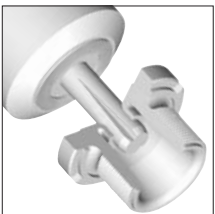
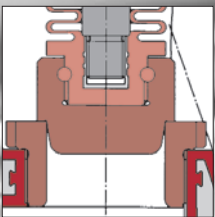
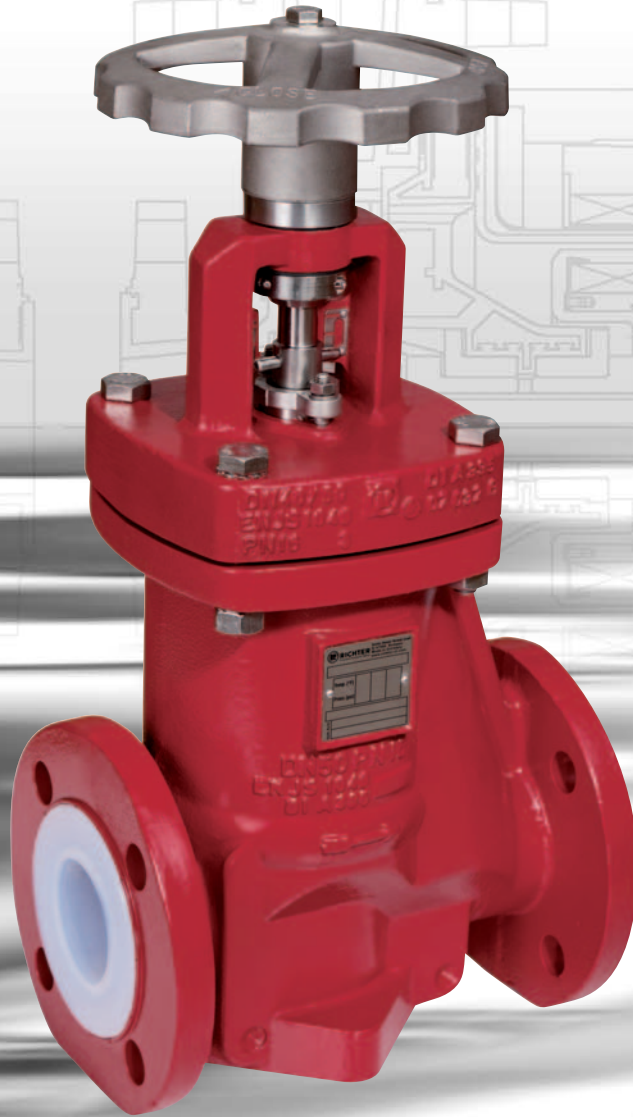


# Richter bellows-sealed shut-off and control valves

– hand actuated –



Lining pure PFA, optionally antistatic

Bellows sealing,  
safety stuffing box

Heavy-duty bellows  
- for permeating media  
- up to 16 bar (230 psi) and  
180 °C (360 °F)



**RICHTER**  
Process Pumps & Valves



## Bellows-sealed shut-off and control valves

### Fields of application

As a shut-off valve, the HV with on/off plug is preferably used where a ball or butterfly valve, for example, cannot be deployed owing to the requirement for hermetic tightness. In conjunction with the standard safety stuffing box, the valve complies with the German Clean Air Code ("TA Luft").

Equipped with an equal percentage or linear control plug, the HVR can perform a genuine control function.

The body, seat and bellows can be replaced and varied independently, permitting optimum adaptation to the operating conditions in question and low-cost maintenance.

### Operating range

- -60 to +180 °C (-76 to +360 °F) operating temperature
- 0.1 mbar (0.01 psi) vacuum up to 16 bar (230 psi) operating pressure

### Design

Sealless bellows globe control valve.

Lined with fluoroplastic. Fitted with safety stuffing box as standard. Also available as a globe control valve, actuation pneumatic or with an electric motor (RSS series).

