



High Performance **Check Valves**

(Combined) Non Return/Slam Check Valve
Nozzle Check Valve
Swing Check Valve



The enterprise which advance
on the world with technique of best





S & W has made great progress with not only Korean customers but also many worldwide customers for years. We have been always with customers.

Our first and final goal is to manufacture world best of check valves and supply to worldwide variety necessary as, power plants, sea water service, ultra low temperature plant LNG, shipment building etc.

Check valves will be certainly with S&W in world market.

Thank you very much

CEO *Min Kyu Kim*



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NOTE

The material in this Catalogue is only for general information. For specific performance data and proper material selection, consult factory and your S&W's representative. Although every attempt has been made to ensure that the information contained in this catalogue is correct S&W, reserves the right to change design, material and specification without notice.

ORDERING GUIDE

NR	15	F	-	A	4	2	8	Y	-	WH	-	
1.	2.	3.		4.	5.	6.	7.	8.		9.		10.

8" Non Return Check Valve 150# Class, Flange, FLANGE, Standard, WCB BODY,
CF8M Disc, 316Stem, Stellite #6 Metal, Counter Weight with Hydraulic Cylinder

1. MODEL

N R: Non Return/Slam Check Valve
CNR: Combined Non Return Check Valve
NCA: Nozzle Check Valve (Single Spring Loaded Type)
NCB: Nozzle Check Valve (Multi Spring Loaded Type)
SCA: Swing Check Valve (Bolted Cover)
SCB: Swing Check Valve (Pressure Seal Cover)

2. RATING

12 : ASME Class 125 10 : DIN PN 10
15 : ASME Class 150 16 : DIN PN 16
30 : ASME Class 300 25 : DIN PN 25
60 : ASME Class 600 40 : DIN PN 40
90 : ASME Class 900
150 : ASME Class 1500
250 : ASME Class 2500

3. END CONNECTION

W : WAFER
L : LUG
RF : Raised Face Flange
FF : Flat Face Flange
RTJ : Ring Joint Type Flange
BW : Butt Weld End

4. Type

1. : Fire Safety Design
2. : Standard

5. BODY

FIG	Material	Specification
A	Carbon Steel	A216,WCB
B	Low Temp Carbon	A352,LCB
C	Low Temp Carbon	A352,LCC
D	5% Cr Steel	A217,C5
E	9% Cr Steel	A217,C12
G	Low Temp 13cr 4n	A352,CA6NM
H	410 Stainless Steel	A217,CA15
I	304 Stainless Steel	A351,CF8
J	316 Stainless Steel	A351,CF8M
K	316L Stainless Steel	A351,CF3M
L	317 Stainless Steel	A352,CG8M
M	Alloy 20	A351,CN7M
AA	Gray Iron	A126 CL,B
AB	Ductile Iron	A395

FIG	Material	Specification
N	Alloy 825	UNS N00825
O	Alloy 625	A494,CW6MC
P	Hastelly C276	A494,CW12MW
Q	Monel 400	A494,M351
R	Nickel Al-Bz	B148,C95800
S	Inconel 625	A494,CW6MC
T	Duplex SS Gr.1	A351,CD4MCu
U	Duplex SS Gr.2	A890,CE8MN
V	Duplex SS Gr.3	A890,CD6MN
W	Duplex SS Gr.4	A890,CD3MN
X	Duplex SS Gr.5	A890,CE3MN
Y	254SMO	A351,CK3MCuN
Z	904L SS	A351,CN2MCuN
T1	Titanium Gr.2	B381,F2

6. Disc

1. : A216,WCB
2. : A217,Wc9
3. : A351,CF8
4. : A351,CF8M
5. : A536
6. : B148
7. : A217,CA15
x : Special

7. STEM

1. : 304SS
2. : 316SS
3. : 410SS
4. : 416SS
5. : 630SS
6. : 17-4PH
X : Special

8. SEAT

1. : BUNA-N
2. : EPDM
3. : VITON
4. : NEOPRENE
5. : PTFE
6. : RTFE
7. : 316SS
8. : Stellite
9. : Integral
10. : Laminated
X : Special

9. OPERATOR

(blank) : No Operator
W : Counter Weight
H : Hydraulic Cylinder
C : Combined Operator
B : Bare Shaft

10. SPECIAL REQUIREMENTS

S-Supply complete information

FEATURE

S&W has the unique Combined Non-Return Check Valves under long R&D results. Non Return/Slam Check Valve offer two stage of opening and closing as Combining counter weight and Hydraulic Cylinder as 90% rapid and 10% slow action that the percentage can be adjusted by mechanical engineering.

