

# DATA SHEET



## T 8048-2 EN

### Type 3349 Aseptic Angle Valve

With USP-VI diaphragm



#### Application

Control valve for aseptic applications in the food and pharmaceutical industries according to DIN or ANSI standards with USP-VI diaphragm

Valve sizes	DN 15 to 100	• NPS ½ to 4
Maximum pressure	10 bar	• 150 psi
Temperature range	0 to 160 °C	• 32 to 320 °F



#### Type 3349 Angle Valve with

- Type 3271 Pneumatic Actuator
- Type 3277 Pneumatic Actuator for integral positioner attachment

#### Special features

- Aseptic design ensures safe product handling
- Plug with flow characteristic for good control accuracy
- Valve body made of stainless steel with low delta ferrite content (1.4435/316 L)
- Wetted inside surfaces with a precision-lathed or polished finish
- Wetted sealing materials comply with FDA regulations
- USP Class VI-121 °C compliance

The valve body is designed without cavities and can be fitted with welding ends depending on the version. The valves are suitable for CIP (cleaning-in-place) or SIP (sterilization-in-place). The plug stem guide is sealed by a diaphragm.

A test connection allows the diaphragm to be monitored for leakage.

#### Versions

**Standard version** · Angle valve in bar stock with USP-VI certification, DN 15 to 100 (NPS ½ to 4) · Maximum operating pressure according to Table 2 · Valve with bolted-on bonnet with or without backup packing · Plug stem sealed by PTFE diaphragm

- Type 3349 Valve with Type 3271 and Type 3277 Pneumatic Actuator (Data Sheet ▶ T 8310-1)



**Fig. 1:** Type 3349 Valve with Type 3277 Pneumatic Actuator and Type 3730 Positioner

### Further versions

- Type 3349 Valve with stainless steel Type 3379 Actuator  
DN 8 to 50 (NPS 1/4 to 2) ·  $K_{VS}$  coefficients: 0.01 to 40  
Data Sheet ▶ T 8048-3
- **Plug and seat** surface with **Stellite®** facing
- **V-port plug** for high pressure drops
- **Body materials:** Hastelloy® C22, Hastelloy® C4, Hastelloy® C276, Uranus B, Duplex, 14547/254SMO, Alloy 20 (N08020) · On request
- **Possible** end connections (on request) · Welding ends, threaded connections (aseptic), clamp connections (aseptic), flanges (aseptic) · See Table 2

### Principle of operation

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

In the standard version, the plug stem (3) is sealed by the diaphragm (24). In the special version, an additional backup V-ring packing (23) is used.

The test connection (36) allows the diaphragm to be monitored for leakage.

In the version with backup packing, the test connection is sealed by a stopper.

The test connection of valves without a backup packing is fitted with a pipe (40) to allow the drainage of any medium that escapes.

### Fail-safe position

Depending on how the springs are arranged in the pneumatic actuator (▶ T 8310-1), the valve has two different fail-safe positions that become effective when the supply air fails.

- **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.

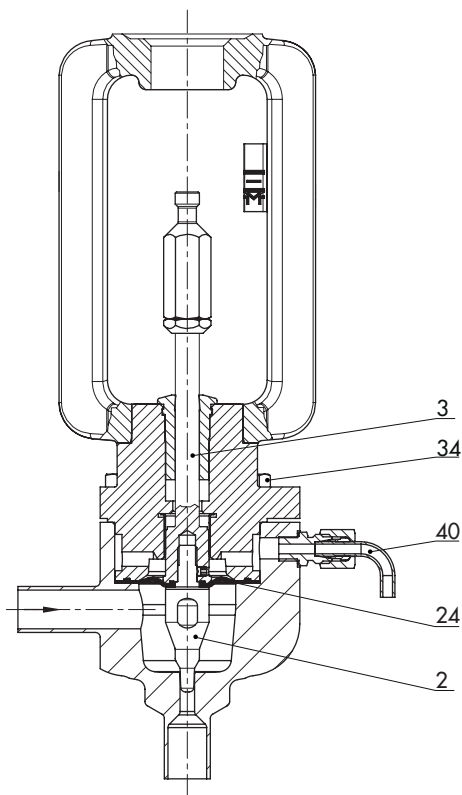


Fig. 2: Type 3349 Angle Valve · Version with wiper ring and test connection

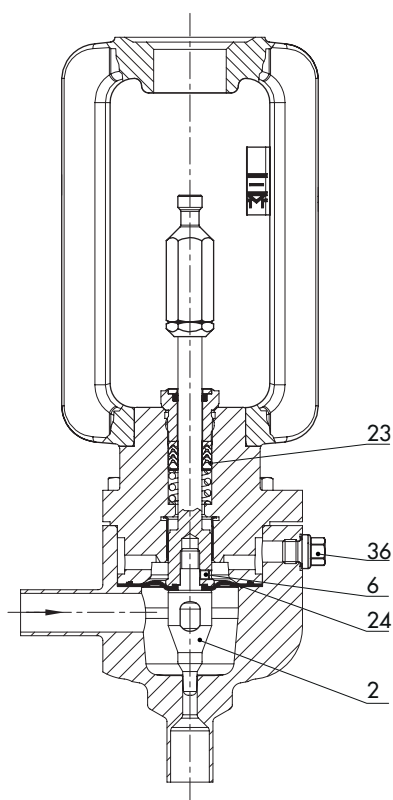



Fig. 3: Type 3349 Angle Valve · Version with additional packing

### Legend for Fig. 2 and Fig. 3

- |    |   |
|----|---|
| 2  | Plug  |
| 3  | Plug stem                                     |
| 6  | Threaded pin                                  |
| 23 | V-ring packing                                |
| 24 | USP-VI diaphragm                              |
| 34 | Hexagon screw                                 |
| 36 | Screw plug (test connection) or nipple (pipe) |
| 40 | Pipe  |

