SEMPELL HIGH PRESSURE CHECK VALVE

MODEL VR500 (ASME)

Designed for use in high temperature and high pressure systems wherever a reverse flow has to be avoided.

FEATURES

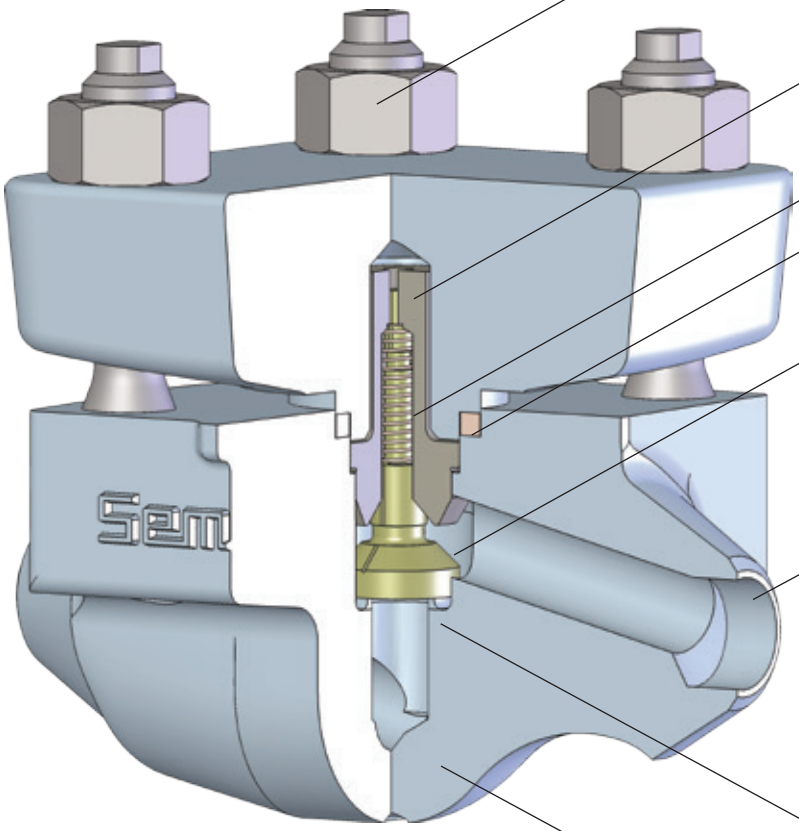
- Piston type check valve
- Body made of forged steel
- Wear resistant stellite body seat
- Separated guiding bush
- Return spring
- Low pressure loss
- Easy maintenance
- Code compliance with ASME B16.34 and PED

GENERAL APPLICATIONS

Designed for all applications in water-steam cycle to allow flow in one direction only and to protect systems that can be affected by reverse flow. The return spring allows reliable function even in vertical installations.

TECHNICAL DATA

Size:	NPS ½" – 2 ½"
Pressure rating:	Class 1690 STD / LTD
	Class 2680 STD / LTD
Temperature:	-29°C to 600°C
	(-20°F to 1100°F)
Body material:	SA105
	SA182F22
	SA182F91
	SA182F347
	SA182F92
	Other materials on request
Connection:	Butt weld ends acc. to ASME B16.25
	Socket weld ends acc. to ASME B16.11



Bolts and nuts made of corrosion resistant material.

Separated guiding bush made of corrosion resistant 17 % Cr steel to avoid any risk of blocking due to mechanical loads.

Return spring for installation even in vertical pipes.

Grooved gasket with graphite layer ensuring high tightness and long service life.

Fully guided disc made of wear and corrosion resistant 17 % Cr steel with relieving grooves for smooth operation.

Welding ends with sufficiently long cylindrical connections for heat treatment and UT testing.

Seats made of wear and corrosion resistant stellite with sufficient thickness to allow for reconditioning.

Low pressure loss due to optimized flow path and large channel borings.

