

# Pneumatic Control Valve Type 3246-1 and Type 3246-7 Three-way Valve Type 3246



ANSI Class 150 and 300 with long insulating section and circulation inhibitor  
ANSI version

## Application

Mixing or flow-diverting valve for cryogenic applications

**Nominal size** NPS ½ to 6  
**Pressure rating** ANSI Class 150 and 300  
**Temperatures** -200 to 220 °C · -328 to 428 °F

Type 3246 Three-way Valve with:

- Type 3271 Pneumatic Actuator (Type 3246-1 Control Valve) or
- Type 3277 Pneumatic Actuator (Type 3246-7 Control Valve) for integral attachment of a positioner

Valve body made of:

- Stainless carbon steel

Low-noise valve plug with:

- Metal sealing or
- Lapped-in metal

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 single PTFE packing for temperatures ranging from -200 to 220 °C (-328 to 428 °F) with long insulating section and circulation inhibitor, nominal sizes NPS ½ to 6, ANSI Class 150 and 300, with flanges with Raised Face

- **Type 3246-1** · With Type 3271 Actuator with 120 to 700 cm<sup>2</sup> effective diaphragm area (refer to T 8310-1 EN)
- **Type 3246-7** · With Type 3277 Actuator with 120 to 700 cm<sup>2</sup> effective diaphragm area (refer to T 8310-1 EN)

## Other versions

- **Type 3246-1/-7 Globe Valve** · with long insulating section and circulation inhibitor, NPS ½ to 10, up to ANSI Class 300 · Refer to Data Sheet T 8046-1 EN
- **Type 3246-1/-7 Globe Valve** · with long insulating section and circulation inhibitor, NPS ½ to 6, ANSI Class 600 · Refer to Data Sheet T 8046-2 EN

