

Pneumatic Control Valve Type 3254-1 and Type 3254-7 Globe Valve Type 3254

Application

Control valve for process engineering applications with high industrial requirements, especially for high pressures and temperatures

Nominal size	DN 80 to 500
Nominal pressure	PN 16 to 400
Temperatures	-200 to +500 °C



Type 3254 Globe Valve with:

- Type 3271 Pneumatic Actuator (Type 3254-1 Control Valve) or
- Type 3277 Pneumatic Actuator (Type 3254-7 Control Valve) for integral positioner attachment

Valve body made of:

- Cast steel
- Stainless cast steel
- High-temperature or cold-resisting cast steel.

Valve plug optionally with:

- Metal sealing
- Soft sealing
- Lapped-in metal
- Balanced for handling high differential pressures
- Additional stem guide in the bottom body flange

The modular design of the control valves allows them to be equipped with various accessories:

Positioners, solenoid valves and other accessories according to IEC 60534-6 and NAMUR recommendation. See Information Sheet T 8350 EN for details.

Version

Standard version with PTFE packing for temperatures from -10 to 220 °C or with adjustable high-temperature (HT) packing for -10 to 350 °C, nominal size DN 80 to DN 500, nominal pressure PN 16 to PN 160

- **Type 3254-1** (Fig. 1) · Type 3254 Valve and Type 3271 Actuator with 700 to 2800 cm² effective diaphragm area (refer to Data Sheets T 8310-1 EN and T 8310-2 EN)
- **Type 3254-7** · Type 3254 Valve and Type 3277 Actuator with 350 to 700 cm² effective diaphragm area (refer to T 8310-1 EN)

Other versions

- **Nominal pressures PN 160 to 400** · On request
- **Welding ends or welding neck ends** acc. to DIN EN 12627
- **Flow divider** · For noise level reduction, see Data Sheet T 8081 EN
- **AC-Trim** · See Data Sheets T 8082 EN and T 8083 EN
- **Extension bonnet or bellows seal** · See Technical data
- **Heating jacket** · Details on request



Fig. 1 · Type 3254-1 Pneumatic Control Valve with Type 3271 Actuator

- **Additional handwheel** · See Data Sheet T 8310-1/-2 EN
- **ANSI version** · NPS 3 to 16, ANSI Class 150 to 2500 (see T 8061 EN)
- **Type 2354-3 Hand-operated Valve** · With Type 3273 Hand-operated Actuator, for valves with max. 30 mm rated travel (see Data Sheet T 8312 EN)
- **Type 3254-2 Electric Control Valve** · Details on request

Principle of operation (Figs. 2 to 4)

The process medium flows through the valve in the direction indicated by the arrow. The valve plug position determines the free area between the valve seat and the plug. The additional stem guide is located in the bottom body flange.

A pressure-balanced plug (Fig. 3) can be used when high pressures or differential pressures act on the valve plug and the force produced by the actuator is insufficient.

Fig. 4 shows the control valve version with a bellows seal. A test connection allows the stainless steel bellows to be monitored.

The control valves can be fitted with Flow Dividers St I (Fig. 4) or St III for a further reduction in the noise level (see Data Sheet T 8081 EN for details).

Fail-safe position

Depending on how the compression springs are arranged in the actuator (see Data Sheet T 8310-1 EN or T 8310-2 EN for details), the control valve has two different fail-safe positions which become effective upon supply air failure:

Actuator stem extends (FA)

The actuator springs close the valve when the supply air fails.

Actuator stem retracts (FE)

The actuator springs open the valve when the supply air fails.

