5,5
80	160,5		168	81		180	98		426,5	6,7
100	170		168	100		180	111		449	8,5
inch										
1"	130,8	132		22,2	100		50	312,8		3,2
1,5"	136,9	132		34,9	100		67	335,9		3,9
2"	143,4		168	47,6		180	72		383,4	4,5
2,5"	150,2		168	60,3		180	85		403,2	5,5
3"	156,5		168	72,9		180	90		414,5	6,0
4"	168,8		168	97,6		180	111		447,8	8,6

## 8. Technical Data

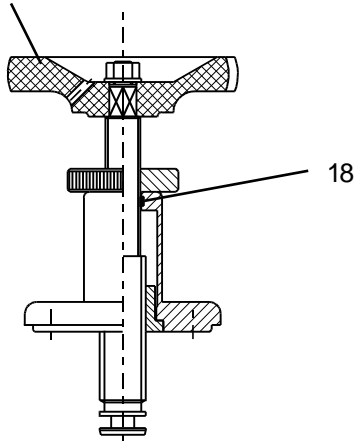
DN ; inch	25 ; 1"	40 ; 1,5"	1,5"	1,5"	50 ; 2"	65 ; 2,5"	3"	80	100 ; 4"
kvs values	6,3	16,0	6,3	2,5	40,0	63,0	80,0	100,0	160,0
	10,0	25,0	10,0	4,0					
stroke in mm	15	15	15	15	15	15	15	15	15
seat Ø in mm	26,0	38,0	26,0	13,0	50,0	66,0	72,9	81,0	100,0

- **admissible operating pressure** : DN 25 - 65 / 1" - 2,5" 25 bar  
: DN 80 - 100 / 3" - 4" 16 bar
- **standard design** : housing 1.4404  
inner surface  
ground Ra 1.6 µm  
outer surface satin finish
- **seal materials**  
standard : EPDM  
option : ( FPM, VMQ, HNBR )
- **characteristics of shaft** : linear or equal-percentage

## 9. Service Instructions

The item numbers refer to the spare parts drawings  
 DIN: RN 01.170.04                      INCH: RN 01.170.05

handwheel



### I. Dismantling from the line system

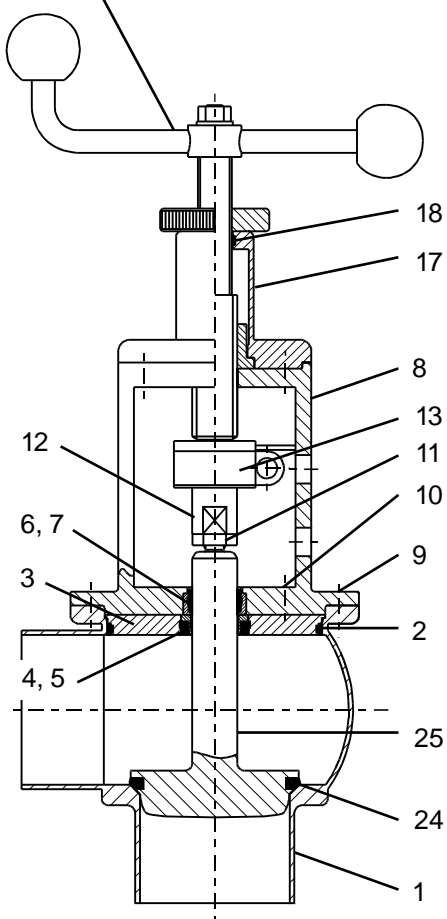
- a. Shut off line pressure and drain off pipelines if possible.
- b. Release housing flange screws (9) and take valve insert with manual operation out of the housing (1).  
 If necessary enter two screws in the threaded bores provided in the valve yoke (8) to lift the insert out of the housing.

### II. Disassembly of the valve to replace wear parts

see 9.I, a. and b.

- a. Release counternut (11), unscrew valve shaft (25) from the coupling piece (12) and pull it out of the housing cover (3).
- b. Release hexagon screw (10) and take housing cover (3) off the valve yoke (8).
- c. Remove housing seal (2) from the housing cover (3).
- d. Remove shaft seal (4, 5) from the housing cover.
- e. Take guide bushes (6, 7) off the yoke (8).
- f. Remove seat seal (24) from the valve shaft (cone) (25).

crank



## 9. Service Instructions

### III. Disassembly of the valve to change characteristics and/or kvs values (with smaller nominal dimensions)

see 9.1, a. and b.

