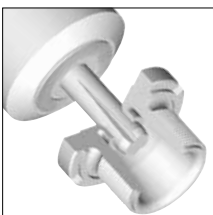
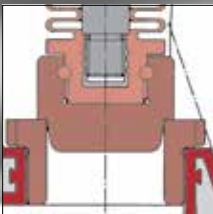


# Richter bellows-sealed shut-off and control valves

– manually actuated –



Lining pure PFA, optionally antistatic

Bellows sealing,  
safety stuffing box

Heavy-duty bellows  
- for permeating media  
- up to 235 psi (16 bar) and  
360 °F (180 °C)



**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

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

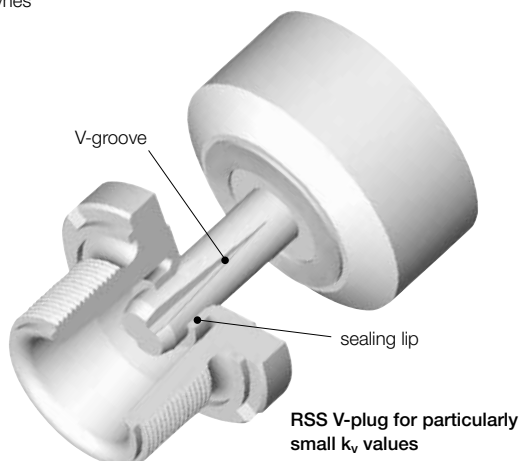
### Type codes, wetted materials

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

Lining:

- PFA .../F
- Antistatic PFA-L .../F-L

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 0.2-0.25" (5-6 mm) (at DN 15 and 20: 0.14-0.16" (3.5-4 mm))
- Vacuum-proof anchoring
- Optimum quality assurance due to transparent lining material
- Optionally also antistatic (PFA-L) lining

### ② One-piece pressure-bearing body of ductile cast iron EN-JS 1049/ASTM A395

- 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 150 psi (10 bar) operating pressure.

#### Options:

#### • Heavy-duty PTFE bellows

for highly permeating media, pressures up to 230 psi (16 bar) 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 ("TA Luft")

### ⑤ Leak monitor connection

as an option, especially for critical media

### ⑥ Exchangeable valve plug

- Pure modified 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 modified 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

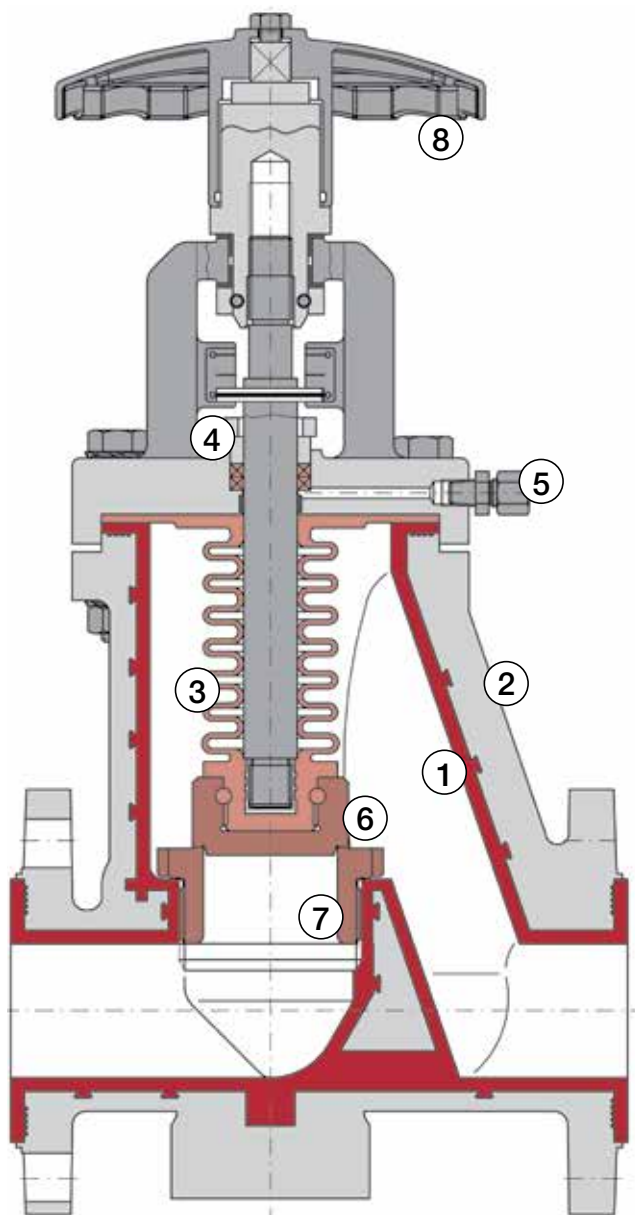
### ⑦ Exchangeable seat

made of pure modified PTFE, without fillers

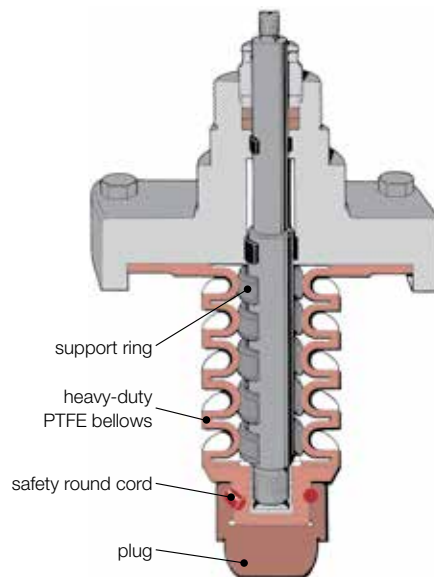
### ⑦ External corrosion protection

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

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



**Option: Heavy-duty bellows**  
 - for highly permeating media  
 - for higher pressures and temperatures



- 0.1" (2.5 mm) wall thickness for the bellows!
- pressure resistance max. 230 psi (16 bar), 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. 145 psi (10 bar) also available on request