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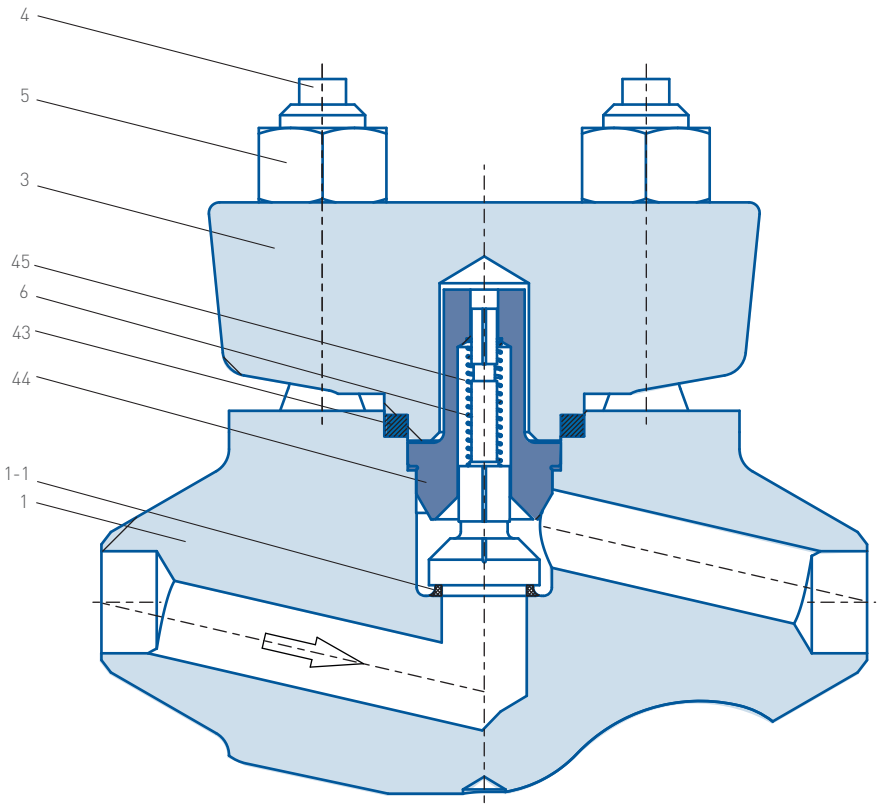


PART LIST

Material Specification		51	63	80 [1]	81	84 [1]
Part	**Designation**	**Material**				
1	Body	SA105	SA182F22	SA182F91	SA182F347	SA182F92
1.1	Body seat	Stellite				
1.2	Welding neck flange	SA105	SA182F22	SA182F91	SA182F347	SA182F92
1.3	Welding neck flange	SA105	SA182F22	SA182F91	SA182F347	SA182F92
3	Cover	SA182F22		SA182F91	SA182F347	SA182F91
4	Screw bolt	SA193B16[2]		SA193B16 Gr. 2H[2]	SA453GR660[2]	SA193B16 Gr.2H[2]
5	Hexagonal nut	SA194 Gr.2H[2]		SA193B16 Gr. 2H[2]	SA453GR660[2]	SA193B16 Gr.2H[2]
6	Disc	17 % Cr				
18	Nameplate	Austenite				
19	Grooved pin	Austenite				
43*	Gasket	Graphite-Austenite				
44	Guide bush	17 % Cr				
45	Spring	Inconel				

NOTES:

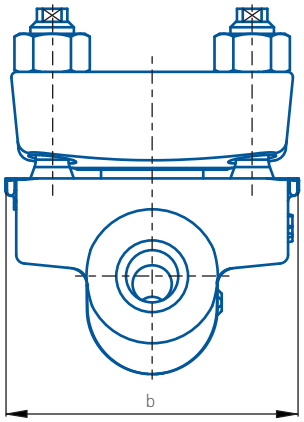
* Commissioning parts: Screws and nuts corrosion protected

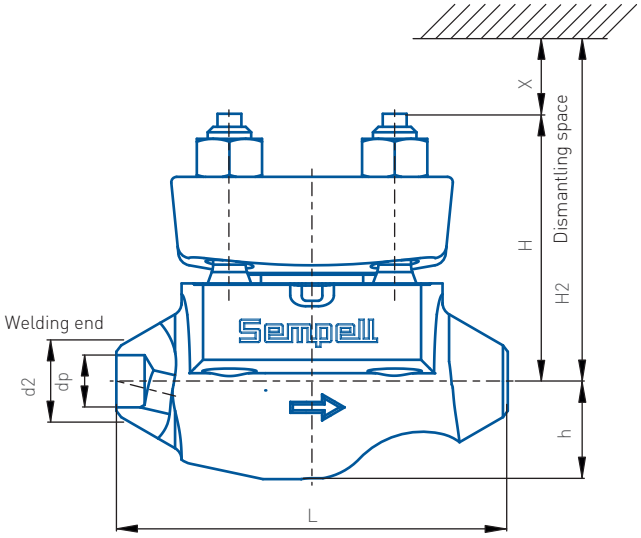
[1] SA182F91 / SA182F92: body and cover from bar material