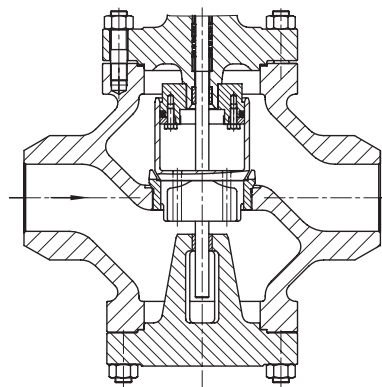


Fig. 3 · Type 3254 Globe Valve with welding ends and balanced valve plug

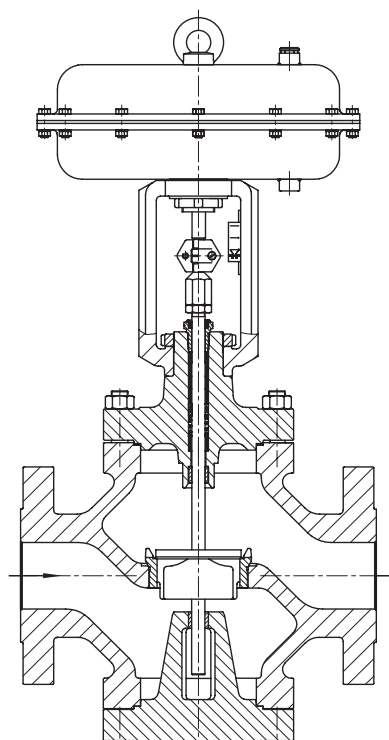


Fig. 2 · Type 3254-1 Control Valve with Type 3271 Pneumatic Actuator

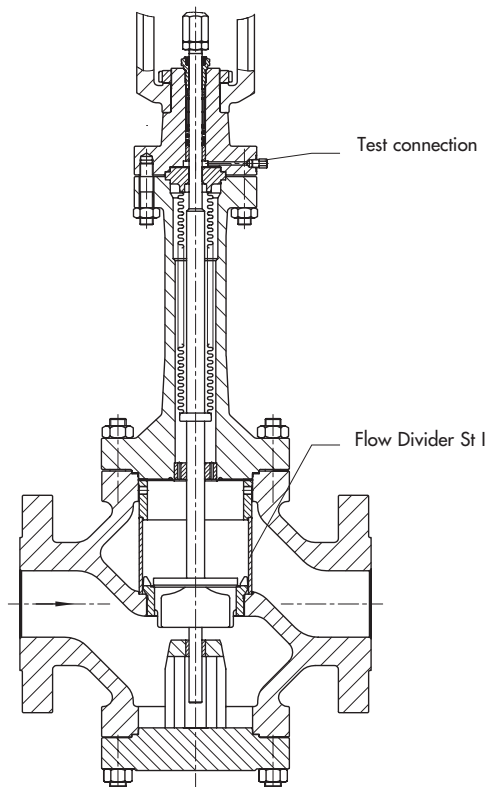


Fig. 4 · Type 3254 Globe Valve with Flow Divider St I and additional bellows seal with test connection

Table 1 · Technical data for Type 3254 Globe Valve

Material		Cast steel 1.0619	Cast steel 1.7357	Stainless cast steel 1.4581	
Nominal size ¹⁾	DN	DN 80 to 500		DN 80 to 100	DN 150 to 500
Nominal pressure	PN	PN 16 to 160 ²⁾	PN 40 to 160 ²⁾	PN 16 to 160	PN 16 to 100 ²⁾
End connections	Flanges	All DIN EN versions			
	Welding ends	According to DIN EN 12627			
Seat-plug sealing		Metal sealing · Soft sealing · Lapped-in metal			
Characteristic		Equal percentage · Linear			
Rangeability		50 : 1			
Temperature ranges in °C · Permissible operating pressures according to pressure-temperature diagrams (see Information Sheet T 8000-2 EN)					
Valve body without extension bonnet		-10 ... 220 °C · Up to 350 °C with high-temperature packing			
Body with	Extension bonnet	-10 ... 400 °C	-10 ... 500 °C	-10 ... 450 °C	
	Bellows seal	-10 ... 400 °C	-10 ... 500 °C	-10 ... 450 °C	
Valve plug ³⁾	Standard	Metal sealing	-250 ... 500 °C		
		Soft sealing	-200 ... 220 °C		
	Balanced	PTFE ring	-200 ... 220 °C		
		Graphite ring	220 ... 500 °C		
Leakage class according to DIN EN 1349 (2000)					
Valve plug	Standard	Metal sealing	IV		
		Soft sealing	VI		
		Lapped-in metal	IV-S2 · IV-S1: DN 100 and larger		
	Balanced	Metal sealing	With PTFE ring: IV · With graphite ring: III		