- a. Release counternut (11), unscrew valve shaft (25) from the coupling piece (12) and pull it out of the housing cover (3).

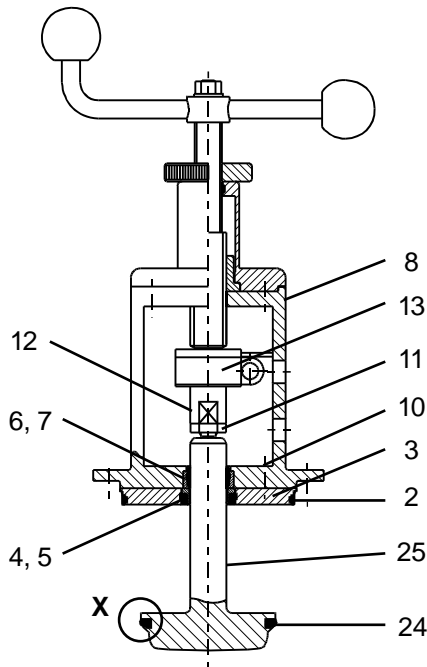
### IV. Assembly of the valve and installation of new wear parts

**Attention:** To ensure a simple assembly and an increased service life of all wear parts (seals, guide bushes, etc.), the parts must be provided with a thin layer of grease. Do not use sharp-edged tools for the assembly of the a. m. parts to guarantee their full function.

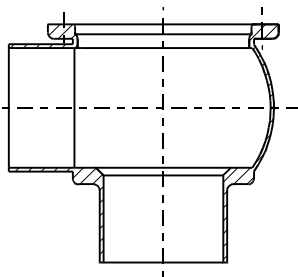
- a. Install seat seal (24) in the valve shaft (cone) (25).

**Attention:** Vent the seal groove with a suitable tool. Check the right fit of the seat seal after installation.

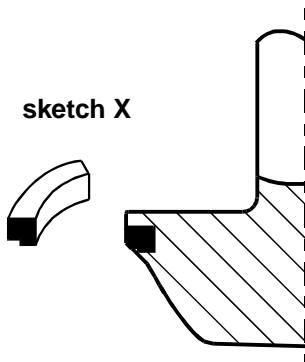
- b. Insert guide bush (7) in the guide bush (6) and place it in the yoke (8).
- c. Place shaft seal (5, 4) in the housing cover (3).
- d. Install housing seal (2) on the housing cover (3).
- e. Screw housing cover (3) and valve yoke (8) together manually.
- f. Introduce valve shaft (25) through housing cover (3) and valve yoke (8) and screw them in the coupling piece (12) with the counternut (11).
- g. Press valve insert into the housing (1) and fasten it crosswise at the housing flange by means of the hexagon screws (9).
- h. Tighten hexagon screws (10).



housing



sketch X



## 9. Service Instructions

### V. Assembly of the valve to change characteristics and/or kvs values (with smaller nominal dimensions)

The designation of the shafts to be replaced are indicated in the spare parts list for **DN** **RN 01.170.4**  
 spare parts list for **inch** **RN 01.170.5**

- a. **Attention:** To ensure a simple assembly and an increased service life of all wear parts (seals, guide bushes, etc.), the parts must be provided with a thin layer of grease. Do not use sharp-edged tools for the assembly of the a. m. parts to guarantee their full function.
- b. Functional check of the existent wear parts (seals and guide bushes) is necessary. Damaged parts must be replaced immediately. (Designation and reference numbers, see corresponding spare parts list.)
- c. Replace damaged parts. (see chapt. 9.IV. b. - e.)
- d. Further assembly as described in 9.IV., f. - h.

## 10. Trouble shooting

**The item numbers refer to the spare parts drawings.**

- Valve leaks : replace seat seal **(24)**.  
check line pressure:  
admissible line  
pressure see 8.
- Leakage between housing and yoke flange : replace housing seal **(2)**.
- Shaft passage in the yoke leaks : replace guide bushes **(6, 7)**, shaft seal **(4, 5)**.

## 11. Spare parts lists

**(see annex)**



BA RGE4HR-HK2

ID-No.: H 2 0 6 6 0 3

Translation of original manual



rev. 0



Your local contact:



APV  
Zeichenstraße 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](http://www.apv.com).

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Ersatzteilliste: spare parts list: Regulierventil RGE41 25-100 mit Handbetätigung (Handrad und Handkurbel) lineare oder gleichproz. Kennlinie

Modulating valve RGE41 25-100 with manual actuation (handle and crank) linear or equal-percentage characteristics

Besteht aus 4 Blatt 1 Blatt 1

Gezeichnet	27.02.02	Name	Trytko
Geprüft			
Normgepr.			



