

**Sempell controlled and uncontrolled Non-Return or Swing Check Valves prevent unallowable pressure built up in the turbine coming due to back-flowing steam.**

#### Use and application of swing check valves

Type 803 is a free-swinging swing check valve. It will be partly or completely opened depending on the difference pressure. In case of decrease or reversal of the difference pressure, the valve will be closed by its own weight to prevent a damage of the turbine by backflowing medium. Mounting an pneumatic or hydraulic actuator supports this quick-closing function. Mounting an inductive remote transmitter shows the opening angle of the sealing plate. The valve is designed for a pressure range from Class 300 to 600. The cast steel body will be inserted into the line by welding ends, flanges or by direct welding-in.

#### Features and Benefits

Special advantages of the valve series are:

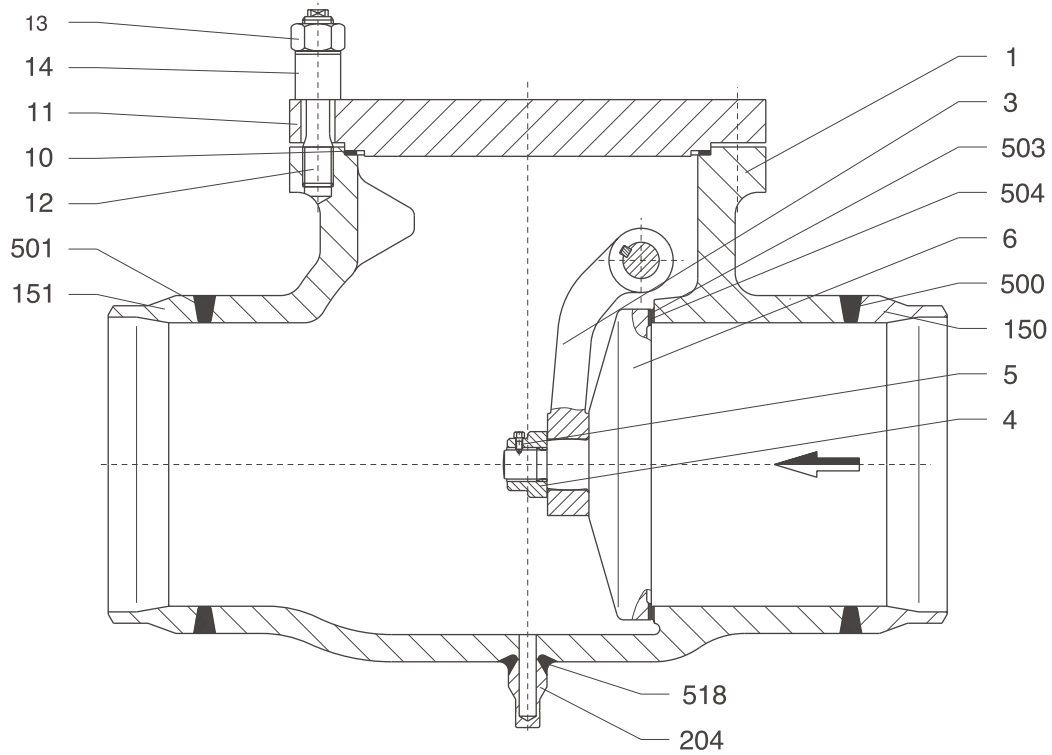
- low maintenance gland can be retightened
- hardfaced sealing faces at disc and body seat
- low friction by burnished shaft
- surfaces treated bearing faces on each part with relative motion
- easy to disassemble bodies
- mechanical taking of control angle directly at disc lever
- mounting of pneumatic or hydraulic actuators
- actuator mounting right or left possible seen from steam flow direction
- universal connections by various design of welding ends and flanges as standard
- deviating designs of welding ends in regard of dimension and material as well as other actuators, limit switches and special designs according to customers' request can be supplied.



