

# Pneumatic Control Valves Type 3249-1 and Type 3249-7

## Aseptic Angle Valve Type 3249



### Application

Control valve for aseptic applications in the pharmaceutical and food processing industries

**Nominal size** DN 15 to DN 80 · ½" to 3"  
**Maximum pressure** 10 bar · 150 psi  
**Temperature range** -10 to 130 °C · 14 to 266 °F



Type 3249 Angle Valve with

- Type 3271 Pneumatic Actuator (Type 3249-1 Control Valve)
- Type 3277 Pneumatic Actuator (Type 3249-7 Control Valve) for integral positioner attachment

Valve body made of

- Stainless steel 1.4404 or 316L
- Wetted internal surfaces polished or turned to a fine finish
- Categorized in conformity assessment module A of the Pressure Equipment Directive
- Ball body version complies with 3A regulations
- Wetted sealing materials comply with FDA regulations
- Both body versions comply with EHEDG regulations

The valve body is designed without cavities. It can be cleaned and sterilized using the CIP or SIP methods. The stem guide is sealed by a diaphragm.

The test connection enables you to monitor the diaphragm for leakages. The valve is suitable for aseptic applications.

### Versions

**Standard version** · Angle valve in ball body version (full-mold cast body). DN 15 to 80 with welding ends according to DIN 11850 (DN 15 to 50 Series 2, DN 65 and 80 Series 1). Maximum pressure 10 bar. Designed with clamp connection between the valve body and bonnet, without stuffing box. The stem is sealed by an EPDM diaphragm with PTFE layer.

**Type 3249-1** · Type 3249 Angle Valve with Type 3271 Actuator (see Data Sheet T 8310 EN)

**Type 3249-7** (Fig. 1) · Type 3249 Angle Valve with Type 3277 Actuator (see Data Sheet T 8311 EN)

**Special version** (Fig. 2) · Full-mold cast body, DN 15 to 80 with screwed-on valve bonnet and additional PTFE V-ring packing

### Further versions with

- **ANSI valve body** with welding ends according to BS 4825
- **Welding ends** according to DIN EN ISO 1127 or ISO 2037 (SMS) or NFA 49-249
- **Threaded ends** according to DIN 11 851 (11 887)
- **Threaded ends** according to SMS or IDf
- **Clamp connections** acc. to ISO 2852, DIN 32676, BS 4825
- **Flanges** with smooth sealing face, DIN EN 1092-1 connection
- **Body material 1.4435**, other materials on request

