

## T 8080 EN

### Type 3599 Axial Globe Valve

ANSI version · DIN version



#### Application

Compact globe valve with axial flow technology for high flow rates with excellent control accuracy. Suitable for critical throttling and on/off services covering all industries.

<b>Valve size</b>	NPS 4 to 48 · DN 100 to 1200
<b>Pressure rating</b>	Class 150 to 2500 · PN 10 to 420
<b>Temperatures</b>	-76 to +392 °F (-60 to +200 °C)

#### Special features

- Suitable for liquids and gases
- The plug is located axially in the flow path of the pipeline
- Variety of cage designs to handle critical applications, e.g. to reduce noise or to control cavitation
- Actuator mechanism protected from the process medium converts the rotational into a linear motion and provides maximum thrust for high control accuracy
- Reduced actuator thrust/size through the use of an actuator mechanism and balanced plug
- Low emissions due to rotating actuator stem
- Linear or equal percentage characteristic
- High  $C_v$  coefficients for valve sizes
- Higher flow capacity possible in on/off valves without cage
- Flanged body according to DIN, ANSI RF or ANSI RTJ

#### Selectable valve trims

- STD: cage with standard hole pattern for non-critical applications; balanced plug
- LDB ( $low_{dB}$ ): cage with small-sized hole pattern to reduce noise emissions; balanced plug
- Cavless: cage with specially shaped holes which create a Venturi effect to protect against cavitation; balanced plug
- DobCage: combination of two LDB cages with small spacing and offset between the cages to achieve maximum noise protection through a multi-state effect; balanced plug

#### Cast valve body

- Cast steel, high-temperature or low-temperature cast steel
- Stainless steel
- Special materials on request

