

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 100	•	NPS ½ to 4
Maximum pressure	10 bar	•	150 psi
Temperature range	-10 to 160 °C	•	14 to 320 °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 with polished or fine machine finish
- Categorized in conformity assessment module A of the Pressure Equipment Directive
- 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 to the CIP or SIP methods. The stem guide is sealed by a diaphragm. The test connection enables the diaphragm to be monitored for leakages. The valve is suitable for aseptic applications.

Versions

Standard version · Angle valve in ball body version (bar stock body). DN 15 to 100 with welding ends according to DIN 11850, Series 2.

Maximum pressure 10 bar according to Table 1b. 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 8310-1 EN)

Type 3249-7 (Fig. 1) Type 3249 Angle Valve with Type 3277 Actuator (see Data Sheet T 8310-1 EN)

Special version (Fig. 2) · Bar stock body, DN 15 to 100 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 11851 (11887)
- **Threaded ends** according to SMS or IDF
- **Clamp connections** acc. to ISO 2852, DIN 32676, BS 4825
- **Flanges**
- **Aseptic flanges** acc. to DIN 11864 with female or male face

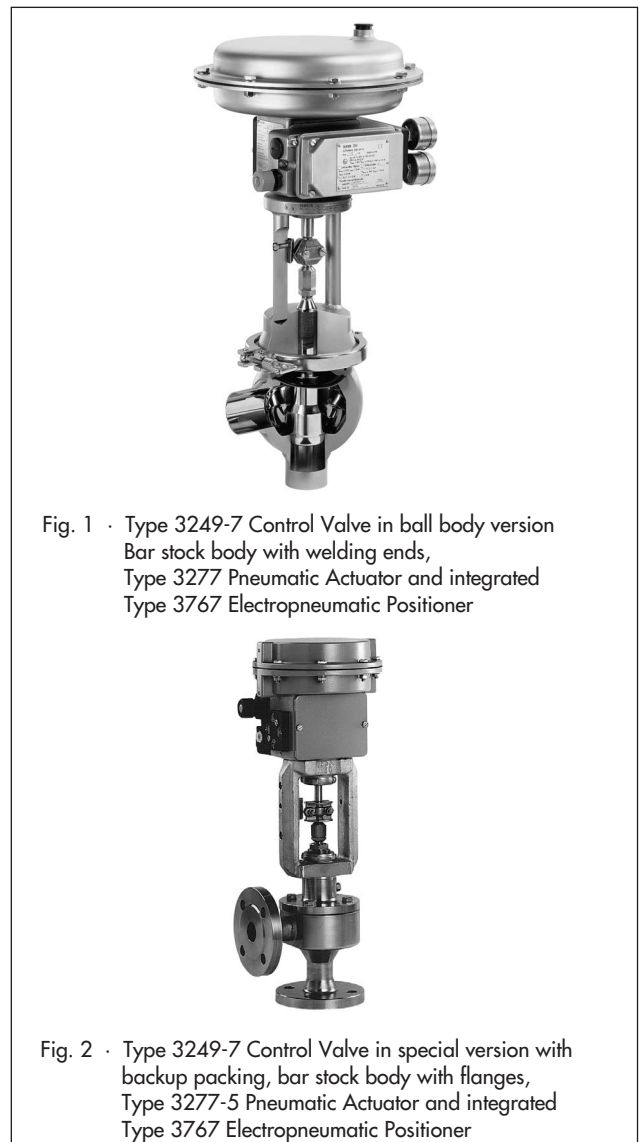


Fig. 1 · Type 3249-7 Control Valve in ball body version
Bar stock body with welding ends,
Type 3277 Pneumatic Actuator and integrated
Type 3767 Electropneumatic Positioner

Fig. 2 · Type 3249-7 Control Valve in special version with
backup packing, bar stock body with flanges,
Type 3277-5 Pneumatic Actuator and integrated
Type 3767 Electropneumatic Positioner

- **Body material 1.4435**, other materials on request
- Functioning 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 flow-to-close direction as 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 the diaphragm (6.2). In the special version, an additional backup 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 (refer to Data Sheet T 8310-1 EN for details), the control valve has two different fail-safe positions, which become effective upon 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.