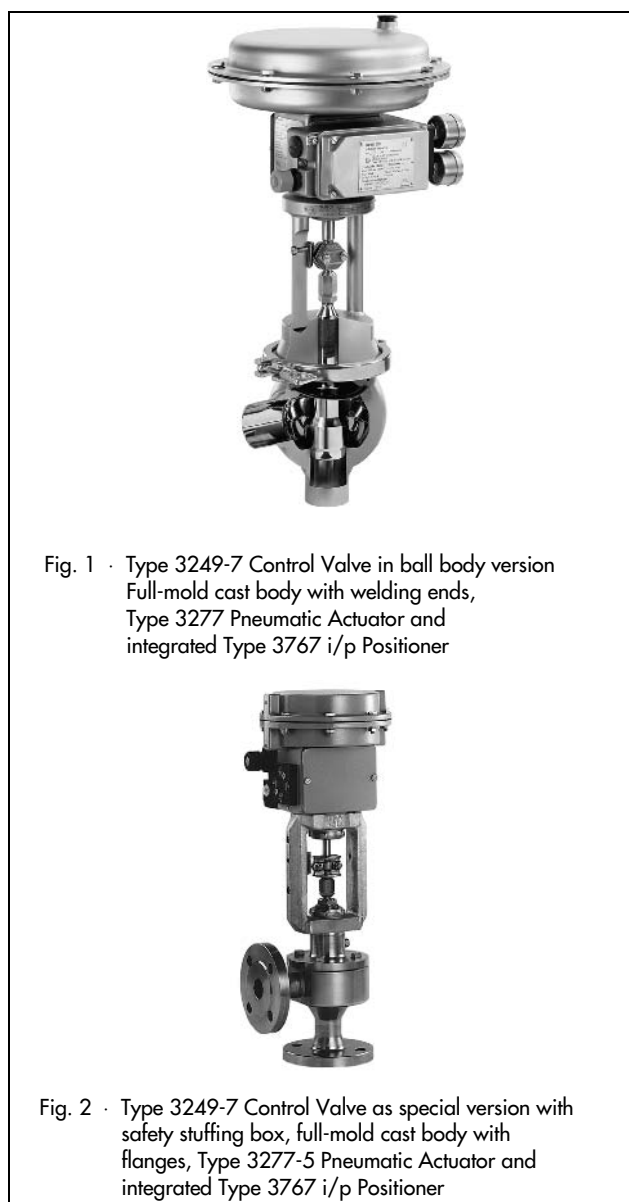


Fig. 1 · Type 3249-7 Control Valve in ball body version  
 Full-mold cast body with welding ends,  
 Type 3277 Pneumatic Actuator and  
 integrated Type 3767 i/p Positioner

Fig. 2 · Type 3249-7 Control Valve as special version with  
 safety stuffing box, full-mold cast body with  
 flanges, Type 3277-5 Pneumatic Actuator and  
 integrated Type 3767 i/p Positioner

- As **on/off valve** with pneumatic piston actuator
- **Heating jacket**
- **Type 3274 Electrohydraulic Actuator**

### Principle of operation

The process medium flows through the valve in the closing direction of the plug, i.e. the direction indicated by the arrow. The position of the valve plug (3) determines the flow rate across the cross-sectional area of flow released between plug (3) and lathed seat (2).

In the standard version, the plug stem is sealed by means of a diaphragm (6.2). In the special version, an additional safety stuffing box (4) is used.

In the standard version, the test connection (4.4) enables you to visually check and monitor the valve. In the special version, it is possible to monitor the pressure inside the valve or apply a sealing medium to the diaphragm (6.2).

### Fail-safe action

Depending on how the springs are arranged in the actuator (for details refer to Data Sheets T 8310 EN and T 8311 EN), the control valve has two different fail-safe positions, which become effective upon a supply air failure:

#### "Actuator stem extends" (FA),

The valve closes when the supply air fails.

#### "Actuator stem retracts" (FE),

The valve opens when the supply air fails.