[2] Or similar material

SEMPELL HIGH PRESSURE CHECK VALVE

MODEL VR500 (ASME)

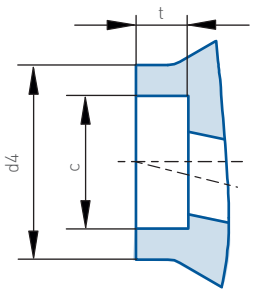




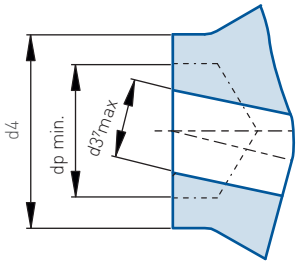
DIMENSIONS

NVS		½	1	2
	⅜	Cl.900-2680		
	½	Cl.900-2680		
	¾	Cl.2680	Cl.900-1680	
	1	Cl.2680	Cl.900-1680	
NPS [1, 6]	1¼		Cl.2680	Cl.900-1680
	1½		Cl.2680	Cl.900-1680
	2			Cl.900-2680
	2½			Cl.900-2680
	3 only standard class			Cl.900-2680
d2	mm	38	54	94
	in	1.49	2.1	3.7
dp	mm	6	15.2	38.2
	in	0.25	0.6	1.5
L [2]	mm	160	180	300
	in	6.3	7.0	11.8
L1 [2]	mm	300	360	530
	in	11.81	14.1	20.8
b	mm	130	130	185
	in	5.1	5.1	7.3
H	mm	approx.130	approx.130	approx.185
	in	approx.5.1	approx. 5.1	approx. 7.3
H2 [3]	mm	approx.550	approx.550	approx.585
	in	approx.21.6	approx.21.6	approx.23
h	mm	45	45	75
	in	1.8	1.8	3
X	mm	approx.420	approx.420	approx.400
	in	approx.16.5	approx.16.5	approx.15.7
Seat Ø	mm	20	20	40
	in	0.78	0.78	1.57
Weight [4]	kg	approx.11	approx.11	approx.35
	lbs	approx.24	approx.24	77
Weight [4/5]	kg	approx.14	approx.14	approx.38
	lbs	approx.31	approx.31	approx.84

SOCKET WELD END



PLAIN



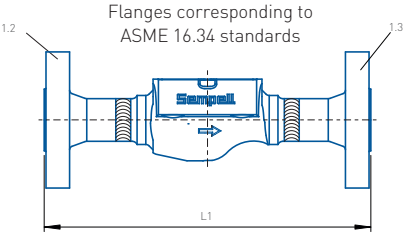
DIMENSIONS - SOCKET WELD ENDS

Valve size					
NPS	NVS		c	t	d4
⅜	½	mm	17.600	10.00	40.50
		in	0.690	0.38	1.59
½	½	mm	21.800	13.00	40.50
		in	0.855	0.50	1.59
¾	1	mm	27.100	13.00	56.50
		in	1.065	0.50	2.22
1	1	mm	33.900	13.00	56.50
		in	1.330	0.50	2.22
1¼	2	mm	42.700	13.00	97.00
		in	1.675	0.50	3.81
1½	2	mm	48.800	13.00	97.00
		in	1.915	0.50	3.81
2	2	mm	61.200	16.00	97.00
		in	2.406	0.63	3.81

DIMENSIONS - PLAIN

NVS		d3 max	d3[7]	dp min	d4
½	mm	13.00	6.00	18.00	40.50
	in	0.51	0.23	0.31	1.59
	mm	13.00	10.00	11.8	40.50
	in	0.51	0.39	0.46	1.59
	mm	13.00	13.00	15.00	40.50
	in	0.51	0.51	0.59	1.59
	mm	20.00	14.00	17.00	56.50
	in	0.78	0.55	0.67	2.22
1	mm	20.00	18.00	20.7	56.50
	in	0.78	0.71	0.81	2.22
	mm	20.00	20.00	22.8	56.50
	in	0.78	0.78	0.9	2.22
	mm	40.00	20.00	24.00	97.00
	in	1.57	0.78	0.94	3.82
2	mm	40.00	30.00	34.00	97.00
	in	1.57	1.18	1.34	3.82
	mm	40.00	40.00	44.00	97.00
	in	1.57	1.57	1.73	3.82