The additional option is the electric motor that can be operated as emergency shut-off function as one of butterfly valve's basic function under variety of dynamic flow.

The seat design can be also applied with "Triple Eccentric Design" that can endure high pressure as laminated metal seat. The basic hydraulic diagram is in accordance to figure (1)

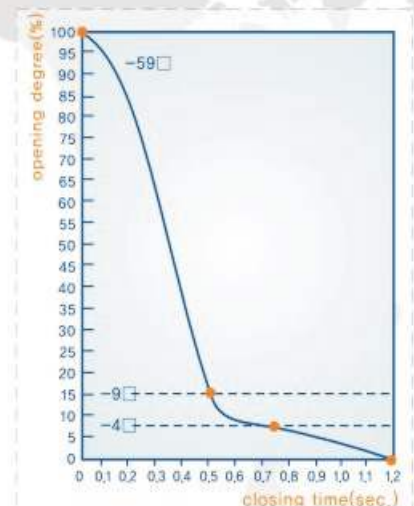
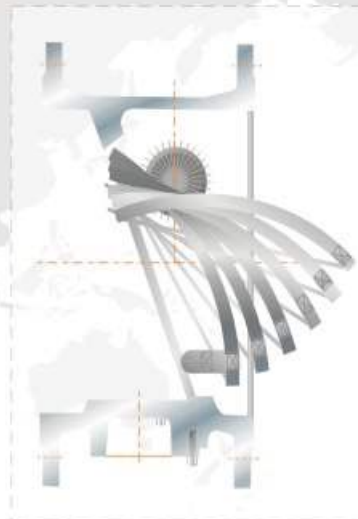
The key of movement transmission is "Rack Gear" (See figure (2)) that S&W has developed as unique design as long R&D results.

S&W non return check valve has result in spuerior performance as below unique features

