

# Pneumatic Control Valve Type 3345-1 and Type 3345-7 Diaphragm Valve Type 3345

## Application

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

**Nominal sizes** DN 15 to 150 · 1/2" to 6"

**Nominal pressure** PN 10

**Temperature range** -10 to 100 °C (others acc. to Table 3)

## Conversion of valve sizing coefficients:

$C_v$  (in US gallons/min) = 1.17 ·  $K_{vs}$  (in m<sup>3</sup>/h)

$K_{vs}$  (in m<sup>3</sup>/h) = 0.86 ·  $C_v$  (in US gallons/min)

Type 3345 Diaphragm Valve can be equipped with

- Type 3271 Pneumatic Actuator to form a Type 3345-1 Control Valve or
- Type 3277 Pneumatic Actuator to form a Type 3345-7 Control Valve for the integral attachment of a positioner

Valve body made of

- Cast iron
- Spheroidal graphite iron
- Stainless cast steel

The valve can be used for a large number of process media due to the different lining materials.

## Versions

**Standard version** · Type 3345 Diaphragm Valve, DN 15 to DN 150, PN 10, body made of cast iron, IIR elastomer diaphragm (Butyl B) for temperatures from -10 to 100 °C; flanges according to DIN, British Standard or ANSI

- **Type 3345-1** (Fig. 1) · Valve with Type 3271 Actuator (see Data Sheet T 8310 EN)
- **Type 3345-7** (Fig. 2) · Valve with Type 3277 Actuator (see Data Sheet T 8311 EN)

## Additional versions

- Valve body with or without lining made of cast iron, spheroidal graphite iron or stainless cast steel
- Version for the food industry made of stainless cast steel with welding ends for pipes according to DIN 11850 Series 2 for DN 15 to 50 and Series 1 for DN 65 to 150  
DIN EN ISO 1127 · ISO 2037 (NFA 49-249)  
BS 4825 · ASTM A270 (OD) · SMS 3008  
clamp connections according to  
DIN 32676 · ISO 2852 · BS 4825  
threaded ends according to  
DIN 11887 · ISO 2853 (IDF) · SMS 1146
- With Type 3274 Electrohydraulic Actuator
- Other diaphragm materials on request



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



Fig. 2 · Type 3345-7 Diaphragm Valve made of stainless cast steel for the food industry with Type 3767 Positioner

### Principle of operation

In diaphragm valves, the valve diaphragm acts as valve plug. The flow rate depends on the free area between the diaphragm and lower valve body. For the protection of the diaphragm, the actuator stem is equipped with stoppers for force limitation.

### Fail-safe action

Depending on the arrangement of the actuator springs (for details, refer to Data Sheets T 8310 EN and T 8311 EN), the control valve features two different fail-safe positions which become effective when the auxiliary energy fails:

**"Actuator stem extends",**

the valve closes when the auxiliary energy fails.

**"Actuator stem retracts",**

the valve opens when the auxiliary energy fails.

### Pressure-temperature diagram for

- Elastomer diaphragms  
DN 15 to 50 (curve 1) and  
DN 65 to 150 (curve 2)
- PTFE diaphragms  
DN 15 to 125 (curve 2) and  
DN 150 (curve 3)