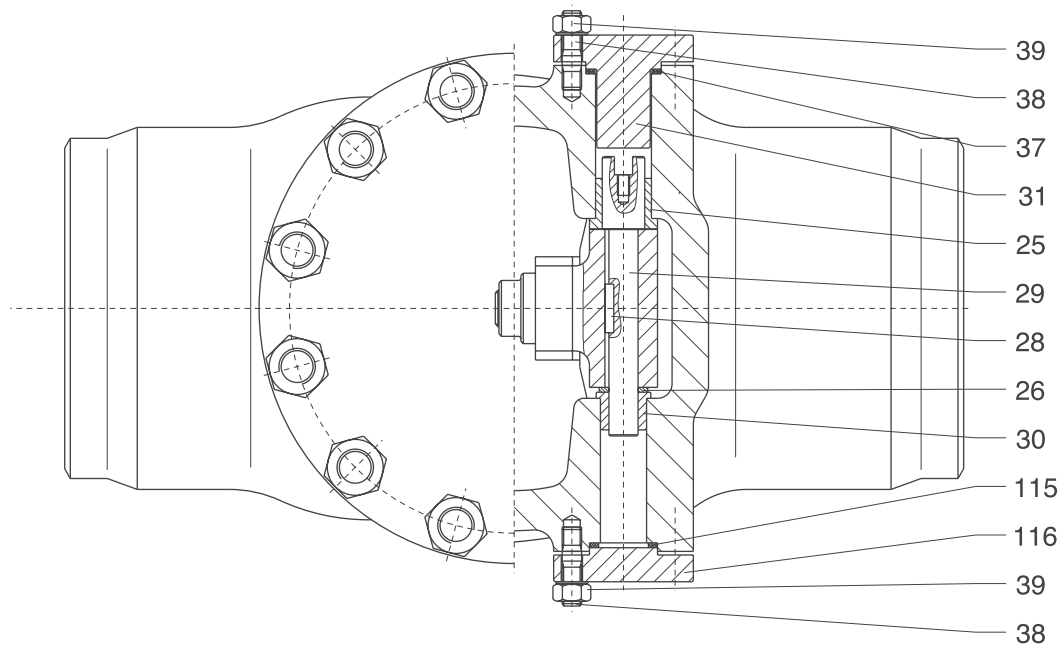
#### Technical data

Size	: NPS 3" – 32"
Pressure class	: Class 150 - 400
Connections	: Flanges acc. to ASME, welding ends acc. to ASME
Body material	: SA216WCB, SA217WC6
Materials internals	: shaft 1.4122 nitriding disc lever = body material hardfacings 1.4115 bearing sleeve 1.8550 nitriding
Body sealing	: cover screwing with serrated gasket
Shaft sealing	: moulded graphite packing rings
Shaft design	: free swinging, burnished, resting into two bushes
Closing time	: < 2 sec.
Sealing body/disc	: metallic
Leakage class	: leakage rate 2 acc. to DIN 3230 part 3 or IEC 534 part 4, Class IV, test course 2, medium L
Possible flow medium	: water, steam, gas, oil

