

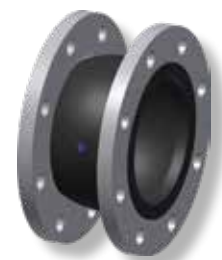
WILLBRANDT Rubber Expansion Joint Type 51

■ partly in stock

DN 32 - DN 600

Type 51 is a low corrugated rubber expansion joint. Due to its low corrugation, the lowest possible flow resistance is achieved. It is also characterised by its high pressure resistance. Type 51 is produced in four different rubber qualities, so that a suitable rubber compound is available for almost every application (see material descriptions on the following pages).

Type 51 is mainly used in industrial plants, where it is used to absorb expansion and vibrations and to dampen noise.



Bellow design	Low corrugated rubber bellow with reinforcement and shaped sealing bead with core ring, self-sealing (no additional seals required). Suitable for accommodating swiveling flanges.	Approvals/Conformity	CE (A2), FDA, EG 1935/2004 conform
Flange version	Both sides with swiveling flange made of galvanized steel, drilled according to DIN PN 10 (standard). Other materials and dimensions are possible.	Vacuum resistance	- DN 32 to 50 vakuum-proof - DN 65 to 250 up to -200 mbar - DN 300 to 600 not vacuum-proof - with vacuum supporting spiral/ring from DN 65 to DN 600 vacuum-proof
Pressure resistance	- Max. 25 bar, for the shortest length of each nominal diameter - Max. 16 bar, for all other length, but depending on nominal diameter and total length	Accessories	- Tie rods - Vacuum supporting spiral/rings - Guide sleeves - PTFE lining - Potential equalisation - Flame-resistant protective covers - Dust and splash protection covers - Earth covers / sun protection covers Further information on page 99 - 105.

Specifications

Bellow		Bellow design			Permissible operating data												
Colour code	Colour marking	Core (inner)	Rein-forcement	Cover (outer)	Only for shortest length						For all other length						
					°C	bar	°C	bar	°C	bar	Short-term °C	°C	bar	°C	bar	°C	bar
red-blue		IIR-D	Aramid	EPDM	80	25	120	16	130	10	140	Operating data depend on the nominal diameter and the total length.					
green-blue		CSM	Aramid	CR	50	25	90	16	120	10	130						
lilac		FPM	Aramid	ECO	50	25	120	16	150	4	160						
yellow-blue		NBR	Aramid	CR	50	25	90	16	120	10	130						

Bursting pressure: 75 bar at 25 bar working pressure / 48 bar at 16 bar working pressure

Application

Type 51 red-blue

For hot water, sea water, cooling water with chemical additives for treating water, saline solutions, weak acids and weak alkali solutions. Not suitable for oil products or cooling water with additives containing oil, hot air or steam.

Type 51 green-blue

For chemicals, aggressive chemical waste water and compressor air containing oil.

Type 51 lilac

For flue gas desulphurisation systems and bio-diesel. Good resistance to benzene, xylene, toluene, fuels with an aromatic content of more than 50 %, aromatic/chlorinated hydrocarbons and mineral acids. Not suitable for water or steam.

Type 51 yellow-blue

For oils, lubricants, fuels, gases, city and natural gas (not liquefied).

Important information

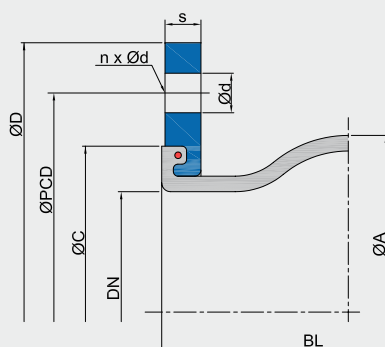
For aggressive media, please have the material resistance checked by our engineers. The bellows must not be painted or insulated at media temperatures >50 °C. Please also note the planning instructions.

WILLBRANDT Rubber Expansion Joint Type 51

Design A - without tie rods

Can be used for absorb movements in all directions (for combined movements, refer to the movement diagram in the technical appendix), for vibration and noise damping.

The expansion joint's reaction force must be absorbed through appropriate pipeline guidance.



