Type 3522-1 and Type 3522-7 Pneumatic Control Valves
Type 3522-2 Electropneumatic Control Valve
Type 3522 Globe Valve

Application
Control valve for process engineering applications

Valve size	**NPS ½ to 2**
Pressure rating	**Class 150 and 300**
Temperatures	**14 to 430 °F (–10 to +220 °C)**
Standards	**ANSI, ASME and ASTM**

Actuator options for Type 3522 Globe Valve:

- Type 3271 Pneumatic Actuator (Type 3522-1 Control Valve)
- Type 3277 Pneumatic Actuator (Type 3522-7 Control Valve) for integral positioner attachment
- Type 3372 Electropneumatic Actuator with integral positioner (Type 3522-2 Control Valve)

Valve body material

- Aluminum bronze C95200
- Cast stainless steel A351 CF8M acc. to ASTM specification

Valve plug seal

- Metal
- Soft

Other characteristics

- Female threaded ends or RF flanges
- Spring-loaded packing

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

Standard version with PTFE packing for temperatures from 14 to 430 °F (–10 to +220 °C) with threaded ends (Fig. 1) or flanges (Fig. 2)

– **Type 3522-1** · NPS ½ to 2 with Type 3271 Pneumatic Actuator (see Data Sheet ▶ T 8310-1)
– **Type 3522-2** · NPS ½ to 1 with Type 3372 Electropneumatic Actuator (see Data Sheet ▶ T 8313)
– **Type 3522-7** · NPS ½ to 2 with Type 3277 Pneumatic Actuator for integral positioner attachment (see Data Sheet ▶ T 8310-1)

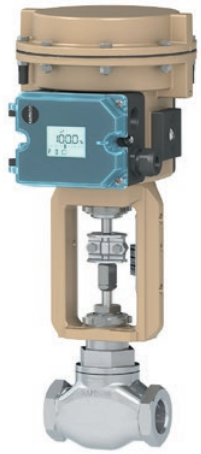

Fig. 1: *Type 3522 Control Valve with threaded ends, Type 3277 Pneumatic Actuator and Type 3725 Positioner*

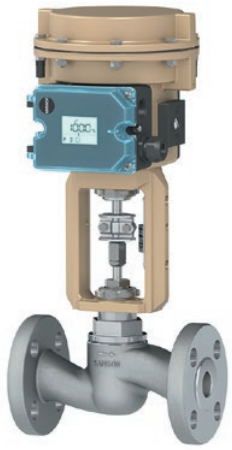

Fig. 2: *Type 3522 Control Valve with flanges, Type 3277 Pneumatic Actuator and Type 3725 Positioner*

Associated Information Sheet for valves	**T 8000-X**
Associated Information Sheet for actuators	**T 8300**
Associated Information Sheet for accessories	**T 8350**

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Data Sheet **T 8822 EN**

Further options

- **Adjustable graphite packing**
- Stellited® trim
- **Additional handwheel** · see Data Sheet ▶ T 8310-1
- **NACE version** acc. to ISO 15156, MR0103:2007, MR0175:2002

Fail-safe action

Depending on how the springs are arranged in the pneumatic actuator (see Data Sheets ▶ T 8310-1), the valve has two different fail-safe positions effective upon air supply failure:

- **Actuator stem extends (air-to-open/fail-close):** The actuator spring closes the valve upon air supply failure.
- **Actuator stem retracts (air-to-close/fail-open):** The actuator spring opens the valve upon air supply failure.

