

Pneumatic Control Valve Type RVG Globe valve and angle valve

Application

Control valve for feedwater and steam applications in power plant engineering and the petrochemical industry

Nominal size DN 25 to 150 · NPS 1 to 6
Nominal pressure PN 16 to 400 · Class 150 to 2500

Type RVG Globe Valve equipped with

- Type 3271 Pneumatic Actuator

Valve body made of

- Forged steel 1.0460 / A105
- High-temperature forged steel 1.7335 / A182 F12 or 1.5415 / A182 F1

Special properties

- No cavitation
- No oscillation or vibrations
- Long service life
- Exact characteristics
- Easy-to-replace internal parts

Versions

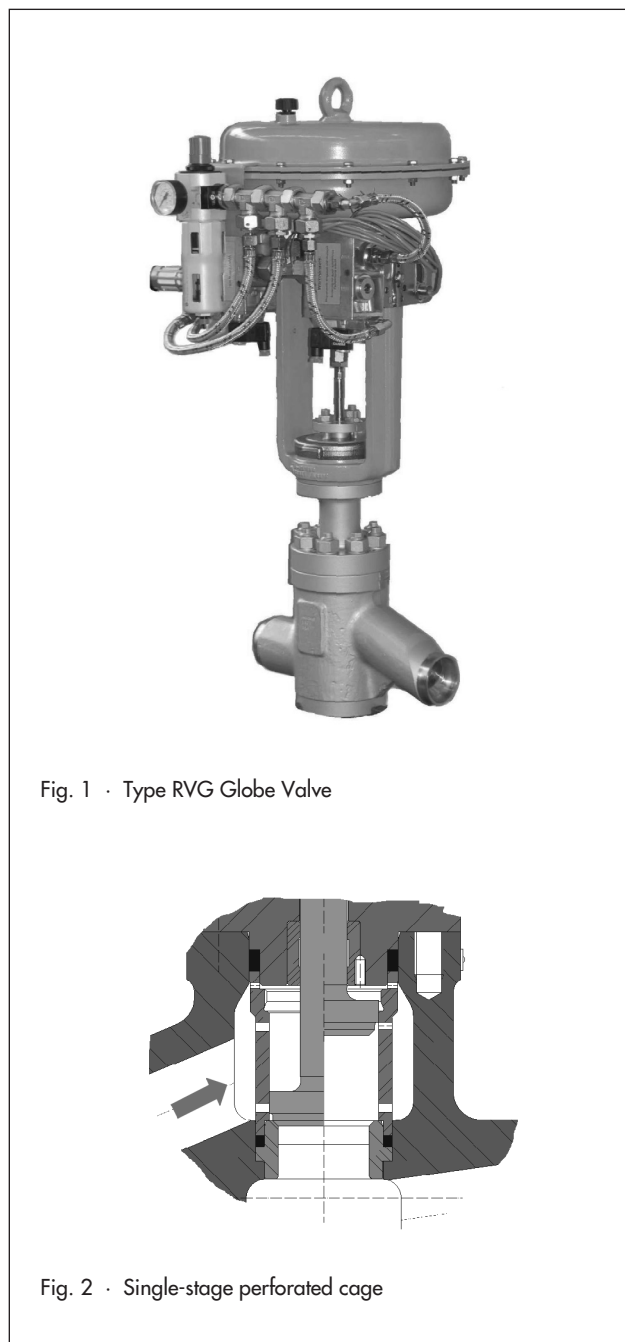
- **Type RVG** · Standard version in globe or angle body style with single-stage, two-stage, or three-stage perforated plug, with welding ends

Special versions

- Electric actuators
- Pressure-balanced plugs
- 4-stage to 10-stage plugs for very high pressure letdown

Application limits for multi-stage plugs

- $\Delta p < 50 \text{ bar} / 725 \text{ psi}$ - single-stage plug
- $\Delta p < 100 \text{ bar} / 1450 \text{ psi}$ - two-stage plug
- $\Delta p < 150 \text{ bar} / 2175 \text{ psi}$ - three-stage plug



Principle of operation

The process medium flows through the valve in the direction indicated by the arrow. The cross-sectional area of flow across the perforated cage is determined by the edge of the valve plug. The arrangement and size of the bores in the perforated cage determine the valve characteristic and the flow coefficient. With two-stage plugs, the pressure is further reduced by a downstream perforated plug.

In valves with three-stage plugs (only for liquids), an additional stage is located downstream of the seat ring. The seat ring is kept inside the body by the cage and can be removed without special tools.