**Table 1:** Technical data for Type 3349

Version		DIN	ANSI		
Valve size		DN 15 to 100	NPS ½ to 4		
Maximum pressure	Refer to Table 2	10 bar	150 psi		
Type of connection		According to Table 2			
Seat-plug seal		Metal seal · Soft seal <sup>1)</sup>			
Characteristic		Equal percentage or linear			
Rangeability		50:1 for K <sub>VS</sub> 0.4 to 40 (up to DN 50/NPS 2) 30:1 for K <sub>VS</sub> 60 to 160 (DN 65/NPS 2½ and larger)			
Permissible temperatures	Operating temperature	0 to 160 °C	32 to 320 °F		
	Sterilizing temperature	180 °C for up to 30 min	356 °F for up to 30 min		
Leakage class according to IEC 60534-4 or ANSI/FCI 70-2	Metal seal	IV			
	Soft seal (PEEK) <sup>1)</sup>	VI			
Cleaning		CIP (cleaning in place) or SIP (sterilization in place)			
Peak-to-valley height <sup>2)</sup> and surface finish	R <sub>a internal</sub> in µm	Standard	Mechanically polished	Mechanical and electropolished	
		0.2	–	• (high-gloss finish)	–
		0.4	–	• (high-gloss finish)	• (satin finish)
		0.6	–	•	• (satin finish)
	0.8	•	–	•	
	R <sub>a external</sub> in µm	Standard	Mechanically polished	Mechanical and electropolished	
		0.4	–	• (high-gloss finish)	• (satin finish)
		0.6	–	•	• (satin finish)
		0.8	•	–	•
	Certificates		USP-VI 121 °C <sup>3)</sup> Free of ADI · CFR Title 21 FDA Regulation (EC) No. 1935/2004 Regulation (EU) No. 10/2011 Regulation (EC) No. 2023/2006 3-A conformity		
Compliance					

<sup>1)</sup> Special version

<sup>2)</sup> Other peak-to-valley heights on request

<sup>3)</sup> Only for metal seal

**Table 2:** End connections, operating range with maximum pressures and temperature limits

Connection	Standard	Valve sizes	Max. operating pressure	Pressure-temperature diagram
Welding ends	DIN 11850 Series 2 (standard)	See Table 10 to Table 12	10 bar	DIN
	DIN 11866, Series B			
	ISO 1127			
	ISO 2037		150 psi	ANSI
	SMS 3008			
	BS 4825			
	ASTM A-270			
Threaded connection	DIN 11864-1, Form A			
Clamp connections	DIN 11864-3, Form A	10 bar	DIN	
Flanges	DIN 11864-2, Form A			

**Table 3: Materials**

Version	DIN	ANSI
Body	1.4435 <sup>1) 2)</sup>	316L <sup>1) 2)</sup>
Bonnet	1.4404	316L
Plug	1.4435 or 1.4435/Stellite®	316L or 316L/Stellite®
Plug stem guide	PTFE	
Plug seal <sup>3)</sup>	PEEK	
Packing Special version	PTFE	
Diaphragm	PTFE	

1) Delta ferrite content ≤1 % for body and ≤3 % for weld seams

2) Other materials on request

3) Options

**Table 4:  $K_{VS}$  and  $C_V$  coefficients and associated nominal sizes**

$K_{VS}$	0.4	0.63	1.0	1.6	2.5	4	6.3	10	6.3	10	16	25	40	60	80	100	160	
$C_V$	0.5	0.75	1.2	2	3	5	7.5	12	7.5	12	20	30	47	70	95	120	190	
Seat Ø [mm]	6		6 12 <sup>1)</sup>	12		12 24 <sup>1)</sup>	24		31			38	48	63	80		100	
Rated travel in mm	7.5								15					30				
Rangeability	50 : 1												30 : 1					
DN	NPS																	
15	½	•	•	•	•	•	•											
20	¾	•	•	•	•	•	•											
25	1	•	•	•	•	•	•	•	•									
32	1¼								•	•	•							
40	1½								•	•	•	•						
50	2								•	•	•	•	•	•				
65	2½								•	•	•	•	•	•	•			
80	3								•	•	•	•	•	•	•	•		
100	4																•	•

1) Seat Ø for version with V-port plug

**Table 5:** Permissible differential pressures for Type 3349 in standard and special version with fail-safe position "actuator stem extends" · Valve CLOSED when the signal pressure is 0 bar/psi · Metal seal (leakage class IV)