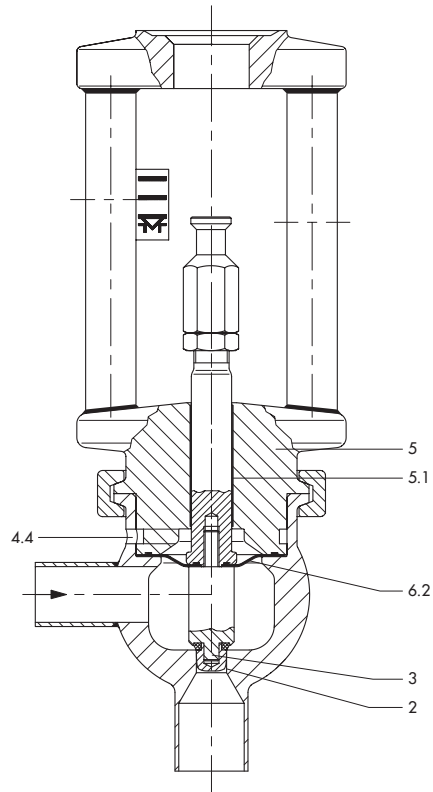


Fig. 3 · Type 3249 Angle Valve in standard version

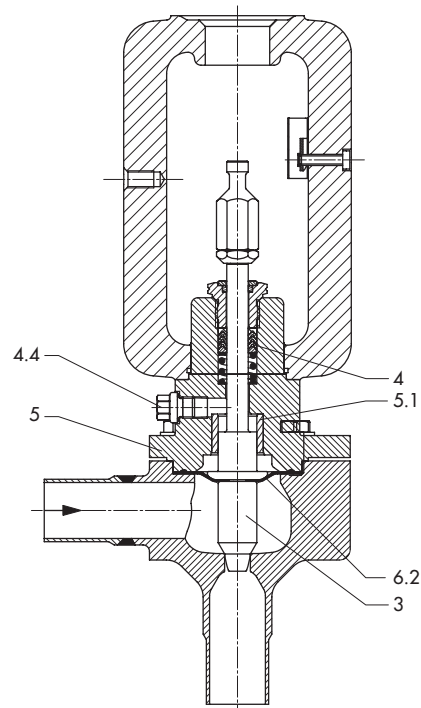


Fig. 4 · Type 3249 Angle Valve in special version

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 ... 100	NPS ½ ... 4
Maximum pressure	See Table 1b	10 bar	150 psi
Type of end connections		According to Table 1b	
Seat/plug sealing ¹⁾		Metal sealing · Soft sealing	
Characteristic		Equal percentage or linear	
Rangeability		50 : 1 for DN 50 or smaller · 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 for up to 30 min	300 °F for up to 30 min
Valid for delivery after September 2008	Operating temp.	160 °C	320 °F
	Sterilizing temp.	180 °C (briefly)	356 °F (briefly)
Leakage class acc. to DIN EN 1349	Metal sealing	IV	
	Soft sealing	VI (not for versions complying with EHEDG regulations)	
Peak-to-valley height and surface finish	External	R _a ≤ 1.6 μm · Glass bead blasted	
		R _a ≤ 0.6 μm · Polished	
	Internal	R _a ≤ 0.8 μm · Fine machine finish	
		R _a ≤ 0.6 μm · Polished	
		R _a ≤ 0.4 μm · Satin finish	
		R _a ≤ 0.4 μm · Mirror finish	

¹⁾ Conformity to food processing regulations only using metal sealing

Table 1b · End connections, working range with maximum pressures and temperature limits

End connections	Standard	Nominal size mm/in	Max. operating pressure	Pressure-temperature diagram
Welding ends	DIN 11 850 Series 2 (11866 A)	DN 15 ... 100	10 bar	DIN
	DIN EN ISO 1127			
	BS 4825	NPS ½ ... 1 NPS 1½ ... 4	150 psi	ANSI
	SMS/ISO 2037 (NFA 49 249)	DN 25 ... 80	10 bar	DIN
Threaded ends	DIN 11 887/11 851 Connection A	DN 15 ... 100	10 bar	DIN
	SMS	DN 25 ... 80	6 bar	
	ISO 2853 (IDF)	NPS 1 ... 3	150 psi	ANSI
Aseptic pipe fitting	DIN 11864 for O-ring and DIN 11850 Series 2	DN 15 ... 80	10 bar	DIN
Clamp connection	ISO 2852 Table 2	DN 25 ... 100	10 bar	DIN
	DIN 32 676	DN 15 ... 100		
	BS 4825	NPS ½ ... 1 NPS 1½ ... 3	150 psi	ANSI
Flanges with smooth face, however, R _a ≤ 0.8	DIN EN 1092-1	DN 15 ... 100	10 bar	DIN
	PN 10 PN 6		6 bar	
	ANSI B 16.5 RF, Cl. 150	NPS ½ ... 4	150 psi	ANSI