Fail-safe action

Depending on how the compression springs are arranged in the actuator (for details refer to Data Sheets T 8310-1 EN and T 8310-2 EN), the control valve provides two fail-safe actions that become effective when the supply air fails.

Actuator stem extends (FA):

The valve is closed when the supply air fails.

Actuator stem retracts (FE):

The valve is opened when the supply air fails.

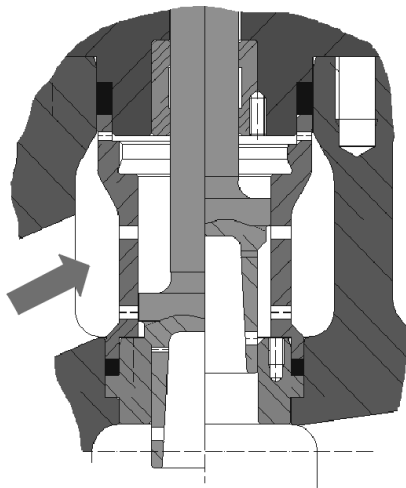


Fig. 3 · Two-stage plug

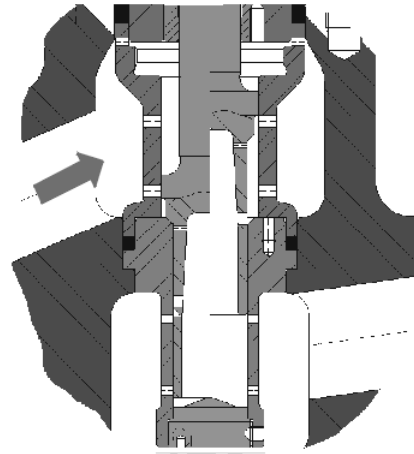


Fig. 4 · Three-stage plug

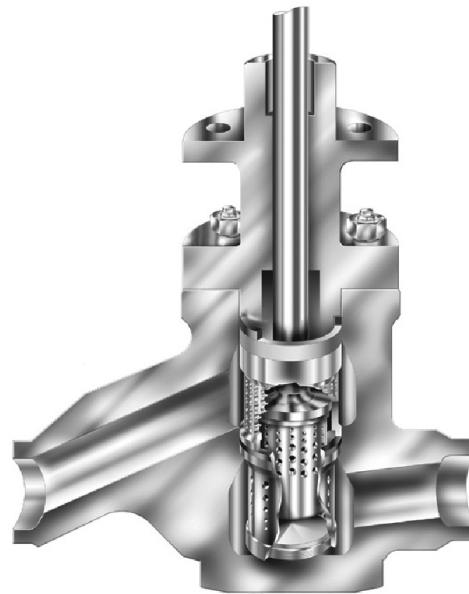


Fig. 5 · Type RVG with three-stage plug, sectional drawing

Table 1 · Technical data

Material		1.0460 · A105	1.7335 · A182 F12 Class 2	1.5415 (≅A181 F1)
Nominal size		DN 25 ... 150 · NPS 1 ... 6		
Nominal pressure		PN 16 ... 400 · Class 150 ... 2500		
Connection	Flanges	All DIN and ANSI flanges on request		
	Welding ends	DIN · ANSI		
Seat-plug seal		Metal sealing		
Characteristic		Equal percentage · Linear		
Throttling element		Perforated plug, single-stage to three-stage		
Rangeability		1 : 30 (higher rangeabilities on request)		
Temperature range	PTFE	≤ 260 °C · ≤ 500 °F		
	Graphite	> 260 °C · > 500 °F		
Leakage class according to EN 1349				
Valve plug	Metal sealing	V		
	Pressure balancing	IV		

Table 2 · Materials

Standard version		1.0460 · A105	1.7335 · A182 F12 Class 2	1.5415 (≅A181 F1)
Nominal pressure		PN 16 ... 400 · Class 150 ... 2500		
Valve body		1.0460	1.7335	1.5415 (≅A181 F1)
Bonnet		1.0460	1.7335	1.5415 (≅A181 F1)
Seat and plug		1.4122		
Guide bushing		Mehanite		
Packing		Pure graphite		
Body gasket		Graphite on metal core (1.4541)		

Table 3 · Available K_{VS} and C_V coefficients

Versions marked * are only available in PN 40 to PN 250 or Class 300 to 1500.

Reduced K_{VS} coefficients apply when used with two-stage plugs in steam applications (details on request).