Pressure-Temperature diagram

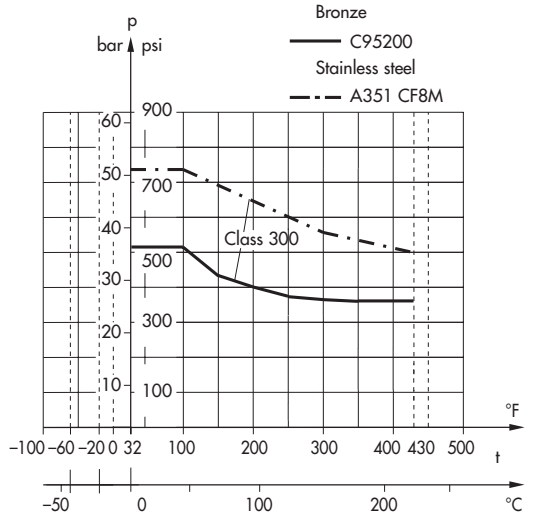


Fig. 3: *Pressure-Temperature diagram according to ASME/ ANSI B16.1 and B16.34*

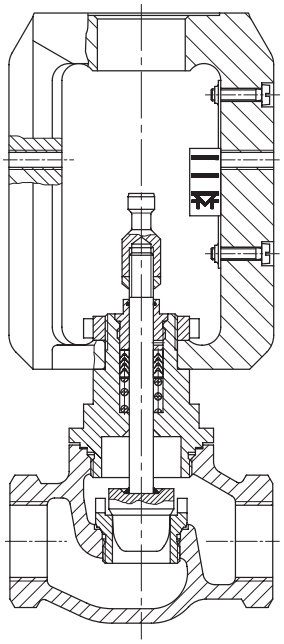


Fig. 4: *Type 3522, NPS ½ to 1, threaded ends*

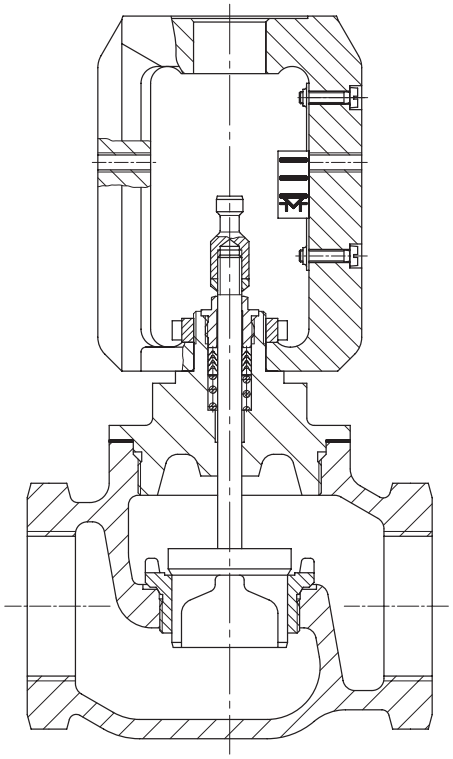


Fig. 5: *Type 3522, NPS 1¼ to 2, version with forged yoke design, threaded ends*

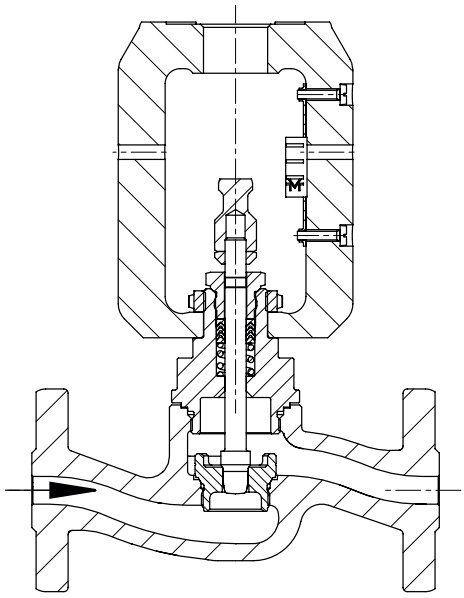


Fig. 6: *Type 3522, NPS ½ to 1, flanged*

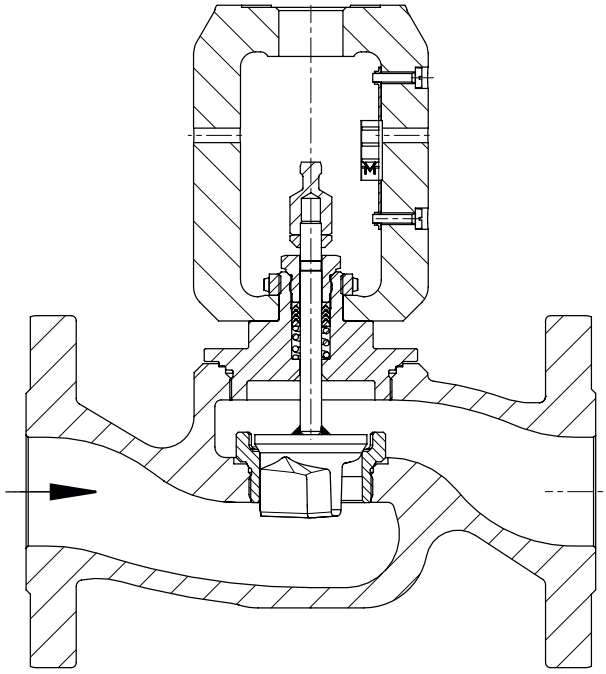


Fig. 7: *Type 3522, NPS 1½ to 2, flanged*

Table 1: *Technical data*

Size		**NPS ½ to 2**	
ASTM material		Aluminum bronze C95200	Cast stainless steel A351 CF8M
Type of connection		Female thread NPT [1] or RF flanged ASME B16.5	
Pressure rating	NPT	Class 300	
	Flanges	Class 150 or 300	
Seat/plug seal		Metal or soft	
Characteristic		Equal percentage or linear	
Rangeability		50:1	
Temperature ranges in °F (°C) · Permissible operating pressures acc. to pressure-temperature diagrams (see Information Sheet ▶ T 8000-2)			
Body		14 to 430 °F (–10 to +220 °C)	
Valve plug Standard	Metal seal	14 to 430 °F (–10 to +220 °C)	
	Soft seal	14 to 430 °F (–10 to +220 °C)	
Leakage class according to ANSI/FCI 70-2			
Valve plug	Metal seal	Standard: IV · High-performance: V	
	Soft seal	VI	

[1] Other versions on request

Table 2: *Materials (ASTM/AISI material description)*

Standard version		
Valve body [1]	Aluminum bronze C95200	Cast stainless steel A351 CF8M
Valve bonnet	Aluminum bronze C95200	Cast stainless steel A351 CF8M
Seat and plug [2] [3]	316 L	
	Sealing ring for soft seal: PTFE	
Packing [4]	V-ring packing: PTFE with carbon · Spring: Stainless steel (AISI 301)	
Body gasket	Copper	Stainless steel

[1] Refer to pressure-temperature diagram, other materials available on request