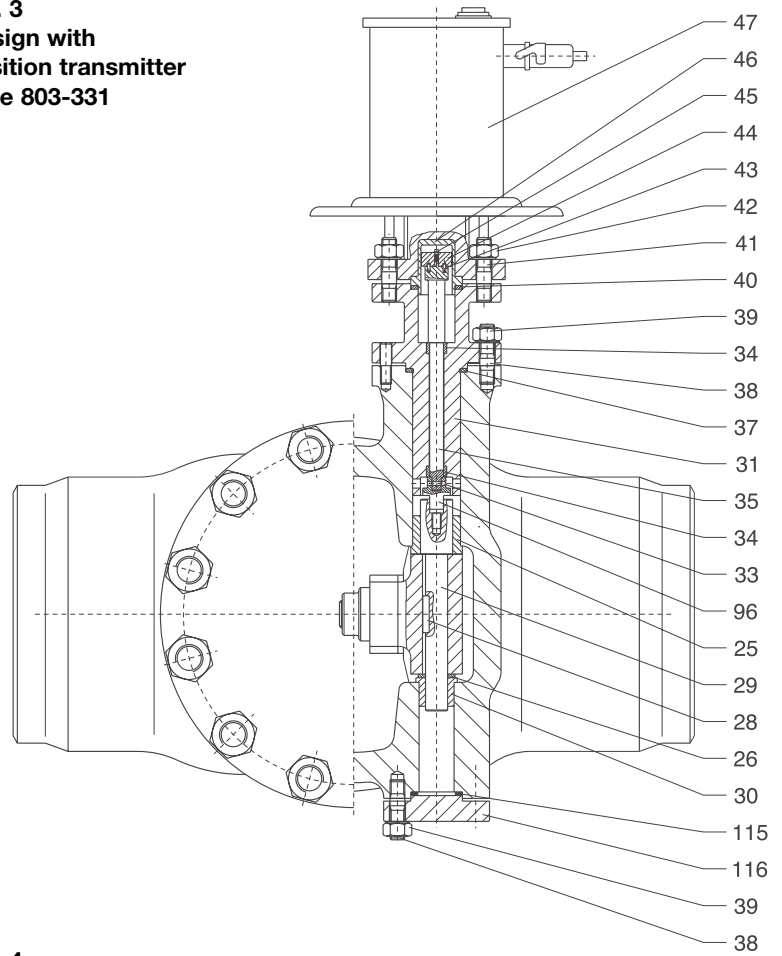
**Fig. 1 - Design swing check valve**



**Fig. 2 - Design without additional mounting Type 803-330**



**Fig. 3**  
**Design with**  