1) DN 400 in PN 40 and PN 100; DN 500 in PN 40

2) Up to PN 400 on request

3) Only in conjunction with suitable body material

Table 2 · Materials

Standard version Body and flanges ¹⁾		Cast steel 1.0619	Cast steel 1.7357	Stainless cast steel 1.4581
Seat and plug ²⁾	Metal sealing	1.4006/1.4008		1.4571/1.4581
	Seat ring with	Soft sealing	PTFE with 15 % glass fiber	
Balanced		PTFE with carbon · Graphite		
Guide bushings		1.4112		2.4610
Packing		PTFE-carbon V-ring packing, spring 1.4310 or high-temperature packing		
Body gasket		Metal		
Extension bonnet		1.0619/1.7335		1.4571
Metal bellows seal				
Intermediate piece		1.0619/1.7335		1.4571
Metal bellows		1.4571		
Heating jacket		1.4541		

1) See also pressure-temperature diagrams in Information Sheet T 8000-2 EN

Material for temperatures exceeding 500 °C: 1.7380

Material for cryogenic service: 1.6220 or 1.4308

2) Seats and plugs with metal sealing also stellite or plug made of solid Stellite

Table 3 · K_{Vs} coefficients · Versions in the gray shaded areas also available with balanced plug

Table 3a · Overview with Flow Divider St I (K_{VsI}) and St III (K_{VsIII})

K _{Vs}	63	100	160	250	360	630	1000	1500	2000	2500	4000
K _{VsI}	57	90	144	225	320	560	900	1350	1800	2250	3600
K _{VsIII}	47	75	120	190	270	480	750	1100	1500	1900	3000
Seat Ø mm	63	80	100	125	150	200	250	300	350	400	500
Travel mm	30			60			120				

Table 3b · Versions without flow divider

K _{Vs}	63	100	160	250	360	630	1000	1500	2000	2500	4000
DN											
80	•	•									
100	•	•	•								
150	•	•	•	•	•						
200		•	•	•	•	•					
250		•	•	•	•	•	•				
300			•	•	•	•	•	•			
400					•	•	•	•	•	•	
500									•	•	•

Table 3c · Versions with Flow Divider St I

K _{VsI}	57	90	144	225	320	560	900	1350	1800	2250	3600
DN											
80	•	•									
100	•	•	•								
150	•	•	•	•	•						
200		•	•	•	•	•					
250		•	•	•	•	•	•				
300			•	•	•	•	•	•			
400					•	•	•	•	•	•	
500									•	•	•

Table 3d · Versions with Flow Divider St III

K _{VsIII}	47	75	120	190	270	480	750	1100	1500	1900	3000
DN											
100	•										
150	•	•	•	•							
200		•	•	•	•						
250		•	•	•	•	•					
300			•	•	•	•	•				
400					•	•	•	•	•		
500									•	•	•

Table 4a · Permissible differential pressures Δp for valves with unbalanced plugs with metal sealing without metal bellows seal; fail-safe position "Valve CLOSED" · Pressures in bar

Values specified in shaded columns apply to standard cases, i.e. application at rated travel · Differential pressures specified in white columns apply to maximum pretensioned springs · Differential pressures in parentheses apply to half travel.