### Control characteristics to DIN EN 60534

Equal percentage, linear, on-off. Rangeability 1:25 or 1:100 with V-control plug for  $k_v$  0.01-1.20

### Product features

- $k_{vs}$  values from 0.01 to 155 m<sup>3</sup>/h in carefully graduated performance groups (table page 3)

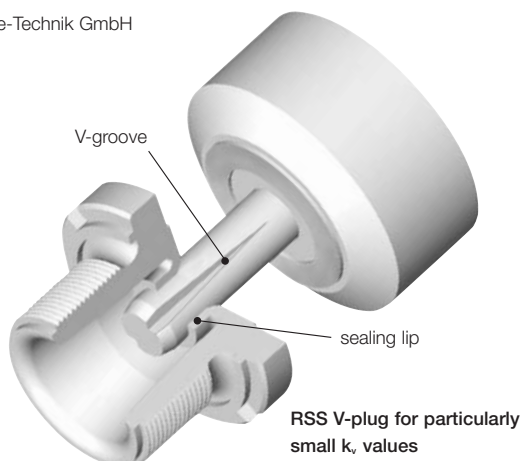
### Type codes, wetted materials

- Shut-off valve HV/...
- Control valve HVR/...

Lining:

- PFA (perfluoroalkoxy) .../F
- Antistatic PFA-L .../F-L
- Highly permeation-resistant PFA-P .../F-P

Richter: WZ Richter Chemie-Technik GmbH  
Hastelloy®: WZ Haynes



- ① **Thermoplastic lining made of pure PFA**
  - Universal chemical resistance
  - High permeation resistance
  - Guaranteed lining thicknesses 5-6 mm (at DN 15 and 20: 3.5-4 mm)
  - Vacuum-proof anchoring
  - Optimum quality assurance due to transparent lining material
  - Optionally also antistatic (PFA-L) and highly permeation-resistant (PFA-P) lining
- ② **One-piece pressure-bearing body of ductile cast iron EN-JS 1049/ASTM A395**
  - Cast steel 1.0619 on request
  - Absorbs system and pipe forces
  - Body heaters on request
- ③ **PTFE bellows**

protect the valve stem against corrosion and hermetically seal the product chamber from the atmosphere. Standard PTFE bellows up to 10 bar (150 psi) operating pressure.

**Options:**

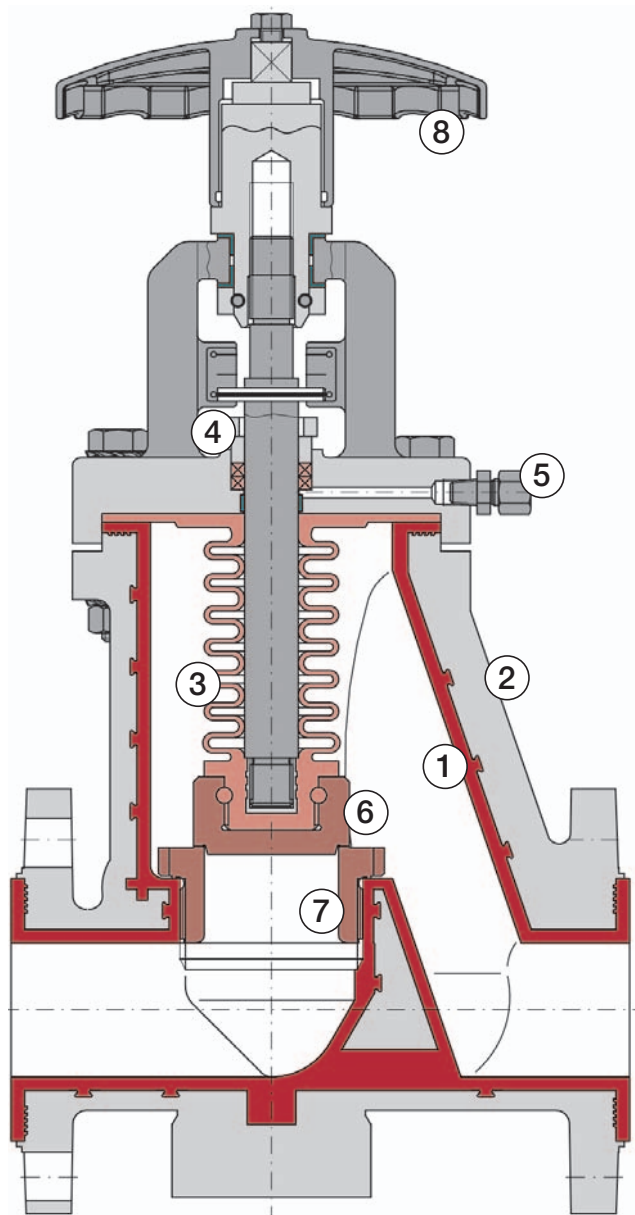
  - **Heavy-duty PTFE bellows** for highly permeating media, pressures up to 16 bar (230 psi) and high temperatures, see illustration on page 3.
  - **Hastelloy bellows** for special cases, e.g. extreme permeation and pressure/temperature conditions
- ④ **Safety stuffing box**
  - Adjustable from outside as a standard feature
  - Valve design complies with German Clean Air Code
- ⑤ **Leak monitor connection**