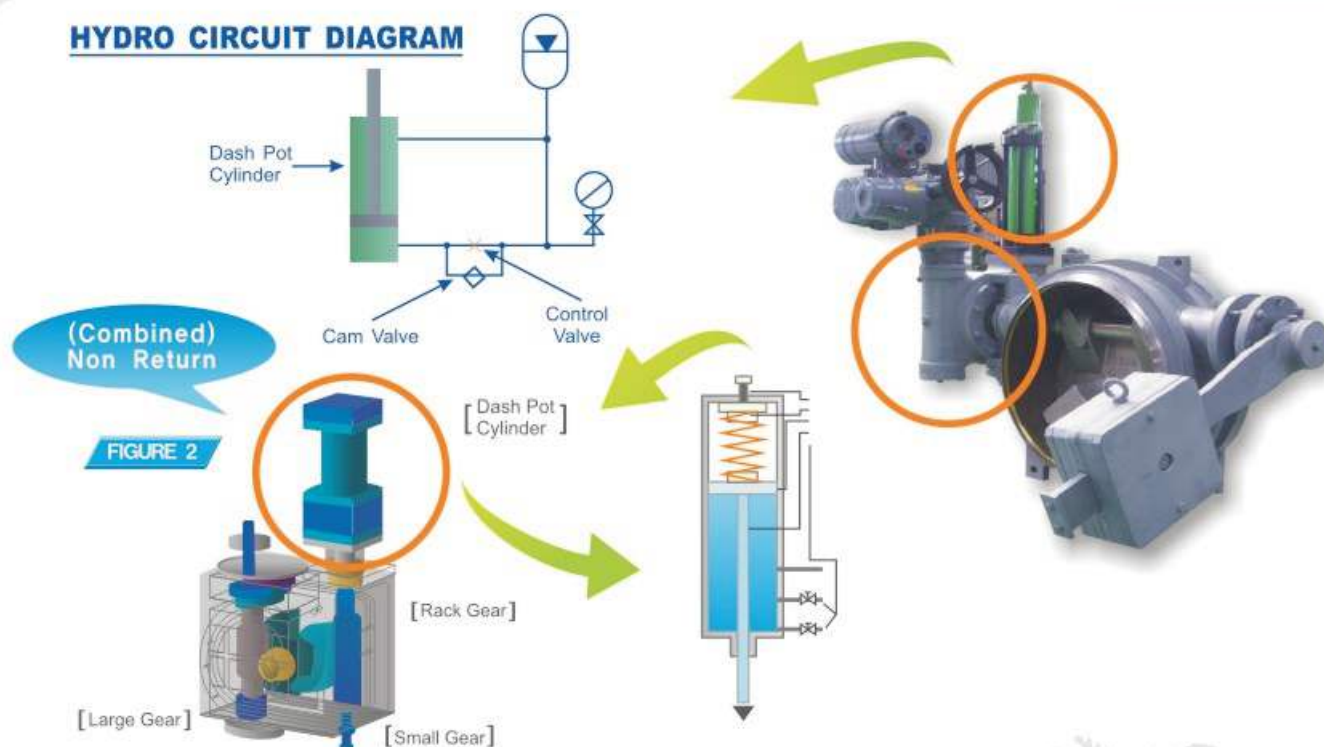
FIGURE 1

- Non Slam Open & Close
- Emergency shut-off function
- Disc's minimizing wear
- Low Pressure Loss
- Adjustable quick & slow movement rate