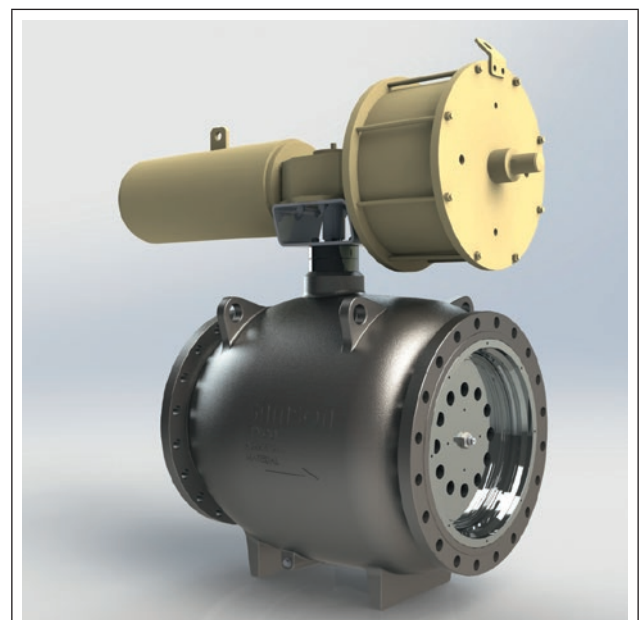


Fig. 1: Type 3599 Axial Flow Valve

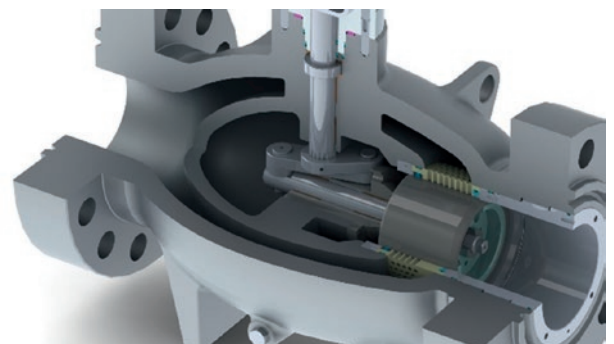


Fig. 2: Inside view of Type 3599 Valve

## Principle of operation

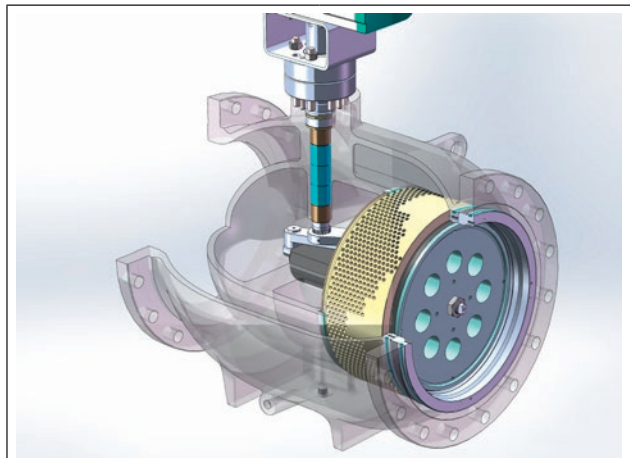
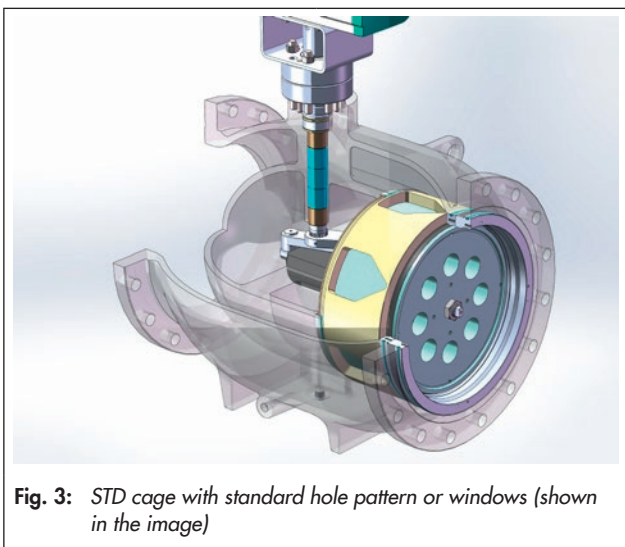
The medium flows through the valve in the direction indicated by the arrow. The position of the valve plug determines the cross-sectional area of the cage.

## Cage designs

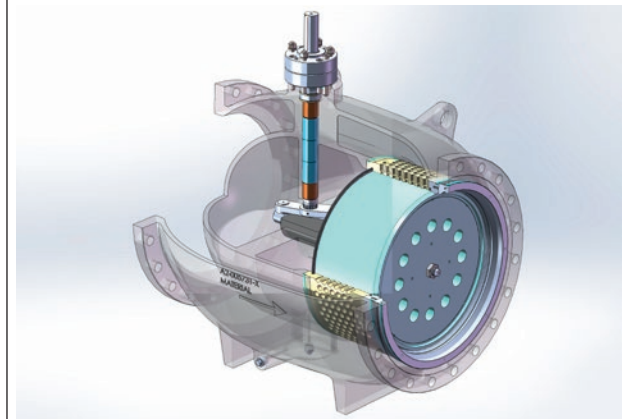
- STD (Fig. 3)
  - Cage with standard hole pattern for control non-critical applications
  - Suitable for control and on/off valves
  - For on-off service, this cage has windows to maximize capacity.
- LDB/low<sub>dB</sub> (Fig. 4)
  - Cage hole pattern with reduced hole diameters
  - Suitable for control and on/off valves
  - Noise-reduced version
- Cavless (Fig. 5 and Fig. 7)
  - Cage for liquid services with double drilled holes. The Venturi effect created by the holes protects against cavitation.
  - Suitable for control and on/off valves
- DobCage (Fig. 6 and Fig. 8)
  - Double LDB cage
    - The hole pattern of the inner and outer cages are offset with one another and a small spacing to one another.
    - Maximum noise reduction through multi-stage effect
  - Suitable for control and on/off valves
  - Cages with more stages on request

## Actuators

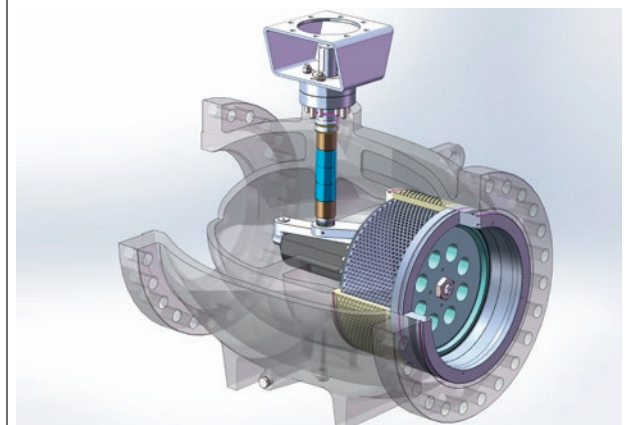
The Type 3599 Axial Globe Valve can be combined with all 90° rotary actuators to form a control valve.