**position transmitter**  
**Type 803-331**



**Fig. 4**  
**Design with actuator Type 803-332**

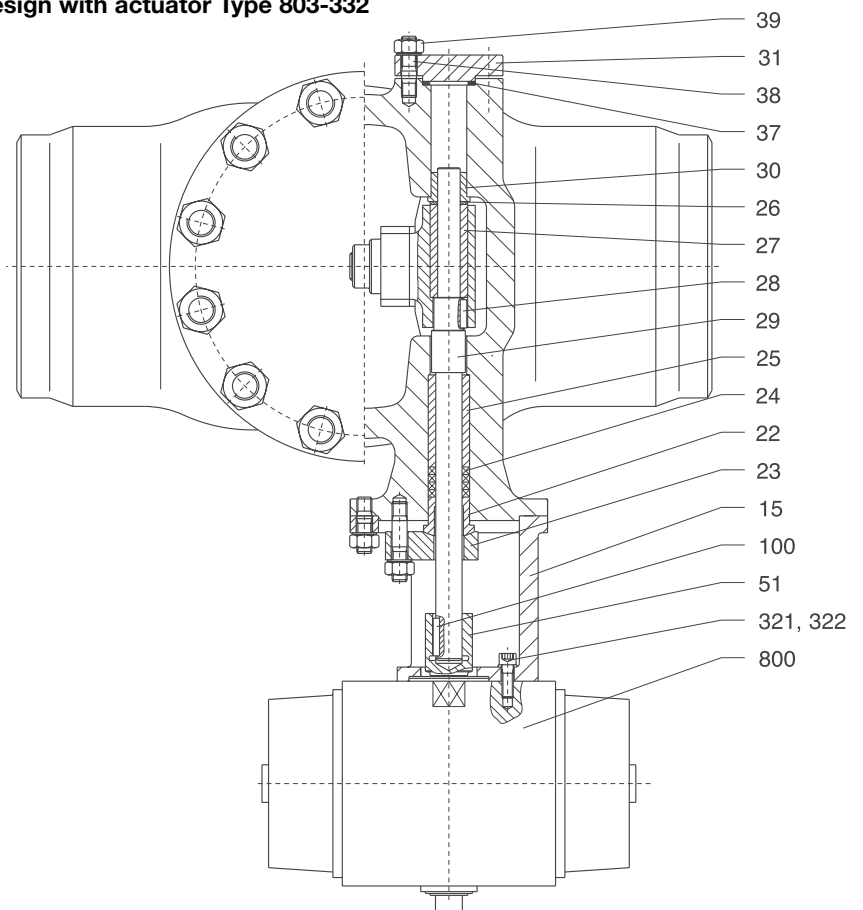
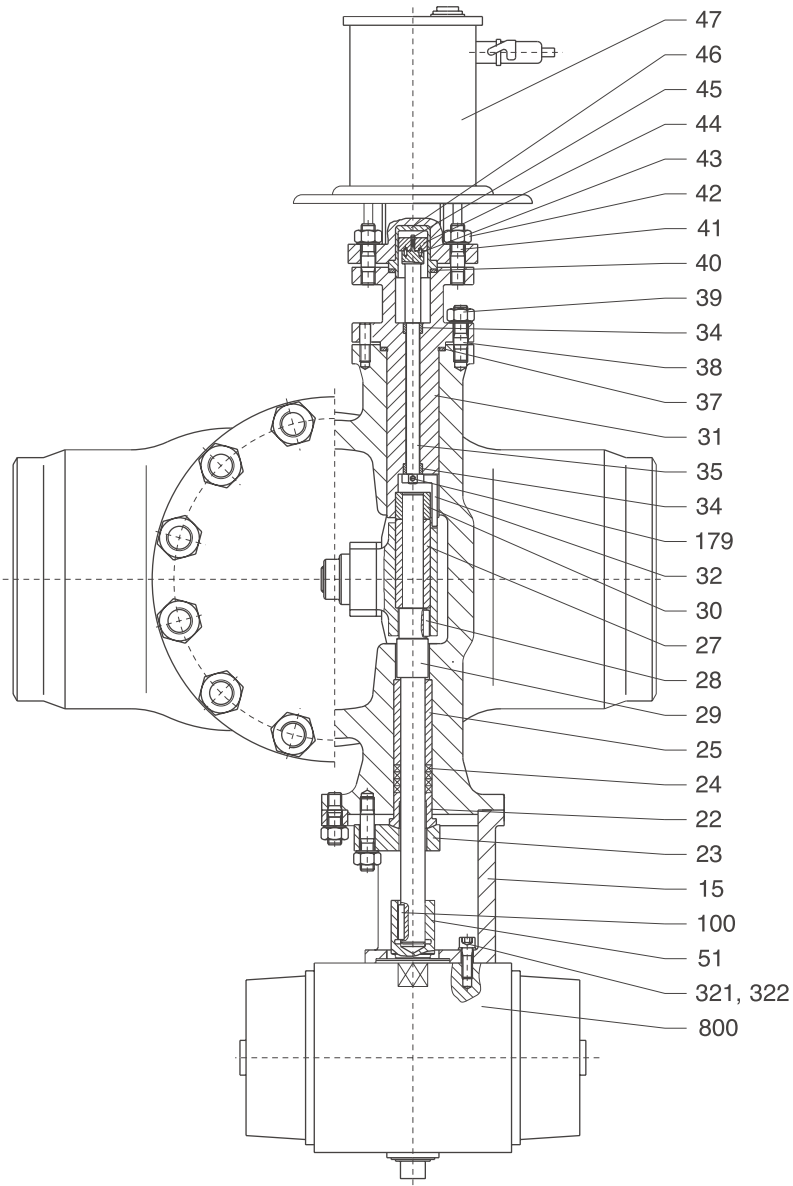


