

Series 3240

Pneumatic Control Valves Type 3522-1 and Type 3522-7 Globe Valve Type 3522 ANSI Class 300



Application

Control valve for process engineering and plants with industrial requirements.

Sizes 1/2" to 2" · Pressures ANSI Class 300

Temperatures from 14 °F to 430 °F (-10 °C to +220 °C)

Compliant ANSI, ASME and ASTM standards.



Type 3522 Globe Valve Actuator options:

- Type 3271 Pneumatic Actuator (Type 3522-1 Control Valve)
- Type 3277 Pneumatic Actuator (Type 3522-7 Control Valve) for integral positioner attachment

Valve body material options:

- Bronze B148-9A
- Stainless cast steel per ASTM specification A 351 CF8M

Valve plug sealing options:

- Metal
- Soft
- Lapped-in metal

These control valves feature a low profile design and interchangeability of parts that provides the flexibility to meet a wide range of applications. The modular accessory packages available can be configured to satisfy any control requirements.

Versions

- **Type 3522-1** · Nominal sizes 1/2" to 2" with Type 3271 Pneumatic Actuator (see Data Sheet T 8310-1)
- **Type 3522-7** (Fig. 1) · Nominal sizes 1/2" to 2" with Type 3277 Pneumatic Actuator for integral positioner attachment (see Data Sheet T 8310-1)

Additional versions optionally with:

- **Non-adjustable packing and blowout protected stems** are standard for maintenance, convenience, and safety
- **Additional handwheel** · See Data Sheet T 8310-1

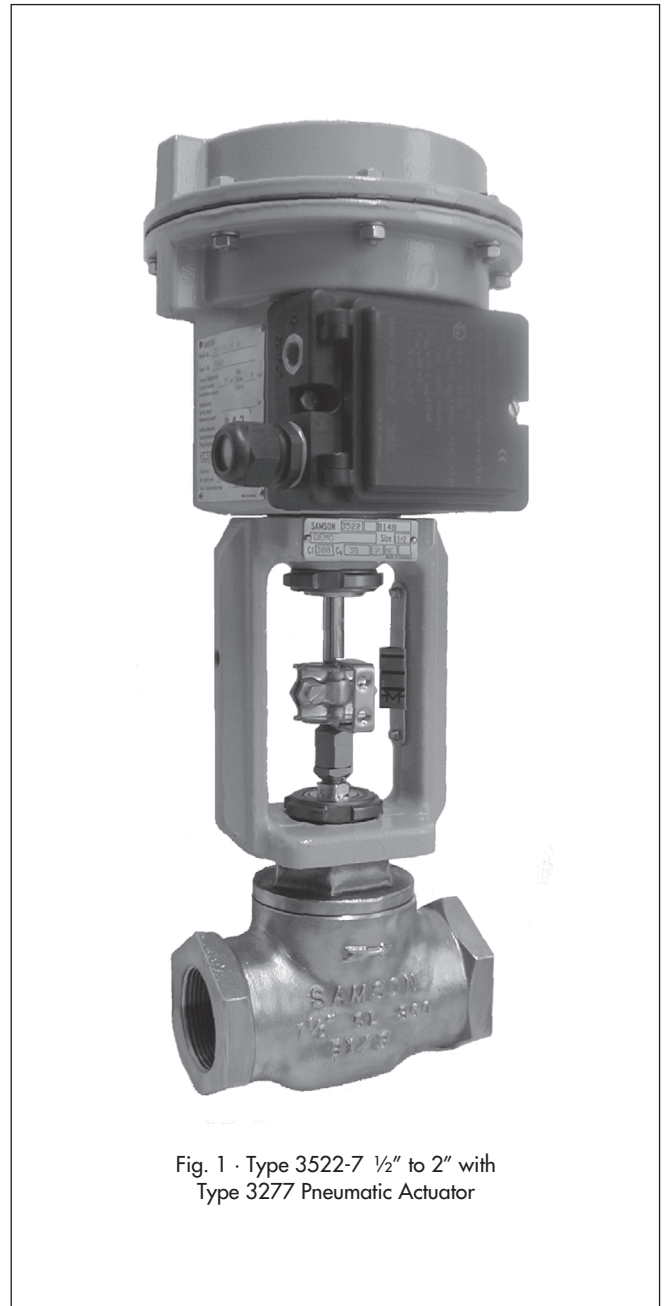


Fig. 1 · Type 3522-7 1/2" to 2" with Type 3277 Pneumatic Actuator

Fail-safe action

Springs/Diaphragm plate orientation determines fail-safe action (see Data Sheet T 8310 for details)

Actuator stem "extends" (air-to-open / fail-close)

The actuator springs "close" the valve upon air supply failure.

