

Application

Control valve for viscous, corrosive and abrasive fluids conforming to DIN, BS or ANSI standards

Valve sizes	DN 15 to 150	• NPS ½ to 6
Maximum pressure	16 bar	• 230 psi
Temperature range	0 to 160 °C	• 32 to 320 °F

**Type 3345 Diaphragm Valve with**

- Type 3271 Pneumatic Actuator (Type 3345-1 Control Valve)
- Type 3277 Pneumatic Actuator (Type 3345-7 Control Valve) for integral positioner attachment
- Various lining materials (optional), allowing the valve to be used with numerous different types of process media (see Table 2)

Versions

Standard version · Type 3345 Diaphragm Valve, DN 15 to 150 (NPS ½ to 6), maximum pressure 16 bar (230 psi), body made of cast iron, elastomer diaphragm (butyl 300) for temperatures ranging from 0 to 130 °C (32 to 266 °F), DIN flanges

- **Type 3345-1** (Fig. 1, Fig. 2) · Diaphragm valve with Type 3271 Actuator (see Data Sheets ▶ T 8310-1 and ▶ T 8310-2)
- **Type 3345-7** (Fig. 3) · Diaphragm valve with Type 3277 Actuator (see Data Sheet ▶ T 8310-1)

Further versions

- Valve body made of
 - Cast iron (without or with lining)
 - Spheroidal graphite iron (without or with lining)
 - Stainless steel (not with lining)
- Valves with flanges conforming to ANSI or British Standard
- For the pharmaceutical and food processing industries **in corrosion-resistant bar stock or forged material**
 - With welding ends for pipes according to DIN 11850, DIN 11866, DIN EN ISO 1127, ISO 2037, BS 4825, ASTM A270 (O.D.), SMS 3008
 - Clamp connections according to DIN 32676, ISO 2852, BS 4825, DIN 11864-3 Form A
 - Threaded connections according to DIN 11887, ISO 2853 (IDF), SMS 1146, DIN 11864-1 Form A
 - Aseptic flanges according to DIN 11864-2 Form A, flanges according to DIN EN 1092-2
- **With Type 3274 Electrohydraulic Actuator**
- **Other diaphragm materials** · On request



Fig. 1: Type 3345-1 Diaphragm Valve, DN 100



Fig. 2: Type 3345-1 Diaphragm Valve, DN 50, version for the pharmaceutical and food processing industries



Fig. 3: Type 3345-7 Diaphragm Valve, DN 15 or 20, version for the pharmaceutical and food processing industries

Principle of operation

The valve diaphragm acts as a valve plug. The flow rate depends on the free cross-section between the diaphragm and the bottom part of the valve body.

The actuator stem is fitted with stoppers which limit the force to protect the diaphragm.

Valves used in the pharmaceutical and food processing industries must be mounted at a certain angle due to the inside construction of the valve (see Fig. 5). This ensures that the process medium can flow out of the valve easily and drain completely (see Fig. 6). Refer to ► EB 8031 for further details.

Fail-safe position

Depending on how the compression springs are arranged in the pneumatic actuator, the valve has two 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.

