

Application

Control valve for industrial high-pressure plants according to IG standard

Valve sizes	DN 16 to 90
Nominal pressure	PN 325
Temperature range	-10 to +450 °C



Type 3259 Angle Valve with

- Type 3271 Pneumatic Actuator (Type 3259-1 Control Valve)
- Type 3277 Pneumatic Actuator (Type 3259-7 Control Valve) for integral positioner attachment

The valve body is made of forged stainless steel. The end connections are designed as screwed flanges with lens ring gaskets.

Valve plug

- Metal seal
- High-performance metal seal

The control valves, designed according to the modular assembly principle, can be equipped with various accessories: Positioners, limit switches, solenoid valves and other accessories according to IEC 60534-6 and NAMUR recommendation (see Information Sheet ► T 8350 for more details).

Versions

Standard version with spring-loaded double packing for temperatures from -10 to +220 °C; nominal sizes DN 16, 24, 30, 45, 58, 70 and 90 · Nominal pressure PN 325.

Body made of 1.4571 (RA4) with intermediate flanges made of 1.7218 (K2), end connections as screwed flanges with lens ring gaskets

- **Type 3259-1** (Fig. 1) · Type 3259 Valve and Type 3271 Actuator with 350 to 2800 cm² actuator area (see Data Sheets ► T 8310-1 and ► T 8310-2)
- **Type 3259-7** · Type 3259 Valve and Type 3277 Pneumatic Actuator with 350 to 700 cm² actuator area, for integral positioner attachment (see Data Sheet ► T 8310-1)

Further versions

- **Adjustable high-temperature packing** · For temperatures between -10 and +350 °C
- **Insulating section** · For temperatures from -10 to +450 °C (see Fig. 4 for pressures and temperatures)
- **Heating jacket** · On request
- **Bellows seal** · Material 2.4819 with additional back-up packing and test connection



Fig. 1: Type 3259-1 Control Valve, DN 70, PN 325 according to the IG standard, with pneumatic actuator (2800 cm²)

- **Nominal sizes DN 6 and 10** · As Type 3510 Micro-flow Valve

Principle of operation

The medium normally flows through the valve in the flow-to-open direction. The valve plug position determines the free area between the valve seat and the plug. The plug stem is sealed by a spring-loaded double PTFE packing.

A metal bellows seal (Fig. 3) can be used to meet stricter emission requirements.

A test connection is available for both valve versions.

The actuators are designed for pressure applied from either side (see Table 4.2 and Table 5.2)

Fail-safe position

Depending on how the springs are arranged in the pneumatic actuator (see Data Sheets ► T 8310-1 and ► T 8310-2), the valve has two different fail-safe positions effective upon air supply failure.

- **Actuator stem extends (fail-close)**
The valve closes when the supply air fails.
- **Actuator stem retracts (fail-open)**
The valve opens when the supply air fails.