Flanges corresponding to ASME 16.34 standards



NOTES:

[1] Possible pipe connections
[2] Other end-to-end dimension on request
[3] Required dimension for disassembly and rework
[4] Weight for W / M / U Weight of flanged valves on request
[5] Bar material
[6] Only buttweld
[7] Corresponding to customer's request

SEMPELL HIGH PRESSURE CHECK VALVE

MODEL VR500 (ASME)

Application ranges:
Limited class for welding end valves up to NPS 2 ½
Standard Class for flanged valves.
Recommended temperatures see ASME B16.34

WORKING PRESSURE BY CLASS (Barg) – ASME B16.34

Class	SA105						SA182F12						SA182F22					
Temp °C	900	1690	2680	900	1690	2680	900	1690	2680	900	1690	2680	900	1690	2680	900	1690	2680
	Standard			Limited			Standard			Limited			Standard			Limited		
-29 to 38	153	288	456	155	291	462	155	291	462	155	291	462	155	291	462	155	291	462
50	150	282	448	155	291	462	155	290	460	155	290	460	155	291	462	155	291	462
100	140	263	416	155	291	461	151	284	451	152	285	452	155	290	460	155	291	461
150	135	254	403	153	288	456	145	271	430	149	280	444	151	283	448	153	287	455
200	131	247	391	152	285	452	139	261	43	149	280	444	146	274	435	151	283	449
250	126	236	375	152	285	451	135	252	400	149	279	443	139	261	414	150	282	446
300	120	224	356	152	285	451	129	242	383	147	276	438	129	242	383	149	280	115
325	116	218	346	150	282	448	124	233	369	146	274	434	124	233	369	149	279	113
350	113	212	336	147	276	437	121	227	359	144	269	427	121	227	359	148	277	440
375	109	205	325	141	265	421	117	219	346	141	265	420	117	219	346	146	275	436
400	104	196	310	130	244	388	110	206	327	141	265	420	110	206	327	146	275	436
425	86	162	257	108	203	321	105	197	313	141	265	420	105	197	313	146	275	436
450	69	130	206	86	162	257	101	190	302	129	242	384	101	190	302	141	266	421
475	52	98	156	65	123	195	84	157	249	105	196	311	95	178	283	128	241	382
500	35	66	105	45	85	137	64	120	191	81	154	249	85	159	252	109	206	332
538	18	33	53	23	45	75	41	77	123	54	105	174	55	104	165	72	141	234
550	-	-	-	-	-	-	36	68	108	47	92	153	47	88	140	61	119	199
575	-	-	-	-	-	-	26	50	79	34	67	112	32	59	94	41	80	134
600	-	-	-	-	-	-	18	34	54	24	46	77	21	39	62	27	53	87
625	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