Table 4a · Fail-safe position "Valve CLOSED" (Actuator stem extends)													
Bench range (bar) for actuators (cm ²)		700		0.2...1.0	0.4...1.2 (0.8...1.2)	0.4...2.0	0.8...2.4 (1.6...2.4)	0.6...3.0	1.2...3.6 (2.4...3.6)	1.4...2.3 (1.85...2.3)	2.1...3.3 (2.7...3.3)	2.35...3.8 (3.05...3.8)	2.6...4.3 (3.45...4.3)
		1400											
		2800		Upper spring range value + 0.2 bar									
		2x2800											
Required supply pressure	Upper spring range value + 0.2 bar												
DN	Kvs	Actuator cm ²	Δp when p ₂ = 0 bar										
80 100	63	700	–	6.5	6.5	14.5	10.5	22.6	26.7	40.8	45.9	50.9	
		1400	–	(30.7)	–	(63)	–	(79.2)	–	(81.2)	–	(97.4)	
150	63	700	–	6.2	6.2	14.3	10.2	22.4	26.4	40.6	45.6	50.7	
		1400	–	(30.4)	–	(62.8)	–	(78.9)	–	(81)	–	(97.1)	
80 100	100	700	–	–	–	8.8	6.3	13.8	16.4	25.1	28.2	31.4	
		1400	–	(18.8)	–	(38.9)	–	(48.9)	–	(50.2)	–	(60.2)	
150	100	700	–	–	–	8.6	6.2	13.7	16.2	24.9	28.1	31.2	
		1400	–	(18.7)	–	(38.7)	–	(48.8)	–	(50)	–	(60)	
200 250	100	700	–	–	–	8.4	5.9	13.4	15.9	24.7	27.8	30.9	
		1400	–	(18.4)	–	(38.5)	–	(48.5)	–	(49.7)	–	(59.8)	
100	160	700	–	–	–	5.5	–	8.7	10.3	15.9	17.9	19.9	
		1400	–	(11.9)	–	(24.7)	–	(31.2)	–	(32)	–	(38.4)	
150	160	700	–	–	–	5.4	–	8.6	10.2	15.8	17.8	19.8	
		1400	–	(11.8)	–	(24.6)	–	(31)	–	(31.9)	–	(38.3)	
200 to 300	160	700	–	–	–	5.2	–	8.4	10	15.6	17.7	19.7	
		1400	–	(11.6)	–	(24.5)	–	(30.9)	–	(31.7)	–	(38.1)	
150	250	1400	–	–	–	7.4	4.4	9.5	10.5	13.6	12.6	16.7	
		2800	(15.6)	(32.1)	(40.3)	(48.5)	–	(24.9)	–	(31)	–	(37.2)	
200 to 300	250	1400	–	–	–	7.3	4.2	9.4	10.4	13.5	12.5	16.6	
		2800	(15.5)	(32)	(40.2)	(48.4)	–	(24.7)	–	(30.9)	–	(37.1)	
		2x2800	(33)	(64)	(80.2)	(96.8)	–	(49.4)	–	(61.8)	–	(74.2)	
150	360	1400	–	–	–	5.1	–	6.5	7.2	9.4	8.6	11.5	
		2800	(10.8)	(22.2)	(27.9)	(33.6)	–	(17.2)	–	(21.5)	–	(25.7)	
200 to 400	360	1400	–	–	–	5	–	6.4	7.1	9.3	8.6	11.4	
		2800	(10.7)	(22.1)	(27.8)	(33.5)	–	(17.1)	–	(21.4)	–	(25.7)	
		2x2800	(21.4)	(44.2)	(55.6)	(67)	–	(34.2)	–	(42.8)	–	(51.4)	
200 to 400	630	1400	–	–	–	–	–	–	–	5.1	4.7	6.3	
		2800	(5.9)	(12.3)	(15.5)	(18.8)	–	(9.5)	–	(11.9)	–	(14.3)	
		2x2800	(11.8)	(24.6)	(31)	(37.6)	–	(19)	–	(23.8)	–	(28.6)	
250 to 400	1000	2800	–	–	4.8	5.8	4.2	5.3	4.8	6	5.3	7.3	
		2x2800	–	7.4	9.6	11.6	8.4	10.6	9.6	12	10.6	14.6	
300 400	1500	2800	–	–	–	4	–	–	–	4.1	–	5	
		2x2800	–	5	6.6	8	5.8	7.2	6.6	8.2	7.2	10	
400 to 500	2000	2800	–	–	–	–	–	–	–	–	–	–	
		2x2800	–	–	4.8	5.8	4.2	5.2	4.8	6	5.2	7.4	
	2500	2800	–	–	–	–	–	–	–	–	–	–	
		2x2800	–	–	–	4.4	–	4	–	4.6	4	5.6	
500	4000	2x2800	–	–	–	2.7	–	2.5	–	2.9	–	3.4	