Fig. 5 - Design with actuator and position transmitter Type 803-333



## Notes

- Recommended spare parts
- 1) With pneumatic or hydraulic actuator

**Table 1 - Materials, material specification**

Pos.	Name	ASME-Material	
		51	60
<b>Design without additional mounting type 803- 330</b>			
1	Body	SA216WCB	SA217WC6
3	Disc lever	SA216WCB	SA217WC6
4	Cover nut	1.5415	
5	Threaded pin	45H	
6	Disc	1.5415	1.7335
10 •	Gasket	1.4541 / Graphite	
11	Cover	SA387 Gr.11 Cl.2	
12	Stud	1.7709	
13	Hexagonal nut	1.7258	
14	Expansion sleeve	1.7709	
25 •	Bearing sleeve	1.8550	
26	Distance ring	1.4057	
28 •	Parallel key	1.4122	
29 •	Shaft	1.4122	
30 •	Bearing sleeve	1.8550	
31	Connecting piece	SA105	SA335P11
37 •	Gasket	1.4541 / Graphite	
38	Stud screw	1.7709	
39	Hexagonal nut	1.7258	
115 •	Gasket	1.4541 / Graphite	
116	Cover	SA105	SA182F12
150	Pipe connection	SA105/SA182F11	SA182F12
151	Pipe connection	SA105/SA182F11	SA182F12
204	Drainage nozzle	SA105/SA182F11	SA182F12
<b>Design with position transmitter Type 803-331</b>			
33	Cylindrical pin	Steel	
34 •	Bearing sleeve	1.4057	
35 •	Shaft	1.4550	
40 •	Gasket	1.4541 / Graphite	
41	Stud screw	1.7709	
42	Hexagonal nut	1.7258	
43 •	Cylindrical pin	Steel	
44 •	Magnet	Div.	
45 •	Retaining ring	PBZ	
46	Pressure jack	1.4922	
47 •	Position transmitter	Div.	
96	Coupling	1.0460	1.7335
<b>Design with actuator Type 803-332</b>			
15	Connecting piece	1.0619	
22	Gland	1.8550	
23	Gland flange	1.7335	
24 •	Packing ring	Graphite	
27 •	Bearing sleeve	1.8550	
51	Distance piece	1.4122	
100	Parallel key	1.4122	
321	Lock washer	Steel	
322	Allan bolt	8.8	
800	Actuator 1)	Div.	
<b>Design with actuator+position transmitter Type 803-333</b>			
32	Driver	1.7335	
179	Threaded pin	45 H	

**Main Dimensions and Characteristic Data of Swing Check valves**

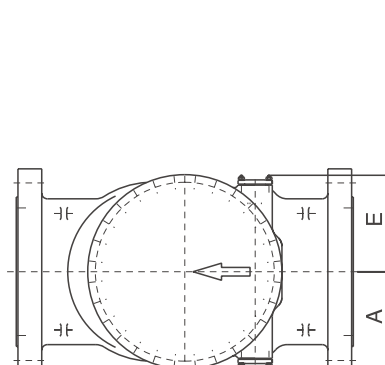
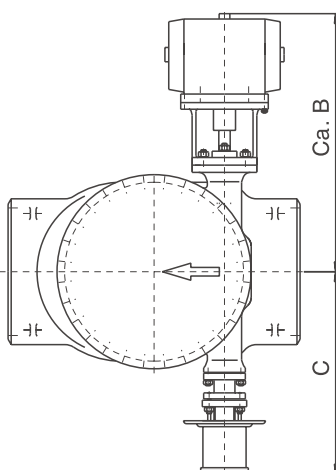
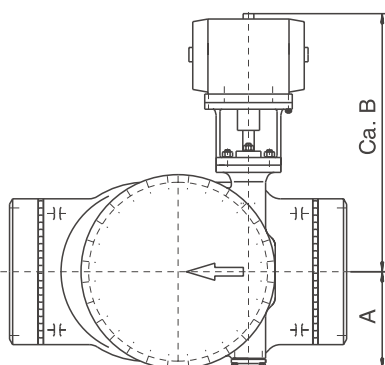
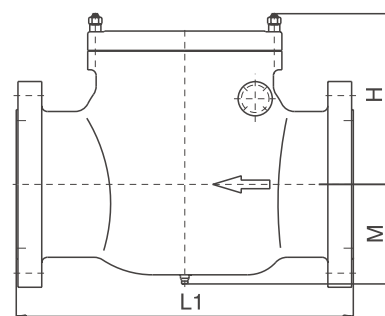
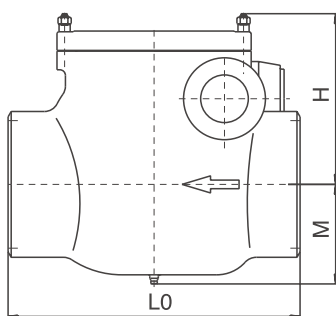
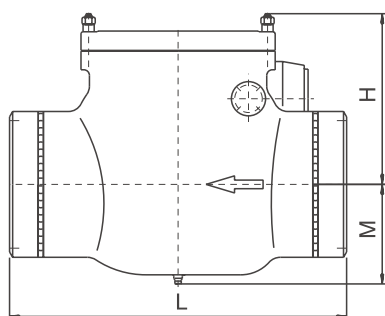