**Table 5.1:** All pressures stated in bar

Valve size		Seat Ø [mm]	K <sub>V5</sub>	Actuator area in cm <sup>2</sup>	Bench range in bar	Operating range in bar when p <sub>2</sub> = 0 bar (valve CLOSED)	
DN	NPS					Δp = 5 bar	Δp = 10 bar
15 to 25	½ to 1	6	0.4 to 1.0	120	0.4 to 2.0	1.2 to 2.0	1.2 to 2.0
		12	1.6 to 4.0				
25	1	24	6.3 to 10				
15 to 25	½ to 1	6	0.4 to 1.0	175v2	0.4 to 2.0	1.2 to 2.0	1.2 to 2.0
		12	1.6 to 4.0				
25	1	24	6.3 to 10				
15 to 25	½ to 1	6	0.4 to 1.0	240	0.4 to 2.0	1.2 to 2.0	1.2 to 2.0
		12	1.6 to 4.0				
25	1	24	6.3 to 10				
32 to 65	1¼ to 2½	31	16	350	0.6 to 3.0	0.6 to 3.0	1.2 to 3.6
40 to 65	1½ to 2½	38	25				
50 to 65	2 to 2½	48	40				
65	2½	63	60				
32 to 65	1¼ to 2½	31	16	355v2	0.4 to 2.0	1.2 to 2.0	1.2 to 2.0
		38	25				
40 to 65	1½ to 2½	48	40				
65	2½	63	60				
80	3	80	80	700	2.1 to 3.3	2.1 to 3.3	2.1 to 3.3
100	4	80	100				
100	4	100	100				
80	3	80	80	750v2	1.9 to 3.1	1.9 to 3.1	2.2 to 3.4
		100	100				
100	4	80	100				
100	4	100	100				

**Table 5.2:** All pressures in psi

Valve size		Seat Ø [mm]	C <sub>V</sub>	Actuator area in cm <sup>2</sup>	Bench range in psi	Operating range in psi when p <sub>2</sub> = 0 psi (valve CLOSED)	
DN	NPS					Δp = 75 psi	Δp = 10 psi
15 to 25	½ to 1	6	0.5 to 1.2	120	6 to 30	18 to 30	18 to 30
		12	2 to 5				
25	1	24	7.5 to 12				
15 to 25	½ to 1	6	0.5 to 1.2	175v2	6 to 30	18 to 30	18 to 30
		12	2 to 5				
25	1	24	7.5 to 12				
15 to 25	½ to 1	6	0.5 to 1.2	240	6 to 30	18 to 30	18 to 30
		12	2 to 5				
25	1	24	7.5 to 12				
32 to 65	1¼ to 2½	31	20	350	9 to 44	9 to 44	18 to 53
40 to 65	1½ to 2½	38	30				
50 to 65	2 to 2½	48	46				
65	2½	63	70				
32 to 65	1¼ to 2½	31	20	355v2	6 to 30	18 to 30	18 to 30
		38	30				
40 to 65	1½ to 2½	48	46				
65	2½	63	70				
80	3	80	95	700	31 to 48	31 to 48	31 to 48
		100	120				
100	4	100	190				
80	3	80	95	750v2	28 to 45	28 to 45	32 to 50
		100	120				
100	4	80	120				
100	4	100	190				

**Table 6:** Permissible differential pressures for Type 3349 in standard and special version with fail-safe position "actuator stem retracts" · Valve CLOSED at the required supply pressure · Metal seal (leakage class IV)

**Table 6.1:** All pressures stated in bar

Valve size		Seat Ø [mm]	K <sub>vs</sub>	Actuator area in cm <sup>2</sup>	Bench range in bar	Required supply pressure in bar when p <sub>2</sub> = 0 bar (valve CLOSED)		
DN	NPS					Δp = 5 bar	Δp = 10 bar	
15 to 25	½ to 1	6	0.4 to 1.0	120	0.4 to 2.0 (operating range 0.4 to 1.2)	1.8	2.1	
		12	1.6 to 4.0					
25	1	24	6.3 to 10					
15 to 25	½ to 1	6	0.4 to 1.0	175v2		0.4 to 2.0 (operating range 0.4 to 1.2)	1.6	1.8
		12	1.6 to 4.0					
25	1	24	6.3 to 10					
15 to 25	½ to 1	6	0.4 to 1.0	240	0.4 to 2.0 (operating range 0.4 to 1.2)		1.5	1.7
		12	1.6 to 4.0					
25	1	24	6.3 to 10					
32 to 65	1¼ to 2½	31	16	350		0.2 to 1.0 <sup>1)</sup>	1.6	1.8
40 to 65	1½ to 2½	38	25					
50 to 65	2 to 2½	48	40					
65	2½	63	60					
32 to 65	1¼ to 2½	31	16	355v2	0.4 to 2.0 (operating range 0.4 to 1.2)	1.8	2.0	
40 to 65	1½ to 2½	38	25					
50 to 65	2 to 2½	48	40					
65	2½	63	60					
80	3	80	80	700	0.2 to 1.0 <sup>1)</sup>	2.1	3.0	
100	4	80	100					
100	4	100	100					
80	3	80	80	750v2	0.2 to 1.0 <sup>1)</sup>	2.1	3.0	
100	4	80	100					
100	4	100	100					