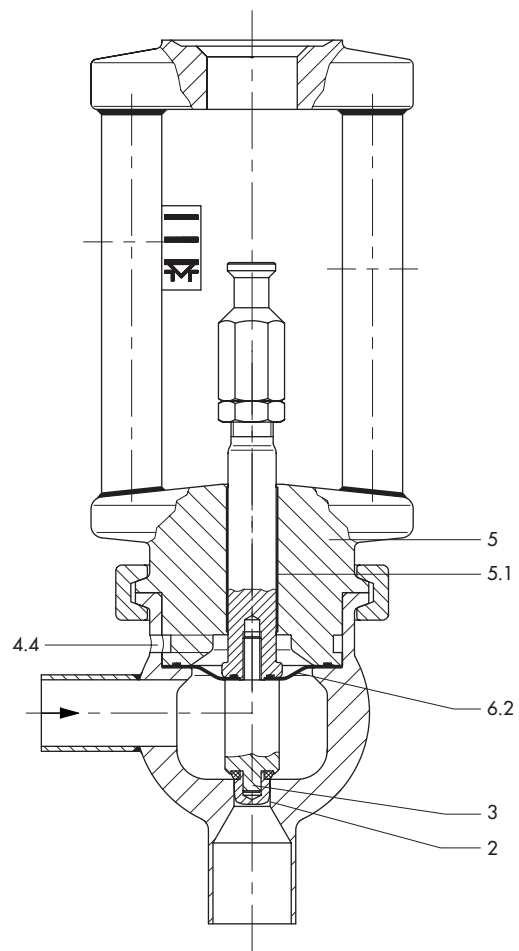


Fig. 3 · Type 3249 Angle Valve, standard version

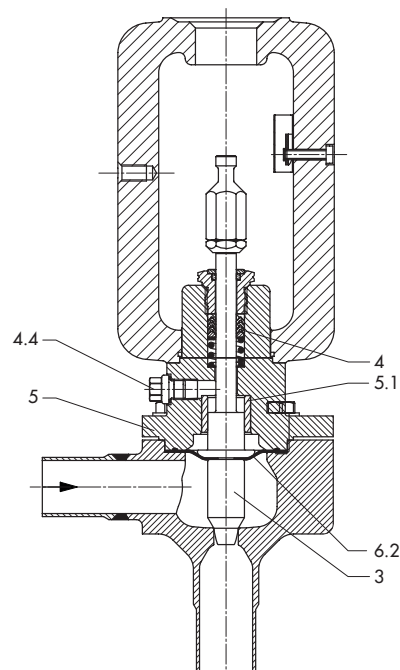


Fig. 4 · Type 3249 Angle Valve, special version

Legend for Figs. 3 and 4

- |                     |                   |
|---------------------|-------------------|
| 2 Seat, lathed      | 5 Valve bonnet    |
| 3 Plug              | 5.1 Guide bushing |
| 4 Stuffing box      | 6.2 Diaphragm     |
| 4.4 Test connection |                   |

**Table 1a · Technical data for Type 3249**

Version		DIN	ANSI
Nominal size		DN 15 ... 80	1/2" ... 3"
Maximum pressure See Table 1b		10 bar	150 psi
Connection		According to Table 1b	
Seat-plug seal <sup>1)</sup>		Metal sealing · Soft sealing (not for 3A version)	
Characteristic		Equal percentage or linear	
Rangeability		50 : 1 up to DN 50 · 30 : 1 for DN 65 and larger	
Permissible temperatures	Operating temp.	-10 °C ... 130 °C (see Table 1b)	14 °F ... 266 °F (see Table 1b)
	Sterilizing temp.	150 °C up to 30 min	300 °F up to 30 min
Leakage class acc. to DIN EN 1349	Metal sealing	IV	
	Soft sealing	VI (not for 3A or EHEDG versions)	
Peak-to-valley height and surface finish	Exterior	R <sub>a</sub> ≤ 1.6 μm · Glass bead blasted	
		R <sub>a</sub> ≤ 0.6 μm · Polished	
	Interior	R <sub>a</sub> ≤ 0.8 μm · Turned to a fine finish	
		R <sub>a</sub> ≤ 0.6 μm · Polished	
		R <sub>a</sub> ≤ 0.4 μm · Satin finish	
		R <sub>a</sub> ≤ 0.4 μm · Mirror finish	