as an option, especially for critical media
- ⑥ **Exchangeable valve plug**
  - Pure TFM-PTFE, without fillers
  - Screwed to the bellows without play and secured by means of a PTFE cord
  - $k_{v100}/C_v$  value changed by replacing the seat/plug
  - Special V-control plug made of TFM-PTFE for minimum  $k_v$  values from 0.01 m<sup>3</sup>/h ( $C_v$  0.012)
  - Special U-plug if there is a risk of cavitation
- ⑦ **Exchangeable seat**

made of pure TFM-PTFE, without fillers
- ⑧ **External corrosion protection**

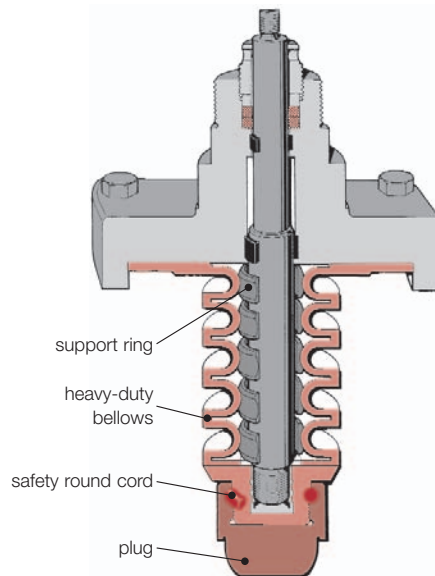
Body epoxy-coated. Stuffing box, hand-wheel, screws/nuts made of stainless steel.

# Heavy-duty bellows and safety stuffing box offer optimum reliability



## Heavy-duty bellows, of advantage for

- highly permeating media
- higher pressures and temperatures



- 2.5 mm wall thickness for the bellows!
- pressure resistance max. 16 bar (230 psi), see diagram
- internal stainless steel support rings
  - support the convolutions of the bellows individually
  - ensure the distribution of the motion on all convolutions of the bellows and their flexibility
  - PTFE/carbon support rings for operating pressure of max. 10 bar (150 psi) also available on request

## Flow rates $k_{v100}$ (m<sup>3</sup>/h), Cv (US gpm)

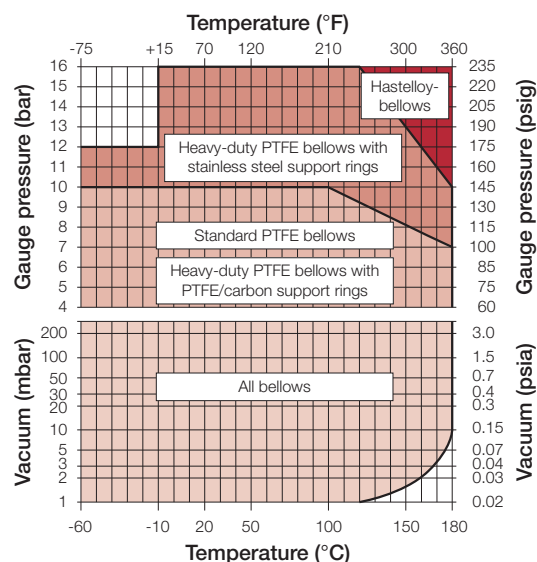
DN (mm)	DIN/ISO ANSI (inch)	$k_{v100}$ Cv	Seat-Ø mm (inch)																	
			96 (3.8)	80 (3.1)	65 (2.6)	50 (2)	40 (1.6)	30 (1.2)	25 (1)	20 (0.8)	15 (0.6)	8 (0.3)	DN 15+20 (1/2" + 3/4"): Seat ø 8 mm (0.31")					DN 25 (1"): Seat ø 14 mm (0.55")		
15+20	1/2+3/4	$k_{v100}$ Cv									4 4.7	2 2.33	0.80 0.93	0.50 0.58	0.20 0.23	0.10 0.12	0.05 0.06	0.02 0.023	0.01 0.012	
25	1	$k_{v100}$ Cv							11 12.8	7 8.2	4 4.7	2 2.33	1.20 1.40	0.80 0.93	0.50 0.58	0.20 0.23	0.10 0.12	0.05 0.06	0.02 0.023	0.01 0.012
40	1 1/2	$k_{v100}$ Cv				28 32.6	15 17.5	11 12.8	7 8.2	4 4.7										
50+65	2	$k_{v100}$ Cv			42 48.9	28 32.6	15 17.5	11 12.8	7 8.2											
80	3	$k_{v100}$ Cv	100* 117*	65 75.7	42 48.9	28 32.6	15 17.5													
100	4	$k_{v100}$ Cv	155* 180*	100* 117*	65 75.7	42 48.9														