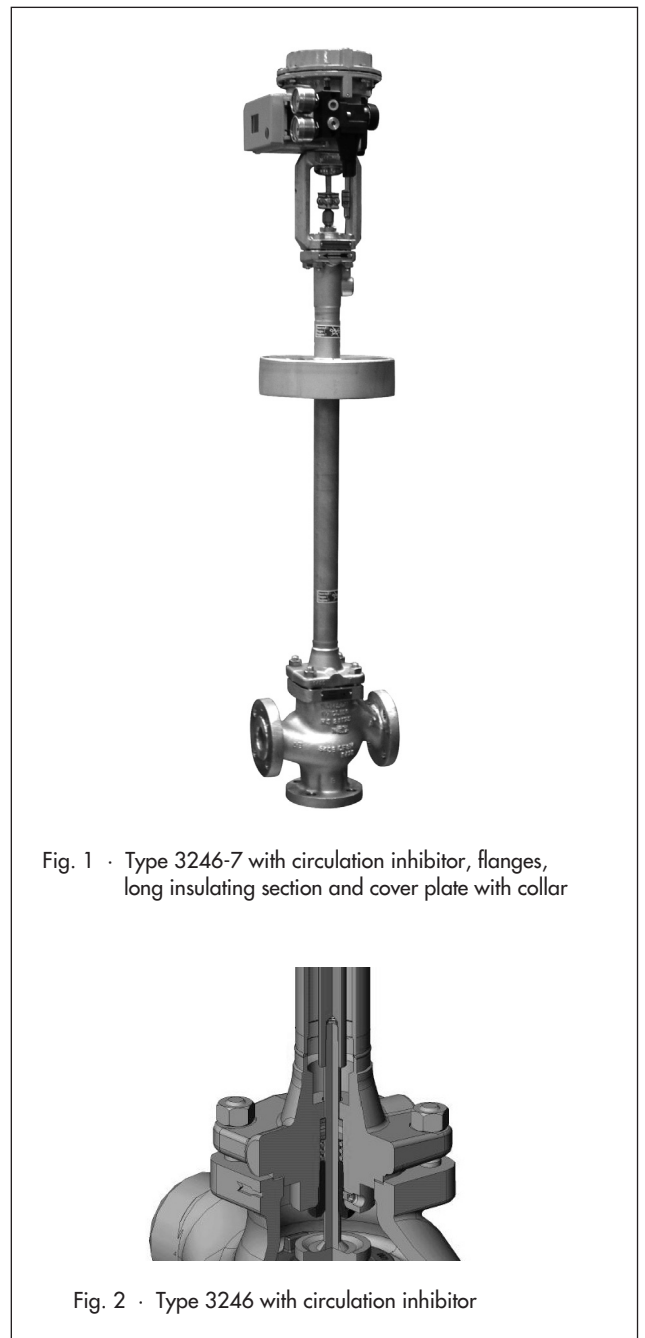


Fig. 1 · Type 3246-7 with circulation inhibitor, flanges, long insulating section and cover plate with collar

Fig. 2 · Type 3246 with circulation inhibitor

### Principle of operation (Figs. 3 and 4)

Depending on the valve version, the three-way valve can be designed as either a mixing or flow-diverting valve.

In mixing valves, the process media to be mixed enter at valve ports A and B. The combined stream flows off at port AB (see Fig. 3). The flow rate from port A or B to port AB depends on the cross-sectional area of flow between the seats and valve plugs.

In flow-diverting valves, in contrast, the process medium enters at port AB and the partial streams flow off at ports A and B (see Fig. 4).

**Note:** The design of the mixing and flow-diverting valves in nominal sizes 1/2 to 1 is identical.

### Fail-safe position

Depending on the arrangement of the compression springs in the actuator (see Data Sheet T 8310-1 EN for details), the valve has two fail-safe positions which become effective upon supply air failure:

#### Actuator stem extends (FA)

On air supply failure, port B (mixing valve) or port A (flow-diverting valve) is closed.

#### Actuator stem retracts (FE)

On air supply failure, port A (mixing valve) or port B (flow-diverting valve) is closed.

### Servicing instructions · For trained personnel only

#### Lubricant

- Apply lubricant (order no. 8150-0116) to the plug stem (6), seats and plug (3).
- Prior to assembling the valve, apply lubricant (order no. 8150-0116) to the thread of the valve bonnet (5 or 5.1), yoke (7), stem connector nut (6.1) and stem connector (6.2).

#### Packing at the top

The packing only needs to be serviced or replaced when leakage occurs.

Prior to installation, apply lubricant (8150-0116) to plug stem.

#### Standard packing (Fig. 5) with spring (4.1), self-adjusting

Apply lubricant (order no. 8150-0116) to all parts.

Tighten threaded bushing (5.2) on assembly.

#### Insulating section (Fig. 6)

To perform maintenance work on the seat or plug, remove the bonnet (5.1) together with intermediate piece (8).

The bonnet (5.1) only needs to be removed on performing work on the packing.

#### Circulation inhibitor (Fig. 7)

A spring-loaded circulation inhibitor is used in place of a bottom metal guided bushing.

Prior to removing or assembling the plug, unscrew the hex socket headless screw at the side. The threaded bushing of the circulation inhibitor can only be removed after the headless screw has first been unscrewed.

On replacing the seals at the circulation inhibitor, insert the spring between the seals and threaded bushing.

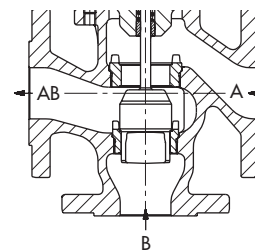


Fig. 3 · Typ 3246, plug arranged for mixing service, with valves in NPS 1/2 to 1 also for flow-diverting service

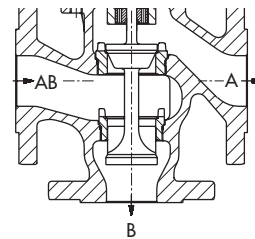


Fig. 4 · Type 3246, plug arranged for flow-diverting service with valves in NPS 1 1/2 to 6