Table 3a · Globe valve with single-stage plug

K _{VS}		1.2	1.8	4.1	6.9	10.5	25	36	53	120	165*
C _V		1.4	2.1	4.7	8.0	12.1	28.9	41.6	61.3	138.7	190.8*
Flow cross-section (cm ²)		0.4	0.6	1.4	2.4	3.8	10	15.7	22.6	50	72
Seat Ø (mm)		12	15	20	25	32	40	50	65	80	110
Travel (mm)		20		25		35		50		75	
DN	NPS										
25	1	•	•	•	•						
32	1¼	•	•	•	•	•					
40	1½		•	•	•	•	•				
50	2			•	•	•	•				
65	2½				•	•	•	•			
80	3						•	•	•	•	
100	4							•	•	•	
125	5									•	•
150	6									•	•

Table 3b · Globe valve with two-stage plug

K _{Vs}	0.85	1.2	2.9	5.2	8	13	22	34	60	76	92	111	128*
C _v	1.0	1.4	3.4	6.0	9.2	15.0	25.4	39.3	69.4	87.9	106.4	128.3	148.0*
Flow cross-section (cm ²)	0.4	0.6	1.4	2.4	3.8	6.2	10.6	17.7	29.6	35.6	48.9	58	70
Seat Ø (mm)	12	15	20	25	32	40	50	65	80	90	100	110	120
Travel (mm)	20		25		35		50		75				
DN	NPS												
25	1	•	•	•	•	•							
32	1¼	•	•	•	•	•							
40	1½	•	•	•	•	•	•						
50	2	•	•	•	•	•	•						
65	2½					•	•	•	•				
80	3						•	•	•	•			
100	4						•	•	•	•	•		
125	5								•	•	•	•	•
150	6								•	•	•	•	•

Table 3c · Globe valve with three-stage plug

K _{Vs}	0.72	1.0	2.5	5.2	7	11	18	30	52	66	81	97*	114*
C _v	0.8	1.2	2.9	6.0	8.1	12.7	20.8	34.7	60.1	76.3	93.6	112.1*	131.8*
Flow cross-section (cm ²)	0.4	0.6	1.4	2.4	3.8	6.2	10.6	17.7	29.6	38.6	48.9	58	70
Seat Ø (mm)	12	15	20	25	32	40	50	65	80	90	100	110	120
Travel (mm)	20		25		35		50		75				
DN	NPS												
25	1	•	•	•	•	•							
32	1¼	•	•	•	•	•							
40	1½		•	•	•	•	•						
50	2		•	•	•	•	•						
65	2½					•	•	•					
80	3						•	•	•	•			
100	4						•	•	•	•	•		
125	5								•	•	•	•	•
150	6								•	•	•	•	•

Table 3d · Angle valve with single-stage plug

K _{Vs}	1.2	1.8	4.1	7.1	11.1	28	38	63	101	130*
C _v	1.4	2.1	4.7	8.2	12.8	32.4	43.9	72.8	116.8	150.3*
Flow cross-section (cm ²)	0.4	0.6	1.4	2.4	3.8	12.5	15.7	26.5	47.5	56.7
Seat Ø (mm)	12	15	20	25	32	40	50	65	80	100
Travel (mm)	20		25		35		50		60	75
DN	NPS									
25	1	•	•	•	•					
32	1¼	•	•	•	•	•				
40	1½	•	•	•	•	•	•			
50	2		•	•	•	•	•	•		
65	2½				•	•	•	•	•	

K _{Vs}	1.2	1.8	4.1	7.1	11.1	28	38	63	101	130*
C _V	1.4	2.1	4.7	8.2	12.8	32.4	43.9	72.8	116.8	150.3*
Flow cross-section (cm ²)	0.4	0.6	1.4	2.4	3.8	12.5	15.7	26.5	47.5	56.7
Seat Ø (mm)	12	15	20	25	32	40	50	65	80	100
Travel (mm)	20		25		35		50		60	75
DN	NPS									
80	3					•	•	•	•	
100	4					•	•	•	•	•
125	5									•

Table 3e · Angle valve with two-stage plug

K _{Vs}	0.9	1.37	3.1	5.4	7.9	12.9	22.4	38	94	112*
C _V	1.0	1.6	3.6	6.2	9.1	14.9	25.9	43.9	108.7	129.5*
Flow cross-section (cm ²)	0.4	0.6	1.4	2.4	3.8	6.2	10.6	18.2	29	48.9
Seat Ø (mm)	12	15	20	25	32	40	50	65	80	100
Travel (mm)	20		25		35		50		60	75
DN	NPS									
25	1	•	•	•	•					
32	1¼	•	•	•	•	•				
40	1½	•	•	•	•	•	•			
50	2		•	•	•	•	•	•		
65	2½				•	•	•	•	•	
80	3						•	•	•	•
100	4						•	•	•	•
125	5									•