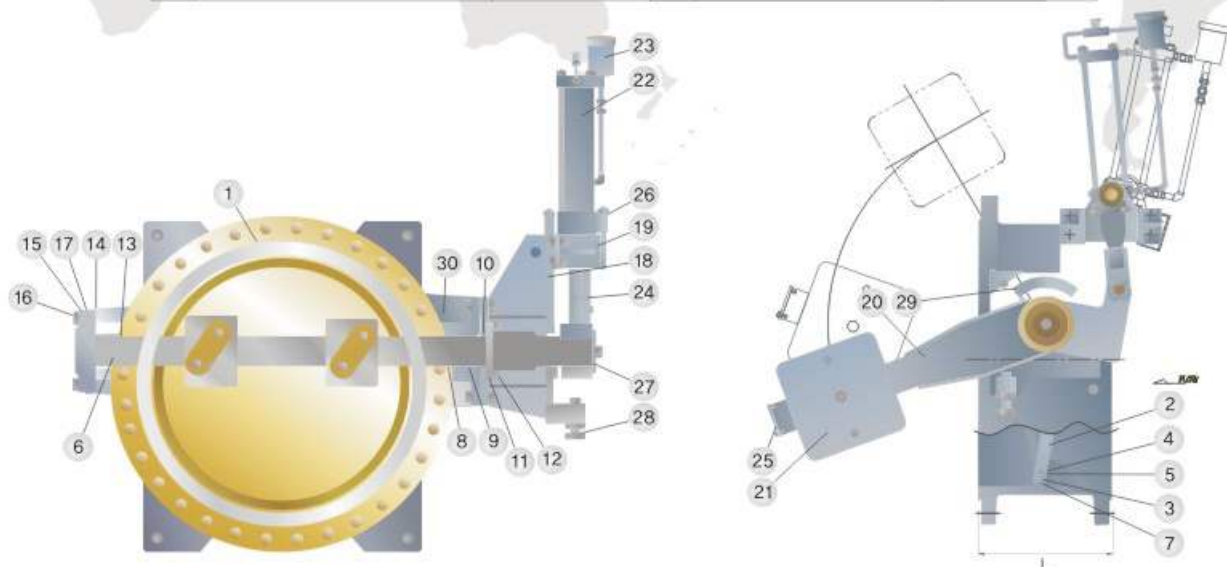
Non Return



HYDRO CIRCUIT DIAGRAM



NO	DESCRIPTION	QUANTITY	NO	DESCRIPTION	QUANTITY
1	BODY	1	16	BOLT	4
2	DISC	1	17	GASKET	1
3	DISC SEAT	1	18	BRACKET	1
4	SEAT RETAINER	1	19	BRACKET COVER	1
5	RETAINER BOLT	-	20	LEVER	1
6	SHAFT	1	21	WEIGHT	1
7	BODY SEAT	-	22	HY'D CYLINDER	1
8	MAIN BUSH	1	23	OIL TANK	1
9	UPPER PACKING	1SET	24	KNUCKLE	1
10	UPPER PACKING BUSH	1	25	WEIGHT STOPER	1
11	UPPER PACKING GLAND	1	26	BUSH	2
12	GLAND BOLT	4	27	LEVER CAP	1
13	STUB BUSH	1	28	STOPER BOLT	1
14	SHAFTRING	1	29	INDICATOR	1
15	END COVER	1	30	TAPER PIN	-



(Combined) Non Return/Slam Check Valve

APPLCALBE CODE

ASME, API, DIN, BS, AWWA, MSS

APPLICALBE FACE TO FACE DIMENSION

ASME, ISO 5752, EN pr 558, AWWA, API 609



WAFLR/LUG TYPE FACE - TO - FACE

Size	in	3	4	6	8	10	12	14	16	18	20	24
	mm	80	100	150	200	250	300	350	400	450	500	600
150LBS	in	1.88	2.12	2.25	2.5	2.81	3.19	3.62	4	4.5	5	6.06
	mm	48	54	57	64	71	81	92	102	114	127	154
300LBS	in	1.88	2.12	2.31	2.88	3.25	3.62	4.62	5.25	5.88	6.25	7.12
	mm	48	54	59	73	83	92	117	133	149	159	181
600LBS	in	2.12	2.5	3.06	4	4.62	5.5	6.12	7	7.88	8.5	9.13
	mm	54	64	78	102	117	140	155	178	200	216	232

FLANGE TYPE FACE - TO - FACE (AWWA C504 SHORT PATTERN)

Size	in	3	4	6	8	10	12	14	16	18	20	24	26
	mm	80	100	150	200	250	300	350	400	450	500	600	650
	in	28	30	32	36	38	40	42	48	56	64	72	80
150LBS	mm	700	750	800	900	950	1000	1050	1200	1400	1600	1800	2000
	in	5	5	5	5.98	7.99	7.99	7.99	7.99	7.99	7.99	7.99	7.99
	mm	127	127	127	152	203	203	203	203	203	203	203	203
	in	7.99	12.01	12.01	12.01	12.01	12.01	12.01	15	15	15	17.99	20
	mm	203	305	305	305	305	305	305	381	381	381	457	508
	in	7.99	12.01	12.01	12.01	12.01	12.01	12.01	15	15	15	17.99	20

Non Return/Slam Check Valve

APPLICABLE FLANGE STANDARD

ASME, API, DIN, BS, AWWA, MSS

APPLICABLE TESTING

ASME B16.34, API 598, BS6755, MSS SP 61



FLANGE TYPE FACE - TO - FACE (API 609 SHORT PATTERN)

Size	in	3	4	6	8	10	12	14	16	18	20	24	26
	mm	80	100	150	200	250	300	350	400	450	500	600	650
	in	28	30	32	36	38	40	42	48	56	64	72	80
	mm	700	750	800	900	950	1000	1050	1200	1400	1600	1800	2000
150LBS (ISO SERIES 13)	in	4.5	5	5.5	6	6.5	7	7.5	8.5	8.75	9	10.5	11.5
	mm	114	127	140	152	165	178	191	216	222	229	267	292
	in	11.5	12.52	12.52	12.99	16.14	16.14	16.14	18.5	20.87	23.62	26.38	29.92
300LBS (ISO SERIES 14)	mm	292	318	318	330	410	410	410	470	530	600	670	760
	in	7.09	7.48	8.27	9.06	9.84	10.63	11.42	12.2	12.99	13.78	15.35	16.14
	mm	180	190	210	230	250	270	290	310	330	350	390	410
600LBS	in	16.93	17.72	18.5	20.8	20.87	21.65	22.44	24.8	27.95	31.1	34.25	37.4
	mm	430	450	470	528	530	550	570	630	710	790	870	950
	in	7.09	7.48	8.27	9.06	9.84	10.63	11.42	12.2	12.99	13.78	15.35	
	mm	180	190	210	230	250	270	290	310	330	350	390	