Table 4b · Permissible differential pressures Δp for valves with unbalanced plugs with metal sealing without metal bellows seal; fail-safe position "Valve OPEN" · Pressures in bar

Table 4b · Fail-safe position "Valve OPEN" (stem retracts)						
Bench range (bar) for actuators (cm ²)		700	0.2...1.0 (0.2...0.6)			
		1400				
		2800				
		2x2800				
Required supply pressure			1.4	2.4	4.0	6.0
DN	Kvs	Actuator cm ²	Δp when $p_2 = 0$ bar			
80 100	63	700	6.5	26.7	59	99.4
		1400	(30.7)	(71)	(136)	–
150	63	700	6.2	26.4	58.7	99.2
		1400	(30.6)	(71)	(136)	–
80 100	100	700	–	16.3	36.4	61.5
		1400	(18.8)	(43.9)	(84)	(134)
150	100	700	–	16.2	36.2	61.3
		1400	(18.7)	(43.7)	(83.8)	(134)
200 250	100	700	–	15.9	35	61.1
		1400	(18.4)	(43.5)	(83)	(134)
100	160	700	–	10.2	23.1	39.1
		1400	(11.8)	(27.8)	(53.5)	(85.6)
150	160	700	–	10.2	23	39.1
		1400	(11.8)	(27.8)	(53.5)	(85.6)
200 to 300	160	700	–	10.1	22.9	38.9
		1400	(11.6)	(27.7)	(53.4)	(85.5)
150	250	1400	–	13.6	30	50.6
		2800	(15.6)	(36.2)	(69)	–
200 to 300	250	1400	–	13.5	29.9	50.4
		2800	(15.5)	(36.1)	(68.9)	–
		2x2800	(31)	(72)	(138)	–
150	360	1400	–	9.4	20.8	35
		2800	(10.8)	(25)	(47.8)	–
200 to 400	360	1400	–	9.3	20.7	34.9
		2800	(10.7)	(25)	(47.8)	–
		2x2800	(21.4)	(50)	(95.6)	–
200 to 400	630	1400	–	5.1	11.5	19.6
		2800	(5.9)	(13.9)	(26.8)	(42.8)
		2x2800	(11.8)	(27.8)	(53.6)	–
250 to 400	1000	2800	–	6.8	15	25.3
		2x2800	–	13.6	30	50.6
300 400	1500	2800	–	4.7	10.4	17.5
		2x2800	–	9.4	20.8	35
400 to 500	2000	2800	–	–	7.6	12.8
		2x2800	–	6.8	15.2	25.6
	2500	2800	–	–	5.8	9.8
		2x2800	–	5.2	11.6	19.6
500	4000	2x2800	–	–	7.4	12.5

Notes on differential pressure tables

The differential pressure tables were prepared under the following conditions:

- Direction of flow: FTO
- Valve plug version with metal sealing or soft sealing
- Version with PTFE packing
- Tables 4a and 4b for unbalanced plug with downstream pressure $p_2 = 0$ bar
- The leakage rate stated in Table 1 is not exceeded with the maximum differential pressures listed and the previously mentioned conditions
- All pressures mentioned are in bar (gauge)
- The differential pressure stated can be limited by the pressure-temperature diagram

Note on fail-safe position "Valve CLOSED": For actuators with reduced travels, pretensioned spring ranges must be used.

Note: Permissible differential pressures for special versions with soft sealing or lapped-in metal plugs, with metal bellows seal or balanced plug with graphite ring are available on request.

Table 5 · Permissible differential pressures Δp for valves with balanced plugs with metal sealing and PTFE ring, without metal bellows seal

Values specified in shaded columns apply to standard cases, i.e. application at rated travel · Differential pressures specified in white columns apply to maximum pretensioned springs · Differential pressures in parentheses apply to half travel.