Fig. 6 - Drawing with welding ends and pneumatic/hydraulic actuator

Fig. 7 - Drawing without welding ends, with actuator and position transmitter

Fig. 8 - Drawing with flanges, without additional mountings

**Table 2 - Dimensions and weights**

Class	NPS	Seat Ø	L	L0	L1	Weight without actuator (lbs)				C	H	without welding flange	
						M	A, E	B <sup>1)</sup>	on request			on request	
400	3"	3"	11.81	8.66		6.69	4.53	19.49	15.35	7.48	231.5	282.1	
	4"	3"	15.75	8.66		6.69	4.53	19.49	15.35	7.48	231.5	480.5	
	4"	4"	17.72	11.81		7.09	4.53	20.27	16.14	8.27	297.6	337.3	
	6"	4"	19.68	11.81		7.09	4.53	20.27	16.14	8.27	297.6	513.6	
	6"	6"	21.65	15.75		8.27	6.50	23.43	19.29	10.24	509.2	564.3	
	8"	6"	23.62	15.75		8.27	6.50	23.43	19.29	10.24	509.2	718.6	
	8"	8"	25.59	17.32		9.84	8.46	29.13	24.21	13.38	729.7	784.8	
	10"	8"	27.56	17.32		9.84	8.46	29.13	24.21	13.38	729.7	965.6	
	12"	10"	29.53	22.44		11.02	10.83	31.10	26.18	16.14	1007.9	1075.8	
	12"	12"	31.50	22.44		11.02	10.83	31.10	26.18	16.14	1007.5	1208.1	
300	12"	12"	33.46	26.77		12.40	11.61	38.19	28.15	19.29	1629.1	1730.5	
	14"	12"	35.43	26.77		12.40	11.61	38.19	28.15	19.29	1629.1	1796.7	
	14"	14"	37.40	29.53		13.98	13.98	40.55	30.91	19.68	1827.6	1951	
	16"	14"	39.37	29.53		13.98	13.98	40.55	30.91	19.68	1827.6	2458.1	
	16"	16"	41.34	33.46		14.96	14.76	45.67	32.09	22.05	2317	2469.1	
	18"	16"	43.31	33.46		14.96	14.76	45.67	32.09	22.05	2317	2623.4	
	18"	18"	45.27	37.40		16.14	15.94	47.64	33.86	25.20	2636.6	2843.9	
	20"	18"	49.21	37.40		16.14	15.94	47.64	33.86	25.20	2636.6	3064.3	
150	20"	20"	49.21	41.34		17.52	17.52	50.00	35.83	27.56	3886.6	4056.4	
	24"	20"	51.18	41.34		17.52	17.52	50.00	35.83	27.56	3886.6	4828	
	24"	24"	55.12	45.27		19.88	18.70	51.18	36.61	30.31	4925	5246.9	
	28"	24"	59.05	45.27		19.88	18.70	51.18	36.61	30.31	4925	5489.4	
	28"	28"	62.99	51.18		22.64	21.06	53.15	38.98	35.04	6082.4	6812.1	
	32"	28"	68.90	51.18		22.64	21.06	53.15	38.98	35.04	6082.4	7473.5	
	32"	32"	74.80	59.05		25.39	24.02	63.58	41.34	41.34	8112.8	8904.3	

On consultation with our engineering department the valves can be used for higher design pressures in special classes.