Actuator stem "retracts" (air-to-close / fail-open)

The actuator springs "open" the valve upon air supply failure.

Notes on the differential pressure tables 3a to 3d

- For all valves in nominal sizes 1/2" to 2", the maximum permissible supply pressure is 90 psi.
- Process medium flows against the closing direction of the valve plug (flow-to-open valve).
- Version with PTFE stuffing box.
- With the maximum differential pressures specified, the leakage rates does not exceed Table 1.
- The differential pressure specified can be limited by the Pressure-Temperature Diagram.

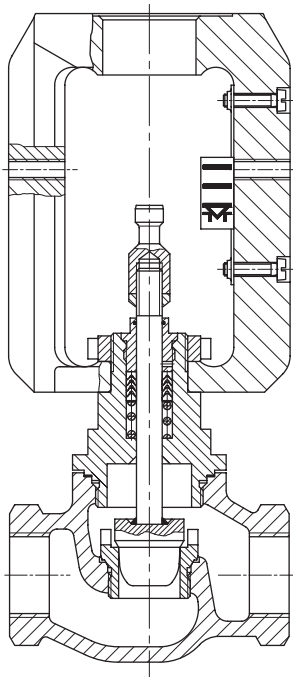


Fig. 2 · Type 3522 1/2" to 1"

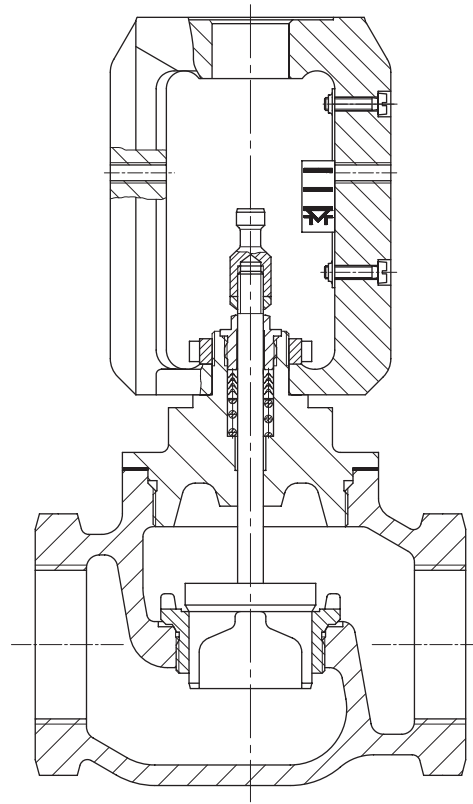


Fig. 3 · Type 3522 1 1/4" to 2"
Version with forged yoke design

Table 1 · Technical Data

Size	1/2" ... 2"	
ASTM material	Bronze B148-9A	Stainless steel A 351 CF8M
Type of connection	Female thread	
Form of connection	NPT 1)	
Pressure ANSI Class	300	
Seat/plug sealing	Metal, soft or lapped-in metal	
Characteristic	Equal percentage or linear	
Rangeability	50 : 1	
Temperature ranges °F (°C) · Permissible operating pressures according to the Pressure-Temperature Diagram		
Body	14...430 °F (-10...+220 °C)	
Valve plug Standard	Metal sealing	14...430 °F (-10...+220 °C)
	Soft sealing	14...430 °F (-10...+220 °C)
Leakage rate class according to ANSI/FCI 70-2-1991		
Valve plug	Metal sealing	IV
	Soft sealing	VI
	Lapped-in metal	IV-S2

1) Other versions available on request

Table 2 · Materials ASTM/AISI Material description

Standard version		
Valve body 1)	Bronze B148-9A	Stainless steel A 351 CF8M
Valve bonnet	Bronze B148-9A	Stainless steel A 351 CF8M
Seat and plug 2) 3)	AISI 410	AISI 316 Ti
	Sealing ring for soft sealing: PTFE with glass fiber	
Stuffing box packing 4)	V-ring packing of PTFE with carbon · Packing spring of stainless steel AISI 301	
Body gasket	Copper	Stainless steel

1) See Pressure-Temperature Diagram; other materials on request.

2) All seats and plugs with metal sealing are also available with stellite hardening.

3) Other materials on request.

4) Other packings available on request.