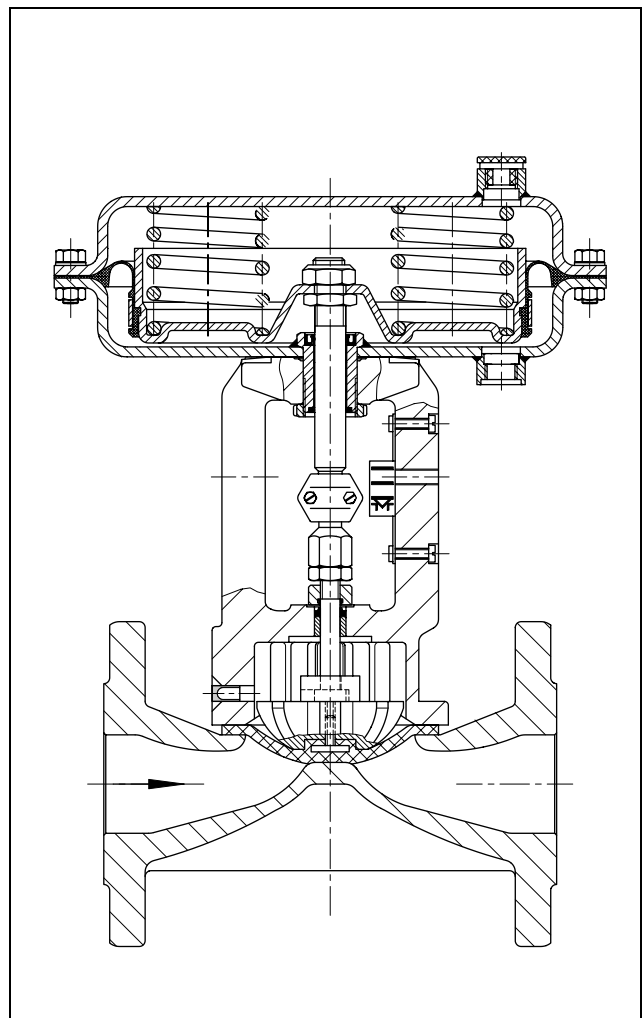
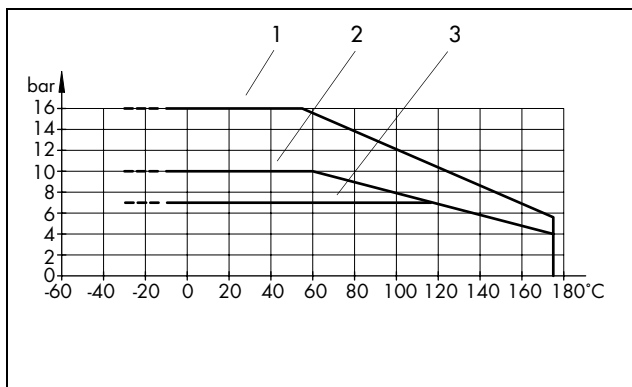


Fig. 3 · Standard version Type 3345-1

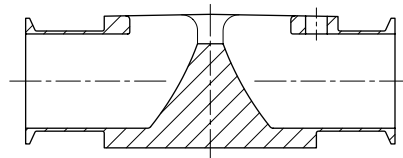


Fig. 4 · Valve body Type 3345,  
stainless cast steel with clamp connection

**Table 1 · Technical data**

Version	DIN		ANSI / BS
Nominal size	DN 15 to 150		1/2" to 6"
Connection	Flanges	PN 10/16 Type B	Flanges Class 125/150 RF
	Length	EN 558-1 Series 1, Table 7	EN 558-1 Series 7, Table 7
Special version for the food industry in DN 15 to 150	Threaded ends	DIN 11887 · ISO 2853 (IDF) · SMS 1146	
	Clamp connection	ISO 2852 · BS 4825 Part 3 · DIN 32676	
	Welding ends	For pipes according to: DIN 11850 Series 2 (DN 15 to 50), Series 1 (DN 65 to 150) DIN EN ISO 1127 · ISO 2037 (NFA 49-249) · BS 4825 · ASTM A270 (OD) · SMS 3008	
Nominal pressure	PN 10 PN 16 for DN 15 to DN 50 with elastomer diaphragms		
Temperature range for standard version	-10 to 100 °C (also see Table 3)		
Characteristic	Linear		
Rangeability	30 : 1		
Leakage rate acc. to DIN EN 1349	VI		