## Dimensions of feasible welding ends

Table 3 - Straight nominal sizes

NPS	seat	OD	10	20	30	STD	40,0	60,0	XS
3"	3"	88,9							
4"	4"	114,3							
6"	6"	168,3							
8"	8"	219,1	/	6,4	7,0	8,2	8,2	10,3	
10"	10"	273,0	/	6,4	7,8	9,3	9,3	12,7	12,7
12"	12"	323,8	/	/	8,4	9,5	10,3	/	12,7
14"	14"	355,6	/	/	9,5	9,5	11,1	15,1	12,7
16"	16"	406,4	/	7,9	9,5	9,5	12,7	/	12,7
18"	18"	457,2	/	7,9	11,1	9,5	/	/	12,7
20"	20"	508,0	6,4	9,5	12,7	9,5	/	/	12,7
24"	24"	609,6	6,4	9,5	/	9,5	/	/	12,7
28"	28"	711,2	7,9	/	/	9,5			
32"	32"	812,8							

### Notes A

- \* Welding ends only
- Allowable working pressure (psi) test pressure acc. PED  
Test pressure = 1,5 x allowable working pressure at 100 °F

### Notes B

- \* Welding ends only
- Allowable working pressure (psi) test pressure acc. PED  
Test pressure = 1,5 x allowable working pressure at 38 °C

Table 4 - Extended pipe connections

NPS	seat	OD	10	20	30	STD	40,0	60,0	XS
4"	3"	114,3							
6"	4"	168,3							
8"	6"	219,1							
10"	8"	273,0	/	6,4	7,8	9,3	9,3	12,7	12,7
12"	10"	323,8	/	/	8,4	9,5	10,3	/	12,7
14"	12"	355,6	/	/	9,5	9,5	11,1	15,1	12,7
16"	14"	406,4	/	7,9	9,5	9,5	12,7	/	12,7
18"	16"	457,2	/	7,9	11,1	9,5	/	/	12,7
20"	18"	508,0	6,4	9,5	12,7	9,5	/	/	12,7
24"	20"	609,6	6,4	9,5	/	9,5	/	/	12,7
28"	24"	711,2	7,9	/	/	9,5			
32"	28"	812,8							

Table 5 - Application limits subject to pressure and temperature

Table 5.1 - Application range ASTM materials (psig / °F) (see notes A)

Class	Body material	Design temperature (°F)															
		100	200	300	400	500	600	650	700	750	800	850	900	950	1000	1050	1100
<b>STANDARD CLASS</b>																	
150	SA216WCB	285	260	230	200	170	140	125	110	95	80						
	SA217WC6	290	260	230	200	170	140	125	110	95	80	65	50	35	20	20	20
300	SA216WCB	740	675	655	635	600	550	535	535	505	410						
	SA217WC6	750	750	720	695	665	605	590	570	530	510	485	450	320	215	145	95
400	SA216WCB	750	750	750	750	750	715	700	695	630	515						
	SA217WC6	1000	1000	965	925	885	805	785	755	710	675	650	600	425	290	190	130

### SPECIAL CLASS

150	SA216WCB	290	290	290	290	290	275	270	265	240	200						
	SA217WC6	290	290	290	290	290	290	290	280	280	275	260	225	155	105	70	45
300	SA216WCB	750	750	750	750	750	715	700	695	630	515						
	SA217WC6	750	750	750	750	750	750	750	735	730	720	680	585	400	270	180	120
400	SA216WCB	1000	1000	1000	1000	1000	950	935	925	840	685						
	SA217WC6	1000	1000	1000	1000	1000	1000	1000	980	970	960	905	785	530	360	240	160