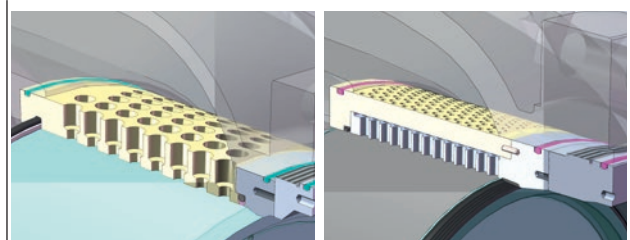
**Fig. 4:** LDB cage (low<sub>dB</sub>)



**Fig. 5:** Cavless cage



**Fig. 6:** DobCage



**Fig. 7:** Detailed view of Cavless cage

**Fig. 8:** Detailed view of DobCage

**Table 1: Technical data**

Type 3599 Axial Globe Valve		Cast body	
Valve size		NPS 4 to 48	DN 100 to 1200
Pressure rating		Class 150 to 2500	PN 10 to 420
Type of connection	ASME B16.34 RF	•	–
	ASME B16.34 RTJ	•	–
	DIN EN 558	–	•
Characteristic		Equal percentage · Linear · Others on request	
Compliance		<b>CE</b>	
Permissible temperature range			
Valve trim	STD	–76 to +392 °F (–60 to +200 °C) <sup>1)</sup>	
	LDB	–76 to +392 °F (–60 to +200 °C) <sup>1)</sup>	
	Cavless	–76 to +392 °F (–60 to +200 °C) <sup>1)</sup>	
	DobCage	–76 to +392 °F (–60 to +200 °C) <sup>1)</sup>	
Leakage class according to IEC 60534-4			
Valve plug	Metal seal	IV or V	
	Soft seal	VI	

<sup>1)</sup> Other temperature ranges on request

**Table 2: Materials**

Type 3599 Globe Valve		Cast body	
Body and valve bonnet	Standard materials	Cast steel	A216 WCB
		High-temperature cast steel	A217 WC6 · A217 WC9
		Low-temperature cast steel	A217 C12A · A352 LCB · A352 LC2
		Stainless steel 18 % Cr	A351 CF8M · A351 CF8C
		Chromium-nickel steel	20 % alloy · A351 CK3MCuN
	Special materials	Duplex steel	A890 Gr. 4A
		Super duplex steel	A890 Gr. 6A
		Nickel alloys	•
		Inconel®	•
		Hastelloy®	•
Valve trim (seat, plug, cage etc.)	Standard materials	Martensitic	A276 410 · A276 420
		Austenitic	A276 316
		Chromium-nickel steel	20 % alloy · A182 F44
		Duplex steel	A182 F51
		Super duplex steel	A182 F55
	Special materials	Nickel alloys	•
		Inconel®	•
		Hastelloy®	•
		Monel®	•
		Titanium	•
Tungsten carbide (sintered bar stock)	Option for high material hardness requirements, e.g. for abrasive media		
Linings and coatings	<b>Hardness HR</b>		<b>Maximum permissible temperature</b>
	Stellite®	45 HRC	200 °C
	Tungsten carbide	74 HRC	200 °C
	Chromium carbide	68 HRC	200 °C
	Inconel®	23 HRC	200 °C

**Table 3:** Maximum flow coefficients for control applications using the axial STD cage <sup>1)</sup>

NPS	C <sub>v</sub> value when an axial STD cage with linear characteristic					
	Class 150	Class 300	Class 600	Class 900	Class 1500	Class 2500
4	273	283	292	310	326	On request
6	591	611	629	664	695	
8	1154	1201	1246	1332	1413	
10	1862	1942	2020	2171	2316	
12	2697	2814	2929	3152	3366	
14	3660	3818	3972	4273	4560	
16	4777	4983	5184	5575	5949	
18	6065	6328	6585	7086	7565	
20	7491	7816	8135	8753	9347	
24	10790	11258	11718	12610	13466	