WORKING PRESSURE BY CLASS (Barg) – ASME B16.34

Class	SA182F91						SA182F92						SA182F347					
Temp °C	900	1690	2680	900	1690	2680	900	1690	2680	900	1690	2680	900	1690	2680	900	1690	2680
	Standard			Limited			Standard			Limited			Standard			Limited		
-29 to 38	155	291	462	155	291	462	155	291	462	155	291	462	149	280	443	155	291	462
50	155	291	462	155	291	462	155	291	462	155	291	462	146	275	436	155	291	462
100	155	290	460	155	291	462	155	290	460	155	291	462	136	255	405	152	285	452
150	151	283	448	155	291	462	151	283	448	155	291	462	127	239	379	142	267	423
200	146	274	435	155	291	462	146	274	435	155	291	462	120	225	357	134	251	398
250	139	261	414	155	291	462	139	261	414	155	291	462	113	213	358	127	238	377
300	129	242	383	155	291	462	129	242	383	155	291	462	108	203	322	121	227	360
325	124	233	369	155	291	462	124	233	369	155	291	462	106	199	316	118	222	352
350	121	227	359	154	290	459	121	227	359	154	290	459	104	196	310	116	219	347
375	117	219	346	152	284	451	117	219	346	152	284	451	103	193	306	115	215	341
400	110	206	327	151	283	448	110	206	327	151	283	448	102	191	303	114	213	338
425	105	197	313	149	280	443	105	197	313	149	280	443	101	189	300	113	211	335
450	101	190	302	141	266	421	101	190	302	141	266	421	100	188	299	112	210	333
475	95	178	283	128	241	382	95	178	283	128	241	382	95	178	283	112	210	333
500	85	159	252	109	206	332	85	159	252	109	206	332	85	159	252	107	201	319
538	75	141	224	90	177	295	75	141	224	90	177	295	75	141	224	87	163	259
550	75	141	223	90	177	295	75	141	223	90	177	295	-	-	-	-	-	-
575	72	135	214	89	174	244	72	135	214	89	174	244	-	-	-	-	-	-
600	59	110	158	76	149	158	64	121	158	84	164	158	-	-	-	-	-	-
625	–	–	–	–	–	–	–	–	–	–	–	–	-	-	-	-	-	-

NOTES:
Admissible working pressure (plain welding ends)
Test pressure = 1.5 × admissible working pressure at 38°C
Pressures for SA182 F92 only for information, based on code case 2179-2 and "ceiling values" B16.34
Pressures for SA182 F91 and SA182 F92 partly reduced above 538 °C due to bolting material. Higher pressures on request.

SEMPELL HIGH PRESSURE CHECK VALVE

MODEL VR500 (ASME)

Application ranges:
Limited class for welding end valves up to NPS 2 ½
Standard Class for flanged valves.
Recommended temperatures see ASME B16.34

WORKING PRESSURE BY CLASS (psig) – ASME B16.34

Class	A105						A182F12						A182F22					
Temp °F	900	1690	2680	900	1690	2680	900	1690	2680	900	1690	2680	900	1690	2680	900	1690	2680
	Standard			Limited			Standard			Limited			Standard			Limited		
-20 to 100	2220	4180	6620	2250	4230	6700	2250	4230	6700	2250	4230	6700	2250	4230	6700	2250	4230	6700
200	2035	3830	6070	2250	4230	6700	2210	4150	6580	2210	4150	6580	2250	4230	6700	2250	4230	6700
300	1965	3690	5850	2220	4170	6620	2100	3940	6250	2165	4070	6450	2185	4110	6510	2220	4170	6610
400	1900	3580	5670	2200	4130	6550	2005	3770	5980	2165	4070	6450	2115	3980	6310	2185	4110	6510
500	1810	3400	5390	2200	4130	6550	1940	3640	5780	2155	4060	6430	1995	3750	5940	2175	4080	6470
600	1705	3200	5080	2200	4130	6550	1815	3410	5410	2125	3990	6330	1815	3410	5410	2165	4070	6450
650	1650	3100	4910	2145	4030	6390	1765	3320	5260	2090	3930	6230	1765	3320	5260	2145	4040	6400
700	1590	3010	4750	2075	3900	6180	1705	3200	5080	2050	3850	6100	1705	3200	5080	2120	3990	6320
750	1520	2860	4540	1905	3580	5670	1595	3000	4750	2050	3850	6100	1595	3000	4750	2120	3990	6320
800	1235	2320	3680	1545	2900	4600	1525	2870	4540	2050	3850	6100	1525	2870	4540	2120	3990	6320
850	955	1800	2850	1195	2250	3560	1460	2750	4360	1840	3460	5480	1460	2750	4360	2030	3820	6060
900	690	1300	2060	860	1620	2570	1120	2110	3340	1400	2640	4180	1350	2530	4020	1800	3380	5360
950	410	780	1230	565	1080	1745	825	1550	2450	1070	2050	3320	1160	2180	3460	1435	2740	4445
1000	255	490	770	335	655	1090	595	1130	1780	775	1515	2525	800	1510	2400	1045	2040	3400
1050	-	-	-	-	-	-	430	820	1290	570	1120	1860	525	990	1560	710	1390	2315
1100	-	-	-	-	-	-	290	550	860	385	755	1255	330	620	990	450	875	1455
1150	-	-	-	-	-	-												