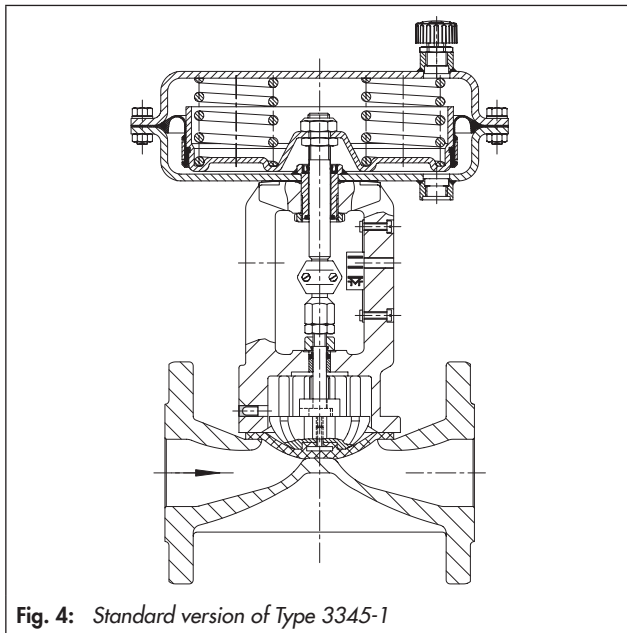


Fig. 4: Standard version of Type 3345-1

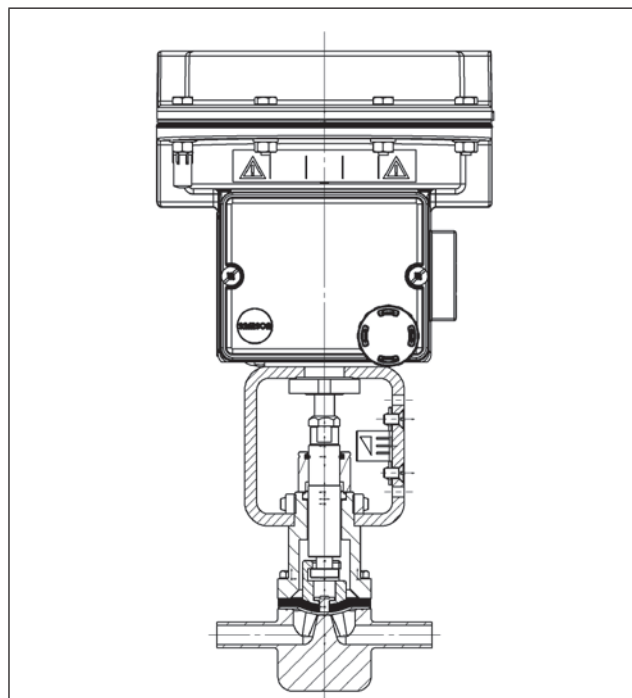


Fig. 5: Type 3345-7, version for the pharmaceutical and food processing industries in DN 15 or 20 with Type 3277 Actuator

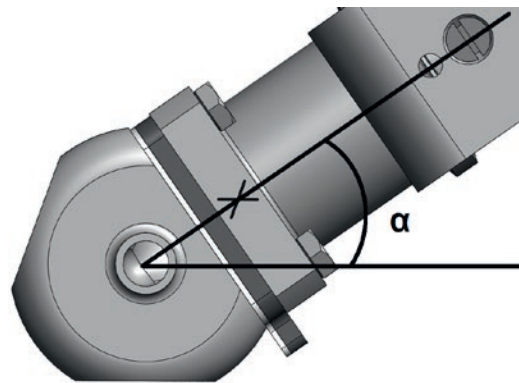


Fig. 6: Mounting position for self-draining of food processing valves

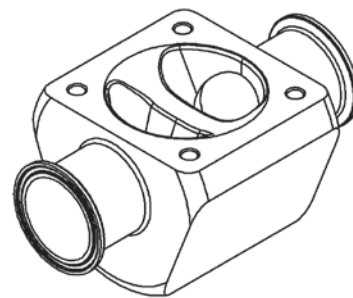


Fig. 7: Valve body of Type 3345, stainless steel with clamp connections

Pressure-temperature diagram

- Line 1
DN 15 to 50 – Elastomer diaphragm
- Line 2
DN 15 to 125 – PTFE diaphragm
DN 65 to 150 – Elastomer diaphragm
- Line 3
DN 150 – PTFE diaphragm

The operating pressures are restricted by the temperature ranges listed in Table 3.