[2] All seats and plugs with metal seal also available with Stellite® facing
[3] Other materials on request
[4] Other packings on request

Table 3: *C_V and K_{VS} coefficients*

Terms for control valve sizing according to ISA S75.01/IEC 60534 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 3.1: *Overview*

C_V		0.12	0.2	0.3	0.5	0.75	1.2	2	3	5	7.5	12	20	30	40 [1]	47 [2]
K_{VS}		0.1	0.16	0.25	0.4	0.63	1.0	1.6	2.5	4.0	6.3	10	16	25	35 [1]	40 [2]
Seat ØD	in	0.12			0.24			0.47			0.945		1.22	1.5	1.9	1.9
	mm	3			6			12			24		31	38	48	48
Travel	in	0.6														
	mm	15														

[1] for threaded version only
[2] for flanged version only

Table 3.2: *Standard version*

C_V	0.12	0.2	0.3	0.5	0.75	1.2	2	3	5	7.5	12	20	30	40 [1]	47 [2]
K_{VS}	0.1	0.16	0.25	0.4	0.63	1.0	1.6	2.5	4.0	6.3	10	16	25	35 [1]	40 [2]
NPS															
½	•	•	•	•	•	•	•	•	•						
¾	•	•	•	•	•	•	•	•	•	•					
1	•	•	•	•	•	•	•	•	•	•	•				
1¼				•	•	•	•	•	•	•	•	•			
1½				•	•	•	•	•	•	•	•	•	•		
2				•	•	•	•	•	•	•	•	•	•	•	•

[1] for threaded version only
[2] for flanged version only

Notes on the differential pressure tables

- The maximum permissible supply pressure is 90 psi for all valves in sizes NPS ½ to 2.
- The medium flows in the flow-to-open direction through the valve.
- Version with PTFE packing
- The leakage rates specified in Table 1 are not exceeded with the maximum differential pressures specified.
- The specified differential pressure may be restricted by the pressure-temperature diagram (see Fig. 3).
- Values specified in the gray-shaded columns correspond to the bench range.
- Differential pressures specified in the white columns apply to maximum pretensioned springs.
- Differential pressures in parentheses refer to the values in parentheses in the bench range row.