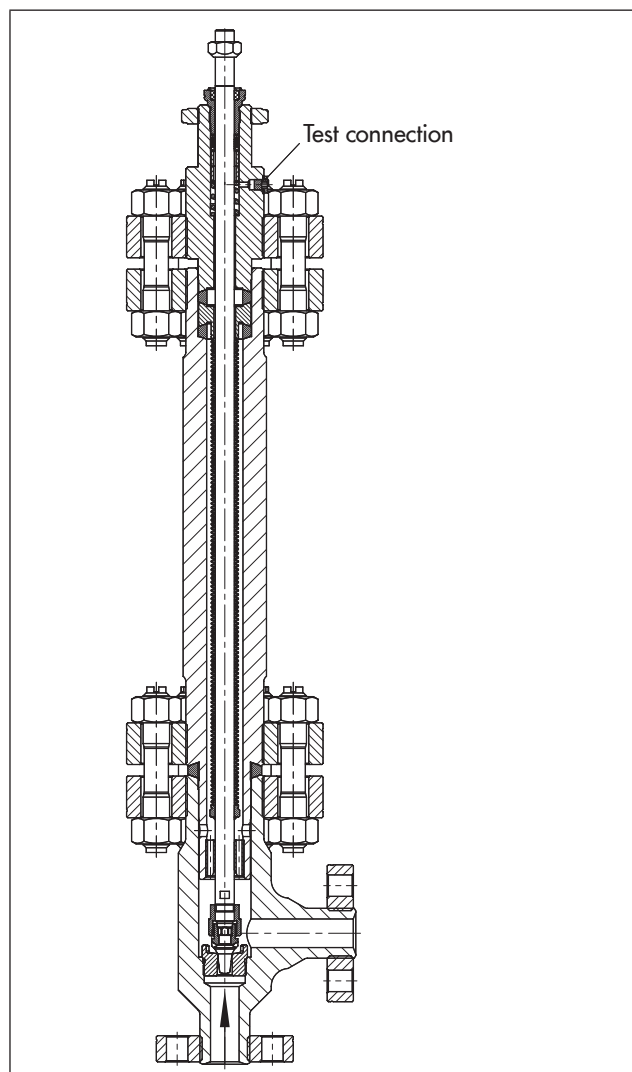
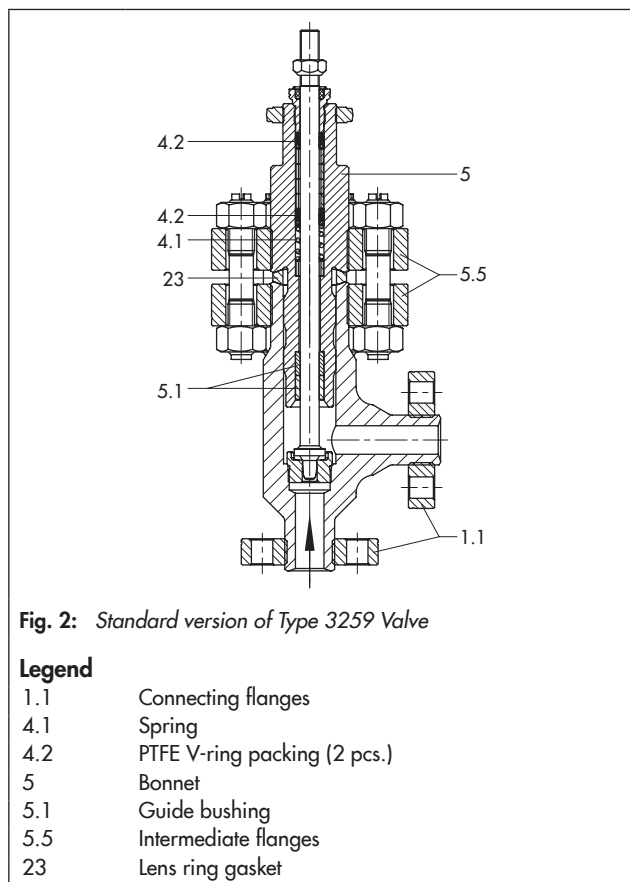


Fig. 3: Type 3259 Valve with bellows seal and test connection

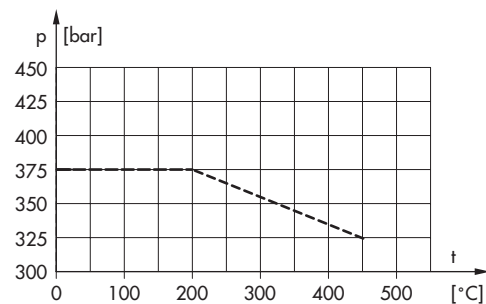


Fig. 4: Pressure-temperature diagram for material 1.4571 (RA4)