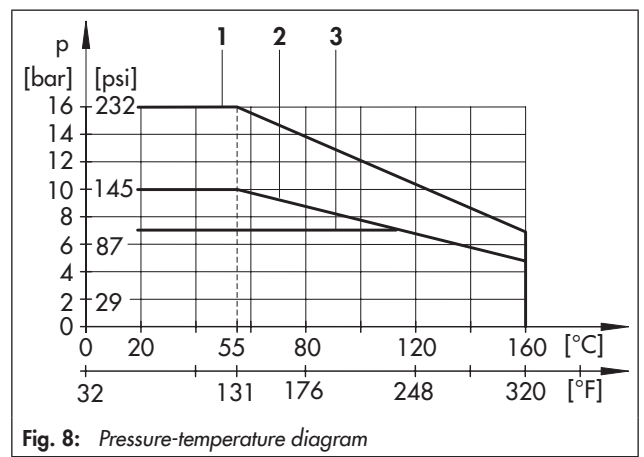


Table 1: Technical data

Version	DIN	ANSI/BS
Valve size	DN 15 to 150	NPS ½ to 6
Connection	Flanges	PN 10/16
	Face-to-face dimensions	EN 558-1, Series 1
Special version for the pharmaceutical and food processing industries in DN 15 to 150	Threaded connections	DIN 11887 · ISO 2853 (IDF) · SMS 1146 · DIN 11864-1 Form A
	Clamp connections	DIN 32676 · ISO 2852 · BS 4825 Part 3 · DIN 11864-3 Form A
	Welding ends	For pipes according to: DIN 11850 · DIN 11866 · DIN EN ISO 1127 ISO 2037 · BS 4825 · ASTM A270 (O.D.) · SMS 3008
	Aseptic flanges	DIN 11864-2 Form A · DIN EN 1092-2
Maximum pressure	DN 15 to 50	16 bar
	DN 65 to 150	10 bar
Temperature range for standard version (see Table 3)	-30 to +130 °C	-22 to +266 °F
Characteristic	Linear	
Rangeability	30 : 1	
Leakage class according to ANSI/FCI 70-2 or IEC 60534-4	VI	
Compliance		

Table 2: Materials

Standard version	DN 15 to 150 (NPS ½ to 6)				
Body	DIN	Cast iron EN-GJL-250 (EN-JL1040)	Spheroidal graphite iron EN-GJS-400-18-LT (EN-JS1049)	1.4408	1.4404/ 1.4435
	ANSI/ASTM	A126B	A395	A351 CF8M	F316L
	BS	Grade 250	Grade 420/12	Grade 316 C 16	Grade 316L A182
Optional lining ¹⁾		Butyl/ebonite/enamel	ETFE/butyl	–	–
Compressor	DIN	Aluminum/EN-GJL-250 (EN-JL1040)		Stainless steel	
	ANSI/ASTM	Aluminum/A126B			
	BS	Aluminum/Grade 250			
Valve bonnet	DIN	EN-GJL-250 (EN-JL1040)		1.4404	
	ANSI/ASTM	A126B		A351 CF8M	
	BS	Grade 250/220		Grade 316L	
Yoke	DIN	EN-GJL-250 (EN-JL1040)/EN-JL1030		1.4301/1.4581	
	ANSI/ASTM	A126B		304/ –	
	BS	Grade 250/220		304S/318C	
Bushing		POM		PTFE/stainless steel	
Diaphragm		See Table 3			

¹⁾ Other lining materials on request

Table 3: Temperature ranges, operating pressures and certification for diaphragms

Diaphragm material	Medium temperature	P _{max} for valve size			Certificates	
		DN 15 to 50 NPS ½ to 2	DN 65 to 125 NPS 2½ to 5	DN 150 NPS 6	FDA	USP Class VI
Butyl 300, black	0 to 130 °C 32 to 266 °F	16 bar 230 psi	10 bar 145 psi	10 bar 145 psi	•	•
425 EPM	0 to 140 °C 32 to 284 °F	16 bar 230 psi	10 bar 145 psi	10 bar 145 psi	•	•
214 S/425 PTFE/EPM (for steam)	0 to 160 °C 32 to 320 °F	10 bar 145 psi	10 bar 145 psi	7 bar 101.5 psi	•	•
214/425 PTFE/EPM	0 to 160 °C 32 to 320 °F	10 bar 145 psi	10 bar 145 psi	7 bar 101.5 psi	•	•
AA natural rubber	0 to 100 °C 32 to 212 °F	16 bar 230 psi	10 bar 145 psi	10 bar 145 psi	-	-
237 Hypalon®	0 to 100 °C 32 to 212 °F	16 bar 230 psi	10 bar 145 psi	10 bar 145 psi	-	-
226 FKM	0 to 150 °C 32 to 302 °F	16 bar 230 psi	10 bar 145 psi	10 bar 145 psi	-	-
214/226 PTFE/FKM	0 to 175 °C 32 to 347 °F	10 bar 145 psi	10 bar 145 psi	7 bar 101.5 psi	-	-

