

# BUTTERFLY VALVE

## AL 45-91 / AL 45-93

## RTFE / Metal Wafer / Lug

### Description

AL 45-91 / AL 45-93 is a high quality double eccentric butterfly valve for mounting between flanges (wafer) or lug connection. Valve body made of stainless steel with sealing ring in RTFE or metal. Operating with lockable hand lever with 10 fixed control modes or gear. The valve has a mounting plate according to ISO 5211 for direct mounting of actuators.

**Applications:** Shut-off valve for liquids and gases. The valve also works for flow control.

### Standard versions

Type	Sealing ring	Connection	Temperature range
AL 45-910	RTFE	Wafer	-29° - +180°C
AL 45-913		Lug	
AL 45-930	Metal	Wafer	-29° - +500°C
AL 45-933		Lug	

**Marking:** The valve is marked 910 / 913 / 930 / 933

**Dimensions:** DN 50-1200

**Pressure class:** PN 16 (see Pressure/Temperature)

### Approvals

- CE/PED 2014/68/EU
- ATEX 2014/34/EU
- Fire type test ISO 10497
- Emission test ISO 15848-1
- SIL 3 IEC 61508-1

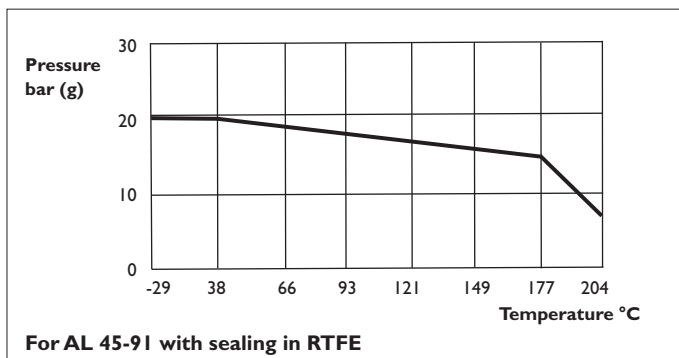
### Design

- Sealed in both directions
- Unique seat holder
- V-shaped chevron seal in RTFE
- Through-stem
- Mechanical stop in closed position

### Optional

- Other materials
- Higher pressure ratings
- Higher temperatures
- Hand lever or gear
- Electric actuators
- Pneumatic actuator
- Limit switch

### Pressure / Temperature



### Torque - Nm

Including safety factor 30%

DN	AL 45-91			AL 45-93		
	5 bar	10 bar	15 bar	5 bar	10 bar	15 bar
50	15	17	20	49	59	65
65	22	29	35	56	78	102
80	29	37	44	71	88	118
100	41	51	61	102	122	157
125	64	76	89	140	154	182
150	83	103	118	169	199	232
200	114	147	166	255	294	333
250	211	261	309	333	402	470
300	294	374	539	461	559	735
350	539	784	980	676	843	1019
400	686	980	1176	990	1225	1490
450	963	1225	1470	1107	1441	1803
500	1411	1764	2058	1411	1882	2352
600	1680	2205	2660	1764	2176	2940
650	3312	4351	4404	4306	5656	-
700	3842	5047	5408	4995	6561	-
750	4410	5792	6539	5733	7530	-
800	5018	6585	8203	6523	8561	-
900	6450	8340	11363	8255	10842	-
1000	7840	10290	14698	10192	13377	-
1100	9486	12456	19284	12332	16193	-
1200	11290	14818	25624	14677	19263	-

Contact us for sizing of actuators.

**Note:** When installing a pneumatic actuator, it is a requirement that the actuator has adjustment capability in both open and closed position. We recommend actuator type AL 79.