Table 1: Technical data

Nominal size	DN	16 · 24 · 30 · 45 · 58 · 70 · 90
Nominal pressure	PN	325
Type of connection	Screwed flanges with lens ring gaskets according to the IG standard	
Seat-plug seal	Metal seal or high-performance metal seal	
Characteristic	Equal percentage or linear	
Rangeability	50:1 for $K_{VS} \geq 1$ · 30:1 for $K_{VS} < 1$	
Compliance	CE · EAC	
Temperature ranges in °C · Permissible operating pressures according to pressure-temperature diagram		
Body without insulating section with	PTFE packing	-10 to +220 °C
	High-temperature packing	-10 to +350 °C
Body with	Insulating section	-10 to +450 °C
	Bellows seal	-10 to +450 °C
Leakage class according to IEC 60534-4		
Valve plug	Metal seal	IV · High-performance metal seal: V

Table 2: Materials

Standard version	1.4571 (RA4)/1.0460 (S2)
Body	
Flanges	1.7218 (K2)
Bolts	1.7218 (K2)
Seat and plug	1.4404 Seat: 1.4404 with Stellite® facing · Plug: Stellite® 6 1.4112 hardened
Guide bushing	2.4610/1.4112
Packing	V-ring packing, PTFE-carbon compound
Body gasket	Lens ring gaskets 1.4571/1.0460
Insulating section	1.4571 (RA4)/1.0460 (S2)
Metal bellows seal	
Intermediate piece	1.4571 (RA4)/1.0460 (S2)
Metal bellows	2.4819

Table 3: K_{VS} coefficients

Table 3.1: Overview · Dimensions in mm

K_{VS}	0.1 · 0.16 0.25 · 0.4	0.63	1.0	1.6	2.5	4	6.3	10	16	25	40	63	100
Seat Ø	6		12			24			31	38	50	63	80
Rated travel	15										30		

Table 3.2: Versions

K_{VS}	0.1 · 0.16 0.25 · 0.4	0.63	1.0	1.6	2.5	4	6.3	10	16	25	40	63	100
DN													
16	•	•	•	•	•	•							
24	•	•	•	•	•	•	•	•					
30	•	•	•	•	•	•	•	•					
45				•	•	•	•	•	•	•			
58						•	•	•	•	•			
70									•	•	•	•	
90									•	•	•	•	•

Table 4: Actuator sizing for Type 3259 Valve without bellows seal**Table 4.1:** Fail-safe position "actuator stem extends" (FA)

DN	K _{vs}	Actuator [cm ²]	Bench range [bar] for			
			Δp = 50 bar	Δp = 100 bar	Δp = 200 bar	Δp = 325 bar
16	0.1 to 1.0	350	0.4 to 1.2	0.8 to 2.4	1.4 to 2.3	2.1 to 3.3
		700	–	–	0.8 to 1.2	1.6 to 2.4
	1.6 to 2.5	350	0.4 to 1.2	0.8 to 2.4	1.4 to 2.3	2.1 to 3.3
		700	–	0.8 to 1.2	0.8 to 1.2	1.6 to 2.4
		1400	–	–	–	1.0 to 1.2
16 to 58	4.0 to 10	350	0.8 to 2.4	2.1 to 3.3	–	–
		700	–	1.6 to 2.4	1.6 to 2.4	2.7 to 3.3
		1400	–	–	1.0 to 1.2	2.0 to 2.4
45 to 90	16	350	1.4 to 2.3	–	–	–
		700	0.8 to 1.2	1.6 to 2.4	2.7 to 3.3	–
		1400	–	1.0 to 1.2	2.0 to 2.4	2.0 to 2.4
	25	350	2.1 to 3.3	–	–	–
		700	1.6 to 2.4	2.7 to 3.3	–	–
		1400	–	1.0 to 1.2	2.0 to 2.4	2.8 to 3.2
		2800	–	–	–	2.2... 2.4
70 to 90	40	700	2.1 to 3.3	–	–	–
		1400	0.8 to 1.2	1.6 to 2.4	–	–
		2800	–	–	2.0 to 2.4	3.0 to 3.6
	63	700	2.6 to 4.3	–	–	–
		1400	1.6 to 2.4	–	–	–
		2800	–	2.0 to 2.4	2.5 to 3.0	–
		2x2800	–	–	–	2.0 to 2.4
90	100	1400	2.0 to 3.0	–	–	–
		2800	1.0 to 1.2	2.0 to 2.4	–	–
		2x2800	–	–	2.0 to 2.4	–