\* If a U-plug is used, the  $k_{v100}$  (Cv) values reduce from 155 m<sup>3</sup>/h (180 US gpm) to 135 m<sup>3</sup>/h (157 US gpm) and from 100 m<sup>3</sup>/h (117 US gpm) to 90 m<sup>3</sup>/h (105 US gpm).

### Remarks:

1. V-control plugs are used for the  $k_{v100}$  values 0.01 to 1.2 (Cv 0.012-1.4).
2. The next lower  $k_{v100}$  (Cv) value can also be attained by using a different plug without changing the seat diameter. This may be important as it is only necessary to replace the plug if the  $k_{v100}$  (Cv) value is later changed.
3. Conversion  $k_{v100}$  to Cv (US gpm) =  $k_{v100} \times 1.165$ .

## Pressure/temperature range



## Dimensions, weights, $k_{VS}$ -values

### Dimensions and weights for HV and HVR

Face-to-face lengths ISO 5752 series 1  
(DIN EN 588-1 series 1)\*,  
flanges ISO 7005-2/PN16 (DIN EN 1092-2)\*

DN (mm)	D (mm)	H (mm)	L (mm)	Weight** approx. kg
15	100	263	130	7
20	100	273	130	7
25	95	301	160	12
40	160	364	200	17
50	160	372	230	20
65	190	372	290	22
80	230	519	310	49
100	350	529	350	55

Face-to-face lengths ANSI/ISA 75.08.01 Cl. 150+300,  
flanges ASME (ANSI) B16.5 Cl.150+300 RF

DN (inch)	D (inch)	H (inch)	L Cl.150 (inch)	L Cl.300 (inch)	Weight** approx. kg
1/2" *	3.94	10.35	5.12***	-	7
3/4"	3.94	10.35	5.12***	-	7
1"	3.74	11.85	7.24	7.75	12
1 1/2"	6.3	14.33	8.7	9.25	17
2"	6.3	14.65	10	10.51	20
2 1/2"	7.48	14.65	***	-	22
3"	9.05	20.43	11.73	-	49
4"	13.78	20.83	13.78***	-	55

### HV valve with on-off plug

DN mm	inch	max. Seat Ø (mm)	$k_{v100}$ (m <sup>3</sup> /h)	Cv (US gpm)
15	1/2"	15	5	6.99
20	3/4"	20	5	6.99
25	1"	25	13	15.15
40	1 1/2"	40	30	34.95
50	2"	50	45	52.43
65	2 1/2"	50	45	52.43
80	3"	80	111	129.32
100	4"	96	160	186.4