Table 4: K_{Vs} and C_v coefficients and associated nominal sizes

Table 4.1: Valves in standard version · Body made of cast iron or spheroidal graphite iron

K _{Vs}	3.5	7.5	15	27	36	57	80	100	120	140	190	215	310	410
C _v	4	9	17	31	42	66	93	116	139	162	220	249	358	474
Rated travel [mm]	6	7.5	10	10	15	15	22	25	22	25	22	25	60	60
DN	NPS													
15	½	•												
20	¾		•											
25	1			•										
32	1¼				•									
40	1½					•								
50	2						•							
65	2½							•	•					
80	3									•	•			
100	4										•	•		
125	5												•	
150	6													•

Table 4.2: Version with enamel lining

K _{Vs}	3.0	7.0	14	25	33	52	72	90	108	125	170	195	280	370
C _v	3.5	8	16	29	38	60	83	104	125	145	197	225	324	428
Rated travel [mm]	6	7.5	10	10	15	15	22	25	22	25	22	25	60	60
DN	NPS													
15	½	•												
20	¾		•											
25	1			•										
32	1¼				•									
40	1½					•								
50	2						•							
65	2½							•	•					
80	3									•	•			
100	4										•	•		
125	5												•	
150	6													•

Table 4.3: Version with polymer lining (ETFE/ebonite)

K _{Vs}		4	10	15	26	40	55	70	95	110	150	170	330
C _v		4.6	12	17	30	46	64	81	110	127	173	197	382
Rated travel [mm]		7.5	10	10	15	15	22	25	22	25	22	25	60
DN	NPS												
20	¾	•											
25	1		•										
32	1¼			•									
40	1½				•								
50	2					•							
65	2½						•	•					
80	3								•	•			
100	4										•	•	
125	5												
150	6												•

Table 4.4: Version with elastomer lining (butyl)

K _{Vs}		6	12	22	29	45	65	80	95	110	150	170	250	330
C _v		7	14	25	34	52	75	93	110	127	173	197	289	382
Rated travel [mm]		7.5	10	10	15	15	22	25	22	25	22	25	60	60
DN	NPS													
20	¾	•												
25	1		•											
32	1¼			•										
40	1½				•									
50	2					•								
65	2½						•	•						
80	3								•	•				
100	4										•	•		
125	5												•	
150	6													•

Table 4.5: Valve version for the pharmaceutical and food processing industries · Body made of corrosion-resistant bar stock or forged material

K _{Vs}		2	3.5	4	5.5	7	8.5	10	12	13	20.5	23	26	28	33	38	40	45
C _v		2.3	4	5	6	8	10	12	14	15	24	27	30	32	38	44	46	52
Rated travel [mm]		6	6	6	7.5	7.5	7.5	10	10	10	10	10	15	15	15	15	15	15
Pipe inside ØD [mm]		9.5	16	18.1	15.75	20	23.7	22.2	26	29.7	32	38.4	34.8	38	44.3	47.5	50	56.3
DN	NPS																	
15	½	•	•	•														
20	¾				•	•	•											
25	1							•	•	•								
32	1¼										•	•						
40	1½												•	•	•			
50	2															•	•	•

Table 5: Specifications and actuator selection for valves with elastomer diaphragms or diaphragms with PTFE facing ¹⁾

