

## Globe Control Valve Type 3252

## Pneumatic Control Valves Type 3252/3271 and Type 3252/3277

## Application

Control valve for process engineering applications with small flow rates and high industrial requirements.

**Nominal sizes** ½" to 1" (15 to 25 mm)

**Pressure ratings** ANSI Class 300 to 2500

**Temperatures** from -328 °F to +842 °F (-200 °C to +450 °C)

These valves comply with ANSI, ASME and ASTM standards

The control valves consist of a body with trim, bonnet, yoke and a pneumatic actuator, with optional metal bellows or insulating section. The valves may also be equipped with electric, electro-hydraulic, or hand-operated actuators, as well as control accessories and other instrumentation.

## Features

- Globe or angle pattern, single-seat
- Modular design, rugged and heavy-duty construction
- Field retrofitable metal bellows seals and extension bonnets
- Trim exchangeable for various  $C_v$  values and characteristics
- Low profile, reversible, multi-spring/rolling diaphragm actuator
- Live-loaded, self-adjusting PTFE/Carbon V-ring stuffing box
- Arbitrary mounting orientation
- Bonnet with NAMUR-compliant yoke
- Complete selection of actuators, positioners and accessories

## Standard version

- **Body material** · ASTM A 479 316L
- **End connections** · NPT-Female
- **Packing** · PTFE/Carbon V-ring spring-loaded/self-adjusting, temperature range 15 °F to 430 °F (-10 °C to 220 °C)
- **Trim** · Equal percentage characteristic, metal-to-metal seal

## Options

- **Extension bonnet module** · For extreme temperatures from -328 °F to 842 °F (-200 °C to 450 °C)
- **Metal bellows seal module** · For complete seal between process and atmosphere, with back-up PTFE V-ring packing
- **End connections** · Male NPT, Welding ends, RF flanged
- **Trim materials** · Stellite, Tungsten Carbide, and others
- **Characteristic** · Linear, quick-opening
- **Body materials** · A 479 316, Hastelloy C, other materials
- **Packing** · Adjustable, pure PTFE-white packing

## Actuator combinations

**Type 3252/3271** · With Type 3271 Pneumatic Actuator  
· For operation with or without yoke-mounted positioner, details see T 8310

**Type 3252/3277** (Fig.1) · With Type 3277 Pneumatic Actuator  
· For integral positioner/accessory mounting according to SAMSON "Valve Management" System, details see T 8311

**Type 3252/3273** · With Type 3273 Hand-Operated Actuator  
· For actuator details see Technical Data Sheet T 8312

**Type 3252/3274** · With Type 3274 Electrohydraulic Actuator  
· For actuator details see Technical Data Sheet T 8340



Fig. 1 · Type 3252/3277 Globe Control Valve with Type 3277 Pneumatic Actuator and Type 3767 Electropneumatic Positioner

DIN Versions · See Data Sheet T 8053 EN

## Principle of operation (Fig. 2)

The process medium flows through the valve in the direction indicated by the arrow. The valve plug position determines the cross-sectional area of flow between the seat (2) and the plug (3).

The plug stem (6) is connected to the actuator stem via the stem connector and sealed by means of a spring-loaded PTFE V-ring packing (4). For a tighter seal, the valve can be equipped with a metal bellows seal (13).

## Pneumatic Actuators

The standard multi-spring actuators by SAMSON are especially well-suited. The **Type 3271** is used when no positioners are specified or when yoke-mounted positioners are preferred. The **Type 3277** is the same design, but with an additional section for the mounting of integrated accessory packages. See Technical Data Sheets T 8310 and T 8311 for details.

## Fail-safe action

Depending on how the springs are arranged in the actuator, the valve moves in a pre-determined direction with the absence of air supply.

## Actuator stem "extends" (fail-close)

When the supply air to the actuator fails, the spring force extends the actuator stem, causing the valve to fail close.

## Actuator stem "retracts" (fail-open)

When the supply air to the actuator fails, the spring force retracts the actuator stem, causing the valve to fail open.

## Ordering information

### Type 3252 Globe Control Valve

Globe or Angle style body

Nominal size ...

ANSI Class ...