<sup>1)</sup> Further/other flow coefficients on request

**Table 4:** Dimensions and weights for Type 3599 Valve <sup>1)</sup>

**Table 4.1:** ANSI flanged body version RF and RTJ · NPS 4 to 18

Dimension	Pressure rating		Valve size NPS								
			4	6	8	10	12	14	16	18	
Length L	Class 150	in	17.01	15.51	17.99	20.98	24.02	27.01	30.00	34.02	
		mm	432	394	457	533	610	686	762	864	
	Class 300	in	17.01	15.87	19.76	22.36	25.51	30.00	32.99	35.98	
		mm	432	403	502	568	648	762	838	914	
	Class 600	in	17.01	22.01	25.98	30.98	32.99	35.00	39.02	42.99	
		mm	432	559	660	787	838	889	991	1092	
	Class 900	in	17.99	24.02	29.02	32.99	37.99	40.51	44.49	47.99	
		mm	457	610	737	838	965	1029	1130	1219	
	Class 1500	in	21.50	27.76	32.76	39.02	44.49	49.49	54.49	60.12	
		mm	546	705	832	991	1130	1257	1384	1527	
	Class 2500	in	26.50	35.98	40.24	50.00	55.98	On request			
		mm	673	914	1022	1270	1422				
Height H2	Class 150	in	6.50	7.48	8.78	10.16	11.57	12.68	14.25	15.63	
		mm	165	190	223	258	294	322	362	397	
	Class 300	in	7.01	8.27	9.45	9.96	11.81	13.50	14.76	16.06	
		mm	178	210	240	253	300	343	375	408	
	Class 600	in	7.40	8.98	10.24	12.01	13.78	14.96	16.14	17.40	
		mm	188	228	260	305	350	380	410	442	
	Class 900	in	7.68	9.45	11.22	12.64	13.98	14.61	16.38	18.19	
		mm	195	240	285	321	355	371	416	462	
	Class 1500	in	8.07	9.65	11.54	13.50	15.28	16.73	18.23	20.00	
		mm	205	245	293	343	388	425	463	508	
	Class 2500	in	8.98	11.54	12.80	15.28	16.93	On request			
		mm	228	293	325	388	430				
Height H4	Class 150	in	12.76	11.63	13.49	15.74	18.01	20.26	22.64	25.51	
		mm	324	295.5	342.75	399.75	457.5	514.5	575	648	
	Class 300	in	13.95	13.01	16.21	20.39	18.70	24.60	27.05	29.51	
		mm	354.24	330.46	411.64	518	475	624.84	687.16	749.48	
	Class 600	in	11.57	14.97	16.85	21.07	23.03	24.88	29.13	30.31	
		mm	293.76	380.12	428	535.16	585	632	740	770	
	Class 900	in	12.23	16.33	19.73	21.93	25.83	27.55	30.25	35.83	
		mm	310.76	414.8	501.16	557	656.2	699.72	768.4	910	
	Class 1500	in	12.25	15.79	18.67	22.24	25.36	28.21	31.06	34.27	
		mm	311.22	401	474.24	564.87	644.1	716.49	788.88	870.39	
	Class 2500	in	15.90	21.59	24.14	30.00	33.59	On request			
		mm	403.8	548.4	613.2	762	853.2				

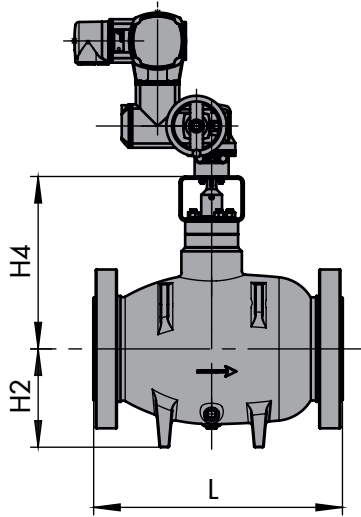
Dimension	Pressure rating		Valve size NPS							
			4	6	8	10	12	14	16	18
Weight	Class 150	kg	69.3	115.5	202.4	275	385	495	656	880
	Class 300	kg	72.42	112.2	193.8	285	402	550.8	734.4	948.6
	Class 600	kg	103.2	206.4	310	528.9	711	920	1300	1656
	Class 900	kg	155	310	539.4	817	1202.8	1512.8	1996.4	2405
	Class 1500	kg	179.8	370	649.6	1090.4	1693.6	2227.2	2992.8	3770
	Class 2500	kg	294	669	1088	1975	4088	On request		