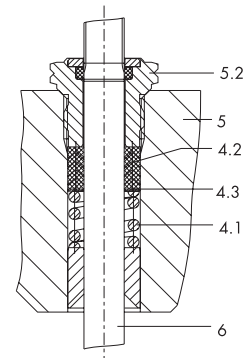


Fig. 5 · Standard packing

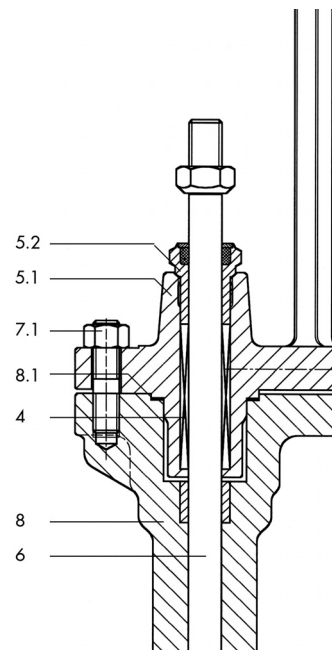


Fig. 6 · Yoke on the intermediate piece of the insulating section

## Mounting and Operating Instructions

Refer to EB 8026 EN for more instructions on how to mount the actuator, installation, operation and maintenance.

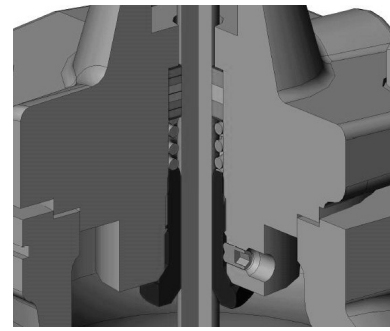


Fig 7 · Circulation inhibitor and hex socket headless screw

**Table 1 · Technical data for Type 3246 with circulation inhibitor**

Material	Stainless carbon steel A 351 CF8M	
Nominal size	NPS ½ ... 6	
Pressure rating	Class 150 or 300	
End connections	ANSI flanges with Raised Face	
Seat-plug sealing	Metal sealing	
Characteristic	Linear	
Rangeability	50 : 1 · 30 : 1 for NPS 2½ and larger	
<b>Temperature ranges</b> in °C (°F) · Permissible operating pressures according to pressure-temperature diagrams (see Information Sheet T 8000-2 EN)		
Valve with	PTFE packing	-200 ... 220 °C (-328 ... 428 °F)
<b>Leakage class</b> according to EN 1349		
Valve plug	Metal sealing	0.05 % Cv

**Table 2 · Materials**

Standard version Body and flanges	Stainless carbon steel A 351 CF8M	
Seat and plug <sup>1)</sup>	Metal sealing	CrNiMo
Threaded bushings	CrNiMo	
Packing	Self-adjusting	PTFE-carbon V-ring packing, spring 1.4310
Circulation inhibitor	PTFE-silk cord, bushing 2.4360 (Monel)	
Body gasket	Graphite with metal core	
Insulating section	A182 F316	

<sup>1)</sup> Seats and metal-seated plugs are also available with stellite facing or plug made of solid Stellite.

**Table 3a · Type 3246 Mixing Valve · C<sub>v</sub> coefficients and permissible differential pressures · Pressures in bar**