Table 5.2 - Application range ASTM materials (psi / °C) (see notes B)

Class	Body material	Design temperature (°C)															
		38	93	149	204	260	315	434	371	399	426	454	482	510	538	565	593
<b>STANDARD CLASS</b>																	
150	SA216WCB	19.7	18	15.9	13.8	11.8	9.7	8.7	7.6	6.6	5.6						
	SA217WC6	20	18	15.9	13.8	11.8	9.7	8.7	7.6	6.6	5.6	4.5	3.5	2.5	1.4	1.4	1.4
300	SA216WCB	51.1	46.6	45.2	43.8	41.4	38	36.9	36.9	34.9	28.3						
	SA217WC6	51.8	51.8	49.7	48	45.9	41.8	40.7	39.3	36.6	35.2	33.5	31.1	22.1	14.9	10	6.6
400	SA216WCB	51.8	51.8	51.8	51.8	51.8	49.3	48.3	48	43.5	35.6						
	SA217WC6	69	69	66.6	63.8	61.1	55.6	54.2	52.1	49	46.6	44.9	41.4	29.4	20	13.1	9

### SPECIAL CLASS

150	SA216WCB	20	20	20	20	20	19	18.7	18.3	16.6	13.8						
	SA217WC6	20	20	20	20	20	20	20	19.4	19.4	19	18	15.6	10.7	7.3	4.9	3.2
300	SA216WCB	51.8	51.8	51.8	51.8	51.8	49.3	48.3	48	43.5	35.6						
	SA217WC6	51.8	51.8	51.8	51.8	51.8	51.8	51.8	50.7	50.4	49.7	46.9	40.4	27.6	18.7	12.5	8.3
400	SA216WCB	69	69	69	69	69	65.5	64.5	63.8	58	47.3						
	SA217WC6	69	69	69	69	69	69	69	67.6	66.9	66.2	62.4	54.2	36.6	24.9	16.6	11.1

# Type 803 ASME

## Swing Check Valve

803 | 330 | 51 | 8 | 8 | 8 | W | XXX

### Valve type

803 Swing check valve

### Valve Code

330 without additional mounting  
331L with position transmitter left  
331R with position transmitter right  
332L with actuator left  
332R with actuator right  
333LR actuator left, transmitter right  
333RL actuator right, transmitter left

### Material Specification

51 body SA216WCB  
60 body SA217WC6

### Inlet nominal size

3" = NPS 3"  
4" = NPS 4"  
6" = NPS 6"  
8" = NPS 8"  
10" = NPS 10"  
12" = NPS 12"  
14" = NPS 14"  
16" = NPS 16"  
18" = NPS 18"  
20" = NPS 20"  
24" = NPS 24"  
28" = NPS 28"  
32" = NPS 32"

### Seat diameter

3" = Ø 3"  
4" = Ø 4"  
6" = Ø 6"  
8" = Ø 8"  
10" = Ø 10"  
12" = Ø 12"  
14" = Ø 14"  
16" = Ø 16"  
18" = Ø 18"  
20" = Ø 20"  
24" = Ø 24"  
28" = Ø 28"  
32" = Ø 32"

### Accessories

see TO.130.80.xxxx DE

### Pipe Connection

S Welding end acc. to ASME  
F Flange acc. to ASME  
U Plain ends

### Outlet nominal size

3" = NPS 3"  
4" = NPS 4"  
6" = NPS 6"  
8" = NPS 8"  
10" = NPS 10"  
12" = NPS 12"  
14" = NPS 14"  
16" = NPS 16"  
18" = NPS 18"  
20" = NPS 20"  
24" = NPS 24"  
28" = NPS 28"  
32" = NPS 32"