Dimensions for design A

DN	Length BL		Bellow		Flange PN 10 ^{*2}						Movement absorption ^{*3}				Weight ^{*4} kg
	max. 25 bar mm	max. 16 bar mm	ØA mm	WF ^{*1} mm ²	ØD mm	ØPCD mm	Ød mm	n	s mm	ØC mm	axial + mm	axial - mm	lateral ± mm	angular ± °	
32	130	150 / 160	81	2700	140	100	18	4	15	79	10	20	15	20	3.2
40	130	150 / 160	86	2700	150	110	18	4	15	79	10	20	15	20	3.6
50	130	150 / 160	96	3200	165	125	18	4	15	88	10	20	15	20	3.8
65	130	150 / 160	110	5300	185	145	18	8	15	104	10	20	15	20	5.4
80	130	150 / 160	122	8500	200	160	18	8	15	119	15	20	15	20	7.0
100	130	150 / 160 / 175	142	12800	220	180	18	8	15	142	15	20	15	20	8.0
125	130	150 / 160 / 175	170	18700	250	210	18	8	18	169	15	20	15	20	9.7
150	130	150 / 160 / 175	196	25900	285	240	23	8	18	195	15	20	15	20	13.0
200	130	150 / 175 / 200 / 250	256	40900	340	295	23	8	20	244	15	20	15	15	16.6
250	130	150 / 175 / 200 / 250	306	59900	395	350	23	12	20	295	15	20	15	10	21.9
300	130	150 / 165 / 175 / 200	356	82200	445	400	23	12	22	351	15	20	15	10	25.2
350	200	-	442	117600	505	460	22	16	24	400	15	20	15	10	39.2
400	200	250 / 300	495	154700	565	515	26	16	25	450	20	25	20	8	38.8
450	250	-	545	227900	615	565	26	20	25	512	20	25	20	6	54.0
500	250	-	595	227900	670	620	26	20	30	563	20	25	20	6	57.3
600	250	-	695	311500	780	725	30	20	30	675	20	25	20	6	77.1

^{*1} WF = effective area

^{*2} Other standards/dimensions possible.

^{*3} Utilisation rate of movement absorption decreases at higher temperatures.

^{*4} For the shortest length.

Important information

Please note the appropriate fixed point constructions and plain bearings in your piping system!
For more information please refer to our planning instructions. Regarding the bracing, please refer to the technical appendix.

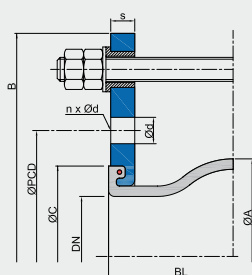
WILLBRANDT Rubber Expansion Joint Type 51

Length limiters

A selection of different bracings is available to absorb the reaction force and to protect the bellows from overstretching or excessive compression.

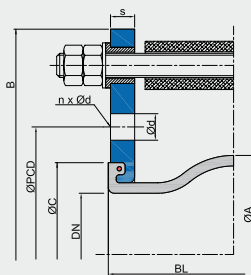
Design B*

Tie rods, mounted in rubber bushing



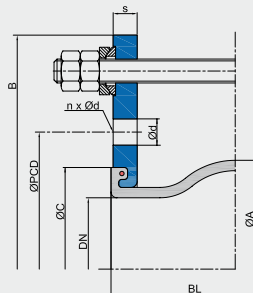
Design C*

Tie rods, mounted in rubber bushing, inside with thrust limiter (plastic bushing)



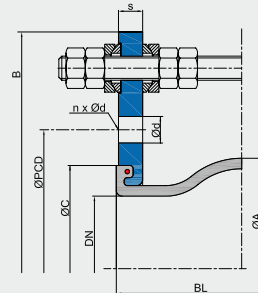
Design E

Tie rods, outside with spherical washers/conical sockets



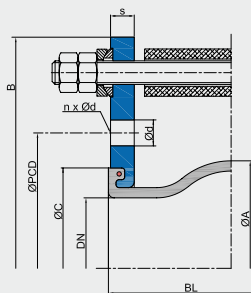
Design M

Tie rods, inside and outside with spherical washers/conical sockets



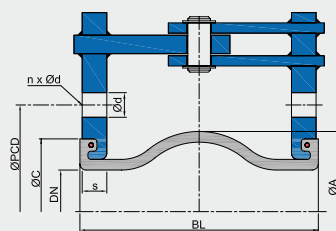
Design S

Tie rods, outside with spherical washer/conical sockets, inside with thrust limiters (plastic bushing)



Design F

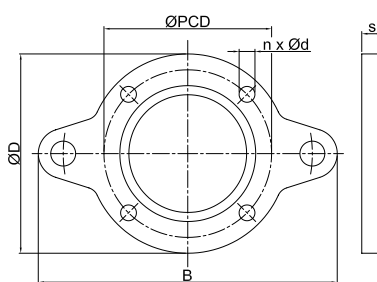
Hinge



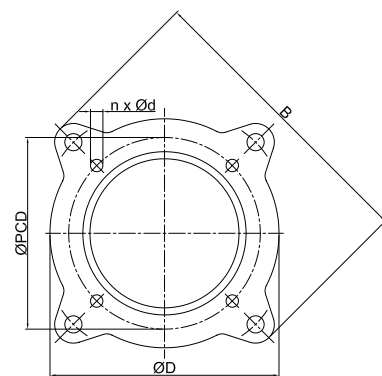
* Note: Design B and C only up to DN 200 PN 10. The lateral movement absorption is reduced by around 50 %.