Table 3 · CvS and Kvs values

Table 3a · Overview

Cv		0.12	0.2	0.3	0.5	0.75	1.2	2	3	5	7.5	12	20	30	47
Kvs		0.1	0.16	0.25	0.4	0.63	1.0	1.6	2.5	4.0	6.3	10	16	25	40
Seat-ØD	in	0.12			0.24			0.47			0.945		1.22	1.5	1.9
	mm	3			6			12			24		31	38	48
Travel	in	0.6													
	mm	15													

Table 3b · Standard version

Cv		0.12	0.2	0.3	0.5	0.75	1.2	2	3	5	7.5	12	20	30	47
Kvs		0.1	0.16	0.25	0.4	0.63	1.0	1.6	2.5	4.0	6.3	10	16	25	40
Size in/mm															
1/2"	15	•	•	•	•	•	•	•	•	•					
3/4"	20	•	•	•	•	•	•	•	•	•	•				
1"	25	•	•	•	•	•	•	•	•	•	•	•			
1 1/4"	40				•	•	•	•	•	•	•	•	•		
1 1/2"	40				•	•	•	•	•	•	•	•	•	•	
2"	50				•	•	•	•	•	•	•	•	•	•	•

Terms for control valve sizing according to ISA S75.01/IEC 60 534 Parts 2-1 and 2-2: $F_L = 0.95$, $x_T = 0.75$ (at 75 % rated travel)

Conversion of valve sizing coefficients: $C_V = K_V/0.865$

Table 4 · Differential pressure tables · Unbalanced valve plugs

Values specified in the **shaded columns** correspond to the **bench range** · Differential pressures specified in the **white columns** apply to maximum **pre-tensioned springs**.

Differential pressures enclosed in parentheses in the table refer to the values enclosed in parentheses in the row "Bench range".

See notes on the differential pressure tables (page 2).

Table 4a · Permissible differential pressures Δp · Pressures in psi

For actuators employing fail-safe action: Actuator stem "extends" · Valve closed at supply pressure 0 psi

Bench range (psi)		240		3...15		5...17		6...30		9...33		9...45 1)		13...49		-		-		
for actuators:		120, 350				6...18				12...36				18...54		20...34		30...48		
Required supply pressure (psi)				18		21		33		39		48		57		37		51		
Size		Cv	Kvs	Actuator Size	Δp with p2 = 0															
in	mm																			
1/2"	15	0.12 to 0.3	0.1 to 0.25	120	320	-	580	-	-	-	-	-	-	-	-	-	-	-	-	
	to 1"			25	240	580	580	-	-	-	-	-	-	-	-	-	-	-	-	-
1/2"	15 to 50	0.5 to 1.2	0.4 to 1.0	120	320	-	580	-	-	-	-	-	-	-	-	-	-	-	-	
				240	580	580	580	-	-	-	-	-	-	-	-	-	-	-	-	
				2	1.6	120	130	-	405	-	-	-	-	-	-	580	-	-	-	-
				3	2.5	240	406	580	580	580	580	580	580	580	580	-	580	-	-	-
5	4	350	580	580	580	580	580	580	580	580	-	580	-	580	-	-	-	-		
3/4"	20 to 50	7.5	6.3	120	-	-	80	-	-	-	-	-	-	-	435	580	-	-	-	
				240	75	135	215	350	350	565	-	-	-	-	-	-	-	-	-	
12	10	350	145	350	350	550	550	580	580	580	580	580	580	580	580	580	580	580		
1 1/4" and 2"	40 and 50	20	16	120	-	-	44	-	-	-	-	-	-	260	405	-	-	-	-	
				240	36	75	115	200	200	335	-	-	-	-	-	-	-	-	-	
				350	75	195	195	435	320	580	580	580	580	580	580	580	580	580		
1 1/2"	40 to 50	30	25	120	-	-	22	-	-	-	-	-	175	275	-	-	-	-	-	
				240	19	45	72	130	130	218	-	-	-	-	-	-	-	-		
				350	45	125	125	290	200	450	535	580	580	580	580					
2"	50	47	40	240	-	-	43	72	72	130	-	-	-	-	-	-	-	-		
				350	23	72	72	175	123	275	330	507	507	507						

1) Not for actuator 120 cm²

Table 4b · Permissible differential pressures Δp · Pressures in bar

For actuators employing fail-safe action: Actuator stem "extends" · Valve fully closed at supply pressure 0 bar