Table 4: *Differential pressure · Unbalanced valve plugs*

Table 4.1: *Permissible differential pressures Δp · Pressures stated in psi*

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

Bench range in psi for actuator area in cm²			240	3 to 15	5 to 17	6 to 30	9 to 33	9 to 45 [1]	13 to 49	–	–
			120, 350		6 to 18		12 to 36		18 to 54	20 to 34	30 to 48
Required supply pressure in psi				18	21	33	39	48	57	37	51
NPS	**C_V**	**K_{VS}**	**Actuator area**	**Δp when p_2 = 0**							
½ to 1	0.12 to 0.3	0.1 to 0.25	120	320	–	580	–	–	–	–	–
			240	580	580	–	–	–	–	–	–
½ to 2	0.5 to 1.2	0.4 to 1.0	120	320	–	580	–	–	–	–	–
			240	580	580	580	–	–	–	–	–
	2 to 5	1.6 to 4	120	130	–	405	–	–	–	580	–
			240	406	580	580	580	580	580	–	–
			350	580	580	580	580	580	–	580	–
¾ to 2	7.5	6.3	120	–	–	80	–	–	–	435	580
	12	10	240	75	135	215	350	350	565	–	–
			350	145	350	350	550	550	580	580	580
1¼ and 2	20	16	120	–	–	44	–	–	–	260	405
			240	36	75	115	200	200	335	–	–
			350	75	195	195	435	320	580	580	580
1½ to 2	30	25	120	–	–	22	–	–	–	175	275
			240	19	45	72	130	130	218	–	–
			350	45	125	125	290	200	450	535	580
2	40	35	240	–	–	43	72	72	130	–	–
	47	40	350	23	72	72	175	123	275	330	507

[1] Not for actuator 120 cm²

Table 4.2: *Permissible differential pressures Δp · Pressures stated in bar*

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

Bench range in bar for actuator area in cm²			240	0.2 to 1.0	0.3 to 1.1	0.4 to 2.0	0.6 to 2.2	0.6 to 3.0 [1]	0.9 to 3.3	–	–
			120, 350		0.4 to 1.2		0.8 to 2.4		1.2 to 3.6	1.4 to 2.3	2.1 to 3.3
Required supply pressure in bar				1.2	1.4	2.2	2.6	3.2	3.8	2.5	3.5
NPS	**C_V**	**K_{VS}**	**Actuator area**	**Δp when p_2 = 0**							
½ to 1	0.12 to 0.3	0.1 to 0.25	120	40	–	40	–	–	–	–	–
			240	40	40	–	–	–	–	–	–
½ to 2	0.5 to 1.2	0.4 to 1.0	120	22	–	40	–	–	–	–	–
			240	40	40	40	–	–	–	–	–
	2 to 5	1.6 to 4	120	9	–	28	–	–	–	40	–
			240	28	40	40	40	40	40	–	–
			350	40	40	40	40	40	–	40	–
¾ to 2	7.5 12	6.3 10	120	–	–	5.5	–	–	–	30	40
			240	5.2	9.3	14.8	24	24	39	–	–
			350	10	24	24	38	38	40	40	40
1¼ and 2	20	16	120	–	–	3	–	–	–	18	28
			240	2.5	5.2	8.0	14	14	23	–	–
			350	5.2	13.5	13.5	30	22	47	40	40
1½ to 2	30	25	120	–	–	1.5	–	–	–	12	19
			240	1.3	3.1	5.0	9.0	9.0	15	–	–
			350	3.1	8.5	8.5	20	14	31	37	40
2	40 47	35 40	240	–	–	3.0	5.0	5.0	9.0	–	–
			350	1.6	5.0	5.0	12	8.5	19	23	35

[1] Not for actuator 120 cm²

Table 4.3: *Permissible differential pressures Δp · Pressures stated in psi and bar*