RN 01.170.4

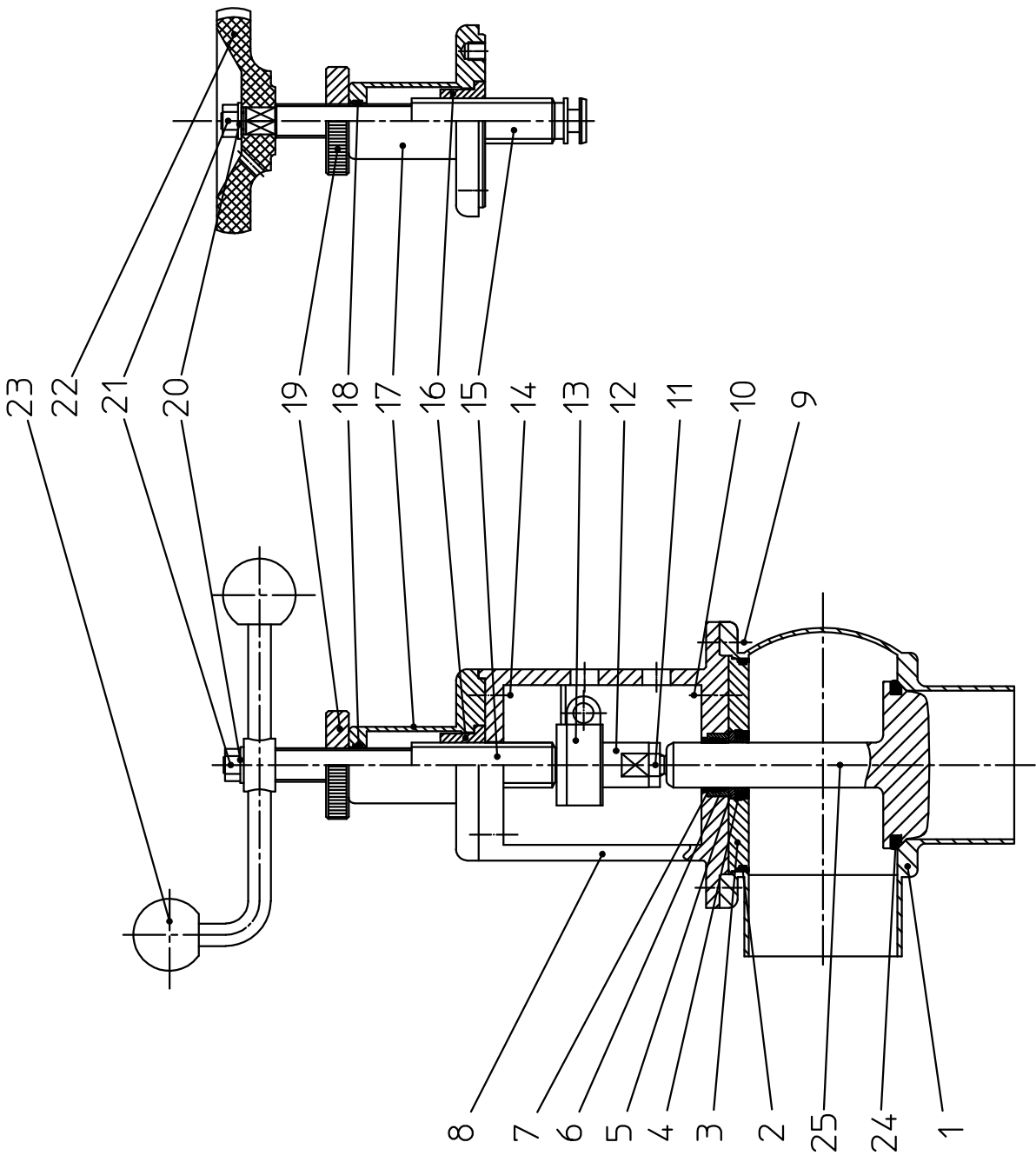
02/94

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/Silicone
  - ../33-HNBR
  - ../73-FPM
  - ../93-EPDM

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













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Ersatzteilliste: spare parts list:Regulierventil RGE41-25-100 mit Handbetätigung (Handrad und Handkurbel) lineare oder gleichproz. Kennlinie  
 Modulating valve RGE41 25-100 with manual actuation (handle and crank) linear or equal-percentage characteristics

Blatt 4

Gezeichnet	27.02.02	Trytko	Name	
Geprüft	05.03.02	Knöchel	Datum	
Normgepr.				