Bench range (in bar) for actuators with effective diaphragm area		120 cm <sup>2</sup>	–	–	0.4...2.0 (1.2...2.0)	–	–	–	1.4...2.3	2.1...3.3			
		240 cm <sup>2</sup>	0.2...1.0	–		–	–	–	–	–	–		
		350 cm <sup>2</sup>		0.4...1.2		0.8...2.4	0.6...3.0 (1.8...3.0)	1.2...3.6	1.4...2.3 (1.85...2.3)	2.1...3.3 (2.7...3.3)			
		700 cm <sup>2</sup>											
Required supply pressure in bar		1.2	1.6	2.4 (3.2)	3.2	3.6 (4.8)	4.8	3.7 (4.2)	5.4 (6.0)				
NPS	C <sub>v</sub> mixing valve	Seat Ø in (mm)	Rated travel (mm)	Actuator cm <sup>2</sup>	Δp when p <sub>2</sub> = 0 bar								
½	2.3 · 5	0.94 (24)	0.59 (15)	120	–	–	5.2	–	–	–	29.3	40	
	¾				2.3 · 5 · 7.5	240	5.2	–	14.8	–	24.9	–	–
1	2.3 · 5	1.22 (31)		120	–	–	–	–	–	–	17	27.1	
	7.5 · 12				350	9.6	23.7	23.7	40	37.8	40	40	40
1½ and 2	7.5 · 12 · 20	1.49 (38)		120	–	–	–	–	–	–	–	–	–
					350	5.2	13.6	13.6	30.5	22.0	40	40	40
2	47	1.89 (48)		120	–	–	–	–	–	–	–	–	–
					350	3.1	8.7	8.7	19.9	14.3	31.1	36.7	40
3	30 and 47	1.89 (48)		120	–	–	–	–	–	–	–	–	–
					350	1.6	5.1	5.1	12.1	8.6	19.2	22.7	35
6	70	2.48 (63)		700	–	–	–	–	–	–	–	–	–
					350	–	2.7	2.7	6.7	4.7	10.8	12.9	20
6	95	2.95 (75)	700	–	–	–	–	–	–	–	–	–	
				350	–	1.7	1.7	4.6	3.1	7.5	8.9	13.9	
4	120	3.15 (80)	700	–	–	–	–	–	–	–	–	–	
				700	1.7	–	(16.1)	–	(24.7)	–	(25.5)	37.7	
6	230	4.33 (110)	700	–	–	–	–	–	–	–	–	–	
				350	–	1.7	1.7	4.6	3.1	7.5	8.9	13.9	
6	350	5.12 (130)	700	–	–	–	–	–	–	–	–	–	
				700	1.4	3.9	3.9	9.0	6.4	14	16.6	25.4	
6	190	3.93 (100)	700	–	–	–	–	–	–	–	–	–	
				700	–	2.3	2.3	5.6	4.0	8.8	10.4	16.1	
6	230	4.33 (110)	700	–	–	–	–	–	–	–	–	–	
				700	–	1.9	1.9	4.5	3.2	7.2	8.6	13.3	
6	350	5.12 (130)	700	–	–	–	–	–	–	–	–	–	
				700	–	1.2	1.2	3.2	2.2	5.1	6.0	9.4	

**Notes on the differential pressure tables**

- Values specified in the shaded columns apply to standard cases
- 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
- The tables apply to both fail-safe positions
- The springs in actuators with fail-safe action "Actuator stem retracts" cannot be pretensioned.

**Table 3b · Type 3246 Mixing Valve · C<sub>v</sub> coefficients and permissible differential pressures · Pressures in psi**