Cv/Kvs-value ...

Characteristic ...

Type of Connections ...

Options/Special version ...

### Actuator:

Type ... Size ...

Fail-safe position ...

### Accessories:

Positioner, limit switches, solenoid valve ...

### Operating conditions:

Process medium ...

Flow rate ...

Inlet pressure ...

Outlet pressure ...

Temperature ...

Maximum shut-off pressure ...

1	Valve body	5.6	Anti-rotation device
1.1	Body gasket	5.7	Travel indicator
2	Seat	6	Plug stem
3	Plug	6.1	Coupling nut
4	Stuffing box	6.2	Lock nut
4.1	Packing spring	11	Extension housing
4.2	V-ring packing	11.1	Gasket
4.3	Packing washer	12	Plug stem extension
5	Valve bonnet	12.1	Bellows lock washers
5.1	Guide bushing	13	Metal bellows seal
5.2	Packing bushing	14	Bellows lock nut
5.3	Yoke	15	Anti-rotation device
5.4	Ring nut	16	Bolt
5.5	Bonnet screw		

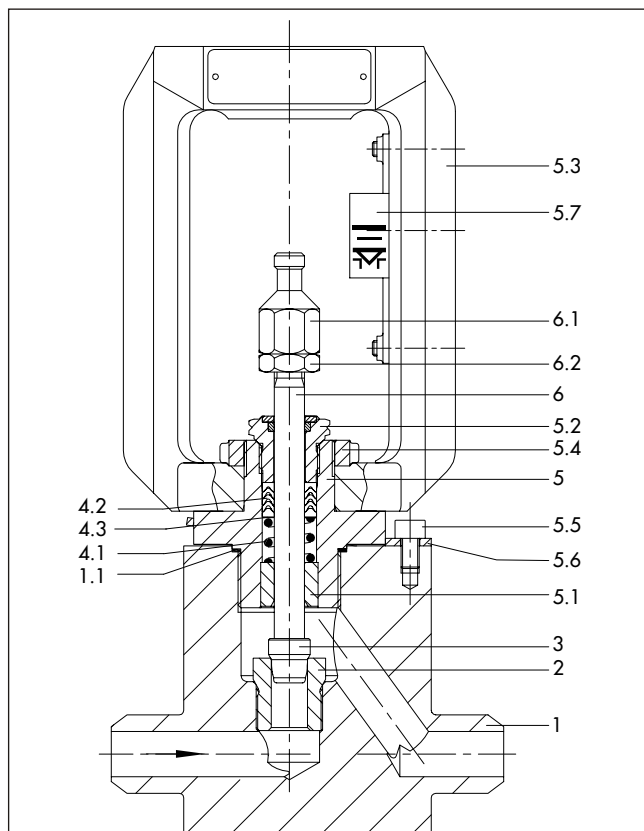


Fig. 2 · Type 3252 valve, globe style body, with welding ends

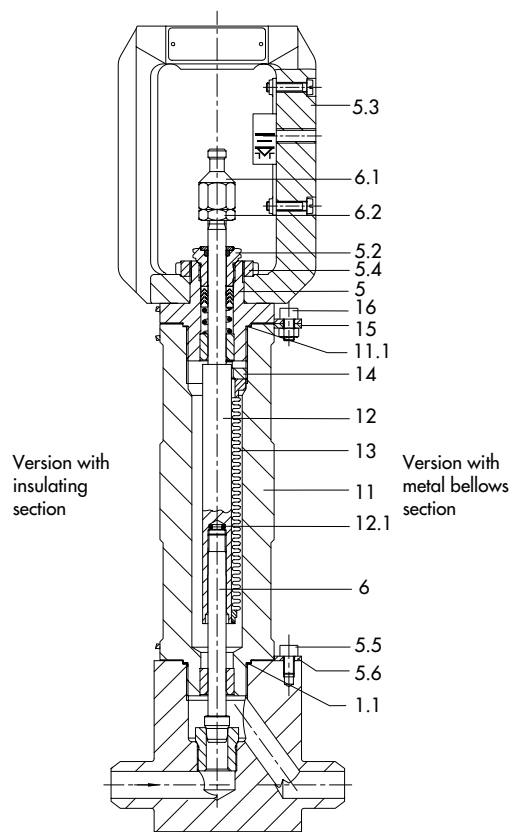


Fig. 3 · Type 3252 globe valve with insulating or bellows section

**Table 1 · Technical data**

Body pattern	Globe or Angle		
Nominal valve size	NPT ½", ¾", 1"	½", ¾", 1"	½", ¾", 1"
End connections	NPT-Female/Male	Welding Ends	RF Flanged
Face-to-face dimension	See Tables 5a, 5b		ANSI 300 TO 600: According to ANSI /ISA-S75.03 ANSI 900 TO 1500: According to ANSI/ASME B16.10 Flanges according to ASME/ANSI B16.5
Pressure rating	ANSI Class 300 to 2500 According to ANSI/ASME B16.34 - 1988 (Standard class)		
Seat/plug seal	Metal-to-metal		
Packing design	V-ring, spring-loaded, self-adjusting		
Flow direction (normal)	Flow to open (FTO)		
Seat bore diameter, rated travel, C <sub>v</sub> , Kvs values	See Table 3		