Table 5.1: Fail-close valve

Valve size		Rated travel (mm)	Actuator (cm ²)	Bench range (bar)	Elastomer diaphragm				Diaphragm with PTFE facing		
DN	NPS				Operating range (bar)	Reference pressure ²⁾		Operating range (bar)	Reference pressure ²⁾		
					(bar)	(bar)	(psi)		(bar)	(psi)	
15	½	6	120 ³⁾	0.8 to 1.6	1.0 to 1.6	10	145	1.1 to 1.7	10	145	
20	¾	7.5		0.8 to 1.6	0.8 to 1.6	4	58	–	–	–	
			1.7 to 2.1	1.7 to 2.1	10	145	1.7 to 2.1	10	145		
25	1	10	120	2.1 to 3.3	2.2 to 3.0	10	145	2.5 to 3.3	9.0	130	
				1.4 to 2.3	1.7 to 2.3	8.0	116	1.7 to 2.3	4.0	58	
240	0.6 to 3.0		1.1 to 2.7	10	145	1.4 to 3.0	10	145			
32	1¼		120	2.1 to 3.3	2.5 to 3.3	9.0	130	–	–	–	
			240	0.6 to 3.0	1.4 to 3.0	10	145	2.5 to 3.3	8.5	123	
			350	0.4 to 2.0	–	–	–	1.3 to 2.4	10	145	
32 ⁴⁾	1¼	240	0.6 to 3.0	1.6 to 3.2	10	145	2.5 to 3.3	6	87		
		350	0.6 to 3.0	1.1 to 2.6	10	145	1.5 to 3.0	10	145		
40	1½	15	240	0.6 to 3.0	0.9 to 3.3	4.5	65	–	–	–	
				0.6 to 3.0	1.1 to 3.5	10	145	1.6 to 4.0	10	145	
			350	0.4 to 2.0	0.8 to 2.5	6	87	0.9 to 2.5	2	29	
50	2		240	0.6 to 3.0	0.9 to 3.3	2.5	36	–	–	–	
			350	0.4 to 2.0	0.8 to 2.5	3.0	43	–	–	–	
				2.1 to 3.3	2.1 to 3.3	10	145	2.1 to 3.3	9	130	
		700	0.6 to 3.0	–	–	–	1.2 to 2.4	10	145		
65	2½	25	700	0.6 to 3.0	1.2 to 3.2	10	145	1.4 to 3.4	10	145	
				0.6 to 3.0	–	–	–	1.2 to 3.2	8.0	116	
				0.4 to 2.0	1.1 to 2.4	9.0	130	–	–	–	
80	3		25	700	2.6 to 4.3	–	–	–	2.6 to 4.0	10	145
					0.4 to 2.0	1.1 to 2.4	4.0	58	–	–	–
					2.1 to 3.3	2.2 to 3.2	10	145	2.3 to 3.3	9.0	130
100	4	25		700	2.6 to 4.3	3.1 to 4.5	10	145	3.1 to 4.5	7.5	108
					2.6 to 4.3	2.6 to 4.0	8.0	116	2.6 to 4.0	6.0	87
					2.1 to 3.3	2.1 to 3.1	6.0	87	–	–	–
125	5		60	1400	1.3 to 2.8	1.8 to 3.3	8.5	123	1.8 to 3.3	5.0	72
150	6			1400	1.3 to 2.8	1.8 to 3.3	4.0	58	1.8 to 3.3	2.0	29

- 1) The maximum supply pressure must only be 1 bar higher at the maximum than the final operating range value (fail-close valve) or the required supply pressure.
- 2) The reference pressure is determined by $\frac{1}{2} \cdot (p_1 + p_2) \leq p_{reference}$; $p_1, p_2 \leq 10 \text{ bar}_{abs}$.
- 3) Version for pharmaceutical and food processing industries with 120 cm² actuator and 7.5 mm travel using the stem connector parts for the micro-trim valve
- 4) Diaphragms with FDA conformity, suitable for pharmaceutical and food processing industries.