Table 4.2: Fail-safe position "actuator stem retracts" (FE)

DN	K _{vs}	Actuator [cm ²]	Bench range	Required supply pressure [bar] for			
				Δp = 50 bar	Δp = 100 bar	Δp = 200 bar	Δp = 325 bar
16	0.1 to 1.0	350	0.2 to 1.0	1.5	1.8	2.4	3.1
		700		–	–	1.4	1.8
16	1.6 to 2.5	350	0.2 to 1.0	1.5	1.8	–	–
		700		–	–	1.4	1.8
16 to 58	4.0 to 10	350	0.2 to 1.0	1.9	2.5	–	–
		700		1.1	1.5	2.1	2.9
		1400	0.4 to 2.0	–	–	1.7	2.0
45 to 90	16	350	0.2 to 1.0	2.2	–	–	–
		700		1.4	1.9	2.0	–
		1400	0.4 to 2.0	–	1.5	2.1	2.8
	25	350	0.2 to 1.0	2.8	–	–	–
		700		1.6	2.5	–	–
		1400	0.4 to 2.0	–	1.8	2.6	3.7
70 to 90	40	700	0.2 to 1.0	2.6	–	–	–
		1400		2.0	2.2	–	–
		2800	0.4 to 2.0	–	1.7	2.4	3.3
	63	700	0.2 to 1.0	3.5	–	–	–
		1400		2.1	3.1	–	–
		2800	0.4 to 2.0	–	2.1	3.2	–
		2x2800	–	–	2.1	2.8	
90	100	1400	0.2 to 1.0	2.6	–	–	–
		2800	0.4 to 2.0	2.0	2.8	–	–
		2x2800		–	1.9	2.8	–

Table 5: Actuator sizing for Type 3259 Valve with bellows seal

Table 5.1: Fail-safe action "actuator stem extends" (FA)

DN	K _{vs}	Actuator [cm ²]	Bench range for			
			Δp = 50 bar	Δp = 100 bar	Δp = 200 bar	Δp = 325 bar
16	0.1 to 1.0	350	0.8 to 2.4	1.4 to 2.3	–	–
		700	–	–	1.6 to 2.4	2.4 to 3.6
	1.6 to 2.5	350	0.8 to 2.4	1.4 to 2.3	–	–
		700	–	–	1.6 to 2.4	2.4 to 3.6
16 to 58	4.0 to 10	350	1.4 to 2.3	2.1 to 3.3	–	–
		700	–	1.6 to 2.4	1.6 to 2.4	2.7 to 3.3
		1400	–	–	1.0 to 1.2	2.0 to 2.4
45 to 90	16	350	2.1 to 3.3	–	–	–
		700	–	2.7 to 3.3	–	–
		1400	–	–	2.0 to 2.4	2.0 to 2.4
	25	350	2.1 to 3.3	–	–	–
		700	1.6 to 2.4	2.7 to 3.3	–	–
		1400	–	1.0 to 1.2	2.0 to 2.4	–
70 to 90	40	700	2.1 to 3.3	–	–	–
		1400	1.0 to 1.2	2.0 to 3.0	–	–
		2800	–	1.0 to 1.2	2.0 to 2.4	3.0 to 3.8
	63	700	2.6 to 4.3	–	–	–
		1400	2.0 to 2.4	–	–	–
		2800	–	2.0 to 2.4	3.0 to 3.6	–
		2x2800	–	–	2.0 to 2.4	2.5 to 3.0
90	100	1400	2.5 to 3.0	–	–	–
		2800	2.0 to 2.4	2.5 to 3.0	3.0 to 3.8	–
		2x2800	–	–	–	–