Characteristic of plug	Equal percentage, linear or on-off		
Terms for control valve sizing according to ISA-S75.02 and IEC 534, parts 2-1 and 2-2	F <sub>L</sub> = 0.95, X <sub>T</sub> = 0.75 at 75% open		
Rangeability	50:1		
Weights and envelope dimensions	See Tables 5a, 5b, 6 and 7		
<b>Temperature ranges °F (°C) · Maximum operating pressure according to pressure rating</b>			
Body without insulating section	15...430 °F (-10...220 °C)		
Body with	Insulating section	Short	-58...842 °F (-50...450 °C)
		Long	-328...842 °F (-200...450 °C)
	Bellows seal	15...430 °F (-10...220 °C) · Other ranges on request	
Leakage rate according to ANSI/FCI 70-2 and IEC 534-6	Metal seal	Class IV	
	Lapped-in metal	Class VI (IEC: IV-S2)	

**Table 2 · Materials**

Valve body	A 479 316L	A 479 316	Hastelloy B574
Bonnet and yoke	A 479 316L	A 479 316	Hastelloy B574
Internals <sup>1)</sup>	Plug AISI 316L (WN 1.4404)	AISI 316 (WN 1.4401)	Hastelloy C
	Seat AISI 316L (WN 1.4404)	AISI 316 (WN 1.4401)	Hastelloy C
Stuffing box	V-ring packing	PTFE with carbon, optional PTFE-white (virgin)	
	Spring	AISI 310 (WN 1.4310)	
Body gasket	AISI 316 L (WN 1.4404)	AISI 316 (WN 1.4401)	Hastelloy C
Insulating/bellows extension housing	A 479 316 L	A 479 316	Hastelloy B574
Metal bellows insert	AISI 316Ti (WN 1.4571)		Hastelloy C-276

<sup>1)</sup> Also available: Stellite 6, Tungsten Carbide, others

**Table 3 · C<sub>v</sub> and Kvs values**

C <sub>v</sub>	0.12	0.2	0.3	0.5	0.75	1.2	2.0	3.0	5.0	
Kvs	0.1	0.16	0.25	0.4	0.63	1.0	1.6	2.5	4.0	
Seat Ø	in.	0.24					0.47		0.55	
	mm	6					12		14	
Travel	in.	0.3								
	mm	7.5								
Size										
inches	mm									
½"	15	•	•	•	•	•	•	•	•	
¾"	20	•	•	•	•	•	•	•	•	
1"	25	•	•	•	•	•	•	•	•	