**Table 2 · Body and lining materials (DN 20 and larger)**

Version	Body		Lining <sup>1)</sup>
	DIN	ANSI (BS)	
Body	Cast iron EN-JL1040	A 126 B (Grade 250)	Without
			EBONIT (NR)
			Butyl (IIR)
			Enamel
	Spheroidal graphite iron EN-JS1024	A 395 (Grade 420/12)	Without
			ETFE
1.4408	A 351 CF8M (Grade 316 C 16)	Butyl (IIR) <sup>2)</sup>	
1.4435 · 1.4404	F 316L (Grade 316 S 11)	Without	
Bonnet	EN-JL1040 <sup>3)</sup> · 1.4404 <sup>4)</sup>	A 126 B (Grade 250) <sup>3)</sup>	-
Packing follower	Aluminum, EN-JL1040 or st. steel <sup>4)</sup>	Aluminum or A 126 B (Grade 250)	
Bushing	Delrin or PTFE/stainless steel <sup>4)</sup>		
Diaphragm	Elastomer diaphragm: Butyl (B), Viton (226) or Ethylene/Propylene (325) PTFE-coated diaphragm: PTFE/Butyl rubber (214/300) <sup>5)</sup>		

1) Other lining materials on request

2) Only for DIN version

3) St 37-2 for nominal sizes DN 125 and 150

4) Special version for the food industry

5) Special diaphragms etc. for the food industry with FDA certificate on request

**Table 3 · Temperature ranges for lining and diaphragm materials in °C**

Lining	Diaphragms			
	Butyl (B)	Viton (226)	Ethylene/Propylene (325)	PTFE/Butyl rubber (214/300)
Without	-10 to 100	-5 to 150	-10 to 130	-10 to 150
Butyl	-10 to 100	-5 to 120	-10 to 120	-10 to 120
ETFE	-10 to 100	-5 to 150	-10 to 130	-10 to 150
Ebonit	-10 to 85	-5 to 85	-10 to 85	-10 to 85
Enamel	-10 to 100	-5 to 150	-10 to 130	-10 to 150

**Table 4 · Variables and available actuators for valve with elastomer diaphragms or PTFE-coated diaphragms**
**Table 4a · Valve with fail-safe position "Actuator stem extends"**

DN	Kvs	Cv	Travel (mm)	Actuator (cm <sup>2</sup> )	Bench range (bar)	Signal pressure range (bar) for reference pressure <sup>1)</sup>					
						Elastomer diaphragm		Diaphragm with PTFE lining			
						5 bar	10 bar	5 bar	10 bar		
15	5	6	6	120	0.2 to 1.0	0.7 to 1.0	–	–			
					0.4 to 2.0	1.0 to 1.7		1.2 to 1.9			
20	7.5	9			0.4 to 2.0	1.4 to 2.2		1.4 to 2.2	–		
					1.4 to 2.3	–		1.7 to 2.2			
25	20	23			10	240	1.4 to 2.3	1.4 to 2.0	–	1.8 to 2.4	–
							2.1 to 3.3	2.1 to 2.9		2.1 to 2.9	–
			0.2 to 1.0	0.6 to 1.2			–	–			
			0.4 to 2.0	1.0 to 2.1			1.0 to 2.1	–			
32	31	36	10	120	1.4 to 2.3	1.6 to 2.2	–	–			
				240	0.6 to 3.0	1.4 to 3.0		1.4 to 3.0	–		
				350	0.4 to 2.0	–		1.3 to 2.4			
40	45	53	15	240	0.6 to 3.0	0.9 to 3.3	–	–			
					350	0.4 to 2.0	1.1 to 2.7		1.1 to 2.7	–	
240	1.4 to 2.3	–		1.5 to 2.4							
	50	57		67	350	0.6 to 3.0	1.7 to 4.1		1.7 to 4.1	–	
0.4 to 2.0						1.0 to 2.6	–	–			
0.6 to 3.0						–	1.7 to 4.1	–			
65	120	140	25	700	2.1 to 3.3	–		–	2.3 to 3.5		
					0.4 to 2.0	1.1 to 2.4		1.1 to 2.4	–		
0.6 to 3.0	–				1.4 to 3.4						
1.4 to 2.3	1.4 to 2.2	–			–						
2.1 to 3.3	2.2 to 3.2				–						
2.6 to 4.3	–				2.6 to 4.0						
100	215	250	60	1400	1.4 to 2.3	1.8 to 2.5	–	–			
125	310	360			2.6 to 4.3	3.1 to 4.5		3.1 to 4.5 · p <sub>max</sub> = 8.0 bar			
			1.1 to 2.4	1.4 to 2.7	–	–					
150	410	480	60	1400	1.3 to 2.8	–	–	1.7 to 3.2	–		
					1.3 to 2.8	1.7 to 3.2	–	1.7 to 3.2	–		
						p <sub>max</sub> = 3.5 bar	–	p <sub>max</sub> = 1.5 bar			