WORKING PRESSURE BY CLASS (psig) – ASME B16.34

Class	SA182F91						SA182F92						SA182F347					
Temp °F	900	1690	2680	900	1690	2680	900	1690	2680	900	1690	2680	900	1690	2680	900	1690	2680
	Standard			Limited			Standard			Limited			Standard			Limited		
-20 to 100	2250	4230	6700	2250	4230	6700	2250	4230	6700	2250	4230	6700	2160	4060	6440	2250	4230	6700
200	2250	4230	6700	2250	4230	6700	2250	4230	6700	2250	4230	6700	1985	3730	5920	2250	4170	6610
300	2185	4110	6510	2250	4230	6700	2185	4110	6510	2250	4230	6700	1850	3480	5520	2065	3880	6150
400	2115	3980	6310	2250	4230	6700	2115	3980	6310	2250	4230	6700	1730	3250	5150	1930	3630	5750
500	1995	3750	5940	2250	4230	6700	1995	3750	5940	2250	4230	6700	1625	3060	4850	1815	3410	5410
600	1815	3410	5410	2250	4230	6700	1815	3410	5410	2250	4230	6700	1550	2910	4610	1730	3250	5150
650	1765	3320	5260	2250	4230	6700	1765	3320	5260	2250	4230	6700	1520	2860	4530	1695	3190	5050
700	1705	3200	5080	2200	4130	6550	1705	3200	5080	2200	4130	6550	1490	2800	4400	1665	3130	4960
750	1595	3000	4750	2185	4110	6510	1595	3000	4750	2185	4110	6510	1475	2780	4400	1645	3100	4910
800	1525	2870	4540	2160	4060	6440	1525	2870	4540	2160	4060	6440	1460	2750	4360	1630	3070	4860
850	1460	2750	4360	2030	3820	6060	1460	2750	4360	2030	3820	6060	1455	2740	4340	1625	3050	4840
900	1350	2530	4020	1800	3380	5360	1350	2530	4020	1800	3380	5360	1350	2530	4020	1625	3050	4840
950	1160	2180	3460	1505	2880	4675	1160	2180	3460	1505	2880	4675	1160	2180	3460	1415	2660	4220
1000	1090	2060	3250	1310	2565	4275	1090	2060	3250	1310	2565	4275	1090	2060	3250	1260	2380	3760
1050	1080	2030	3220	1300	2545	4120	1080	2030	3220	1300	2545	4120	-	-	-	-	-	-
1100	905	1710	2580	1155	2260	2580	960	1810	2580	1235	2415	2580	-	-	-	-	-	-
1150	–	–	–	–	–	–	–	–	–	–	–	–	-	-	-	-	-	-

NOTES:
Admissible working pressure (plain welding ends)
Test pressure = 1.5 × admissible working pressure at 100°F
Pressures for SA182 F92 only for information, based on code case 2179-2 and "ceiling values" B16.34
Pressures for SA182 F91 and SA182 F92 partly reduced above 538 °C due to bolting material. Higher pressures on request.

SEMPELL HIGH PRESSURE CHECK VALVE

MODEL VR500 (ASME)

SELECTION GUIDE

Example:	VR500	51	2680	1"	1"	G	W	43.0
Valve type								
VR500 Piston check valve								
Material specification								
51 SA105								
60 SA182F12								
63 SA182F22								
80 SA182F91								
81 SA182F347								
84 SA182F92								
Pressure rating weld end								
900 Class 900								
1690 Class 1690								
2680 Class 2680								
Nominal pipe size (NPS)								
⅜" NPS ⅜								
½" NPS ½								
¾" NPS ¾								
1" NPS 1								
1 ¼" NPS 1 ¼								
1 ½" NPS 1 ½								
2" NPS 2								
2 ½" NPS 2 ½								
3" NPS 3								
Nominal valve size (NVS)								
½" NVS ½								
1" NVS 1								
2" NVS 2								
Body design								
G Globe type (T-pattern)								
Pipe connection								
W Welding ends acc. to ASME								
M Socket weld end acc. to ASME								
A Flange acc. to ASME								
U Plain ends								
SN **Designation**								
43.0 Welding rings inlet and outlet side								
43.2 Welding ring inlet side								
43.3 Welding ring outlet side								
177 Nameplate operating pressure in MPa								
178 Nameplate, foreign language								