Table 5.2: Fail-open valve · Bench range 0.2 to 1.0 ¹⁾

Valve size		Rated travel	Actuator	Operating range	Minimum required supply pressure (bar) for reference pressure ²⁾							
					Elastomer diaphragm				Diaphragm with PTFE facing			
DN	NPS	(mm)	(cm ²)	(bar)	Required supply pressure		Max. operating pressure		Required supply pressure		Max. operating pressure	
					(bar)	(psi)	(bar)	(psi)	(bar)	(psi)	(bar)	(psi)
15	½	6	120 ³⁾	0.4 to 0.75	1.8	26.1	10	145	1.9	27.6	10	145
20	¾	7.5		0.4 to 0.8	1.9	27.6	10	145	2.1	30.5	10	145
25	1	10	120	0.2 to 0.8	3.0	43.5	10	145	3.5	50.8	10	145
			240		1.9	27.6	10	145	2.2	31.9	10	145
120	3.6		52.2		10	145	4.6	66.7	10	145		
240	2.2		31.9		10	145	2.6	37.7	10	145		
32	1¼	350	240	0.2 to 0.8	1.7	24.6	10	145	2.0	29.0	10	145
					240	2.4	34.8	10	145	3.0	43.5	10
32 ⁴⁾	1¼	700	350	0.2 to 0.8	1.9	27.6	10	145	2.4	34.8	10	145
					240	2.6	37.7	10	145	3.2	46.4	10
40	1½	15	240	0.2 to 1.0	2.1	30.5	10	145	2.6	37.7	10	145
			350		3.5	50.8	10	145	4.3	62.4	10	145
240	2.8		40.6		10	145	3.3	47.9	10	145		
350	1.5		21.8		10	145	1.8	26.1	10	145		
50	2	700	700	0.2 to 0.6	3.8	55.1	10	145	4.3	62.4	10	145
				0.2 to 1.5	2.1	30.5	10	145	2.3	33.4	10	145
65	2½	22	350	0.2 to 1.5	5.5	79.8	8.0	116	5.5	79.8	7.0	101.5
		25	700	0.2 to 0.9	3.1	45.0	10	145	3.4	49.3	10	145
80	3	700	700	0.2 to 1.5	5.5	79.8	6.0	87.0	5.5	79.8	3.5	50.8
				0.2 to 0.9	3.9	56.6	10	145	4.5	65.3	10	145
100	4	700	700	0.2 to 0.9	2.9	42.1	6.0	87.0	3.6	52.2	6	87.0
					22	350	0.2 to 1.5	3.1	45.0	10	145	3.5
125	5	60	1400	0.2 to 1	4.5	65.3	10	145	5.0	72.5	9.5	137.8
150	6											

¹⁾ Other bench ranges on request

²⁾ **Note:** The closing pressure may, if at all, only exceed the required supply pressure slightly. Otherwise, the service life diaphragm will be impaired. With positioner plus 0.2 bar (3 psi).

³⁾ Version for pharmaceutical and food processing industries with 120 cm² actuator and 7.5 mm travel using the stem connector parts for the micro-trim valve

⁴⁾ Diaphragms with FDA conformity, suitable for pharmaceutical and food processing industries.

Table 6: Dimensions in mm for Type 3345-1 and Type 3345-7 Control Valves**Table 6.1:** Type 3345 Valve

Valve	DN	15 ¹⁾	20	25	32	40	50	65	80	100	125	150
	NPS	½	¾	1	1¼	1½	2	2½	3	4	5	6
Length L	DIN flanges	130	150	160	180	200	230	290	310	350	400	480
	ANSI/BS flanges ²⁾	108	117	127	146	159	190	216	254	305	356	406
	Version for the pharmaceutical and food processing industries ³⁾	108	117	127	146	159	190	216	254	305	–	–
H1	Standard	195	200	205	215	220	230	300	310	355	540	550
	Version for the pharmaceutical and food processing industries ⁴⁾	135	139	232	242	245	249	280	290	300	–	–
H2	DIN	48	53	58	70	75	83	88	100	110	125	143
	ANSI/BS	45	49	54	59	64	76	89	96	115	127	140

¹⁾ Lining for DN 15 (NPS ½) only available in enamel

²⁾ The dimension is approx. 6 mm longer for lined valves, and approx. 2 mm longer for coated valves

³⁾ Optionally with threaded or clamp connections or welding ends (see Table 1)

⁴⁾ Stainless steel bonnet

Table 6.2: Types 3271 and 3277 Pneumatic Actuators

Actuator area		cm ²	120	240	350	700	1400-60
Diaphragm ØD		mm	168	240	280	390	530
H ¹⁾		mm	69	62	82	199	287
H3 ²⁾		mm	110	110	110	190	610
H5		mm	88	101	101	101	–
Thread	Type 3271	M30 x 1.5					M60 x 1.5
	Type 3277	M30 x 1.5					–
	For micro-flow valve version	M20 x 1.5	–				
α		Type 3271	G ½ (½ NPT)	G ¼ (¼ NPT)	G ⅜ (⅜ NPT)	G ⅜ (⅜ NPT)	G ¾ (¾ NPT)
α2		Type 3277	–	G ⅜	G ⅜	G ⅜	–