<sup>1)</sup> Operating range corresponds to bench range

**Table 6.2:** All pressures in psi

Valve size		Seat Ø [mm]	C <sub>v</sub>	Actuator area in cm <sup>2</sup>	Bench range in psi	Required supply pressure in psi when p <sub>2</sub> = 0 psi (valve CLOSED)		
DN	NPS					Δp = 75 psi	Δp = 150 psi	
15 to 25	½ to 1	6	0.5 to 1.2	120	6 to 30 (operating range 6 to 18)	27	31	
		12	2 to 5					
25	1	24	7.5 to 12					
15 to 25	½ to 1	6	0.5 to 1.2	175v2		6 to 30 (operating range 6 to 18)	24	27
		12	2 to 5					
25	1	24	7.5 to 12					
15 to 25	½ to 1	6	0.5 to 1.2	240	6 to 30 (operating range 6 to 18)		22	25
		12	2 to 5					
25	1	24	7.5 to 12					
32 to 65	1¼ to 2½	31	20	350		3 to 15 <sup>1)</sup>	24	27
40 to 65	1½ to 2½	38	30					
50 to 65	2 to 2½	48	46					
65	2½	63	70					
32 to 65	1¼ to 2½	31	20	355v2	6 to 30 (operating range 6 to 18)	27	30	
40 to 65	1½ to 2½	38	30					
50 to 65	2 to 2½	48	46					
65	2½	63	70					
80	3	80	95	700	3 to 15 <sup>1)</sup>	31	44	
100	4	80	120					
100	4	100	190					
80	3	80	95	750v2	3 to 15 <sup>1)</sup>	31	44	
100	4	80	120					
100	4	100	190					

<sup>1)</sup> Operating range corresponds to bench range

**Table 7:** Permissible differential pressures for Type 3349 in standard and special version with fail-safe position "actuator stem extends" · Valve CLOSED when the signal pressure is 0 bar/psi · Soft PEEK seal (leakage class VI)

**Table 7.1:** All pressures stated in bar

Valve size		Seat Ø [mm]	K <sub>VS</sub>	Actuator area in cm <sup>2</sup>	Bench range in bar	Operating range in bar when p <sub>2</sub> = 0 bar (valve CLOSED)	
DN	NPS					Δp = 5 bar	Δp = 10 bar
15 to 25	½ to 1	6	0.4 to 1.0	240	0.4 to 2.0	1.2 to 2.0	1.2 to 2.0
		12	1.6 to 4.0				
25	1	24	6.3 to 10	350	1.2 to 3.6	1.2 to 3.6	2.1 to 3.3
32 to 65	1¼ to 2½	31	16				
40 to 65	1½ to 2½	38	25				
50 to 65	2 to 2½	48	40				
65	2½	63	60				
32 to 65	1¼ to 2½	31	16	355v2	1.2 to 3.6	2.4 to 3.6	2.4 to 3.6
40 to 65	1½ to 2½	38	25				
50 to 65	2 to 2½	48	40				
65	2½	63	60				
80	3	80	80	700	2.1 to 3.3	2.1 to 3.3	2.6 to 4.3
100	4	80	100				
100	4	100	100				
80	3	80	80	750v2	1.9 to 3.1	1.9 to 3.1	2.5 to 4.2
100	4	80	100				
100	4	100	100				

**Table 7.2:** All pressures in psi

Valve size		Seat Ø [mm]	K <sub>VS</sub>	Actuator area in cm <sup>2</sup>	Bench range in psi	Operating range in psi when p <sub>2</sub> = 0 psi (valve CLOSED)	
DN	NPS					Δp = 75 psi	Δp = 150 psi
15 to 25	½ to 1	6	0.5 to 1.2	240	6 to 30	18 to 30	18 to 30
		12	2 to 5				
25	1	24	7.5 to 12	350	18 to 53	18 to 53	31 to 48
32 to 65	1¼ to 2½	31	20				
40 to 65	1½ to 2½	38	30				
50 to 65	2 to 2½	48	46				
65	2½	63	70				
32 to 65	1¼ to 2½	31	20	355v2	18 to 53	35 to 53	35 to 53
40 to 65	1½ to 2½	38	30				
50 to 65	2 to 2½	48	46				
65	2½	63	70				
80	3	80	95	700	31 to 48	31 to 48	38 to 63
100	4	80	120				
100	4	100	190				
80	3	80	95	750v2	28 to 45	28 to 45	37 to 61
100	4	80	120				
100	4	100	190				

**Table 8:** Permissible differential pressures for Type 3349 in standard and special version with fail-safe position "actuator stem retracts" · Valve CLOSED at the required supply pressure · Soft seal (leakage class VI)

**Table 8.1:** All pressures stated in bar

Valve size		Seat Ø [mm]	K <sub>Vs</sub>	Actuator area in cm <sup>2</sup>	Bench range in bar	Required supply pressure in bar when p <sub>2</sub> = 0 bar (valve CLOSED)			
DN	NPS					Δp = 5 bar	Δp = 10 bar		
15 to 25	½ to 1	6	0.4 to 1.0	120	0.4 to 2.0 (operating range 0.4 to 1.2)	2.2	3.1		
		12	1.6 to 4.0						
25	1	24	6.3 to 10						
15 to 25	½ to 1	6	0.4 to 1.0	175v2		0.4 to 2.0 (operating range 0.4 to 1.2)	1.9	2.6	
		12	1.6 to 4.0						
25	1	24	6.3 to 10						
15 to 25	½ to 1	6	0.4 to 1.0	240			0.4 to 2.0 (operating range 0.4 to 1.2)	1.7	2.2
		12	1.6 to 4.0						
25	1	24	6.3 to 10						
32 to 65	1¼ to 2½	31	16	350	0.2 to 1.0 <sup>1)</sup>			2.0	2.8
40 to 65	1½ to 2½	38	25						
50 to 65	2 to 2½	48	40						
65	2½	63	60						
32 to 65	1¼ to 2½	31	16	355v2	0.4 to 2.0 (operating range 0.4 to 1.2)	2.2		2.9	
40 to 65	1½ to 2½	38	25						
50 to 65	2 to 2½	48	40						
65	2½	63	60						
80	3	80	80	700	0.2 to 1.0 <sup>1)</sup>	2.3	3.4		
100	4	80	100						
100	4	100	100						
80	3	80	80	750v2	0.2 to 1.0 <sup>1)</sup>	2.2	3.2		
100	4	80	100						
100	4	100	100						