**Table 4a · Permissible differential pressures for version without metal bellows seal · All pressures in psi (gauge)**

Fail-safe action:		Actuator stem:					"Extends" (Fail close)				"Retracts" (Fail open)		
Bench range (psi)							9...15	18...30	27...34	39...48	3 ...9		
Required supply pressure		psi					18	33	37	51	15	30	45
Valve size		C <sub>v</sub>	K <sub>vs</sub>	SB Ø (inch)	Actuator area		Δp with p <sub>2</sub> = 0 psi						
in.	mm				in <sup>2</sup>	cm <sup>2</sup>							
½" to 1"	15 to 25	0.12 to 1.2	0.1 to 1.0	0.24	18.6	120	725	1856	2972	5800	725	5800	5800
					54	350	4785	5800	-	-	4785	5800	-
		2.0 to 3.0	1.6 to 2.5	0.47	18.6	120	116	1189	1958	3335	116	1450	3335
					54	350	1885	3915	5800	-	1885	4278	5800
		5.0	4.0	0.55	18.6	120	29	870	1436	2392	29	1160	2392
					54	350	1305	2871	4495	5800	1305	4568	5800

**Table 4b · Permissible differential pressures for version with metal bellows seal · All pressures in psi (gauge)**

Fail-safe action:		Actuator stem:					"Extends" (Fail close)				"Retracts" (Fail open)		
Bench range (psi)							9...15	18...30	27...34	39...48	7. ...19		
Required supply pressure		psi					18	33	37	51	22	37	51
Valve size		C <sub>v</sub>	K <sub>vs</sub>	SB Ø (inch)	Actuator area		Δp with p <sub>2</sub> = 0 psi						
in.	mm				in <sup>2</sup>	cm <sup>2</sup>							
½" to 1"	15 to 25	0.12 to 1.2	0.1 to 1.0	0.24	18.6	120	-	1479	2378	5800	-	1160	5800
					54	350	1450	4640	-	-	1450	5800	-
		2.0 to 3.0	1.6 to 2.5	0.47	18.6	120	-	957	1566	2030	-	798	2030
					54	350	942	3132	4640	5800	942	2508	5800
		5.0	4.0	0.55	18.6	120	-	696	1146	1812	-	798	1812
					54	350	942	2291	3596	5800	942	3625	5800

**Table 4c · Permissible differential pressures for version without metal bellows seal · All pressures in bar (gauge)**

Fail-safe action:		Actuator stem:					"Extends" (Fail close)				"Retracts" (Fail open)		
Bench range (bar)							0.6...1.0	1.2...2.0	1.85...2.3	2.7...3.3	0.2 ...0.6		
Required supply pressure		bar					1.2	2.2	2.5	3.5	1.0	2.0	3.0
Valve size		C <sub>v</sub>	K <sub>vs</sub>	SB Ø (mm)	Actuator area		Δp with p <sub>2</sub> = 0 bar						
in.	mm				in <sup>2</sup>	cm <sup>2</sup>							
½" to 1"	15 to 25	0.12 to 1.2	0.1 to 1.0	6	18.6	120	50	128	205	400	50	400	400
					54	350	330	400	-	-	330	400	-
		2.0 to 3.0	1.6 to 2.5	12	18.6	120	8	82	135	230	8	100	230
					54	350	130	270	400	-	130	295	400
		5.0	4.0	14	18.6	120	2	60	99	165	2	80	165
					54	350	90	198	310	400	90	315	400

**Table 4d · Permissible differential pressures for version with metal bellows seal · All pressures in bar (gauge)**

Fail-safe action:		Actuator stem:					"Extends" (Fail close)				"Retracts" (Fail open)		
Bench range (bar)							0.6...1.0	1.2...2.0	1.85...2.3	2.7...3.3	0.5 ...1.3		
Required supply pressure		bar					1.2	2.2	2.5	3.5	1.5	2.5	3.5
Valve size		C <sub>v</sub>	K <sub>vs</sub>	SB Ø (mm)	Actuator area		Δp with p <sub>2</sub> = 0 bar						
in.	mm				in <sup>2</sup>	cm <sup>2</sup>							
½" to 1"	15 to 25	0.12 to 1.2	0.1 to 1.0	6	18.6	120	-	102	164	400	-	80	400
					54	350	100	320	-	-	100	400	-
		2.0 to 3.0	1.6 to 2.5	12	18.6	120	-	66	108	140	-	55	140
					54	350	65	216	320	400	65	173	400
		5.0	4.0	14	18.6	120	-	48	79	125	-	55	125
					54	350	65	158	248	400	65	250	400