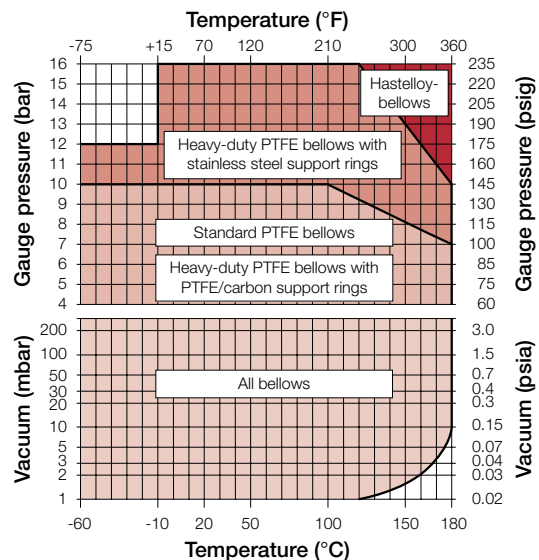
**Flow rates Cv (USgpm),  $k_{v100}$  (m<sup>3</sup>/h)  
 for series HVR with control plug**

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

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

\*\* V-control plugs are used for the Cv 0.012-1.4 ( $k_{v100}$  values 0.01 to 1.2).

## 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 558-1 series 1)\*, flanges ISO 7005-2/PN16 (DIN EN 1092-2)\*

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

DN (inch)	D (mm)	H		L		L Cl. 150		L Cl. 300		Weight approx. kg		
		(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)			
1/2***	15	3.94	100	10.35	263	5.12	130	5.12***	130	-	7	
3/4"	20	3.94	100	10.35	263	5.12	130	5.12***	130	-	7	
1"	25	3.74	95	11.85	301	6.3	160	7.24	184	7.75	197	12
1 1/2"	40	6.3	160	14.33	364	7.87	200	8.7	222	9.25	235	17
2"	50	6.3	160	14.65	372	9.05	230	10	254	10.51	267	20
2 1/2"	65	7.48	190	14.65	372	11.42	290	***	***	-	-	22
3"	80	9.05	230	20.43	519	12.2	310	11.73	298	-	-	49
4"	100	13.78	350	20.83	529	13.78	350	13.78	352	-	-	55

\* formerly DIN 3202/F1, 2532/33 \*\* DN 1/2": flanges with tapped bore \*\*\* not to ANSI/ISA

### HV Flow rates for series with on-off plug

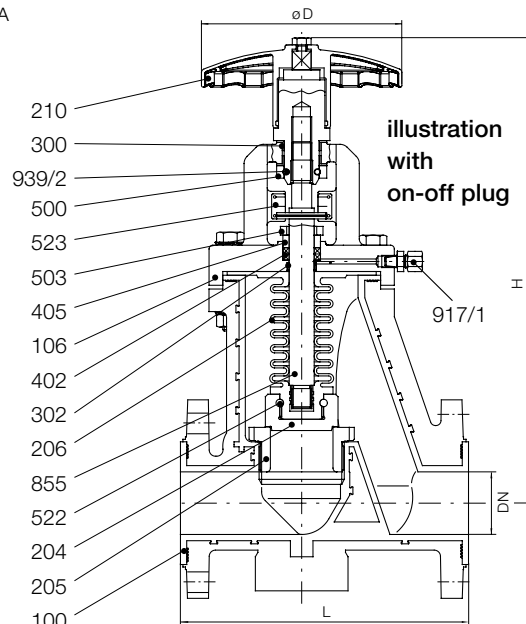
DN (inch)	(mm)	max. seat Ø (mm)	Cv (USgpm)	$k_{v100}$ (m <sup>3</sup> /h)
1/2"	15	15	7	5
3/4"	20	20	7	5
1"	25	25	15.2	13
1 1/2"	40	40	35	30
2"	50	50	52.4	45
2 1/2"	65	50	52.4	45
3"	80	80	129.3	111
4"	100	96	180.6	155

### 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	modified PTFE
205	Seat	modified PTFE
206	Bellows	modified 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 (DN 80, 100)	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"



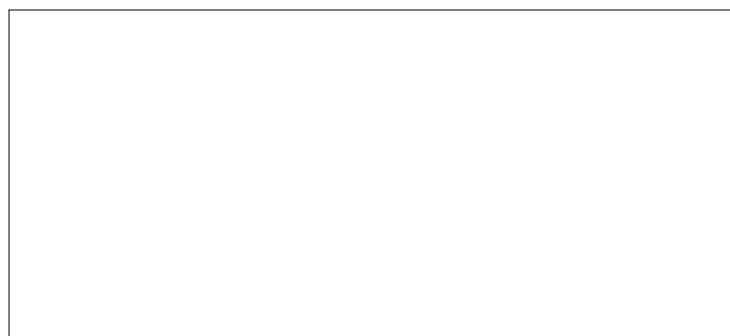
### Special designs

#### 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

Presented by:



#### 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.



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