<sup>1)</sup> Operating range corresponds to bench range

**Table 8.2:** All pressures in psi

Valve size		Seat Ø [mm]	C <sub>v</sub>	Actuator area in cm <sup>2</sup>	Bench range in psi	Required supply pressure in psi when p <sub>2</sub> = 0 psi (valve CLOSED)			
DN	NPS					Δp = 75 psi	Δp = 150 psi		
15 to 25	½ to 1	6	0.5 to 1.2	120	6 to 30 (operating range 6 to 18)	32	45		
		12	2 to 5						
25	1	24	7.5 to 12						
15 to 25	½ to 1	6	0.5 to 1.2	175v2		6 to 30 (operating range 6 to 18)	28	38	
		12	2 to 5						
25	1	24	7.5 to 12						
15 to 25	½ to 1	6	0.5 to 1.2	240			6 to 30 (operating range 6 to 18)	25	32
		12	2 to 5						
25	1	24	7.5 to 12						
32 to 65	1¼ to 2½	31	20	350	3 to 15 <sup>1)</sup>			30	41
40 to 65	1½ to 2½	38	30						
50 to 65	2 to 2½	48	46						
65	2½	63	70						
32 to 65	1¼ to 2½	31	20	355v2	6 to 30 (operating range 6 to 18)	32		43	
40 to 65	1½ to 2½	38	30						
50 to 65	2 to 2½	48	46						
65	2½	63	70						
80	3	80	95	700	3 to 15 <sup>1)</sup>	34	50		
100	4	80	120						
100	4	100	190						
80	3	80	95	750v2	3 to 15 <sup>1)</sup>	32	47		
100	4	80	120						
100	4	100	190						

<sup>1)</sup> Operating range corresponds to bench range



**Table 9:** Dimensions in mm

**Table 9.1:** Type 3349 Valve

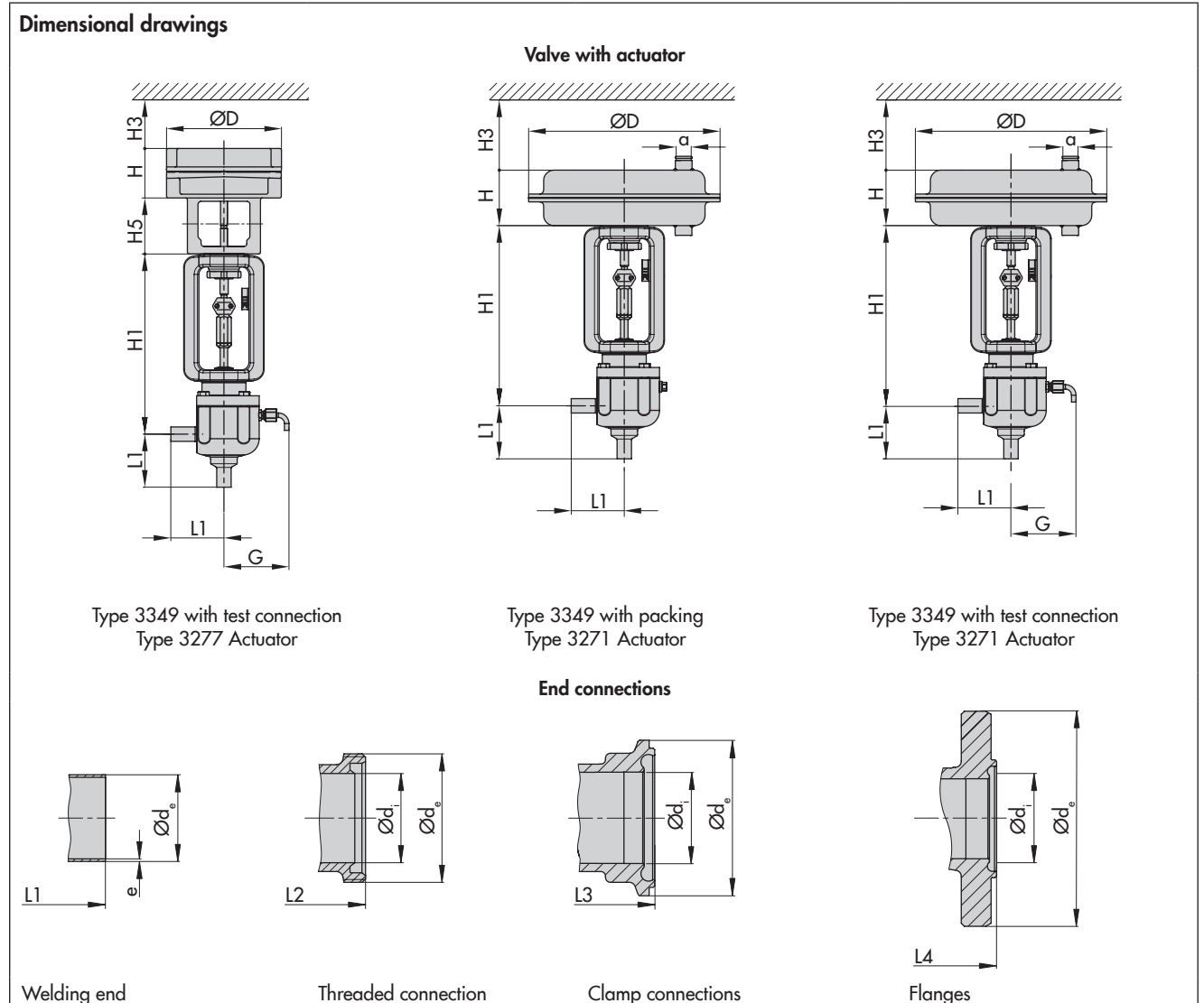
Valve	DN	15	20	25	32	40	50	65	80	100
	NPS	½	¾	1	1¼	1½	2	2½	3	4
H1	mm	238	241	244	276	279	285	293	348	360
G	mm	86	86	86	113	113	113	113	144	144