**Table 4.2:** ANSI flanged body version RF and RTJ · NPS 20 to 48

Dimension	Pressure rating		Valve size NPS								
			20	24	28	30	32	36	40	48	
Length L	Class 150	in	35.98	42.01	49.02	50.98	54.02	60.00	65.98	On request	
		mm	914	1067	1245	1295	1372	1524	1676		
	Class 300	in	39.02	45.00	52.99	55.00	60.00	67.99	73.62		
		mm	991	1143	1346	1397	1524	1727	1870		
	Class 600	in	47.01	55.00	62.99	65.00	70.00	82.01	92.01		
		mm	1194	1397	1600	1651	1778	2083	2337		
	Class 900	in	52.01	60.98	69.02	72.99	77.13	85.24	93.50		
		mm	1321	1549	1753	1854	1959	2165	2375		
	Class 1500	in	65.51	76.26	On request						
		mm	1664	1937							
	Class 2500	in	On request								
		mm									
Height H2	Class 150	in	16.73	19.72	21.57	23.07	24.29	26.93	29.88	On request	
		mm	425	501	548	586	617	684	759		
	Class 300	in	17.40	20.51	22.87	23.90	25.75	29.09	31.26		
		mm	442	521	581	607	654	739	794		
	Class 600	in	19.69	22.83	25.12	26.42	28.31	31.61	32.83		
		mm	500	580	638	671	719	803	834		
	Class 900	in	19.88	23.11	26.02	29.13	29.25	32.64	34.49		
		mm	505	587	661	740	743	829	876		
	Class 1500	in	21.38	25.00	On request						
		mm	543	635							
	Class 2500	in	On request								
		mm									
Height H4	Class 150	in	26.99	31.51	36.76	38.24	40.51	45.00	49.49	On request	
		mm	685.5	800.25	933.75	971.25	1029	1143	1257		
	Class 300	in	31.99	36.90	43.45	45.10	49.20	55.75	60.37		
		mm	812.62	937.26	1103.72	1145.54	1249.68	1416.14	1533.4		
	Class 600	in	31.22	35.47	42.83	44.20	47.60	55.77	62.57		
		mm	793	901	1088	1122.68	1209.04	1416.44	1589.16		
	Class 900	in	35.37	41.47	46.93	46.89	52.45	57.96	63.58		
		mm	898.28	1053.32	1192.04	1191	1332.12	1472.2	1615		
	Class 1500	in	37.34	43.47	On request						
		mm	948.48	1104.09							
	Class 2500	in	On request								
		mm									
Weight	Class 150	kg	1067	1705	2508	3069	3597	4895	6303	On request	
	Class 300	kg	1173	1836	2703	3223.2	3774	4998	6018		
	Class 600	kg	2110	3334	4631.1	5611.5	6514.5	9094.5	11223		
	Class 900	kg	3087.6	5257.6	6882	8315	9796	13392	16616		
	Class 1500	kg	4814	7830	On request						
	Class 2500	kg	On request								

<sup>1)</sup> Dimensions and weights for DIN version of Type 3599 Valve on request

## Dimensional drawing



Type 3599 Axial Flow Valve

### Ordering text

Axial globe valve	Type 3599
Valve size	NPS .../DN ...
Pressure rating	Class .../PN ...
Body material	Refer to Table 2
Type of connection	Flanges according to ANSI and DIN
Characteristic	Linear or equal percentage
Process medium	Density and temperature (other medium data, if required)
Flow coefficient	in kg/h or m <sup>3</sup> /h
Pressure	Upstream pressure $p_1$ and downstream pressure $p_2$ in bar (absolute pressure)
Cage	STD, LDB (Low <sub>dB</sub> ), Cavless, DobCage
Seat-plug seal	Metal or soft sealing