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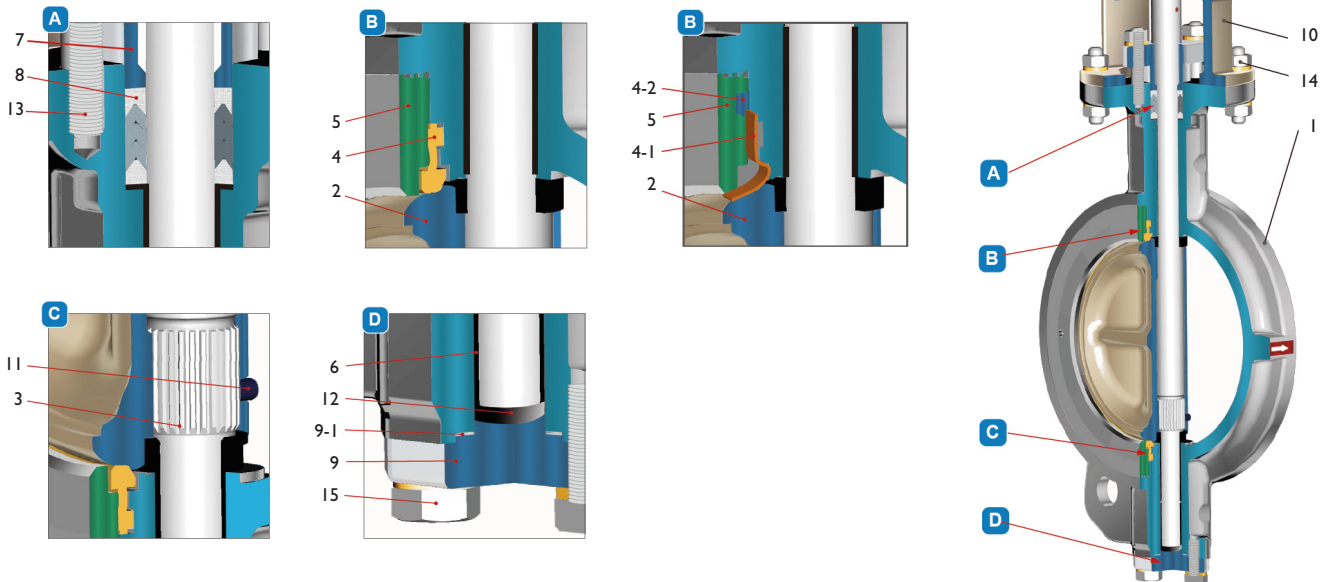
## AL 45-91 / AL 45-93

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### Kv value

DN	Opening angle									
	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %	90 %	100 %
50	1	2	4	9	13	20	30	46	55	57
65	4	8	19	28	44	60	79	96	117	120
80	8	14	35	51	79	110	146	182	220	224
100	12	22	56	83	131	181	237	291	353	361
125	21	39	97	139	218	301	408	501	599	619
150	21	66	131	194	359	626	757	1011	1152	1182
200	36	118	233	346	470	658	846	1121	1247	1505
250	108	262	423	501	794	1084	1419	1772	2098	2294
300	146	357	575	830	1118	1509	2631	2970	3310	3755
350	191	435	685	1002	1388	1927	2685	3638	4610	5129
400	271	462	776	1138	1637	2137	3185	4640	5923	6675
450	337	814	1252	1754	2422	3369	4658	6072	7340	8044
500	441	1029	1577	2129	3014	4251	6182	7823	9469	10169
600	725	1600	2367	3363	4731	6591	9322	12405	15778	17081
650	378	1049	2081	3535	5426	8075	12427	17286	22903	23500
700	416	1154	2289	3888	5793	8883	13670	19015	25193	26550
750	632	1426	2672	4693	7020	10215	17598	22424	29387	31745
800	849	1697	2883	5498	8247	11546	19654	25832	33581	36940
900	1240	2895	4495	6738	10005	14846	21709	30304	41399	46856
1000	1514	3530	5481	8216	12199	18882	27610	38640	52653	59593
1100	1597	3789	6583	10380	15723	22893	34326	48210	62279	66963
1200	1683	4065	7851	12897	19831	27518	42108	59306	73304	75211