RN 01.170.4



APV Rosista GmbH  
 D-58425 Urra  
 Germany

Pos. item	Benennung description	DN 25/kvs		DN 40/kvs		DN 50/kvs		DN 65/kvs		DN 80/kvs		DN 100/kvs				
		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.	WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.			
24	Tellerdichtung Seal seal	6,3	10	16	25	40	63	100	160	58-33-294/	=	58-33-394/	58-33-444/	58-33-494/	58-33-544/	58-33-644/
25	Schaff-lineare Kennlinie Shaft flow character-linear	15-25-046/42	15-25-047/42	15-25-048/42	15-25-049/42	15-25-050/42	15-25-051/42	15-25-052/42	15-25-053/42	15-25-026/42	15-25-027/42	15-25-028/42	15-25-029/42	15-25-030/42	15-25-031/42	15-25-032/42
1	Schaff-gleichproz. Kennlinie Shaft flow character-equal percen.															

Pos. 2, 4, 5, 7, 24 nur im kompletten Dichtungssatz erhältlich  
 item. 2, 4, 5, 7, 24 available as complete seal kits only

1	Dichtungssatz Seal kit	58-34-500/00	=	58-34-501/00	=	58-34-502/00	58-34-503/00	58-34-505/00	58-34-506/00
1	Dichtungssatz Seal kit	58-34-500/01	=	58-34-501/01	=	58-34-502/01	58-34-503/01	58-34-505/01	58-34-506/01
1	Dichtungssatz Seal kit	58-34-500/02	=	58-34-501/02	=	58-34-502/02	58-34-503/02	58-34-505/02	58-34-506/02
1	Dichtungssatz Seal kit	58-34-500/06	=	58-34-501/06	=	58-34-502/06	58-34-503/06	58-34-505/06	58-34-506/06





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02/94

Ersatzteilliste: spare parts list: Regulierventil RGE41 1-4 Zoll mit Handbetätigung (Handrad und Handkurbel) lineare oder gleichproz. Kennlinie

Modulating valve RGE41 1-4 Zoll with manual actuation (handle and crank) linear or equal-percentage characteristics

Besteht aus 5 Blatt Blatt 1

Gezeichnet	28.02.02	Name	Trytko
Geprüft			
Normgepr.			