Table 3f · Angle valve with three-stage plug (for water only)

K _{Vs}	0.72	1.08	2.5	4.3	6.8	11.6	19	32	51	
C _V	0.8	1.2	2.9	5.0	7.9	13.4	22.0	37.0	59.0	
Flow cross-section (cm ²)	0.4	0.6	1.4	2.4	3.8	6.2	10.6	17.7	29.6	
Seat Ø (mm)	12	15	20	25	32	40	50	65	80	
Travel (mm)	20		25		35		50			
DN	NPS									
25	1	•	•	•	•					
32	1¼	•	•	•	•	•				
40	1½	•	•	•	•	•	•			
50	2		•	•	•	•	•	•		
65	2½				•	•	•	•	•	
80	3						•	•	•	
100	4						•	•	•	

Table 4 · Parameters for flow rate and noise level calculation

Travel [%]	10	20	30	40	50	60	70	80	90	100
F _L	0.84	0.84	0.84	0.85	0.86	0.87	0.88	0.89	0.90	0.91
x _{Fz}	0.45	0.44	0.44	0.43	0.41	0.41	0.41	0.41	0.40	0.40

Table 5 · Permissible differential pressures

Note! Required supply pressure $p_{supply} = 4 \text{ bar}$ · Differential pressure Δp at $p_2 = 0 \text{ bar}$ · Actuators marked E require the use of pressure-balanced valve plugs · Actuator sizing on request

Bench range [bar] for actuator [cm ²]			350 cm ² (0.6 ... 3.0 bar)						700 cm ² (0.6 ... 3.0 bar)				1400 cm ² (0.5...2.5 bar/1.3...2.8 bar)					
			Δp at $p_2 = 0 \text{ bar}$															
p_1			10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160
DN	Seat \varnothing	Actuator																
See Table 3a to Table 3f	8	350										700 E						
	10	350										700 E						
	12	350										700 E						
	15	350										700 E						
	20	350										700 E						
	25	-										-						
	32	700		1400						-				-				
	40	700		1400						-				-				
	50	700		1400						-				-				
	65	700		1400						-				-				
	80	700		1400						-				-				
	90	700		1400						-				1400 E				
	100	-		-						-				-				
	110	-		-						-				-				
120	-		-						-				-					