Table 2 · Materials

Version ¹⁾	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	
Packing Special version	PTFE V-ring packing	
Diaphragm	EPDM with PTFE facing	

¹⁾ Suitable for Groups 1 and 2 fluids in the European Pressure Equipment Directive 97/23/EC

Table 3 · K_{VS} and C_V coefficients 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	80	100	160	
C_V	0.12	0.2	0.3	0.50	0.75	1.2	2	3	5	7.5	12	20	30	47	70	95	120	190	
Seat \varnothing [mm]	6					12				24 ≤ DN 25 31 ≥ DN 32		31	38	48	63	80		100	
Rated travel [mm]	7.5 mm to DN 25											–							
	–									15 mm for DN 32 and larger					30				
DN	NPS																		
15	½	•	•	•	•	•	•	•	•										
20	¾	•	•	•	•	•	•	•	•										
25	1	•	•	•	•	•	•	•	•	•	•								
32	1¼									•	•	•							
40	1½									•	•	•	•						
50	2									•	•	•	•	•					
65	2½									•	•	•	•	•	•				
80	3									•	•	•	•	•	•	•			
100	4																	•	•

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

Fail-safe position				Actuator stem extends FA				Actuator stem retracts FE			Force applied by the valve diaphragm in N/bar	
Bench range in bar for		Travel = 7.5 mm		0.6 ... 1.0	1.2 ... 2.0	-		0.2...0.6	-			
		Travel = 15/30 mm		0.2 ... 1.0	0.4 ... 2.0	1.4 ... 2.3	2.1 ... 3.3	-	0.2 ... 1.0			
Required supply pressure bar				1.4	2.2	2.5	3.5	1.8	2.4	3.1		
DN	Kvs	Actuator cm ²	Rated travel	Max. upstream pressure p ₁ when p ₂ = 0 bar								
15	0.1 ... 4	120	7.5 mm	5.5	10	-		10	-	-	130	
		240		10	10	-		10	-	-		
20	0.1 ... 4	120		5.5	10	-		10	-	-		
		240		10	10	-		10	-	-		
25	0.1 ... 10	120		5.5	10	-		10	-	-		
		240		10	10	-		10	-	-		
32	6.3 ... 16	240		-	2	-	-	2.0	8	10		400
		350		1.5	3	10	-	3.0	10	-		
40	6.3 ... 25	240	-	2	-	-	2.0	8	10			
		350	1.5	3	10	-	3.0	10	-			
50	6.3 ... 40	240	-	2	-	-	2.0	8	10			
		350	1.5	3	10	-	3.0	10	-			
65 · 80	60	240	-	2	-	-	2.0	8	10			
		350	1.5	3	10	-	3.0	10	-			
80 · 100	80 · 100 160	700	30 mm	-	1.5	6.5	10	1.5	6.5	10	1450	

Table 4b · Permissible differential pressure for Type 3249 in standard and special version · Pressures in psi

Fail-safe position				Actuator stem extends FA				Actuator stem retracts FE			Force applied by the valve diaphragm in N/bar	
Bench range in psi for		Travel = 7.5 mm		9 ... 15	18 ... 30	-		3 ... 9	-			
		Travel = 15/30 mm		3 ... 15	6 ... 30	20 ... 34	30 ... 48	-	3 ... 15			
Required supply pressure psi				20	32	36	50	26	35	45		
NPS	Cv	Actuator cm ²	Rated travel	Max. upstream pressure p ₁ when p ₂ = 0 bar								
½	0.12 ... 5	120	7.5 mm	80	145	-		145	-	-	130	
		240		145	145	-		145	-	-		
¾	0.12 ... 5	120		80	145	-		145	-	-		
		240		145	145	-		145	-	-		
1	0.12 ... 12	120		80	145	-		145	-	-		
		240		145	145	-		145	-	-		
1¼	7.5 ... 20	240		-	29	-	-	29	116	145		400
		350		22	44	145	-	44	145	-		
1½	7.5 ... 30	240	-	29	-	-	29	116	145			
		350	22	44	145	-	44	145	-			
2	7.5 ... 47	240	-	29	-	-	29	116	145			
		350	22	44	145	-	44	145	-			
2½ · 3	70	240	-	29	-	-	29	116	145			
		350	22	44	145	-	44	145	-			
3 · 4	95 · 120 190	700	30 mm	-	22	94	145	22	94	145	1450	