Datum	02/02		
Name	Trytko		

RN 01.170.5

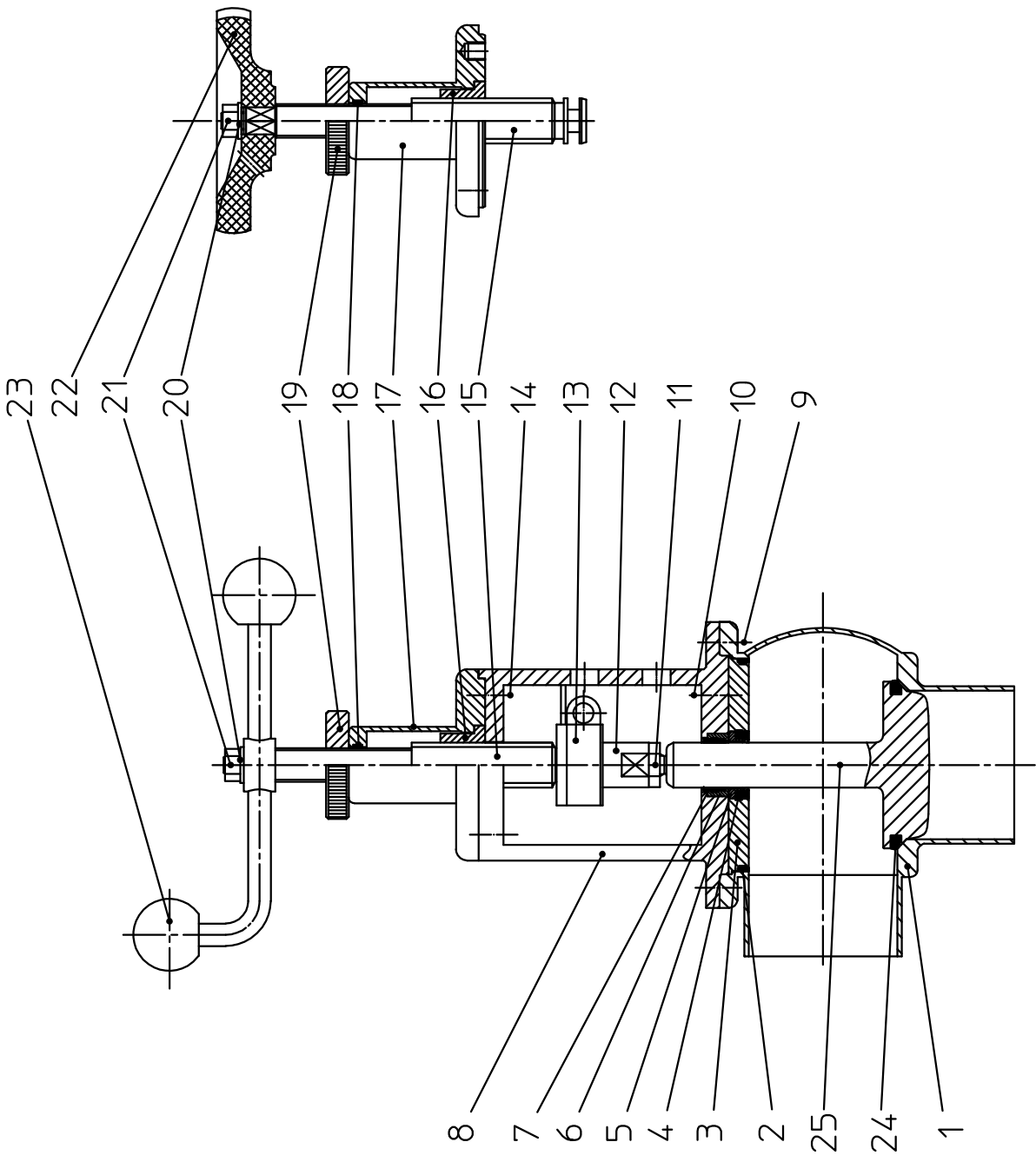


Es stehen verschiedene Dichtungswerkstoffe zur Verfügung. Bitte WS-Nr. ergänzen

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

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





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Ersatzteilliste: spare parts list **Regulierventil RGE41-1-4 Zoll**  
 mit Handbetätigung (Handrad und Handkurbel)  
 lineare oder gleichproz. Kennlinie

Modulating valve RGE41 1-4 Zoll with manual actuation  
 (handle and crank) linear or equal-percentage characteristics

Blatt 2

Gezeichnet	28.02.02	Trytko	Name	
Geprüft	05.03.02	Knöchel		
Normgepr.				
Datum	02/02	07/02	02/07	08/07
Name	Trytko	Nasgo.	Trytko	Trytko

RN 01.170.5



Pos. item	Benennung description	1"		1,5"		2"		2,5"		3"		4"		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	Gehäuse RGE41 1+2S Housing	15-56-310/47				15-56-460/47		15-56-510/47		15-56-560/47		15-56-660/47		WS-Nr. ref.-no.
1	Gehäuse RGE41-1,5T/kvs 2,5+4,0 Housing		15-56-005/47											WS-Nr. ref.-no.
1	Gehäuse RGE41-1,5T/kvs 6,3+10 Housing		15-56-006/47											WS-Nr. ref.-no.
1	Gehäuse RGE41-1,5T/kvs 16+25 Housing		15-56-410/47											WS-Nr. ref.-no.
2	Gehäusedichtung * Housing seal	58-33-292/		58-33-392/		58-33-442/		58-33-492/		58-33-567/		58-33-642/		WS-Nr. ref.-no.
3	Gehäusedeckel Housing cover	15-00-065/42		15-00-069/42		15-00-793/42		15-00-794/42		15-00-799/42		15-00-798/42		WS-Nr. ref.-no.
4	Tellerdichtung * Seat seal	58-33-293/		=		=		=		=		=		WS-Nr. ref.-no.
5	Schaftdichtung SW4 Shaft seal SW4	58-33-150/26		=		=		=		=		=		WS-Nr. ref.-no.
6	Führungsbuchse Bushing	08-01-181/12		=		=		08-01-179/12		=		=		WS-Nr. ref.-no.
7	Führungsbuchse 20x9 Bushing	08-01-178/23		=		=		=		=		=		WS-Nr. ref.-no.
8	Laterne Yoke	16-40-091/17		16-40-385/17		16-40-435/17		16-40-485/17		16-40-560/17		16-40-635/17		WS-Nr. ref.-no.
9	Skt Schraube Hex.screw	DIN EN 24017-M8x14-A2-70												
10	Skt Schraube Hex.screw	DIN EN 24017-M6x16-A2-70												
11	Kontermutter Mating nut	DIN EN 24017-M8x16-A2-70												
11	Kontermutter M10x1 Mating nut	21-50-025/15												WS-Nr. ref.-no.
12	Kupplungsstück Coupling	08-52-024/42		=		=		=		=		=		WS-Nr. ref.-no.
13	Kupplung mit Begrenzung Coupling with limitation	08-52-190/13		=		=		=		=		=		WS-Nr. ref.-no.
14	Skt. Schraube Hex. screw	DIN EN 24017-M8x14-A2-70												
15	Spindel Shaft	15-24-110/42		=		=		=		=		=		WS-Nr. ref.-no.
16	Spindelmutter Shaft nut	15-28-065/52		=		=		=		=		=		WS-Nr. ref.-no.
17	Kopfstück Head piece	15-01-001/17		=		=		=		=		=		WS-Nr. ref.-no.