Table 5a · Fail-safe position "Valve CLOSED" (Actuator stem extends)									5b · "Valve OPEN" (stem retracts)		
Bench range (bar) for actuators (cm ²)	700	0.4...2.0	0.8...2.4	-	-	0.6...3.0	1.2...3.6	0.4...2.0 (0.4...1.2)	2.4	4.0	6.0
	1400		0.8...2.4 (1.6...2.4)	0.5...2.5	1.0...3.0 (2.0...3.0)	-	-				
	2800		0.6...3.0	1.2...3.6 (2.4...3.6)							
	2x2800										
Required supply pressure		Upper spring range value + 0.2 bar									
DN	Kvs	Actuator cm ²	Δp when p ₂ = 0 bar								
80 100	100	700	48.1	144	-	-	96.9	243	48.1	400	400
		1400	-	(400)	-	(400)	-	-	(400)	(400)	(400)
100	160	700	37.2	135	-	-	85.9	232	37.2	400	400
		1400	-	(400)	-	(400)	-	-	(400)	(400)	(400)
150	160	700	13.9	53.9	-	-	33.9	93.8	13.9	173	373
		1400	-	(293)	-	(373)	-	-	(213)	(400)	(400)
200 to 300	160	700	4.6	20.2	-	-	12.4	35.8	4.6	67	145
		1400	-	(113)	-	(145)	-	-	(82.6)	(207)	(363)
150	250	1400	48.3	128	68.2	168	-	-	48.3	367	400
		2800	-	(236)	-	(298)	-	(361)	(400)	(400)	(400)
200 to 300	250	1400	18	49.2	25.8	64.8	-	-	18	143	298
		2800	-	(236)	-	(298)	-	(361)	(174)	(400)	(400)
150	360	1400	42.6	122	62.6	162	-	-	42.7	362	400
		2800	-	(400)	-	(400)	-	(400)	(400)	(400)	(400)
200 to 400	360	1400	15.8	47	23.6	62.6	-	-	15.8	140	296
		2800	-	(234)	-	(296)	-	(359)	(172)	(400)	(400)
		2x2800	-	(400)	-	(400)	-	(400)	(344)	(400)	(400)
200 to 400	630	1400	11.4	42.6	19.2	58.2	-	-	11.4	136	292
		2800	-	(230)	-	(292)	-	(355)	(167)	(400)	(400)
		2x2800	-	(400)	-	(400)	-	(400)	(334)	(400)	(400)
250 to 400	1000	2800	38.3	100	53.9	132	69.4	163	38.3	288	400
		2x2800	76.6	200	107.8	264	138.8	326	76.6	400	400
300 400	1500	2800	33.9	96.3	49.5	127	65.1	158	33.9	283	400
		2x2800	67.8	192	99	254	130	316	67.8	400	400
400 to 500	2000	2800	29.5	91.9	45.1	123	60.7	154	29.5	279	400
		2x2800	59	184	90.2	246	121	308	59	400	400
	2500	2800	25.1	87.5	40.7	118	56.3	150	25.1	274	400
		2x2800	50.2	175	81.4	236	112	300	50.2	549	400
500	4000	2800	16.5	78	32	110	47	141	16	265	400
		2x2800	33	156	64	220	94	282	32	400	400

Table 7 · Dimensions in mm for Type 3254-1 and Type 3254-7 Pneumatic Control Valve in standard version

Valve	DN	80	100	150	200	250	300	400	500
Length L	PN 10... 40	310	350	480	600	730	850	1100	1250
	PN 63...160	380	430	550	650	775	900	1150	1400
H1 for actuator	700 cm ²	462	482	732	805	-			
	1400 cm ²	517	537	732	805	860	-		
	2800 cm ²	702	722	817	890	1094	1290	1290	1470
H2	PN 10... 40	175	207	288	390	410	480	560	630
	PN 63...160	222	249	338	390	410	480	650	735