<sup>1)</sup> Conformity to 3A and food regulations only with metal sealing

**Table 1b · Connections, maximum pressures and temperature limits**

Connection	Standard	Nominal sizes mm/in	Operating range	
			Max. operating pressure	Medium temperature
Welding ends	DIN 11 850	DN 15 ... 50	10 bar	-10 ... 120 °C
	DIN EN ISO 1127	DN 15 ... 80	9.7 bar	130 °C
	BS 4825	1/2" ... 1" · 1 1/2" ... 3"	150 psi	14 ... 100 °F
			118 psi	266 °F
	SMS/ISO 2037 (NFA 49 249)	DN 25 ... 80	10 bar	-10 ... 120 °C
9.7 bar			130 °C	
Threaded ends	DIN 11 887/11 851 Connection A	DN 15 ... 80	10 bar	-10 ... 120 °C
			9.7 bar	130 °C
	SMS	DN 25 ... 80	6 bar	-10 ... 120 °C
			5.8 bar	130 °C
			150 psi	14 ... 100 °F
IDF	1" ... 3"	118 psi	266 °F	
Aseptic pipe fitting	DIN 11864 for O-ring and DIN 11850 Series 2	DN 15 ... 80	10 bar	-10 ... 120 °C
			9.7 bar	130 °C
Clamp connection	ISO 2852 Table 2	DN 25 ... 80	10 bar	-10 ... 120 °C
			9.7 bar	130 °C
	DIN 32 676	DN 15 ... 80	10 bar	-10 ... 120 °C
			9.7 bar	130 °C
			150 psi	14 ... 100 °F
BS 4825	1/2" ... 1" · 1 1/2" ... 3"	118 psi	266 °F	
Flanges with smooth sealing face, but with R <sub>a</sub> ≤ 0.8	DIN EN 1092-1	PN 10 DN 15 ... 80	10 bar	-10 ... 120 °C
			9.7 bar	130 °C
	PN 6 DN 15 ... 80	6 bar	-10 ... 120 °C	
		5.8 bar	130 °C	
	ANSI B 16.1, Class 125	1" ... 3"	150 psi	14 ... 100 °F
118 psi			266 °F	

**Table 2 · Materials**

Version <sup>1)</sup>	DIN	ANSI
Body version with lathed seat	1.4404	316 L
Bonnet	1.4404	316 L
Plug	1.4404	316 L
Guide bushing	PTFE-coated stainless steel	
Stuffing box packing Special version	PTFE V-ring packing	
Diaphragm	EPDM with PTFE layer	

<sup>1)</sup> Suitable for Group 1 and Group 2 fluids according to the European Pressure Equipment Directive 97/23/EC

**Table 3 ·  $K_{vs}$  and  $C_v$  values and associated nominal sizes**

$K_{vs}$	0.1	0.16	0.25	0.4	0.63	1.0	1.6	2.5	4	6.3	10	16	25	40	60	
$C_v$	0.12	0.2	0.3	0.50	0.75	1.2	2	3	5	7.5	12	20	30	47	70	
Seat Ø mm	6						12				24 up to DN 25 31 in DN 32 and larger		31	38	48	63
Travel [mm]	7.5 mm up to DN 25											-				
	-									15 mm for DN 32 and larger						
Nominal size																
15	1/2"	•	•	•	•	•	•	•	•	•						
20	3/4"	•	•	•	•	•	•	•	•	•						
25	1"	•	•	•	•	•	•	•	•	•	•	•				
32	1 1/4"										•	•	•			
40	1 1/2"										•	•	•	•		
50	2"										•	•	•	•	•	
65	2 1/2"										•	•	•	•	•	•
80	3"										•	•	•	•	•	•

**Table 4a · Permissible differential pressures for Type 3249 in standard and special versions · Pressures in bar**

Bench ranges for fail-safe action		Actuator stem extends (FA)		Travel = 7.5 mm	0.6 ... 1.0	1.2 ... 2.0	–		
				Travel = 15 mm	0.2 ... 1.0	0.4 ... 2.0	1.4 ... 2.3	2.1 ... 3.3	
				Requ. supply press.	1.4	2.2	2.5	3.5	
		Actuator stem retracts (FE)		Travel = 7.5 mm	0.2 ... 0.6	0.4 ... 1.2	–		
				Travel = 15 mm	0.2 ... 1.0	0.4 ... 2.0	0.2 ... 1.0		
				Requ. supply press.	1.4	2.4	2.4	3.1	
DN	K <sub>v5</sub>	Actuator area cm <sup>2</sup>	Travel mm	Max. upstream pressure p <sub>1</sub> at p <sub>2</sub> = 0					
15	0.1 ... 4	120	7.5	7.4	10	–			
		240		10	10	–			
20	0.1 ... 4	120		6.8	10	–			
		240		10	10	–			
25	0.1 ... 10	120		6.4	10	–			
		240		10	10	–			
32	6.3 ... 16	240	0.6	2.0	–	–	–		
		350	1.3	3.4	10	10	–		
40	6.3 ... 25	240	0.5	1.9	–	–	–		
		350	1.2	3.2	10	10	–		
50	6.3 ... 35	240	0.28	1.7	–	–	–		
		350	0.9	3.0	10	10	–		
65 · 80	60	350	–	–	10	10	–		