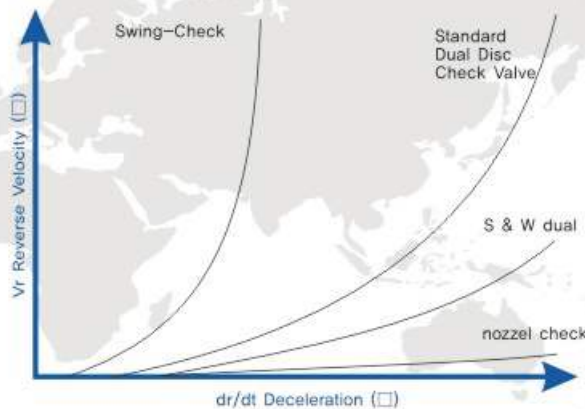
FEATURE

S&W has resulted in these unique Nozzle Check Valve features under long R&D results. Nozzle Check Valves deliver an effective dynamic response under various flow deceleration conditions.

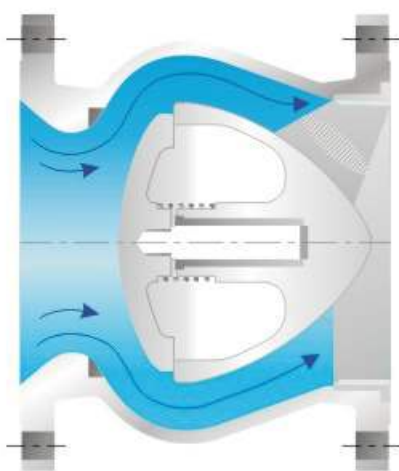
The dynamic performance characteristics of Nozzle Check Valves are compared to swing check and dual plate check valve as Figure (1)

S&W nozzle check valve has result in superior performance as below unique features

FIGURE 1

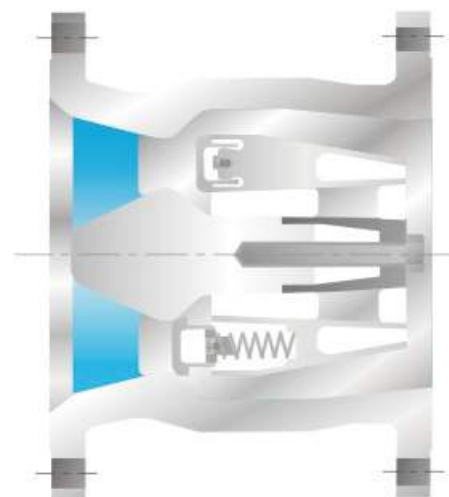


- Non Slam Closure
- Extreme quick Closure
- Lowest Pressure Loss
- Short stroke of disc
- Axial movement of disc
- Disc's minimizing wear



[OPEN]

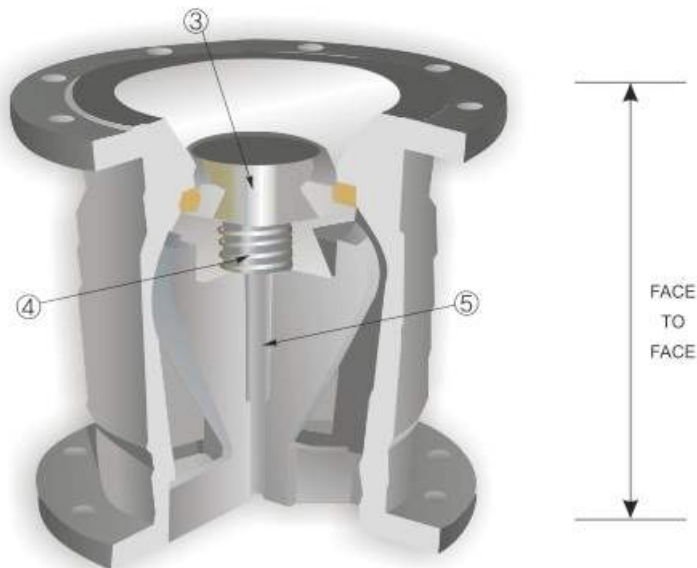
S&W Nozzle Check Valve is designed to meet the criteria of conventional check valves by allowing forward flow under normal conditions, opening easily, firmly backseating at low velocity