\* formerly DIN 3202/F1, 2532/33

\*\* without handwheel

\* DN 1/2": flanges with tapped bore

\*\* for B16.5 Cl.150 \*\*\* not to ANSI/ISA

### Components and materials

Item	Designation	Material
100	Body	Ductile cast iron EN JS 1049 (ASTM A395)/PFA*
106	Cover	Ductile cast iron EN JS 1049 (ASTM A395)/PFA*
204	Plug	TFM-PTFE
205	Seat	TFM-PTFE
206	Bellows	TFM-PTFE, optionally Hastelloy®
210	Hand wheel	1.4401 (Stainless steel)
300	Plain bearing	PTFE/carbon
302	Guide ring	PTFE/carbon
402	Packing ring	PTFE/carbon
405	Thrust ring	1.4401 (Stainless steel)
500	Ring	1.4305 (Stainless steel)
503	Packing gland follower	1.4401 (Stainless steel)
522	Round cord	PTFE
523	Travel indicator	1.4401 (Stainless steel)
855	Stem	Stainless steel
917/1	Screw-in pipe connector**	Stainless steel, optionally hex. head screw plug
939/2	spring-type pin	1.4310 (Stainless steel)

\* Optionally also antistatic (PFA-L) and highly permeation-resistant (PFA-P) lining

\*\* only with option "leak monitor connection"

### Special designs

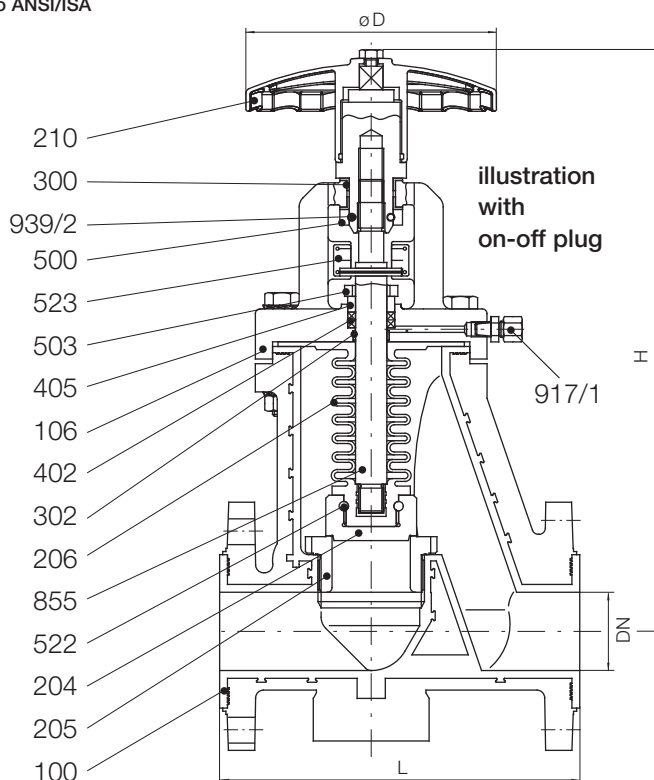
#### Version for "biotechnology/pure media"

for the pharmaceutical and fine chemical industries, electronic chemicals, fermentation etc., suitable for CIP and SIP! Unique in terms of freedom from cavities and ease of cleaning in the segment of lined control valves:

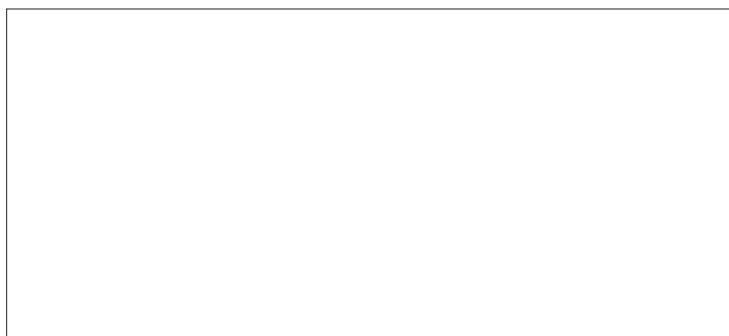
- Anti-adhesive lining, seamlessly integrated seat
- One-piece PTFE bellows/plug design without cavities, DN 15+20 with standard bellows
- "Pure media production processes" and FDA certificate on request

#### Version for highly permeating media (e.g. chlorine)

A special bush made of Hastelloy® C, for example, protects the cover flange in the valve stem area against corrosive attack by permeating media. The valve stem made of Hastelloy® C, for example, remains moveable. Thick-walled pure PFA, optionally: highly permeation-resistant PFA-P.



Presented by:



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