Actuator	cm ²	700	1400	2800	2 x 2800
Diaphragm Ø D		390	530	770	
H		200	287	620	1130
H3 1)		190	610	650	
Thread		M 30 x 1.5	M 60 x 1.5	M 100 x 2	
a (with Type 3271 Actuator)		G 3/8 (3/8 NPT)	G 3/4 (3/4 NPT)	G 1 (1 NPT)	
a2 (with Type 3277 Actuator)		G 3/8 (3/8 NPT)	-		

1) Minimum clearance for removing actuator

Table 8 · Weights for Type 3254-1 and Type 3254-7 Pneumatic Control Valve in standard version

Valve	DN	80	100	150	200	250	300	400	500
Valve without actuator (kg)	PN 10... 40	70	104	245	480	810	1081	1930	3023
	PN 63...160	121	158	375	1)				

Actuator	cm ²	700	1400	2800	2 x 2800
Type 3271 (approx. kg) 2)	Without	22	70	450	950
	With handwh.	27	Only with side-mounted handwheel, see T 8310-2 EN		
Type 3277 (approx. kg) 2)	Without	26	-		
	With handwh.	31	-		

1) Weights on request · 2) Top row without handwheel, bottom row with handwheel

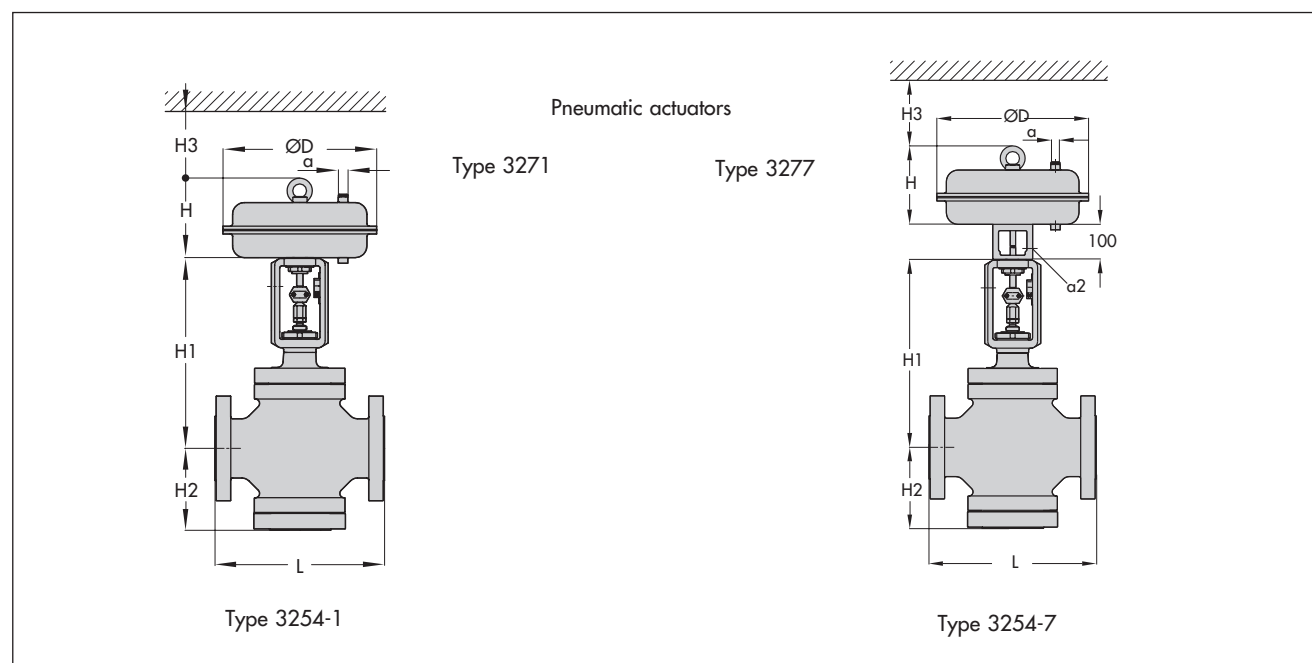


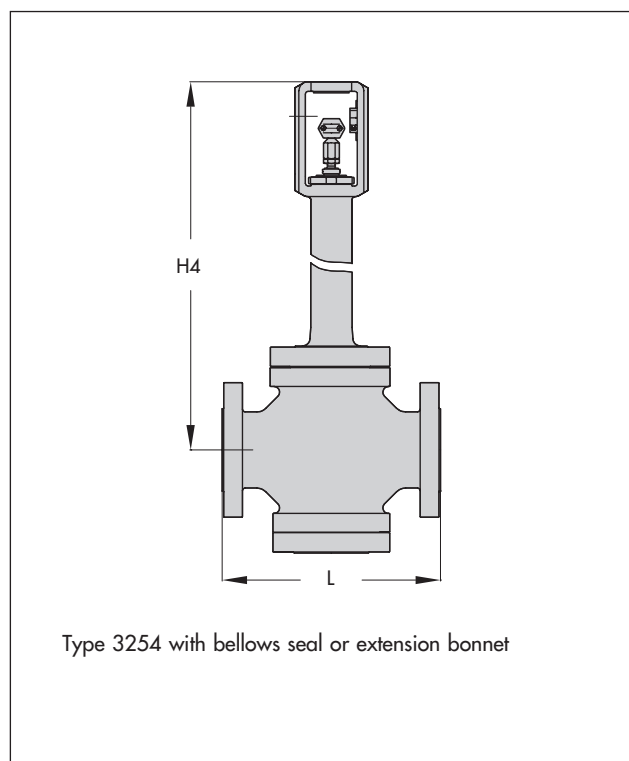
Table 9 · Dimensions and weights for Type 3254 Valve in standard version with extension bonnet · Without actuator

Valve	DN	80	100	150	200	250	300	400	500
H4 for actuator	700 cm ²	732	752	1083	1365	–	–	–	–
	1400 cm ²	787	807	1083	1365	1485	–	–	–
	2800 cm ²	972	992	1168	1450	1719	1810	1870	1920
H2	PN 10...40	77	111	281	1)				
	PN 63...160	128	165	411					

Table 10 · Dimensions and weights for Type 3254 Valve in standard version with bellows seal · Without actuator

Valve	DN	80	100	150	200	250	300	400	500
H4 for actuator	700 cm ²	841	841	1139	1455	–	–	–	–