### Material specification



No	Part	Material	
		AL 45-91	AL 45-93
1	Body	Stainless steel A351 Gr. CF8M	
2	Disc	Stainless steel A351 Gr. CF8M	
3	Shaft	Stainless steel A182 Gr. F316	
4	Seat	PTFE + 15 % glass fiber	-
4-1	Metal seat	-	Inconel 718
4-2	Gasket	-	Graphite
5	Retainer	Stainless steel A351 Gr. CF8M	
6	Bushingw	Stainless steel + RTFE	
7	Gland	Stainless steel A351 Gr. CF8M	

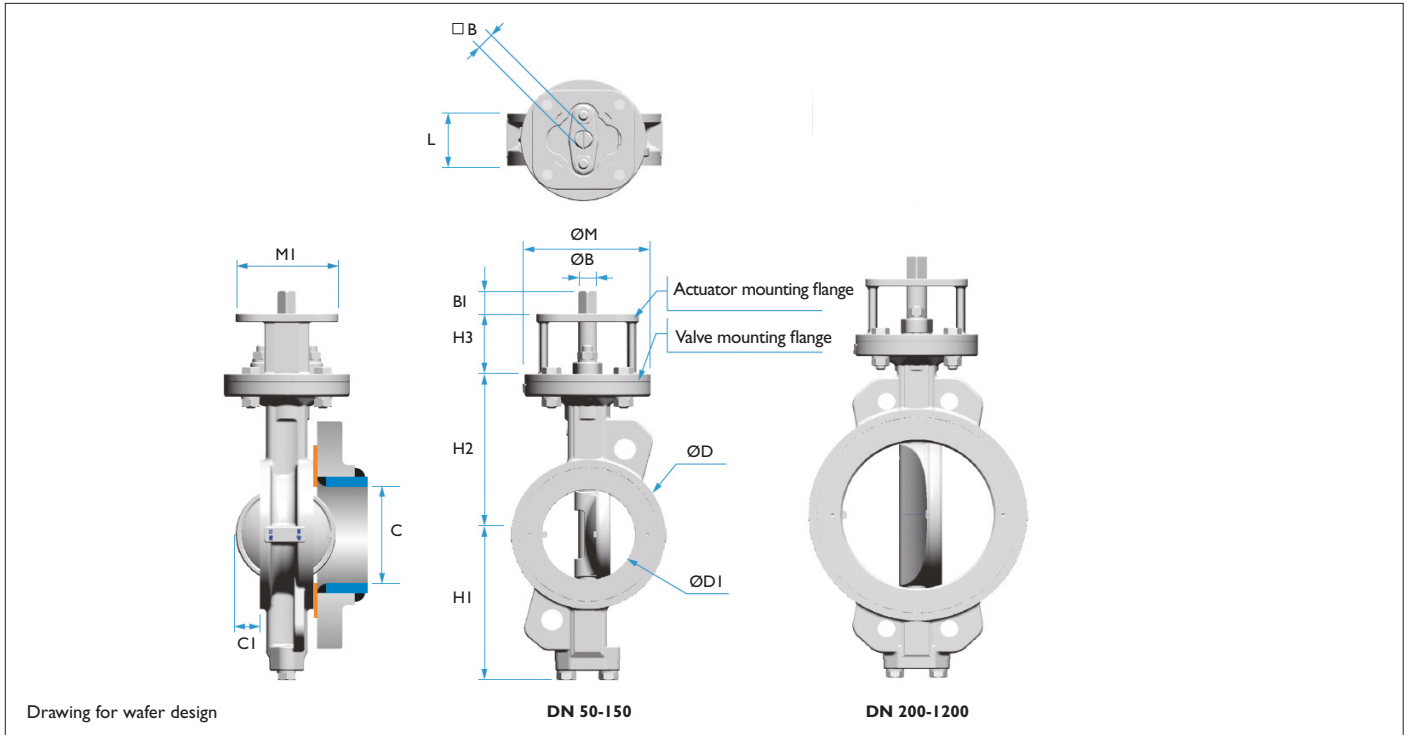
No	Part	Material	
		AL 45-91	AL 45-93
8	Gland packing	PTFE	Graphite
9	Bottom cover	Stainless steel A351 Gr. CF8M	
9-1	Bottom cover gasket	RTFE	Graphite
10	Yoke	Ductile iron A536 Gr. 65-45-12	
11	Stop stud	Stainless steel A193 Gr. B8M	
12	Lock plate	RTFE + SS 316	
13	Stud	Stainless steel A193 Gr. B8	
14	Nut	Stainless steel A193 Gr. 8	
15	Bolt	Stainless steel A193 Gr. B8	