Bench range (in psi) for actuators with effective diaphragm area		120 cm <sup>2</sup>	–	–	6...30 (18...30)	–	–	–	20...34	30...48			
		240 cm <sup>2</sup>	3...15	–		–	–	–	–	–			
		350 cm <sup>2</sup>		6...18		12...35	9...44 (26...44)	18...52	20...34 (26...34)	30...48 (39...48)			
		700 cm <sup>2</sup>		–		–	–	–	–	–			
Required supply pressure in psi		18	23	35 (47)	47	52 (70)	70	54 (61)	78 (87)				
NPS	C <sub>v</sub> mixing valve	Seat Ø in (mm)	Rated travel (mm)	Actuator cm <sup>2</sup>	Δp when p <sub>2</sub> = 0 psi								
½	2.3 · 5	0.94 (24)	0.59 (15)	120	–	–	75	–	–	–	425	580	
	¾			2.3 · 5 · 7.5	240	75	–	215	–	355	–	–	–
				1	2.3 · 5 7.5 · 12	350	139	344	344	580	548	580	580
1½ and 2	7.5 · 12 · 20	700			344	–	–	–	–	–	–	–	–
		120		–	–	–	–	–	–	–	247	393	
		350		75	197	197	442	319	580	580	580	580	
	30	700		197	–	–	–	–	–	–	–	–	
		120		–	–	–	–	–	–	–	–	158	257
		350		45	126	126	289	207	451	532	580	580	
2	47	1.89 (48)		700	126	–	–	–	–	–	–	–	–
				120	–	–	–	–	–	–	–	94	155
				350	23	74	74	175	125	278	329	508	508
3	30 and 47	1.89 (48)		700	74	–	(580)	–	(580)	–	–	–	–
				350	23	74	74	175	125	278	329	508	508
	70	2.48 (63)		700	74	–	(580)	–	(580)	–	–	–	–
			350	–	39	39	97	68	157	187	290	290	
	95	2.95 (75)	700	39	–	(335)	–	(512)	–	(526)	(580)	(580)	
			350	–	25	25	67	45	109	129	202	202	
700	25	–	(233)	–	(358)	–	(370)	547	547				
4	120	3.15 (80)	1.18 (30)	700	20	57	57	131	93	203	241	368	
	190	3.93 (100)			–	33	33	81	58	128	151	233	
6	230	4.33 (110)			–	28	28	65	46	104	125	193	
	350	5.12 (130)			–	17	17	46	32	74	87	136	

**Table 4a · Type 3246 Diverting Valve · C<sub>v</sub> coefficients and permissible differential pressures · Pressures in bar**

 Valves NPS 2½ to 6: Direction of flow AB ⇒ A with maximum C<sub>v</sub> and  
 AB ⇒ B with reduced C<sub>v</sub>

Bench range (in bar) for actuators with effective diaphragm area					120 cm <sup>2</sup>	–	–	0.4...2.0 (1.2...2.0)	–	–	–	1.4...2.3	2.1...3.3
					240 cm <sup>2</sup>	–	–		–	–	–	–	–
					350 cm <sup>2</sup>	0.2...1.0	0.4...1.2		0.8...2.4	0.6...3.0 (1.8...3.0)	1.2...3.6	1.4...2.3 (1.85...2.3)	2.1...3.3 (2.7...3.3)
					700 cm <sup>2</sup>								
Required supply pressure in bar					1.2	1.6	2.4 (3.2)	3.2	3.6 (4.8)	4.8	3.7 (4.2)	5.4 (6.0)	
NPS	C <sub>v</sub> diverting valve	Seat Ø in (mm)	Rated travel (mm)	Actuator cm <sup>2</sup>	Δp when p <sub>2</sub> = 0 bar								
½	2.3 · 5	0.94 (24)	0.59 (15)	120	–	–	5.2	–	–	–	29.3	40	
¾	2.3 · 5 · 7.5			240	5.2	–	14.8	–	24.5	–	–	–	
1	2.3 · 5 7.5 · 12			350	9.6	23.7	23.7	40	37.8	40	40	40	
				700	23.7	–	–	–	–	–	–	–	
1½ and 2	7.5 · 12 · 20	1.22 (31)		120	–	–	–	–	–	–	17	27.1	
				350	5.2	13.6	13.6	30.5	22.0	40	40	40	
	30	1.49 (38)		120	–	–	–	–	–	–	10.9	17.7	
				350	3.1	8.7	8.7	19.9	14.3	31.1	36.7	40	
2 and 3	47	1.89 (48)		700	8.7	–	–	–	–	–	–	–	
				120	–	–	–	–	–	–	6.5	10.7	
				350	1.6	5.1	5.1	12.1	8.6	19.2	22.7	35	
3	30 and 47	1.89 (48)		700	5.1	–	(40)	–	(40)	–	–	–	
			350	1.6	5.1	5.1	12.1	8.6	19.2	22.7	35		
	70	2.48 (63)	700	5.1	–	(40)	–	(40)	–	–	–		
			350	–	2.7	2.7	6.7	4.7	10.8	12.9	20		
	95/70	2.95/2.48 (75/63)	700	2.7	–	(23.1)	–	(35.3)	–	(36.3)	(40)		
			350	–	1.7	1.7	4.6	3.1	7.5	8.9	13.9		
700	1.7	–	(16.1)	–	(24.7)	–	(25.5)	(37.7)					
4	120	3.15 (80)	1.18 (30)	700	1.4	3.9	3.9	9.0	6.4	14	16.6	25.4	
	190/120	3.93/3.15 (100/80)			–	2.3	2.3	5.6	4.0	8.8	10.4	16.1	
6	230	4.33 (110)			–	1.9	1.9	4.5	3.2	7.2	8.6	13.3	
					–	1.2	1.2	3.2	2.2	5.1	6.0	9.4	