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 350 cm² without lifting eyelet

²⁾ Minimum clearance required to remove the actuator

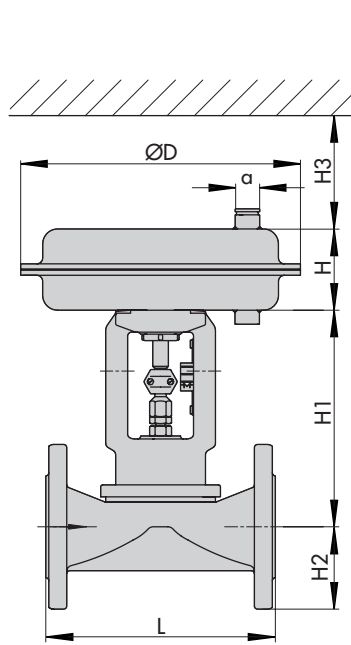
Table 7: Weights in kg for Type 3345-1 and Type 3345-7 Control Valves**Table 7.1:** Type 3345 Valve

Valve	DN	15	20	25	32	40	50	65	80	100	125	150
	NPS	½	¾	1	1¼	1½	2	2½	3	4	5	6
Body	DIN standard	5	6	8	10	12	16	23	34	49	69	92
	ANSI/BS standard										67	83
	Valve for the pharmaceutical and food processing industries	4	4	5	6	9	13	18	27	–	–	–

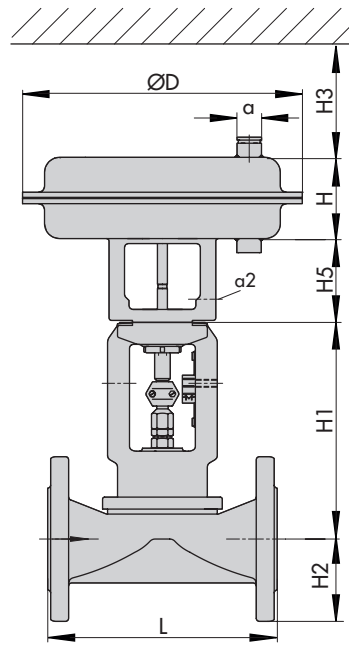
Table 7.2: Type 3271 and Type 3277 Pneumatic Actuators · Without handwheel

Actuator		cm ²	120	240	350	700	1400-60
Type 3271	kg (approx.)	2.5	5	8	22	70	
Type 3277	kg (approx.)	3.2	9	12	26	–	

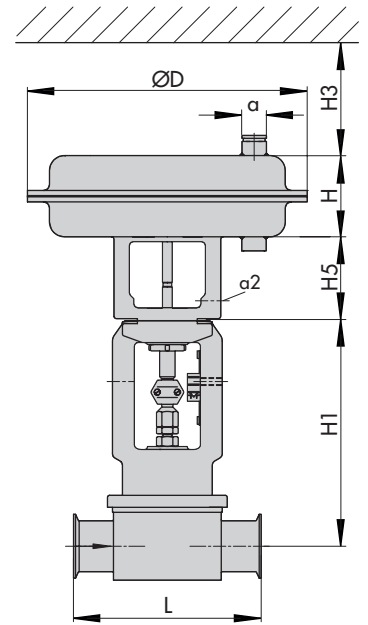
Dimensional drawings



Type 3345-1



Type 3345-7



Type 3345-7, cast stainless steel (version for the pharmaceutical and food processing industries)

Ordering text

Diaphragm valve	Type 3345
Body material	See Table 2
Valve size	DN .../NPS ...
Version for the pharmaceutical and food processing industries	
Diaphragm material	See Table 3
K_{VS}/C_V coefficient	See Table 4
End connections	See Table 1: Flanges, welding ends, clamp connections, aseptic flanges, threaded connections
Actuator	Type 3271/3277
Actuator area	... cm ²
Travel	... mm
Fail-safe position	Fail-close or fail-open
Bench range	...
Valve accessories	Positioner/limit switch

Specifications subject to change without notice



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