Bench range (bar) for actuators:		240		0.2...1.0	0,3...1.1 0.4...1.2		0.4...2.0	0.6...2.2 0.8...2.4		0.6...3.0 ¹⁾	0.9...3.3 1.2...3.6		– 1.4...2.3 2.1...3.3									
		120, 350																				
Required supply pressure (bar)				1.2		1.4		2.2		2.6		3.2		3.8		2.5		3.5				
Size		C _v	K _{vS}	Actuator Size	Δp with p ₂ = 0																	
in	mm																					
½" to 1"	15 to 25	0.12 to 0.3	0.1 to 0.25	120	40	–	40	–	–	–	–	–	–	–	–	–	–	–	–			
				240	40	40	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
½" to 2"	15 to 50	0.5 to 1.2	0.4 to 1.0	120	22	–	40	–	–	–	–	–	–	–	–	–	–	–	–			
				240	40	40	40	–	–	–	–	–	–	–	–	–	–	–	–	–		
		2 to 5	1.6 to 2.5	120	9	–	28	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
				240	28	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
				350	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
¾" to 2"	20 to 50	7.5	6.3	120	–	–	5.5	–	–	–	–	–	–	–	–	–	–	–	–			
				240	5.2	9.3	14.8	24	24	39	–	–	–	–	–	–	–	–	–	–		
				350	10	24	24	38	38	40	40	40	40	40	40	40	40	40	40	40	40	
1¼" and 2"	40 and 50	20	16	120	–	–	3	–	–	–	–	–	–	–	–	–	–	–	–			
				240	2.5	5.2	8.0	14	14	23	–	–	–	–	–	–	–	–	–	–		
				350	5.2	13.5	13.5	30	22	47	40	40	40	40	40	40	40	40	40	40	40	
1½" to 2"	40 to 50	30	25	120	–	–	1.5	–	–	–	–	–	–	–	–	–	–	–	–			
				240	1.3	3.1	5.0	9.0	9.0	15	–	–	–	–	–	–	–	–	–	–		
				350	3.1	8.5	8.5	20	14	31	37	37	37	37	37	37	37	37	37	37	37	
2"	50	47	40	240	–	–	3.0	5.0	5.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0			
				350	1.6	5.0	5.0	12	8.5	19	23	23	23	23	23	23	23	23	23	23		

¹⁾ Not for actuator 120 cm²**Table 4c and 4d · Permissible differential pressures Δp**

For actuators employing fail-safe action: Actuator stem "retracts" · Valve closed at required supply pressure

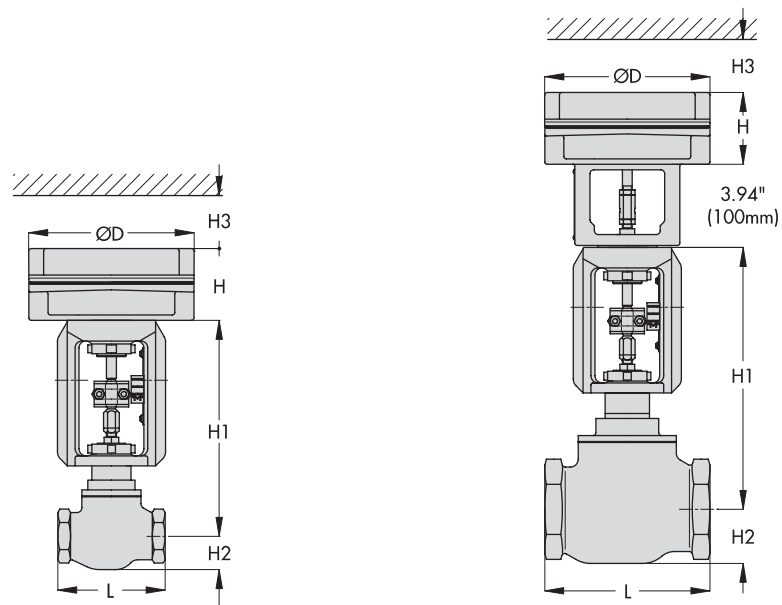
Bench range (psi/bar) for actuators:		120...350		Table 4c · Pressures in psi				Table 4d · Pressures in bar								
				3...15			0.2...1.0									
Required supply pressure (psi/bar)				18		36		58		1.2		2.4		4		
Size		C _v	K _{vS}	Actuator Size	Δp with p ₂ = 0				Δp with p ₂ = 0							
in	mm															
½" to 1"	15 to 25	0.12 to 0.3	0.1 to 0.25	120	330	580	–	–	–	23	40	–	–	–	–	
				240	580	–	–	–	40	–	–	–	–	–	–	–
½" to 2"	15 to 50	0.3 to 1.2	0.4 to 1.0	120	330	580	–	–	–	23	40	–	–	–	–	
				240	580	580	–	–	–	40	40	–	–	–	–	–
		2 to 5	1.6 to 2.5	120	130	580	–	–	–	9	40	–	–	–	–	–
				240	410	580	–	–	–	28	40	–	–	–	–	–
				350	580	580	–	–	–	40	40	–	–	–	–	–
¾" to 2"	20 to 50	7.5	6.3	120	10	450	580	580	0.6	31	40	–	–	–	–	
				240	80	580	580	5.2	40	40	40	40	40	40	40	40
				350	145	580	580	10	40	40	40	40	40	40	40	40
1¼" and 2"	40 and 50	20	16	120	–	260	580	580	–	18	40	–	–	–	–	
				240	35	540	580	580	2.5	37	40	40	40	40	40	
				350	75	580	580	580	5.2	40	40	40	40	40	40	
1½" to 2"	40 to 80	30	25	120	–	160	410	580	–	11	28	–	–	–	–	
				240	20	350	580	580	1.3	24	40	40	40	40	40	
				350	45	540	580	580	3.1	37	40	40	40	40	40	
2"	50	47	40	240	10	220	490	580	0.5	15	34	–	–	–	–	
				350	25	330	580	580	1.6	23	40	40	40	40	40	