[CLOSE]

S&W Nozzle Check valve is designed to be closed prior to reverse flow as non-slaming by spring loaded disc that allows mounting in any orientation

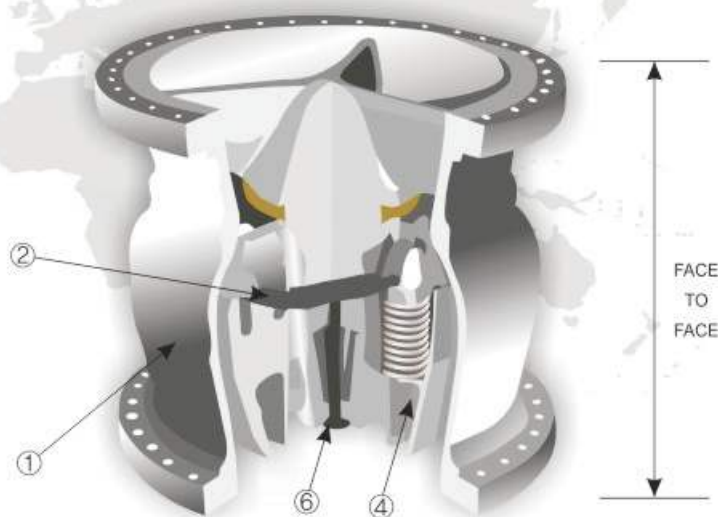
Single Spring Loaded Nozzle Check Valve



(Model Number : NCA)

S&W Nozzle Check Valve is covered with 10" and below size and 150~300LBS pressure rating service by single spring loaded design (Model Number: NCA) under minimum pressure loss with excellent dynamic performance

Multi Spring Loaded Nozzle Check Valve



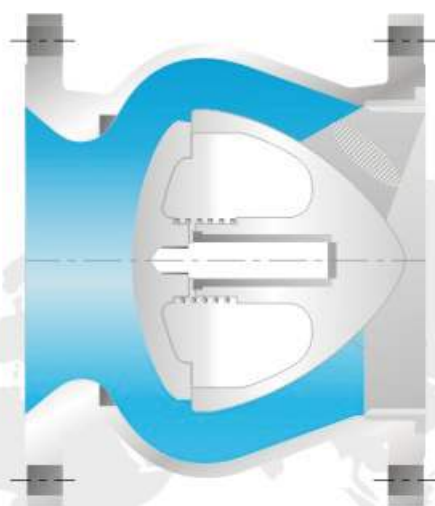
(Model Number : NCB)

S&W Nozzle Check Valve is covered with 10" and above size and 150~2500LBS pressure rating service by multi spring loaded design (Model Number : NCB) under minimum pressure loss with excellent dynamic performance

(body does not have any boring holes of hinge pin to out side)

NO	PARTNAME	Q'TY
1	BODY	1
2	SEAT	1
3	DISC	1
4	SPRING	1/3
5	BUSHING	1
6	CENTER TIE BOLT	1

Single Spring



APPLCALBE CODE

ASME, API, DIN, BS

APPLICABLE FACE TO FACE DIMENSION

ASME, MAKER STANDARD

FACE - TO - FACE DIMENSIONS

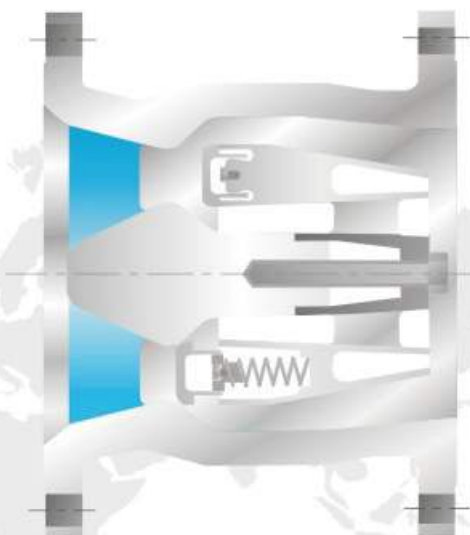
[ANSI 150]