**Table 4b · Type 3246 Diverting Valve · C<sub>v</sub> coefficients and permissible differential pressures · Pressures in psi**

Valves NPS 2½ to 6: Direction of flow AB ⇒ A with maximum C<sub>v</sub> and  
AB ⇒ B with reduced C<sub>v</sub>

				120 cm <sup>2</sup>	–	–	6...30 (18...30)	–	–	–	20...34	30...48	
Bench range (in psi) for actuators with effective diaphragm area				240 cm <sup>2</sup>	3...15	–		12...35	–	9...44 (26...44)	–	–	–
				350 cm <sup>2</sup>		6...18			18...52		20...34 (26...34)	30...48 (39...48)	
				700 cm <sup>2</sup>									
Required supply pressure in psi				18	23	35 (47)	47	52 (70)	70	54 (61)	78 (87)		
NPS	C <sub>v</sub> diverting valve	Seat Ø in (mm)	Rated travel (mm)	Actuator cm <sup>2</sup>	Δp when p <sub>2</sub> = 0 psi								
½	2.3 · 5	0.94 (24)	0.59 (15)	120	–	–	75	–	–	–	425	580	
	¾				2.3 · 5 · 7.5	240	75	–	215	–	355	–	–
1	2.3 · 5 7.5 · 12	1.22 (31)		350	139	344	344	580	548	580	580	580	580
				700	344	–	–	–	–	–	–	–	–
1½ and 2	7.5 · 12 · 20	1.49 (38)		120	–	–	–	–	–	–	–	247	393
				350	75	197	197	442	319	580	580	580	580
	30	120		–	–	–	–	–	–	–	–	158	257
		350		45	126	126	289	207	451	532	580	580	
2 and 3	47	1.89 (48)		700	126	–	–	–	–	–	–	–	–
				120	–	–	–	–	–	–	–	94	155
				350	23	74	74	175	125	278	329	508	508
3	30 and 47	2.48 (63)		700	74	–	(580)	–	(580)	–	–	–	–
				350	23	74	74	175	125	278	329	508	508
	70	350		–	39	39	97	68	157	187	290	290	
		700		39	–	(335)	–	(512)	–	(526)	(580)	(580)	
	95/70	2.95/2.48 (75/63)	350	–	25	25	67	45	109	129	202	202	
			700	25	–	(233)	–	(358)	–	(370)	547	547	
4	120	3.15 (80)	1.18" (30)	700	20	57	57	131	93	203	241	368	
	190/120	3.93/3.15 (100/80)			–	33	33	81	58	128	151	233	
6	230	4.33 (110)			–	28	28	65	46	104	125	193	
					350/230	5.12/4.33 (130/110)	–	17	17	46	32	74	87

**Table 5 · Dimensions (inches, mm) and weights for Type 3246 Three-way Valve with long insulating section and circulation inhibitor**