**Table 5a · Dimensions of standard version in inches (see Fig. 4)**

Body style		Globe			Angle		
Nominal size	inches	½"	¾"	1"	½"	¾"	1"
	Length L, L1 (NPT-Female)	Cl. 300...2500	5.12			1.57	1.97
Length L, L1 (Welding Ends)		Cl. 300...2500	5.12			2.24	
Length L, L1 (RF Flanges)	Cl. 300	7.50	7.62	7.75	3.74 <sup>1)</sup>	3.82 <sup>1)</sup>	3.86 <sup>1)</sup>
	Cl. 600	8.00	8.12	8.25	4.02 <sup>1)</sup>	4.06 <sup>1)</sup>	4.13 <sup>1)</sup>
	Cl. 900/1500	8.50	9.00	10.00	4.25	4.50	5.00
	Cl. 2500	10.38	10.75	12.12	5.19	5.38	6.06
W		2.76			2.76		
H1		8.98			7.64		
H2		1.02			-		
Pneumatic actuator	Size	120			350		
	in <sup>2</sup>	18.6			54		
Diaphragm Ø D		6.61			11.02		
H		2.72			3.35		
H3 (Type 3271 and 3277 actuator) <sup>2)</sup>		8.86					
Thread		M 30 x 1.5					
a (for Type 3271 actuator)		NPT 1/8"			NPT 3/8"		
a2 (for Type 3277 actuator)		-			NPT 3/8"		

**Table 5b · Dimensions of standard version in mm (see Fig. 4)**

Body style		Globe			Angle		
Nominal size	inches	½"	¾"	1"	½"	¾"	1"
	mm	15	20	25	15	20	25
Length L, L1 (NPT-Female)	Cl. 300...2500	130			40	50	60
	Length L, L1 (Welding Ends)	Cl. 300...2500	130			57	
Length L, L1 (RF Flanges)	Cl. 300	190	194	197	95 <sup>1)</sup>	97 <sup>1)</sup>	98 <sup>1)</sup>
	Cl. 600	203	206	210	102 <sup>1)</sup>	103 <sup>1)</sup>	105 <sup>1)</sup>
	Cl. 900/1500	216	229	254	108	114	127
	Cl. 2500	264	273	308	132	136	154
W		70			70		
H1		228			194		
H2		26			-		
Pneumatic actuator	Size	120			350		
	cm <sup>2</sup>	120			350		
Diaphragm Ø D		168			280		
H		69			85		
H3 (Type 3271 and 3277 actuator) <sup>2)</sup>		225					
Thread		M 30 x 1.5					
a (for Type 3271 actuator)		NPT 1/8"			NPT 3/8"		
a2 (for Type 3277 actuator)		-			NPT 3/8"		