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

				Pressures in psi			**Pressures in bar**		
Bench range in psi/bar for actuator area in cm²			120 to 350	3 to 15			0.2 to 1.0		
Required supply pressure in psi/bar				18	36	58	1.2	2.4	4
NPS	**C_V**	**K_{VS}**	**Actuator area**	**Δp when p_2 = 0**			**Δp when p_2 = 0**		
½ to 1	0.12 to 0.3	0.1 to 0.25	120	330	580	–	23	40	–
			240	580	–	–	40	–	–
½ to 2	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 4	120	130	580	–	9	40	–
			240	410	580	–	28	40	–
			350	580	580	–	40	40	–
¾ to 2	7.5 12	6.3 10	120	10	450	580	0.6	31	40
			240	80	580	580	5.2	40	40
			350	145	580	580	10	40	40
1¼ and 2	20	16	120	–	260	580	–	18	40
			240	35	540	580	2.5	37	40
			350	75	580	580	5.2	40	40
1½ to 2	30	25	120	–	160	410	–	11	28
			240	20	350	580	1.3	24	40
			350	45	540	580	3.1	37	40
2	40 47	35 40	240	10	220	490	0.5	15	34
			350	25	330	580	1.6	23	40

Table 5: *Dimensions for Type 3522 Valve in standard version*

Table 5.1: *Version with threaded ends*

Globe valve	Size	NPS	½	¾	1	1¼	1½	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	Type 3271, Type 3277 ≤350 cm²	in	9.25			8.75	8.62	8.88
		mm	235			222	219	225
	Type 3372	in	10.6			–		
		mm	269					
H2		in	1.13	1.13	1.38	1.50	1.68	1.75
		mm	28.5	28.5	35	38	43	44.5

Table 5.2: *Version with flanges*

Globe valve	Size	NPS	½	¾	1	1¼	1½	2
Length L	Class 150	in	7.3	7.3	7.3	–	8.7	10
		mm	184	184	184		222	254
	Class 300	in	7.5	7.6	7.8	–	9.3	10.5
		mm	190	194	197		235	267
H1 for actuators	Type 3271, Type 3277 ≤350 cm²	in	9.25			–	8.62	8.88
		mm	235			–	219	225
	Type 3372	in	10.6			–		
		mm	269					
H2		in	1.3	1.2	1.4	–	2.1	2.1
		mm	33	31	36	–	54.5	54.5

Table 6: *Dimensions for actuators*

Table 6.1: *Dimensions for Type 3271 and Type 3277 Pneumatic Actuators*

Actuator area	in²	18.6	27.1	37.2	54.3
	cm²	120	175	240	350
Diaphragm ØD	in	6.6	8.5	9.5	11.0
	mm	168	215	240	280
H for Type 3271	in	2.7	3.1	2.4	3.2
	mm	69	78	62	82
H for Type 3277	in	2.8	3.1	2.6	3.2
	mm	70	78	65	82
H3 [1]	in	4.33			
	mm	110			
H5	in	3.98			
	mm	101			
Thread		M30 x 1.5			
a (for Type 3271 Actuator)		⅛ NPT (G ⅛)	¼ NPT (G ¼)	¼ NPT (G ¼)	⅜ NPT (G ⅜)
a2 (for Type 3277 Actuator)		–	⅜ NPT (G ⅜)		

[1] Minimum clearance to remove the actuator

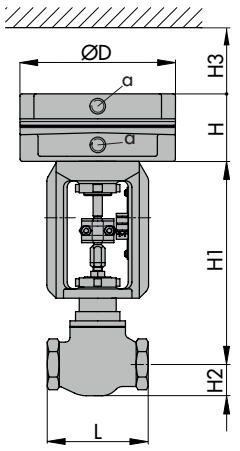
Table 6.2: *Dimensions for Type 3372 Electropneumatic Actuator*

Actuator area	cm²	120
	in²	18.6
Diaphragm ØD	in	6.6
	mm	168
H	in	Stem extends: 9.3 · Stem retracts: 12.2
	mm	Stem extends: 236 · Stem retracts: 309
H3 [1]	in	4.33
	mm	110
a3		⅛ NPT (G ⅛)