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### Dimensions



DN	L	H1	H2	H3	φ D	φ DI	C	CI	ISO 5211				φ B	□ B	Key	BI	Weight kg	
									Valve		Actuator						Wafer	Lug
									Type	φ M	Type	M1						
50	43	99	118	60	92	38	19	2	F07	90	F07	70	14	11	-	18	4	5
65	46	111	125	60	108	63	56	15	F07	90	F07 / F05	70	14	11	-	18	5	9
80	47	128	140	70	126	78	74	22	F10	125	F07 / F05	102	18	14	-	23	8	10
100	53	150	157	70	153	95	86	25	F10	125	F10 / F07	102	18	14	-	23	10	16
125	57	163	170	70	184	118	112	36	F10	125	F10 / F07	102	22	17	-	23	13	19
150	56	176	185	70	212	143	138	49	F10	125	F10 / F07	102	22	17	-	23	14	20
200	62	206	220	80	268	188	182	68	F12	150	F10 / F07	125	25	19	-	28	25	33
250	68	238	260	80	326	236	230	89	F12	150	F12 / F10	125	28	22	-	28	33	47
300	78	269	290	100	375	282	275	106	F14	175	F12 / F10	160	35	27	-	37	48	77
350	78	306	326	100	416	322	314	125	F14	175	F14 / F12	160	36	27	-	37	64	90
400	102	342	370	120	476	371	361	140	F16	210	F14 / F12	195	48	36	-	47	102	138
450	114	370	395	120	534	418	406	157	F16	210	F16 / F14	195	48	36	-	47	129	164
500	127	397	430	120	588	466	453	177	F16	210	F16 / F14	195	60	46	-	56	123	189
600	154	455	490	150	692	570	550	210	F25	300	F16	300	60	46	-	56	273	367
650	165	494	503	150	720	618	595	229	F25	300	F25	300	70	-	18 x 12	90	-	-
700	165	514	559	150	770	666	654	259	F25	300	F25	300	75	-	20 x 12	110	-	-
750	190	553	585	150	820	721	711	284	F25	300	F25	300	80	-	24 x 16	110	-	-
800	190	578	610	150	870	759	741	290	F25	300	F25	300	90	-	25 x 14	110	-	-
900	203	631	670	150	980	860	844	335	F30	350	F30	350	100	-	28 x 16	180	-	-
1000	216	710	735	150	1090	960	941	377	F30	350	F30	350	105	-	28 x 16	180	-	-
1100	254	767	820	180	1186	1054	1023	402	F35	415	F35	415	115	-	32 x 18	180	-	-
1200	254	812	880	180	1305	1124	1100	440	F35	415	F35	415	130	-	36 x 20	180	-	-

### Installation

The fixation ring should be checked and tightened if necessary before mounting. The valve can be installed in horizontal and vertical lines. In horizontal lines it is an advantage with the shaft in horizontal position. The valve is marked with an arrow for preferred flow direction. When the valve is used as "dead end valve" it shall be installed according to the flow arrow. The valve is maintenance free but should be operated at regular intervals depending on installation. Checking of the packing box after startup is recommended.



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