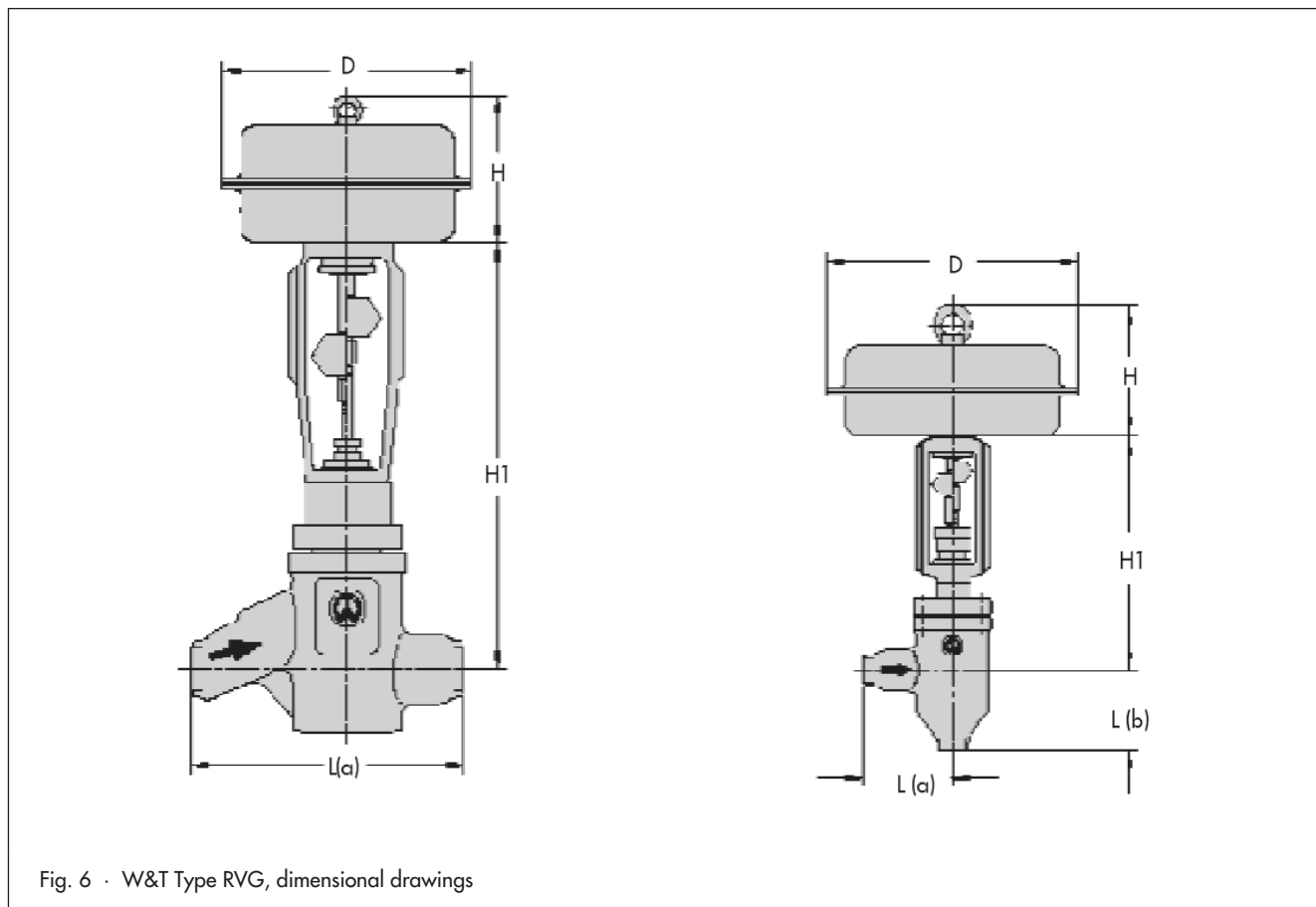


Table 6 · Dimensions in mm/in and weights in kg/lbs**Table 6a · Globe valve with single-stage or two-stage plug**

Valve	DN	25	32	40	50	65	80	100	125	150
	NPS	1	1¼	1½	2	2½	3	4	5	6
Length L (a)		350 mm / 13.8"				450 mm / 17.7"		560 mm / 22"		
H1		230 mm / 9"				295 mm / 11.6"		310 mm / 12.2"		
Weight	PN 40...400	39 kg				84 kg		296 kg		
	Cl. 300...2500	86 lbs				185 lbs		651 lbs		

Table 6b · Angle valve with single-stage or two-stage plug

Valve	DN	25	32	40	50	65	80	100	125
	NPS	1	1¼	1½	2	2½	3	4	5
Length L (a)		175 mm / 6.88"				250 mm / 9.8"			
Length L (b)		150 mm / 5.9"				225 mm / 8.8"			
H1		175 mm / 6.88"				220 mm / 8.66"			
Weight	PN 40...400	42 kg				120 kg			
	Cl. 300...2500	93 lbs				264 lbs			

Table 6c · Angle valve with three-stage plug

Valve	DN	25	32	40	50	65
	NPS	1	1¼	1½	2	2½
Length L (a)		175 mm / 6.88"				
Length L (b)		325 mm / 12.8"				
H1		195 mm / 7.6"				
Weight	PN 40...400	69 kg				
	Cl. 300...2500	152 lbs				

Table 7 · Pneumatic actuator · Dimensions and weights

Actuator	cm ²	350	700	1400
Diaphragm Ø D		280 mm / 11"	390 mm / 15.3"	530 mm / 20.86"
H (700 cm ² and larger: including lifting ring)		85 mm / 3.35"	200 mm / 7.87"	287 mm / 11.3"
H3 (min. clearance for actuator disassembly)			190 mm / 7.5"	610 mm / 24"
Threads		M30 x 1.5		M60 x 1.5
a (for Type 3271 Actuator)		G ¾ (¾ NPT)		G ¾ (¾ NPT)
Weight	Type 3271	8 kg / 17.6 lbs	22 kg / 48.5 lbs	70 kg / 154.3 lbs

Ordering text

Valve Type RVG	Globe valve or angle valve
Nominal size	DN / NPS
Nominal pressure	PN / ANSI Class
Body material	According to Table 2
Plug version	Standard or pressure-balanced single-stage to three-stage
Characteristic	Equal percentage or linear
Actuator	Type 3271 (see T 8310-1 EN or T 8310-2 EN)
Fail-safe action	Valve CLOSED or valve OPEN
Process medium	Density and temperature
Flow rate	During operation
Pressure	p_1 and p_2 in bar/psi (absolute pressure p_{abs}), each at minimum, standard, and maximum flow rate
Accessories	Positioner and/or limit switch

Specifications subject to change without notice.