<sup>1)</sup> Special length

<sup>2)</sup> Minimum clearance for disassembly of actuator

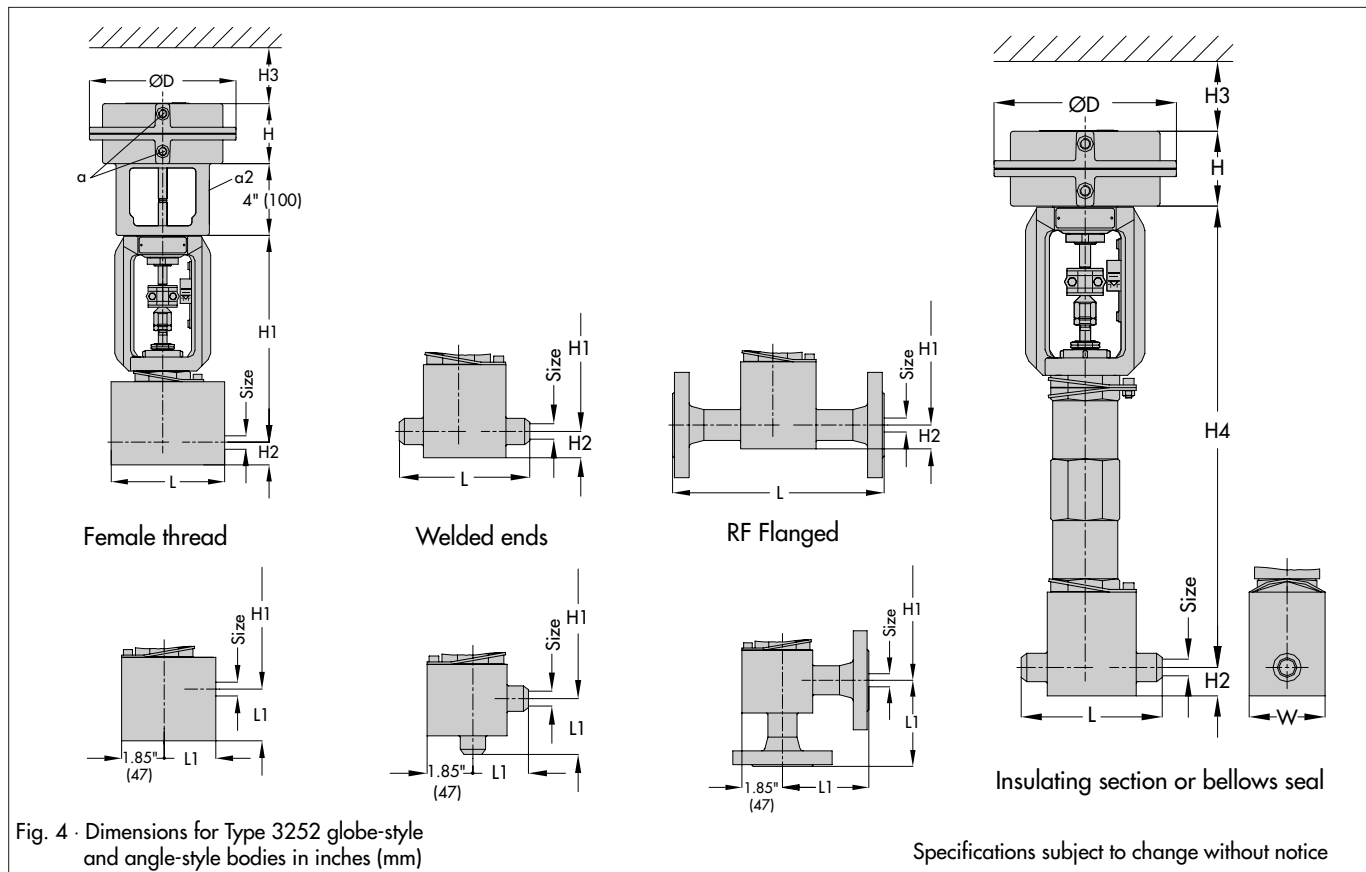
**Table 6 · Dimensions for versions with insulating or metal bellows section in inches (mm)**

Body style		Globe			Angle		
		1/2"	3/4"	1"	1/2"	3/4"	1"
Nominal size	inches						
	mm	15	20	25	15	20	25
H4 with insulating section	Cl. 300...2500	16.34 (415)			15.00 (381)		
	Cl. 300...900	16.34 (415)			15.00 (381)		
H4 with metal bellows seal	Cl. 1500	19.02 (483)			17.72 (450)		
	Cl. 2500	23.15 (588)			21.81 (554)		

**Table 7 · Weights in lbs (kg) for valve body with yoke (approx.)**

Body style		Globe			Angle		
		1/2"	3/4"	1"	1/2"	3/4"	1"
Nominal size	inches						
	mm	15	20	25	15	20	25
With female thread	Cl. 300...2500	On request			On request		
With welding ends		On request			On request		
With RF flanges	Cl. 2500	27.5 (12.5)	29.7 (13.5)	36.3 (16.5)	25.3 (11.5)	27.5 (12.5)	34.1 (15.5)
With insulating or metal bellows section (additional weight)		On request			On request		

Pneumatic actuator	Size	120	350
	in <sup>2</sup>	18.6	54
Weight, Type 3271	Without	6.6 (3.0)	17.6 (8.0)
	With handwheel	11.0 (5.0)	28.6 (13.0)
Weight, Type 3277	Without	7.7 (3.5)	26.4 (12.0)
	With handwheel	12.1 (5.5)	37.4 (17.0)



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