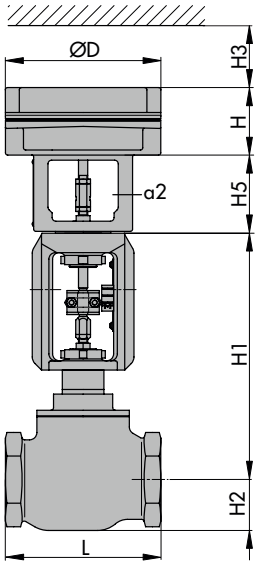
[1] Minimum clearance to remove the actuator

Dimensional drawings

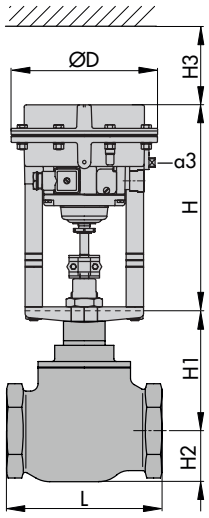
Version with threaded ends



Type 3522 NPS ½ to 1 with Type 3271 Pneumatic Actuator (120 cm²)

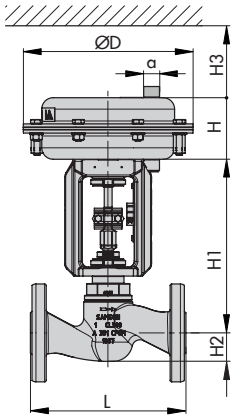


Type 3522 NPS 1¼ to 2 with Type 3277 Pneumatic Actuator (120 cm²)

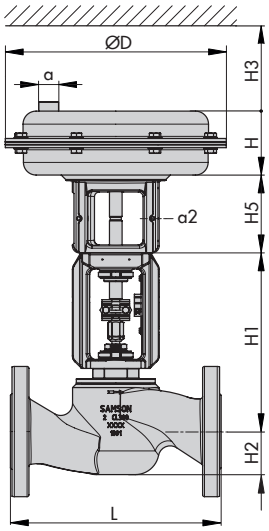


Type 3522 NPS ½ to 1 with Type 3372 Electropneumatic Actuator (120 cm²)

Version with flanges



Type 3522 NPS ½ to 1 with Type 3271 Pneumatic Actuator (175 cm²)



Type 3522 NPS 1½ to 2 with Type 3277 Pneumatic Actuator (350 cm²)

Table 7: *Weights in lbs and kg*

Table 7.1: *Weights for Type 3522 Valve without actuator*

Globe valve Size	NPS	½	¾	1	1¼	1½	2
Version with threaded ends	lbs	7	7.5	9	11	12	17
	kg	3	3.4	4	5	5.4	7.7
Version with flanges	lbs	11.5	14.8	16.8	–	31.1	34.6
	kg	5.2	6.7	7.6	–	14.1	15.7

Table 7.2: *Weights for Type 3271 and Type 3277 Pneumatic Actuators and for Type 3372 Electropneumatic Actuator*

Actuator	cm^2	120	175	240	350
	in^2	18.6	27.1	37.2	54.25
Weight of Type 3271	lbs	5.5	13.2	11	18
	kg	2.5	6	5	8
Weight of Type 3277	lbs	7.1	22	20	26.5
	kg	3.2	10	9	12
Weight of Type 3372	lbs	7.7	–	–	–
	kg	3.5	–	–	–

Ordering text

Size	NPS …
Pressure rating	Class 300 (NPT) Class 150 or 300 (flanged)
Body material	According to Table 2
Type of connection	NPT female thread or RF flanged ASME B16.5
Valve plug	Metal or soft seal
Characteristic	Equal percentage or linear
Actuator	Type 3271 or Type 3277 Pneumatic Actuator ▶ T 8310-1 Type 3372 Electropneumatic Actuator ▶ T 8313
Fail-safe action	Fail-close or fail-open
Process fluid	Density in lb/cu.ft or kg/m³ and temperature in °F or °C
Flow rate	Flow rate in lb/hr, scfh under standard or operating conditions
Pressure	p_1 in psia (absolute pressure) p_2 in psia (absolute pressure) with minimum, normal and maximum flow rate
Valve accessories	Versions according to ▶ T 8350

Specifications subject to change without notice

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