**Table 4b · Valve with fail-safe position "Actuator stem retracts" · Spring range 0.2 to 1.0 <sup>2)</sup>**

DN	Kvs	Cv	Travel (mm)	Actuator (cm <sup>2</sup> )	Bench range (bar)	Minimum required supply pressure (bar) for reference pressure <sup>1)</sup>					
						Elastomer diaphragm		PTFE-coated diaphragm			
						5 bar	10 bar	5 bar	10 bar		
15	6.3	7.5	6	120	0.2 to 0.6	1.1	1.4	1.3	1.6		
20	7.5	9				1.5	2.0	1.8	2.3		
25	20	23	10	240	0.2 to 0.8	2.0	2.8	2.6	3.5		
						1.4	1.8	1.7	2.1		
32	31	36				120	2.4	3.6	3.3	4.4	
						240	1.6	2.2	2.0	2.6	
40	45	53	15	240	0.2 to 1.0	2.0	2.6	2.5	3.2		
						350	1.7	2.1	2.0	2.5	
50	57	67		240		2.5	3.5	3.2	4.3		
				350		2.0	2.7	2.5	3.3		
65	100	115		22		350	0.2 to 1.2	2.5	3.5	3.1	4.0
	120	140		25		700	0.2 to 0.9	1.6	2.0	1.9	2.3
80	160	185	22	350	0.2 to 1.2	3.7	(5.6)	4.4	–		
	190	220	25	700	0.2 to 0.9	2.2	3.1	2.5	3.4		
100	190	220	22	350	0.2 to 1.2	4.7	–	(6)	–		
	215	250	25	700	0.2 to 0.9	2.7	3.9	3.3	4.5		
125	310	360	60	1400	0.2 to 1	2.2	3.1	2.7	3.5		
150	410	480				3	4.5	3.7	–		

<sup>1)</sup> Reference pressure results from  $\frac{p_1 + p_2}{2} \leq p_{reference}$ ;  $p_1, p_2 \leq 10 \text{ bar}_{abs}$ 
<sup>2)</sup> Other spring ranges on request

**Table 5 Dimensions for Type 3345-1 and Type 3345-7 Control Valve**

Valve	DN	15 <sup>1)</sup>	20	25	32	40	50	65	80	100	125	150
Length L (mm)	DIN flanges <sup>2)</sup>	130	150	160	180	200	230	290	310	350	400	480
	ANSI/BS flanges <sup>2)</sup>	108	117	127	146	159	190	216	254	305	356	406
	Version for food industry <sup>3)</sup>	108	117	127	146	159	190	216	254	-	356	406
H1	mm	210			215	220	225	295	300	355	550	570
H1	Version for food industry with stainl. steel bonnet	150			250			280		300	520	
H2 (mm)	Flanged version	48	53	58	70	75	83	88	93	110	123	143

<sup>1)</sup> For DN 15 only enamel lining available

<sup>2)</sup> For lined valves, add approx. 6 mm to the length, for coated valves, add approx. 2 mm

<sup>3)</sup> Optionally available with threaded ends or clamp connections or welding ends, also see Table 1