**Table 9.2:** Types 3271 and 3277 Pneumatic Actuators

Actuator area	cm <sup>2</sup>	120	175v2	240	350	355v2	700	750v2
Diaphragm ØD	mm	168	215	240	280	280	390	394
H <sup>1)</sup>	mm	69	78	62	82	121	199	236
H3 <sup>2)</sup>	mm	110	110	110	110	110	190	190
H5	Type 3277	mm	88	101	101	101	101	101
Thread	Type 3271	M30x1.5						
	Type 3277	M30x1.5						
α	Type 3271	G ½ (½ NPT)	G ¼ (¼ NPT)	G ¼ (¼ NPT)	G ¾ (¾ NPT)	G ¾ (¾ NPT)	G ¾ (¾ NPT)	G ¾ (¾ NPT)
α2	Type 3277	–	G ¾	G ¾	G ¾	G ¾	G ¾	G ¾

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 cm<sup>2</sup> without lifting eyelet

2) Minimum clearance required to remove the actuator



**Table 10: Dimensions of end connections for DIN version · Dimensions in mm**

**Table 10.1: Welding ends**

Valve	DN	15	20	25	32	40	50	65	80	100
Welding ends for pipes according to DIN 11866, Series A (DIN 11850, Series 2) <sup>1)</sup>	L1	70	70	70	105	105	105	105	150	150
	Ød <sub>i</sub>	16	20	26	32	38	50	66	81	100
	Ød <sub>e</sub>	19	23	29	35	41	53	70	85	104
	e	1.5	1.5	1.5	1.5	1.5	1.5	1.5	2	2
Welding ends for pipes according to ISO 1127, Series 1	L1	70	70	70	105	105	105	105	150	150
	Ød <sub>i</sub>	18.1	23.7	29.7	38.4	44.3	55.1	70.9	83.7	109.1
	Ød <sub>e</sub>	21.3	26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3
	e	1.6	1.6	2	2	2	2.6	2.6	2.6	2.6
Welding ends for pipes according to SMS 3008	L1	70	-	70	105	105	105	105	150	150
	Ød <sub>i</sub>	16		22.6	31.3	35.6	48.6	60.3	72.9	97.6
	Ød <sub>e</sub>	18		25	33.7	38	51	63.5	76.1	101.6
	e	1		1.2	1.2	1.2	1.2	1.6	1.6	2

**Table 10.2: Threaded connections**

Valve	DN	15	20	25	32	40	50	65	80	100
Threaded connections according to DIN 11864-1 GS Form A Series A	L2	70	70	70	100	100	100	100	155	155
	Ød <sub>i</sub>	16	20	26	32	38	50	66	81	100
	Ød <sub>e</sub>	Rd 34 x 1/8"	Rd 44 x 1/6"	Rd 52 x 1/6"	Rd 58 x 1/6"	Rd 65 x 1/6"	Rd 78 x 1/6"	Rd 95 x 1/6"	Rd 110 x 1/4"	Rd 130 x 1/4"
Threaded couplings according to ISO 2853	L2	-	-	70	100	100	100	100	155	-
	Ød <sub>i</sub>			22.6	31.3	35.6	48.6	60.3	72.9	
	Ød <sub>e</sub>			Rd 37 x 1/8"	Rd 45.9 x 1/8"	Rd 50.6 x 1/8"	Rd 64.1 x 1/8"	Rd 77.6 x 1/8"	Rd 91.1 x 1/8"	
Threaded connections according to SMS 1146	L2	-	-	70	100	100	100	100	155	155
	Ød <sub>i</sub>			22.6	29.6	35.6	48.6	60.3	72.9	100
	Ød <sub>e</sub>			Rd 40 x 1/6"	Rd 48 x 1/6"	Rd 60 x 1/6"	Rd 70 x 1/6"	Rd 85 x 1/6"	Rd 98 x 1/6"	Rd 125 x 1/4"
Threaded couplings according to DIN 11887	L2	70	70	70	100	100	100	100	155	155
	Ød <sub>i</sub>	16	20	26	32	38	50	66	81	100
	Ød <sub>e</sub>	Rd 34 x 1/8"	Rd 44 x 1/6"	Rd 52 x 1/6"	Rd 58 x 1/6"	Rd 65 x 1/6"	Rd 78 x 1/6"	Rd 95 x 1/6"	Rd 110 x 1/4"	Rd 130 x 1/4"