	1400 cm ²	896	896	1139	1455	1905	–	–	–
	2800 cm ²	1081	1081	1224	1540	2139	2150	2180	On request
H4 for actuator	700 cm ²	841	841	1271	1855	–	–	–	–
	1400 cm ²	896	896	1271	1855	–	–	–	–
	2800 cm ²	1081	1081	1356	1940	–	–	–	On request
Weight (kg) without actuator	PN 10...40	97	1)	1)	1)				
	PN 63...160	141		420					

1) Weights on request



Selection and sizing of control valves

1. Calculate the K_v coefficient according to IEC 60534.
2. Select the nominal size and K_{vs} coefficient from Tables 3 and 4.
3. Determine the permissible differential pressure Δp from Table 4 or 5.
4. Select the valve body material from Tables 1 and 2 as well as from the pressure-temperature diagrams in the Information Sheet T 8000-2 EN.
5. Select accessories from Tables 1 and 2.

The following details are required on ordering

Nominal size	DN
Nominal pressure	PN
Body material	According to Table 2
End connection	Flanges/welding ends
Plug	Standard/balanced Soft sealing, metal sealing or lapped-in metal
Characteristic	Equal percentage or linear
Actuator	Type 3271 or Type 3277 (see T 8310-1 EN or T 8310-2 EN)
Fail-safe position	Valve CLOSED or valve OPEN
Process medium	Density in kg/m ³ and temperature in °C
Flow rate	kg/h or m ³ /h under normal or operating condition
Pressure	p_1 and p_2 in bar (absolute pressure p_{abs}), both with minimum, normal and maximum flow rate
Accessories	Positioner and/or limit switches

Specifications subject to change without notice.



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