Table 5.2: Fail-safe position "actuator stem retracts" (FE)

DN	K _{vs}	Actuator [cm ²]	Bench range	Required supply pressure [bar] for			
				Δp = 50 bar	Δp = 100 bar	Δp = 200 bar	Δp = 325 bar
16	0.1 to 1.0	350	0.2 to 1.0	1.9	2.5	–	–
		700		–	–	1.9	2.6
	1.6 to 2.5	350	0.2 to 1.0	1.9	2.5	–	–
		700		–	1.5	1.9	2.6
16 to 58	4.0 to 10	350	0.2 to 1.0	2.1	2.7	–	–
		700		–	1.5	2.2	3.0
		1400	0.4 to 2.0	–	–	1.5	2.1
45 to 90	16	350	0.2 to 1.0	2.5	–	–	–
		700		–	2.0	3.0	–
		1400	0.4 to 2.0	–	1.6	2.1	2.8
	25	350	0.2 to 1.0	3.0	–	–	–
		700		1.7	2.5	–	–
		1400	0.4 to 2.0	–	1.8	2.7	3.7
70 to 90	40	700	0.2 to 1.0	2.7	–	–	–
		1400		2.0	2.7	–	–
		2800	0.4 to 2.0	–	1.7	2.4	3.3
	63	700	0.2 to 1.0	3.6	–	–	–
		1400		2.4	3.5	–	–
		2800	0.4 to 2.0	–	2.1	3.3	–
		2x2800	–	–	2.1	2.8	
90	100	1400	0.2 to 1.0	3.0	–	–	–
		2800	0.4 to 2.0	2.9	2.8	–	–
		2x2800		–	2.0	2.8	–

Table 6: Dimensions in mm for standard versions of Type 3259-1 and Type 3259-7

Table 6.1: Type 3259 Valve

Valve	DN	16	24	30	45	58	70	90
Length L		95	110	120	150	170	200	235
H1 for actuator	350 cm ²	470	470	470	560	560	-	
	355v2 cm ²	470	470	470	560	560	-	
	700 cm ²	470	470	470	560	560	820	820
	750v2 cm ²	470	470	470	560	560	820	820
	1000 cm ² 1400-60 cm ²	525	525	525	615	615	820	820
	1400-120 cm ² 2800 cm ²	-			800	800	905	905
	2 x 2800 cm ²	-					905	905

Table 6.2: Types 3271 and 3277 Pneumatic Actuators

Actuator area	cm ²	350	355v2	700	750v2	1000	1400-60	1400-120	2800	2 x 2800
Diaphragm ØD	mm	280	280	390	394	462	530	534	770	770
H ¹⁾	mm	82	121	199	236	403	333	490 ³⁾ / 580 ⁴⁾	630 ³⁾ / 695 ⁴⁾	1130 ³⁾ / 1195 ⁴⁾
H3 ²⁾	mm	110	110	190	190	610	610	650	650	650
H5	Type 3277 mm	101	101	101	101	-	-	-	-	-
Thread	Type 3271	M30 x 1.5				M60 x 1.5		M100 x 2		
	Type 3277	M30 x 1.5				-	-	-	-	-
α	Type 3271	G 3/8 (3/8 NPT)	G 3/8 (3/8 NPT)	G 3/8 (3/8 NPT)	G 3/8 (3/8 NPT)	G 3/4 (3/4 NPT)	G 3/4 (3/4 NPT)	G 1 (1 NPT)	G 1 (1 NPT)	G 1 (1 NPT)
α2	Type 3277	G 3/8	G 3/8	G 3/8	G 3/8	-	-	-	-	-