Valve	NPS		½	¾	1	1½	2	3	4	6
Length L	Class 150	in	7.25	7.25	7.25	8.75	10.0	11.75	13.87	17.75
		mm	184	184	184	222	254	298	352	451
	Class 300	in	7.50	7.62	7.75	9.25	10.50	12.50	14.50	18.62
		mm	190	194	197	235	267	318	368	473
H2	Class 150	in	3.62	3.62	3.62	4.37	5.0	5.87	6.93	8.88
		mm	92	92	92	111	127	149	176	225.5
	Class 300	in	3.76	3.82	3.88	4.63	5.26	6.26	7.24	9.31
			95	97	98.5	117.5	133.5	159	184	236.5
H4	Class 150	in	24					27		33
		mm	610					686		838
H5		in	29.13					31.30	33.66	32.29
		mm	740					795	855	998
H8		in	6.30						9.06	
		mm	160						230	
Cover plate	∅ d	in	5.98						7.99	10.0
		mm	152						203	254
	h	in	1.57						1.57	
		mm	40						40	
Weight, approx.	lbs		33			44	53	100	190	444
	kg		15			20	24	45	86	201



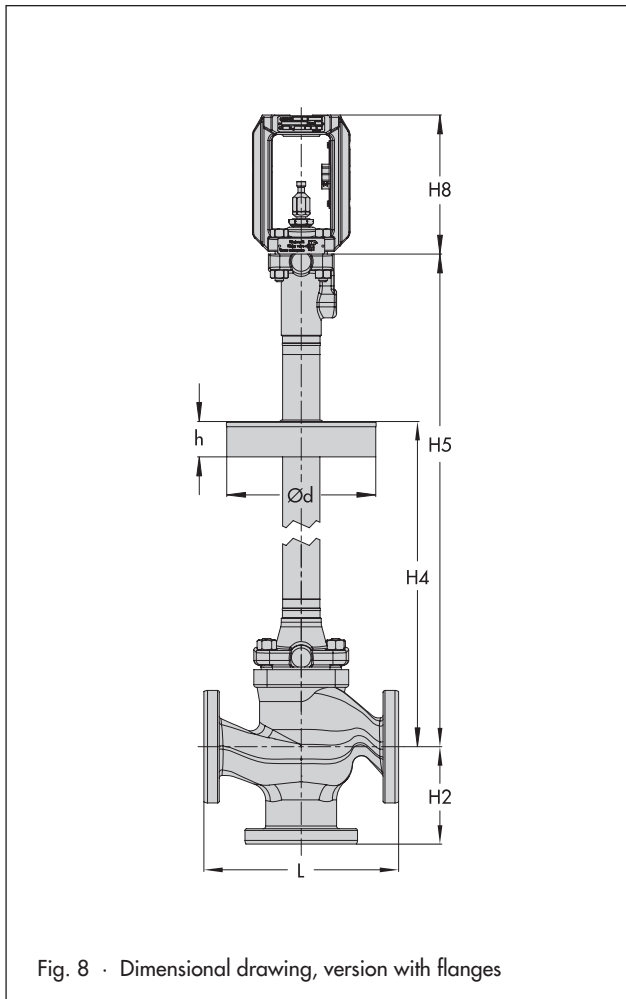


Fig. 8 · Dimensional drawing, version with flanges

**Ordering text**

Mixing or flow-diverting valve	Type 3246
Nominal size	NPS ...
Pressure rating	ANSI Class ...
Pneumatic actuator	Type 3271 or Type 3277
Fail-safe action	Actuator stem extends or actuator stem retracts
Process medium and density	in lb/cu.ft or kg/m <sup>3</sup> and temperature in °C (°F)
Flow rate in	kg/h or cu. ft/min in standard or operating state
Upstream pressure	p <sub>1</sub> in bar or psi (absolute pressure p <sub>abs</sub> )
Downstream pressure	p <sub>2</sub> in bar or psi (absolute pressure p <sub>abs</sub> ) at minimum, standard and maximum flow rate
Accessories	Positioner and/or limit switch

Specifications subject to change without notice.



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