		Single Spring					Multi - Spring								
Size	in	2	4	6	8	10	12	14	16	18	20	24	28	30	36
	mm	50	100	150	200	250	300	350	400	450	500	600	700	750	900
Short Pattern	in	4.49	8.98	13.07	15.12	16.81	17.32	18.70	19.69	22.24	27.17	30.24	35.43	36.54	40.67
	mm	114	228	332	394	427	440	475	500	565	690	768	900	928	1033
	kg	6	21	38	118	198	254	312	373	484	965	1179	1404	1768	2344
Long Pattern	in	7.99	11.50	14.02	19.49	24.49	27.52	30.98	34.02	38.50	38.50	50.98	57.01	60.00	77.01
	mm	203	292	358	495	622	699	787	864	978	978	1295	1448	1524	1956
	kg	11	43	68	175	219	257	385	440	733	1037	1297	1805	2211	2443

[ANSI 300]

		Single Spring					Multi - Spring								
Size	in	2	4	6	8	10	12	14	16	18	20	24	28	30	36
	mm	50	100	150	200	250	300	350	400	450	500	600	700	750	900
Short Pattern	in	4.69	9.33	13.58	15.12	17.32	17.48	19.05	19.69	22.24	27.17	30.24	35.43	36.54	40.67
	mm	119	237	345	394	440	444	484	500	565	690	768	900	928	1033
	kg	8	36	68	147	226	274	400	477	621	981	1233	1980	2155	3303
Long Pattern	in	10.51	14.02	17.52	20.98	24.49	27.99	32.99	39.02	42.99	47.01	55.00	62.99	65.00	82.01
	mm	267	356	445	533	622	711	838	991	1092	1194	1397	1600	1651	2083
	kg	12	43	86	184	251	298	534	582	738	1056	1363	2148	2380	3922

Multi - Spring



APPLICABLE FLANGE STANDARD

ASME, API, DIN, BS, AWWA, MSS

APPLICABLE TESTING

ASME B16.34, API 598, BS6755

FACE - TO - FACE DIMENSIONS

[ANSI 600]

		Single Spring					Multi - Spring								
Size	in	2	4	6	8	10	12	14	16	18	20	24	28	30	36
	mm	50	100	150	200	250	300	350	400	450	500	600	700	750	900
Short Pattern	in	7.99	9.61	13.98	16.02	17.99	18.03	19.61	20.59	27.09	28.27	30.63	34.33	38.19	45.98
	mm	203	244	355	407	457	458	498	523	688	718	778	872	970	1168
	kg	12	41	152	176	302	383	484	711	1219	1242	1741	2394	2700	4050
Long Pattern	in	11.50	17.01	22.01	25.98	30.98	32.99	35.00	39.02	42.99	47.01	55.00	52.99	65.00	82.01
	mm	292	432	559	660	787	838	889	991	1092	1194	1397	1600	1651	2083
	kg	28	67	174	225	365	464	587	861	1192	1383	2170	2748	3541	7901

[ANSI 900]

		Single Spring					Multi - Spring								
Size	in	2	4	6	8	10	12	14	16	18	20	24	28	30	36
	mm	50	100	150	200	250	300	350	400	450	500	600	700	750	900
Short Pattern	in	8.19	9.84	14.33	16.42	18.43	18.62	20.08	21.10	27.76	28.98	31.38	35.20	39.13	47.13
	mm	208	250	364	417	468	473	510	536	705	736	797	894	994	1197
	kg	27	54	174	261	435	607	625	1098	1296	1908	2864	4185	4275	6525
Long Pattern	in	14.49	17.99	24.02	29.02	32.99	37.99	40.51	44.49	47.99	52.01	60.98			
	mm	368	457	610	737	838	965	1029	1130	1219	1321	1539			
	kg	41	136	229	301	616	796	1195	1317	1819	2647	3317			