**Table 4b · Permissible differential pressures for Type 3249 in standard and special versions · Pressures in psi**

Bench ranges for fail-safe action		Actuator stem extends (FA)		Travel = 7.5 mm	9 ... 15	18 ... 30	–		
				Travel = 15 mm	3 ... 15	6 ... 30	20 ... 34	30 ... 48	
				Requ. supply press.	20	32	36	50	
		Actuator stem retracts (FE)		Travel = 7.5 mm	3 ... 9	6 ... 18	–		
				Travel = 15 mm	3 ... 15	6 ... 30	3 ... 15		
				Requ. supply press.	20	36	36	45	
Nom. size	C <sub>v</sub>	Actuator area cm <sup>2</sup>	Travel mm	Max. upstream pressure p <sub>1</sub> at p <sub>2</sub> = 0					
1/2"	0.12 ... 5	120	7.5	107	150	–			
		240		150	150	–			
3/4"	0.12 ... 5	120		98	150	–			
		240		150	150	–			
1"	0.12 ... 12	120		93	150	–			
		240		150	150	–			
1 1/4"	7.5 ... 20	240	8.7	29	–	–	–		
		350	18.8	49.3	150	150	–		
1 1/2"	7.5 ... 30	240	7.2	27.5	–	–	–		
		350	17.4	46.4	150	150	–		
2"	7.5 ... 40	240	4	24.6	–	–	–		
		350	13	43.5	150	150	–		
2 1/2" · 3"	70	350	–	–	150	150	–		

**Table 5 · Dimensions in mm for Type 3249-1 and Type 3249-7 Control Valves**
**Table 5a · Standard version (N) with ball body and special version (S) with safety stuffing box**