**Table 10.3: Clamp connections**

Valve	DN	15	20	25	32	40	50	65	80	100
Clamp connections according to DIN 11864-3 NKS Form A Series A	L3	60.3	60.3	60.3	88.9	88.9	88.9	88.9	150	150
	Ød <sub>i</sub>	16	20	26	32	38	50	66	81	100
	Ød <sub>e</sub>	34	50.5	50.5	50.5	64	77.5	91	106	130
Clamp connections according to DIN 32676, Series B	L3	60.3	60.3	60.3	88.9	88.9	88.9	88.9	150	150
	Ød <sub>i</sub>	18.1	23.7	29.7	38.4	44.3	56.3	72.1	84.3	109.7
	Ød <sub>e</sub>	50.5	50.5	50.5	64	64	77.5	91	106	130

**Table 10.4: Flanges**

Valve	DN	15	20	25	32	40	50	65	80	100
Flanges according to DIN 11864-2 NF Form A, Series A	L4	90	95	100	105	115	125	145	155	175
	Ød <sub>i</sub>	16	20	26	32	38	50	66	81	100
	Ød <sub>e</sub>	59	64	70	76	82	94	113	133	159
PN 40 flanges according to DIN EN 1092-1, B2	L4	90	95	100	105	115	125	145	155	175
	Ød <sub>i</sub>	16	20	26	32	38	50	66	81	100
	Ød <sub>e</sub>	95	105	115	140	150	165	185	200	220

**Table 11: Dimensions of end connections for OD version · Dimensions in mm****Table 11.1: Welding ends**

Valve	OD	17.2	21.3	26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3
Welding ends for pipes according to DIN 11866, Series B	L1	70	70	70	70	105	105	105	105	150	150
	Ø <sub>d<sub>i</sub></sub>	14.0	38.4	23.7	29.7	38.4	44.3	56.3	72.1	84.3	109.7
	Ø <sub>d<sub>e</sub></sub>	17.2	21.3	26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3
	e	1.6	1.6	1.6	2	2	2	2	2	2.3	2.3
Welding ends for pipes according to ISO 2037	L1	50	70	70	70	105	105	105	105	150	150
	Ø <sub>d<sub>i</sub></sub>	10	15.2	19.3	22.6	31.3	35.6	48.6	60.3	72.9	97.6
	Ø <sub>d<sub>e</sub></sub>	12	17.2	21.3	25	33.7	38	51	63.5	76.1	101.6
	e	1	1	1	1.2	1.2	1.2	1.2	1.6	1.6	2

**Table 11.2: Threaded connections**

Valve	OD	17.2	21.3	26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3
Threaded connections according to DIN 11864-1 GS Form A Series B	L2	70	70	70	70	100	100	100	100	155	-
	Ø <sub>d<sub>i</sub></sub>	14	18.1	23.7	29.7	38.4	44.3	56.3	72.1	84.3	
	Ø <sub>d<sub>e</sub></sub>	Rd 34 x 186"	Rd 44 x 166"	Rd 52 x 1/8"	Rd 58 x 1/8"	Rd 65 x 1/8"	Rd 78 x 1/8"	Rd 95 x 1/8"	Rd 110 x 1/4"	Rd 130 x 1/4"	

**Table 11.3: Clamp connections**

Valve	OD	17.2	21.3	26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3
Clamp connections according to DIN 11864-3 NKS Form A Series B	L3	60.3	60.3	60.3	60.3	88.9	88.9	88.9	88.9	150	150
	Ø <sub>d<sub>i</sub></sub>	14.0	18.1	23.7	29.7	38.4	44.3	56.3	72.1	84.3	-
	Ø <sub>d<sub>e</sub></sub>	34	34	50.5	50.5	64	64	91	106	119	-

**Table 11.4: Flanges**

Valve	OD	17.2	21.3	26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3
Flanges according to DIN 11864-2 NF Form A, Series B	L4	90	90	95	100	105	115	125	145	155	175
	Ø <sub>d<sub>i</sub></sub>	14.0	18.1	23.7	29.7	38.4	44.3	56.3	72.1	84.3	109.7
	Ø <sub>d<sub>e</sub></sub>	59	62	69	74	82	88	103	125	137	168