- 1) Height with welded-on lifting eyelet or height of eyebolt according to DIN 580. Height of the swivel lifting hook may differ. Actuators up to 355v2 cm² without lifting eyelet
 2) Minimum clearance required to remove the actuator
 3) Height for version with welded-on lifting eyelet (material EN-JS1030)
 4) Height for version with female thread (material 1.5638/A352 LC3)

Table 7: Weights for standard version of Type 3259-1 and Type 3259-7

Valve	DN	16	24	30	45	58	70	90
Valve without actuator (approx. kg)		35	40	45	85 ¹⁾	90 ¹⁾	220 ¹⁾	230 ¹⁾

1) The weight of the valve with a 2800 cm² or 2 x 2800 cm² actuator increases by 30 kg.

Actuator	cm ²	350	355v2	700	750v2	1000	1400-60	1400-120	2800	2 x 2800
Type 3271 (approx. kg)	Without handwheel	8	15	22	22	85	70	175	450	950
	With handwheel	13	20	27	27	190	Only with side-mounted handwheel, see Data Sheets ▶ T 8310-2, ▶ T 8310-3, and ▶ T 8312			
Type 3277 (approx. kg)	Without handwheel	12	19	26	26	-				
	With handwheel	17	24	31	31					

Table 8: Dimensions and weights for Type 3259 with insulating section · Without actuator

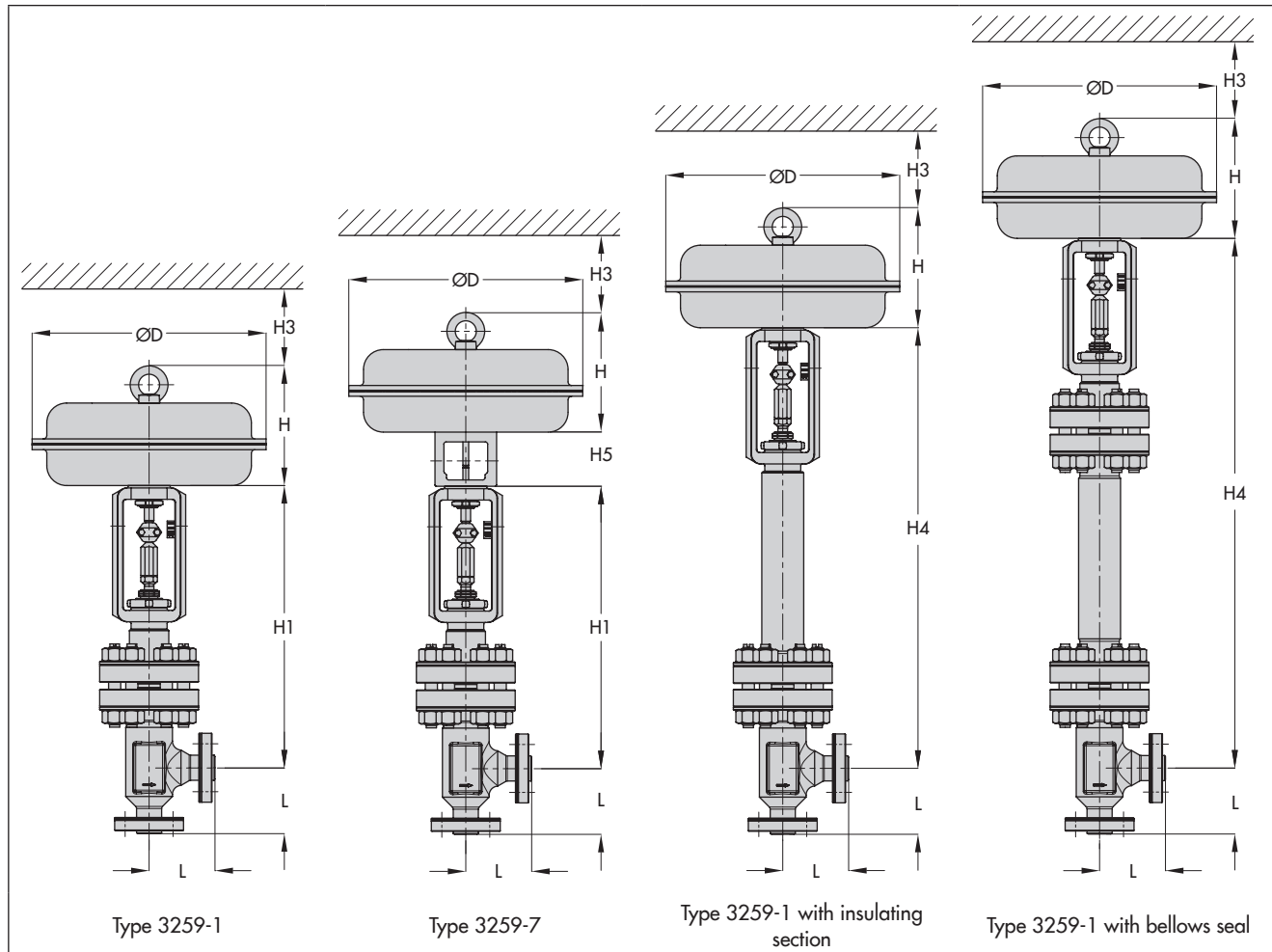
Nominal size	DN	16	24	30	45	58	70	90
H4 for actuator	350 cm ²	735	735	735	810	810	–	
	355v2 cm ²	735	735	735	810	810	–	
	700 cm ²	735	735	735	810	810	1175	1175
	750v2 cm ²	735	735	735	810	810	1175	1175
	1000 cm ² 1400-60 cm ²	790	790	790	865	865	1175	1175
	1400-120 cm ² 2800 cm ²	–			1050	1050	1260	1260
	2 x 2800 cm ²	–					1260	1260
Weight without actuator	kg	45	48	53	100 ¹⁾	105 ¹⁾	295 ¹⁾	305 ¹⁾