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02/94

Ersatzteilliste: spare parts list  
 mit Handbetätigung (Handrad und Handkurbel)  
 lineare oder gleichproz. Kennlinie  
 Modulating valve RGE41 1-4 Zoll with manual actuation  
 (handle and crank) linear or equal-percentage characteristics

Blatt 4

Datum	02/02
Name	Trytko

Gezeichnet		28.02.02		Trytko		Name	
Geprüft							
Normgepr.							



RN 01.170.5

Pos. / Item	Benennung / description	6,3	10	2,5	4,0	6,3	10	16	25
		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.
24 1	Tellerdichtung Seat seal	58-33-294/	=	=	=	=	=	58-33-394/	=
25 1	Schaft-lineare Kennlinie Shaft flow character-linear	15-25-046/42	15-25-047/42	15-25-044/42	15-25-045/42	15-25-046/42	15-25-047/42	15-25-048/42	15-25-049/42
1	Schaft-gleichproz. Kennlinie Shaft flow character-equal percen.	15-25-026/42	15-25-027/42	15-25-024/42	15-25-025/42	15-25-026/42	15-25-027/42	15-25-028/42	15-25-029/42

1,5"/kvs





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Blatt 5

Gezeichnet	28.02.02	Trytko	Name	Trytko
Geprüft	05.03.02	Knöchel		
Normgepr.				

Datum	02/02	04/04	02/07		
Name	Trytko	Trytko	Trytko		

Pos. item	Benennung description	2" 40 WS-Nr. ref.-no.	2,5" 63 WS-Nr. ref.-no.	3" 80 WS-Nr. ref.-no.	4" 160 WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.
24	1 Tellerdichtung Seal seal	58-33-444/ *	58-33-494/ *	58-33-569/ *	58-33-644/ *			
25	1 Schaff-lineare Kennlinie Shaft flow character-linear	15-25-050/42	15-25-051/42	15-25-054/42	15-25-053/42			
1	1 Schaff-gleichproz. Kennlinie Shaft flow character-equal percen.	15-25-030/42	15-25-031/42	15-25-034/42	15-25-033/42			

Pos. 2, 4, 5, 7, 24 nur im kompletten Dichtungssatz erhältlich  
item. 2, 4, 5, 7, 24 available as complete seal kits only

		1"	1,5"	2"	2,5"	3"	4"	
1	Dichtungssatz Seal kit	58-34-500/00	58-34-507/00	58-34-502/00	58-34-503/00	58-34-504/00	58-34-506/00	
1	Dichtungssatz Seal kit	58-34-500/01	58-34-507/01	58-34-502/01	58-34-503/01	58-34-504/01	58-34-506/01	
1	Dichtungssatz Seal kit	58-34-500/02	58-34-507/02	58-34-502/02	58-34-503/02	58-34-504/02	58-34-506/02	
1	Dichtungssatz Seal kit	58-34-500/06	58-34-507/06	58-34-502/06	58-34-503/06	58-34-504/06	58-34-506/06	

Ersatzteilliste: spare parts list: Regulierventil RGE41 1-4 Zoll  
mit Handbetätigung (Handrad und Handkurbel)  
lineare oder gleichproz. Kennlinie

Modulating valve RGE41 1-4 Zoll with manual actuation  
(handle and crank) linear or equal-percentage characteristics

RN 01.170.5