Table 5 · Dimensions of the standard Type 3522-1 and Type 3522-7 versions

Globe valve	Size	NPT	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
Length L	Class 300	in	3.5	3.5	4.31	4.63	5.31	6.66
		mm	89	89	109	118	135	169
H1 for actuators: ≤ 350		in	9.25			8.75	8.62	8.875
		mm	235			22.2	219	225
H2 (approximately)		in	1.125	1.125	1.375	1.50	1.68	1.75
		mm	28.5	28.5	35	38	43	44.5

Pneumatic actuator	Size	120	240	350
		in ²	18.6	37.2
Diaphragm ØD	in	6.6	9.5	11.0
	mm	168	240	280
H	in	2.72	2.56	3.35
	mm	69	65	85
H3 (Type 3271 and Type 3277 Actuators) 1)	in	4.33		
	mm	110		
Thread		M30 x 1.5		
α (for Type 3271 Actuator)		1/8 NPT (G 1/8)	1/4 NPT (G 1/4)	3/8 NPT (G 3/8)
α2 (for Type 3277 Actuator)		3/8 NPT (G 3/8)		

1) Minimum clearance for actuator removal/disassembly



Type 3522-1 · Sizes 1/2" to 1"

Type 3522-7 · Sizes 1 1/4" to 2"

Table 6 · Weights of Type 3522-1 and Type 3522-7 Control Valve

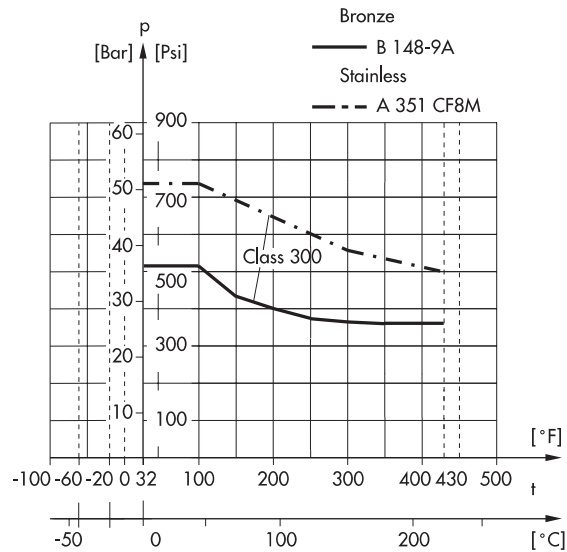
Globe valve	Size	in	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
		Weight without actuator	lbs	7	7.5	9	11	12
		kg	3	3.4	4	5	5.4	7.7

Pneumatic actuator	Size	120	240	350
	in ²	18.6	37.2	54.25
Weight of Type 3271	lbs	6.6	11	18
	kg	3	5	8
Weight of Type 3277	lbs	7.7	20	26.5
	kg	3.5	9	12

Ordering text:

Size ...		Process fluid:	Density in lb/ft ³ and temperature in °F
ANSI Class ...	300	Flow rate:	In lb/hr, scfh under standard or operating conditions
Body material:	According to Table 2	Pressure:	p ₁ in psia (absolute pressure) p ₂ in psia (absolute pressure) at minimum, normal, and maximum flow rate
Type of connections:	NPT female thread	Valve accessories:	Versions according to T 8350
Valve plug:	Standard; with metal, soft or lapped-in metal sealing		
Characteristic:	Equal percentage or linear		
Pneumatic actuator:	Versions according to T 8310-1		
Fail-safe action:	Fail-open/fail-close		

Pressure-Temperature Diagram according to ASME/ANSI B 16.1 and B 16.34



Specifications subject to change without notice.



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