Table 5 · Dimensions in mm for Type 3249-1 and Type 3249-7 Control Valves
Table 5a · Standard version with ball body and special version with backup stuffing box

Valve	DN	15	20	25	32	40	50	65	80	100	
	NPS	½	¾	1	1¼	1½	2	2½	3	4	
Rated travel	mm	7.5			15				30		
Welding ends for pipes acc. to DIN 11850 Series 2	L (standard)	70 *	70 *	70 *	105 *	105 *	105 *	105 *	105 *	150 *	150 *
	L (special)	90	90	90	105	105	115	115	115	–	–
	∅ d2	19	23	29	35	41	53	70	85		104
	t	1.5	1.5	1.5	1.5	1.5	1.5	2	2		2
Welding ends for pipes acc. to DIN EN ISO 1127	L (standard)	70 *	70 *	70 *	105 *	105 *	105 *	105 *	105 *	150 *	150 *
	L (special)	90	90	90	105	105	115	115	115	–	–
	∅ d2	21.3	26.9	33.7	42.4	48.3	60.3	76.1	88.9		114.3
	t	1.6	1.6	2	2	2	2.6	2.6	2.6		2.6
Welding ends for pipes acc. to BS 4825	L (standard)	70 *	70 *	70 *	–	105 *	105 *	105 *	105 *	150 *	150 *
	∅ d2	12.7	19.1	25.4		38.1	50.8	63.5	76.2		97.6
	t	1.6	1.6	1.6		1.6	1.6	1.6	1.6		2
Welding ends for pipes acc. to ISO 2037 (SMS), NFA 49-249	L (standard)	–	–	70 *	105 *	105 *	105 *	105 *	105 *	150 *	150 *
	∅ d2			25	33.7	38	51	63.5	76.1		104 *
	t			1.2	1.2	1.2	1.2	1.6	1.6		2 *
Thread acc. to DIN 11887	L1 (standard)	64 *	64 *	64	100 *	100 *	100 *	100	115	155 *	155 *
	∅ d1	16	20	26	32	38	50	66	81		100
	∅ C1	34 x ⅛"	44 x ⅛"	52 x ⅛"	58 x ⅛"	65 x ⅛"	78 x ⅛"	95 x ⅛"	110 x ¼"		130 x ¼"
Thread acc. to SMS 1146	L2 (standard)	–	–	55 *	105 *	105 *	105 *	105	110	155 *	155 *
	∅ d1			22.6	29.6	35.6	48.6	60.3	72.9		100 *
	∅ C2			40 x ⅛"	48 x ⅛"	60 x ⅛"	70 x ⅛"	85 x ⅛"	98 x ⅛"		125 x ¼"
Clamp connection acc. to ISO 2852 (pipeline acc. to ISO 2037)	L3 (standard)	60.3 *	60.3 *	60.3 *	88.9 *	88.9 *	88.9 *	88.9 *	95.3 *	150 *	150 *
	∅ d1			22.6	31.3	35.6	48.6	60.3	72.9		97.6
	∅ C3			50.5	50.5	50.5	64	77.5	91		119
Flanges acc. to DIN EN 1092-1 (EN 558-1, Ser. 8)	L4 (standard)	90	95	100	105	115	125	145	155	155 *	175
	∅ d1	16	20	26	32	38	50	66	81		100
Common dimensions	A	80	80	80	110	110	110	110	110	155	155
	H1 (standard)	225	228	231	257	260	265	275	280	300	310