**Table 12:** Dimensions of end connections for ANSI version - Dimensions in mm

**Table 12.1:** Welding ends

Valve	NPS	½	¾	1	1¼	1½	2	2½	3	4
Welding ends for pipes according to DIN 11866 Series C (ASTM A-270/ASME BPE)	L1	70	70	70	-	105	105	105	150	150
	Ød <sub>i</sub>	9.4	15.75	22.1		34.8	47.5	60.2	72.9	97.38
	Ød <sub>e</sub>	12.7	19.05	25.4		38.1	50.8	63.5	76.2	101.6
	e	1.65	1.65	1.65		1.65	1.65	1.65	1.65	2.11
Welding ends for pipes according to BS 4825	L1	-	-	70	-	105	105	105	150	150
	Ød <sub>i</sub>			22.2		34.9	47.6	60.3	73	97.6
	Ød <sub>e</sub>			25.4		38.1	50.8	63.5	76.2	101.6
	e			1.60		1.60	1.60	1.60	1.60	2
Welding ends according to JIS G 3447	L1	-	-	70	105	105	105	105	150	150
	Ød <sub>i</sub>			23	29.4	35.7	47.8	59.5	72.3	97.6
	Ød <sub>e</sub>			25.4	31.8	38.1	50.8	63.5	76.3	101.6
	e			1.2	1.2	1.2	1.5	2	2	2
Welding ends according to JIS G 3459	L1	70	70	70	105	105	105	105	150	150
	Ød <sub>i</sub>	18.4	23.9	30.7	39.4	45.3	57.2	72.1	84.9	110.1
	Ød <sub>e</sub>	21.7	27.2	34	42.7	48.6	60.5	76.3	89.1	114.3
	e	1.65	1.65	1.65	1.65	1.65	1.65	2.1	2.1	2.1

**Table 12.2:** Threaded connections

Valve	NPS	½	¾	1	1¼	1½	2	2½	3	4
Threaded connections according to DIN 11864-1 GS Form A Series C	L2	70	70	70	-	100	100	100	155	155
	Ød <sub>i</sub>	9.4	15.75	22.1		34.8	47.5	60.2	72.9	97.38
	Ød <sub>e</sub>	Rd 28 x ⅝"	Rd 34 x ⅞"	Rd 52 x ⅞"		Rd 65 x ⅞"	Rd 78 x ⅞"	Rd 95 x ⅞"	Rd 110 x ⅞"	Rd 130 x ⅞"

**Table 12.3:** Clamp connections

Valve	NPS	½	¾	1	1¼	1½	2	2½	3	4
Clamp connections according to DIN 11864-3 NKS Form A Series C	L3	60.3	60.3	60.3	-	88.9	88.9	88.9	150	150
	Ød <sub>i</sub>	9.4	15.75	22.1		34.8	47.5	60.2	72.9	97.38
	Ød <sub>e</sub>	34	34	50.5		64	77.5	91	106	130
Clamp connections according to BS 4825, Part 3	L3	-	-	60.3	-	88.9	88.9	88.9	150	150
	Ød <sub>i</sub>			22.2		34.9	47.6	60.3	73	97.6
	Ød <sub>e</sub>			50.5		50.5	64	77.5	91	119
Clamp connections according to ASME-BPE	L3	60.3	60.3	60.3	-	88.9	88.9	88.9	150	150
	Ød <sub>i</sub>	9.4	15.75	22.1		34.8	47.5	60.2	72.9	97.38
	Ød <sub>e</sub>	25	25	50.5		50.5	64	77.5	91	119
Clamp connections according to OSS for JIS G3447	L3	-	-	60.3	88.9	88.9	88.9	88.9	150	150
	Ød <sub>i</sub>			23	29.4	35.7	47.8	59.5	72.3	97.6
	Ød <sub>e</sub>			50.5	50.5	50.5	64	77.5	91	119
Clamp connections according to OSS for JIS G3459	L3	-	-	60.3	88.9	88.9	88.9	88.9	150	150
	Ød <sub>i</sub>			30.7	39.4	45.3	57.2	72.1	84.9	110.1
	Ød <sub>e</sub>			50.5	50.5	50.5	64	77.5	91	119

**Table 12.4:** Flanges

Valve	NPS	½	¾	1	1¼	1½	2	2½	3	4
Flanges according to DIN 11864-2 NF Form A, Series C	L4	90	95	100	-	115	125	145	155	175
	Ød <sub>i</sub>	9.4	15.75	22.1		34.8	47.5	60.2	72.9	97.38
	Ød <sub>e</sub>	54	59	66		79	92	107	125	157
Class 150 flanges according to ASME B16.5	L4	90	95	100	-	115	125	145	155	175
	Ød <sub>i</sub>	9.4	15.75	22.1		34.8	47.5	60.2	72.9	97.38
	Ød <sub>e</sub>	88.9	98.6	108		127	152.4	177.8	190.5	228.6

**Table 13: Weights in kg****Table 13.1: Type 3349 Valve**

Valve	DN	15	20	25	32	40	50	65	80	100
	NPS	½	¾	1	1¼	1½	2	2½	3	4
Weight with welding ends	Approx.	6			16			42		

**Table 13.2: Types 3271 and 3277 Pneumatic Actuators**

Actuator	cm <sup>2</sup>	120	175v2	240	350	355v2	700	750v2
Type 3271		2.5	6	5	8	15	22	36
Type 3277		3.2	10	9	12	19	26	40

## Ordering text

Control valve for aseptic service	Type 3349 with USP-VI diaphragm
Body version	Standard or special version with or without backup packing
Valve size	DN ... or NPS ... or OD ...
$K_{VS}/C_V$ coefficient	...
Plug seal	Metal or soft seal
End connections	Welding ends, threaded connections, clamp connections or flanges
Characteristic	Equal percentage or linear
Actuator	Type 3271/3277
Actuator area	... cm <sup>2</sup>
Travel	... mm
Fail-safe position	Fail-close or fail-open
Signal pressure range	...