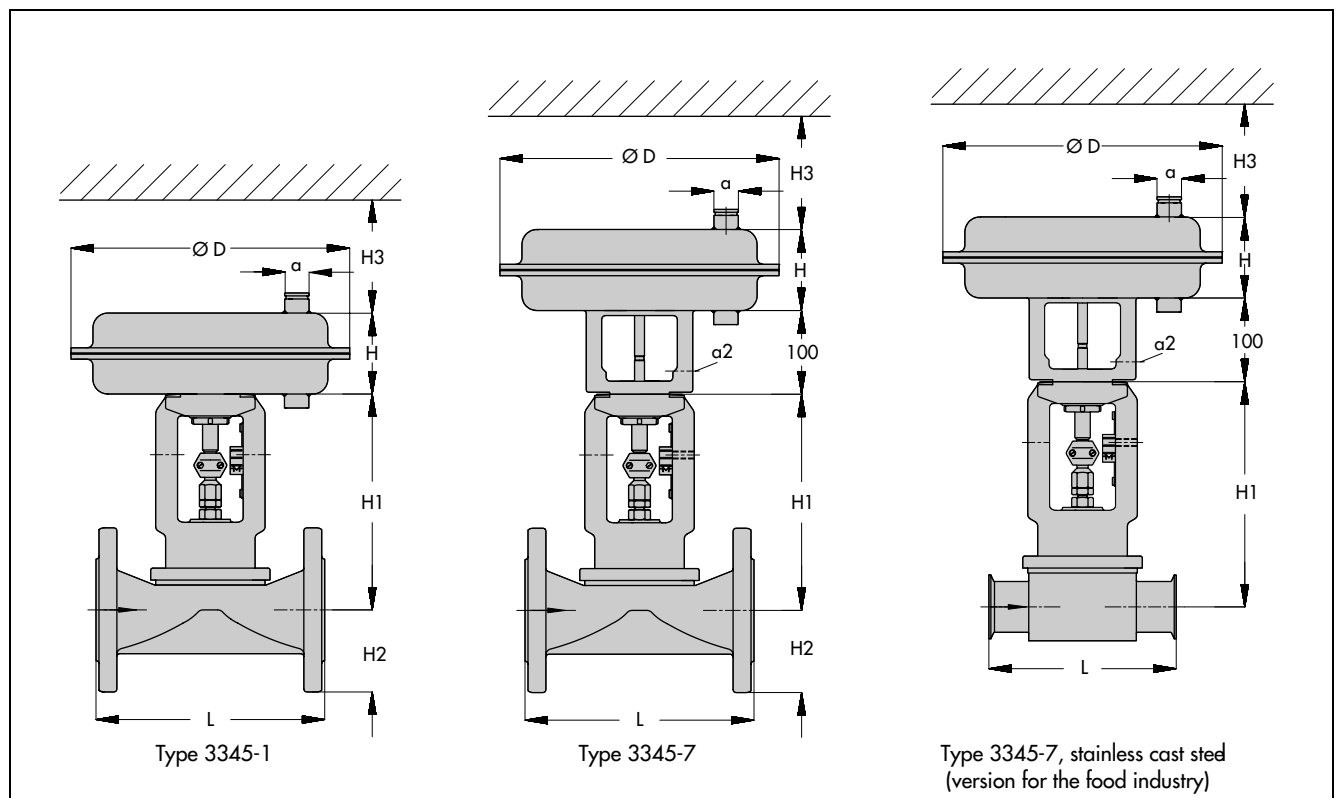
Actuator	cm <sup>2</sup>	120	240	350	700	1400
Diaphragm Ø D	mm	168	240	280	390	530
H from 700 cm <sup>2</sup> lifting ring included	mm	70	62	82	199	287
H3	mm	110			190	610
Thread	mm	M 30 x 1.5				M 60 x 1.5
a (for Type 3271 Actuator)		G 1/8 (1/8 NPT)	G 1/4 (1/4 NPT)	G 3/8 (3/8 NPT)		G 3/4
a2 (for Type 3277 Actuator)		-	G 3/8 (3/8 NPT)			-

**Table 6 Weights for valve Type 3345 and actuators**

Valve	DN	15	20	25	32	40	50	65	80	100	125	150
Body without actuator	kg	5	6	7	10	12	16	23	34	49	70	95

Actuator	cm <sup>2</sup>	120	240	350	700	1400
Type 3271	Approx. kg	2	5	8	22	70
Type 3277	Approx. kg	3.2	9	12	26	-





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