* Not standardized

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

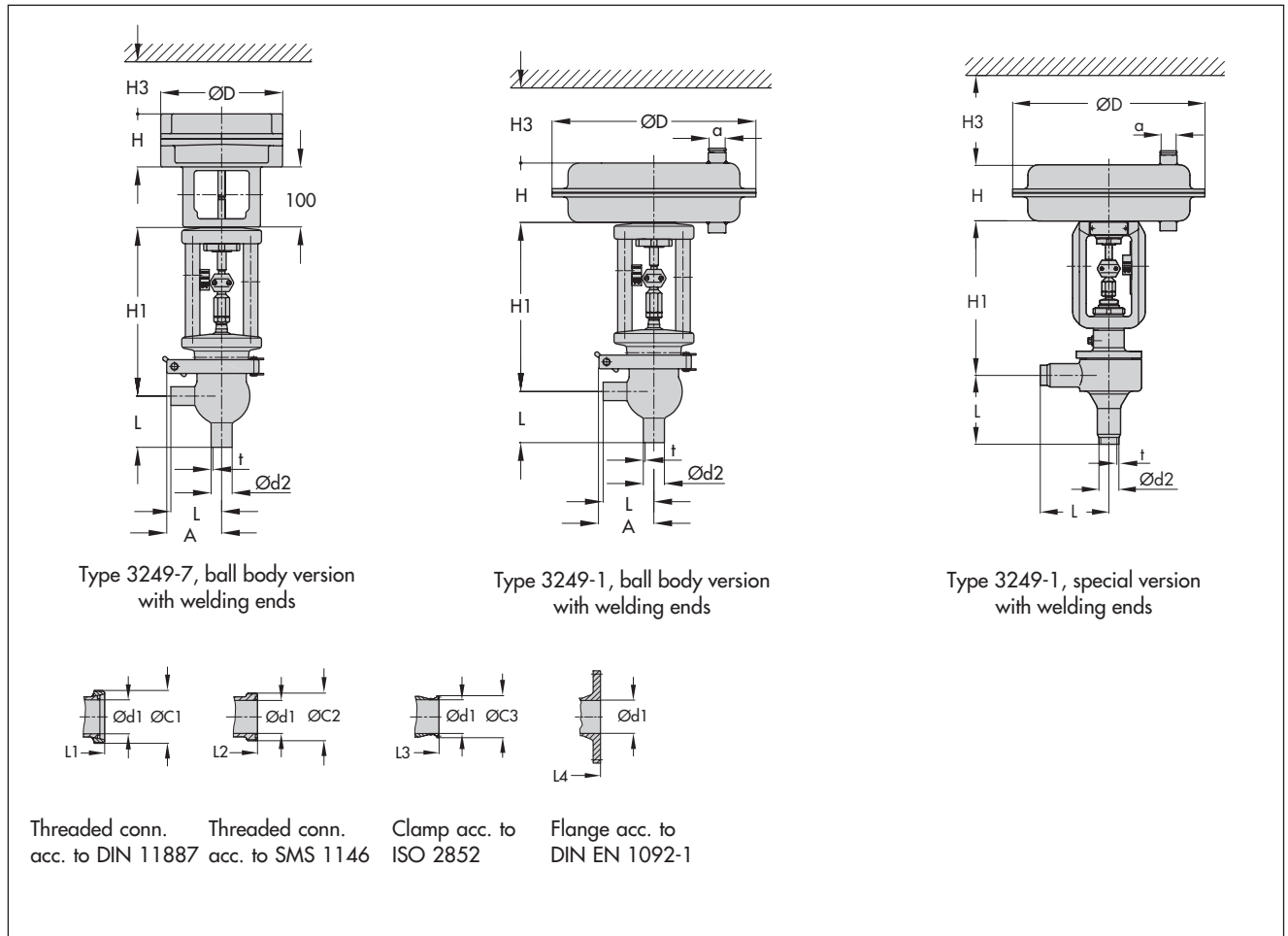
Actuator	Type	3271-5	3271			3277-5	3277		
Actuator area	cm ²	120	240	350	700	120	240	350	700
Actuator ∅ D	mm	168	240	280	390	168	240	280	380
H	mm	70	65	85	199	70	65	85	199
H3 1)	mm	180	175	195	325	280	275	295	425
α	mm	G ⅝	G ¼	G ⅝		–	G ⅝		

1) Minimum clearance for removing the actuator

Table 6 · Weights in kg for Type 3249 Angle 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	appr. kg	6			16			20	36	40
										(30 mm travel)

Actuator	Type	3271-5	3271		3277-5	3277			
Actuator area	cm ²	120	240	350	700	120	240	350	700
Weight	appr. kg	3	5	8	22	3,5	9	12	26



Ordering text

Type 3249 Control Valve for aseptic applications
 Body version Ball body or special version with backup stuffing box
 Nominal size DN ... or NPS ...
 K_{VS}/C_V coefficient ...
 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 ... cm²
 Travel ... mm
 Fail-safe position Valve CLOSED or valve OPEN
 Bench range ...

Specifications subject to change without notice.



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