Valve	DN	15 / 1/2"	20 / 3/4"	25 / 1"	32 / 1 1/4"	40 / 1 1/2"	50 / 2"	65 / 2 1/2"	80 / 3"
Welding ends for pipes according to DIN 11850, Ser. 2; DN 65 and 80 acc. to Series 1	L (N)	70 <sup>1)</sup>	70 <sup>1)</sup>	70 <sup>1)</sup>	105	105	105 <sup>1)</sup>	105 <sup>1)</sup>	105 <sup>1)</sup>
	L (S)	90	90	90	105	105	115	115 <sup>1)</sup>	115 <sup>1)</sup>
	∅ d2	19	23	29	35	41	53	70	85
	t	1.5	1.5	1.5	1.5	1.5	1.5	2	2
Welding ends for pipes according to DIN EN ISO 1127	L (N)	70 <sup>1)</sup>	70 <sup>1)</sup>	70 <sup>1)</sup>	105	105	105 <sup>1)</sup>	105 <sup>1)</sup>	105 <sup>1)</sup>
	L (S)	90	90	90	105	105	115	115 <sup>1)</sup>	115 <sup>1)</sup>
	∅ d2	21.3	26.9	33.7	42.4	48.3	60.3	76.1	88.9
	t	1.6	1.6	2	2	2	2.6	2.6	2.6
Welding ends for pipes according to BS 4825	L (N)	70 <sup>1)</sup>	70 <sup>1)</sup>	70 <sup>1)</sup>	-	105 <sup>1)</sup>	105 <sup>1)</sup>	105 <sup>1)</sup>	105 <sup>1)</sup>
	∅ d2	12.7	19.1	25.4		38.1	50.8	63.5	76.2
	t	1.6 <sup>1)</sup>	1.6 <sup>1)</sup>	1.6		1.6	1.6	1.6	1.6
Welding ends for pipes according to ISO 2037 (SMS), NFA 49-249	L (N)	-	-	70 <sup>1)</sup>	105 <sup>1)</sup>	105 <sup>1)</sup>	105 <sup>1)</sup>	105 <sup>1)</sup>	105 <sup>1)</sup>
	∅ d2			25	33.7	38	51	63.5	76.1
	t			1.2	1.2	1.2	1.2	1.6	1.6
Thread according to DIN 11887	L1 (N)	64 <sup>1)</sup>	64 <sup>1)</sup>	64	100 <sup>1)</sup>	100 <sup>1)</sup>	100 <sup>1)</sup>	100	115
	∅ d1	16	20	26	32	38	50	66	81
	∅ C1	34 x 1/8"	44 x 1/8"	52 x 1/8"	58 x 1/8"	65 x 1/8"	78 x 1/8"	95 x 1/8"	110 x 1/4"
Thread according to SMS 1146	L2 (N)	-	-	55 <sup>1)</sup>	105 <sup>1)</sup>	105 <sup>1)</sup>	105 <sup>1)</sup>	105 <sup>1)</sup>	110 <sup>1)</sup>
	∅ d1			22.6	29.6	35.6	48.6	60.3	72.9
	∅ C2			40 x 1/8"	48 x 1/8"	60 x 1/8"	70 x 1/8"	85 x 1/8"	98 x 1/8"
Clamp connection acc. to ISO 2852 (piping acc. to ISO 2037)	L3 (N)	-	-	60.3 <sup>1)</sup>	88.9	88.9 <sup>1)</sup>	88.9 <sup>1)</sup>	88.9 <sup>1)</sup>	95.3 <sup>1)</sup>
	∅ d1			22.6	31.3	35.6	48.6	60.3	72.9
	∅ C3			50.5	50.5	50.5	64	77.5	91
Flanges acc. to DIN EN 1092-1	L4 (N)	90	95	100	105	115	125	145	155
	∅ d1	16	20	26	32	38	50	66	81
<b>Dimensions in common</b>	A	80	80	80	110	110	110	110	110
	H1 (N)	225	228	231	257	260	265	275	280

**Table 5b · Dimensions in mm for Type 3271 and Type 3277 Actuators**

Actuator	Type	3271-5	3271		3277-5	3277	
Actuator area	cm <sup>2</sup>	120	240	350	120	240	350
Diaphragm ∅ D	mm	168	240	280	168	240	280
H	mm	70	65	85	70	65	85
H3 <sup>2)</sup>	mm	110					
a	mm	G 1/8	G 1/4	G 3/8	-	G 3/8	