¹⁾ The weight of the valve with a 2800 cm² or 2 x 2800 cm² actuator increases by 30 kg.

Table 9: Dimensions and weights for Type 3259 with bellows seal · Without actuator

Nominal size	DN	16	24	30	45	58	70	90
H4 for actuator	350 cm ²	885	885	885	875	875	–	
	355v2 cm ²	885	885	885	875	875	–	
	700 cm ²	885	885	885	875	875	1485	1485
	750v2 cm ²	885	885	885	875	875	1485	1485
	1000 cm ² 1400-60 cm ²	940	940	940	930	930	1485	1485
	1400-120 cm ² 2800 cm ²	–			1115	1115	1570	1570
	2 x 2800 cm ²	–					1570	1570
Weight	On request							

Dimensional drawings



Selection and sizing of the control valve

1. Calculate K_v coefficient according to IEC 60534-6
2. Select nominal size DN and K_{VS} coefficient from Table 3, Table 4 and Table 5.
3. Determine the permissible differential pressure Δp from Table 4 and Table 5.
4. Select accessories from Table 1 and Table 2.

Order specifications:

Nominal size	DN
Direction of flow	Flow-to-open or flow-to-close design
Plug	Metal seal or high-performance metal seal
Characteristic	Equal percentage or linear
Actuator	Type 3271 or Type 3277 (see Data Sheets ▶ T 8310-1 or ▶ T 8310-2)
Fail-safe position	Fail-close or fail-open
Process medium	Density in kg/m^3 and temperature in $^{\circ}\text{C}$
Flow rate	kg/h or m^3/h in standard or operating state
Pressure	p_1 and p_2 in bar (absolute pressure p_{abs}) (with minimum, normal and maximum flow rate)
Valve accessories	Positioner and/or limit switch

Specifications subject to change without notice



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