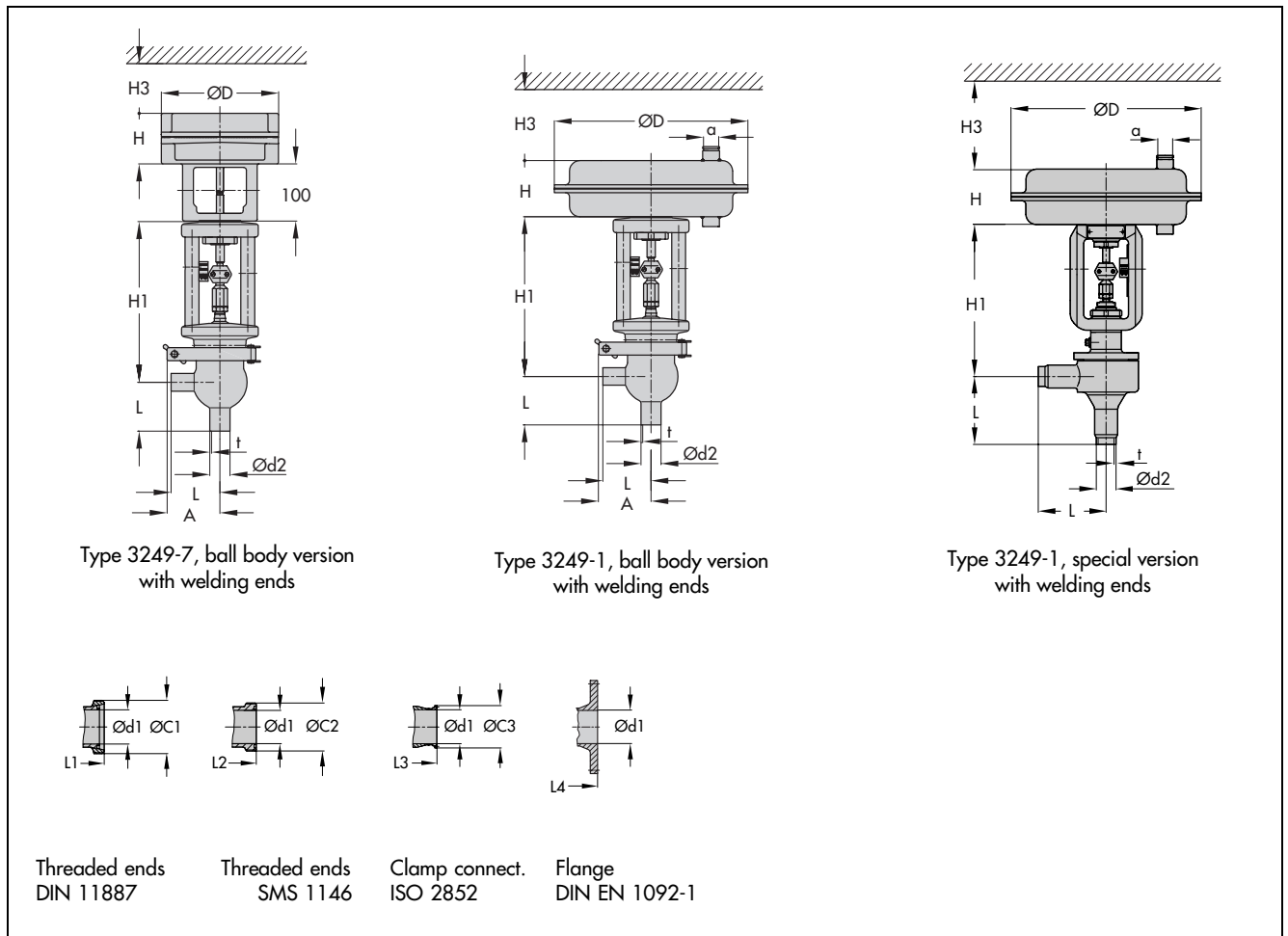
1) Not standardized

2) Minimum clearance for removal of the actuator

**Table 6 · Weights in kg for Type 3249 Valve**

Valve	DN	15 / 1/2"	20 / 3/4"	25 / 1"	32 / 1 1/4"	40 / 1 1/2"	50 / 2"	65 / 2 1/2"	80 / 3"
Weight including welding ends	Approx. kg	6	6	6	16	16	16	20	20

Actuator	Type	3271-5	3271	3277-5	3277		
Actuator area	cm <sup>2</sup>	120	240	350	120	240	350
Weight	Approx. kg	3	5	8	3.5	9	12



**Ordering text**

Type 3249 Control Valve for aseptic applications  
 Body version Ball body or special version with safety stuffing box  
 Nominal size DN ...  
 K<sub>vs</sub> value ...  
 Plug seal Metal/soft sealing  
 End connections Welding ends, Threaded ends, Flanges or Clamp connection  
 Characteristic Equal percentage or linear

Actuator Type 3271/3277  
 Actuator area ... cm<sup>2</sup>  
 Travel ... mm  
 Fail-safe action Valve CLOSED or valve OPEN  
 Bench range ...

Specifications subject to change without notice.



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