Flange dimensions for designs with tie rods

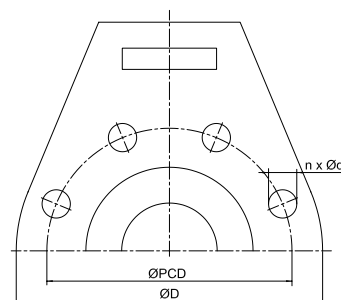
DN	Flange PN 10 (example dimensions)						
	B	ØD	ØPCD	Ød	n	s	ØC
	mm	mm	mm	mm		mm	mm
32	230	140	100	18	4	15	79
40	240	150	110	18	4	15	79
50	255	165	125	18	4	16	88
65	275	185	145	18	8	16	104
80	290	200	160	18	8	18	119
100	310	220	180	18	8	18	142
125	340	250	210	18	8	18	169
150	375	285	240	23	8	18	195
200	440	340	295	23	8	20	244
250	509	395	350	23	12	20	295
300	559	445	400	23	12	22	351
350	619	505	460	22	16	24	400
400	700	565	515	26	16	25	450
450	760	615	565	26	20	30	512
500	810	670	620	26	20	30	563
600	930	780	725	30	20	30	675



DN 32 - 200



DN 250 - 600



DN 50 - 600 (Design F)

WILLBRANDT Rubber Expansion Joint Type 51

Axial stiffness rates

DN	Overall length BL mm	Stiffness rates (averages value from full way)						
		0 bar N/mm	2.5 bar N/mm	4 bar N/mm	6 bar N/mm	10 bar N/mm	16 bar N/mm	25 bar N/mm
32	130	54	130	245	368	466	605	788
40	130	56	126	237	356	451	584	760
50	130	47	97	187	256	330	430	558
65	130	61	134	252	379	480	624	811
80	130	82	170	305	434	543	706	918
100	130	95	191	315	559	743	966	1256
125	130	111	216	419	655	863	1122	1459
150	130	127	268	496	770	1024	1332	1731
200	130	148	267	541	842	1089	1416	1841
250	130	160	315	591	927	1185	1540	2002
300	130	182	367	663	974	1307	1699	2208
350	200	189	318	627	1018	1352	1757	2285
400	200	200	339	671	696	1417	1842	2395
450	250	217	416	755	1174	1511	1964	2553
500	250	255	489	892	1378	1773	2305	2997
600	250	270	380	900	1460	1873	2435	3166

Warning: Deviations (+/-25 %) in the stiffness rates may occur due to use of different materials and manufacturing processes.

Lateral stiffness rates

DN	Overall length BL mm	Stiffness rates (averages value from full way)						
		0 bar N/mm	2.5 bar N/mm	4 bar N/mm	6 bar N/mm	10 bar N/mm	16 bar N/mm	25 bar N/mm
32	130	85	166	240	315	346	360	470
40	130	81	159	232	305	335	348	455
50	130	65	85	104	137	189	245	319
65	130	52	101	150	195	215	279	363
80	130	46	96	177	202	225	292	380
100	130	72	114	186	218	250	324	422
125	130	130	260	339	381	498	647	841
150	130	156	338	402	476	606	788	1024
200	130	420	940	1087	1234	1585	2060	2678
250	130	492	1048	1329	1525	1923	2500	3249
300	130	510	1088	1388	1581	2005	2606	3388
350	200	397	793	991	1138	1427	1856	2412
400	200	439	835	1062	1230	1559	2026	2634
450	250	445	831	1067	1262	1560	2028	2636
500	250	554	1063	1362	1565	1944	2527	3285
600	250	593	1084	1381	1684	2062	2680	3484

Warning: Deviations (+/-25 %) in the stiffness rates may occur due to use of different materials and manufacturing processes.

Important information

Please note the appropriate fixed point constructions and plain bearings in your piping system!
For more information please refer to our planning instructions. Regarding the bracing, please refer to the technical appendix.

WILLBRANDT Rubber Expansion Joint Type 51

Angular stiffness torque

DN	Overall length BL mm	Stiffness torque (averages value from full way)						
		0 bar Nm/°	2.5 bar Nm/°	4 bar Nm/°	6 bar Nm/°	10 bar N/mm	16 bar Nm/°	25 bar Nm/°
32	130	0.9	0.8	1.8	2.7	2.6	3.7	5.7
40	130	1	0.9	1.9	2.8	3.8	4	5.9
50	130	1	1	2	3	4	5	6
65	130	1	2	4	6	7	9	12
80	130	2	4	6	9	11	15	19
100	130	3	6	10	17	23	30	38
125	130	5	10	19	30	39	51	66
150	130	8	17	31	48	63	83	107
200	130	16	29	59	92	119	154	201
250	130	26	51	96	151	193	251	327
300	130	42	84	152	224	300	390	507
350	200	60	101	200	325	432	561	729
400	200	85	143	283	294	599	778	1012
450	250	114	218	396	615	791	1029	1337
500	250	162	311	567	877	1128	1467	1907
600	250	242	339	804	1305	1674	2176	2829

Warning: Deviations (+/-25 %) in the stiffness torque may occur due to use of different materials and manufacturing processes.

Frictional force

DN	Overall length BL mm	For design E and M Frictional force N/bar	For design F Frictional moment Nm/bar
32	130	7	0.3
40	130	7	0.3
50	130	12	0.3
65	130	20	0.5
80	130	35	1.0
100	130	51	1.4
125	130	75	2.1
150	130	118	4.4
200	130	167	6.2
250	130	243	11.2
300	130	335	15.4
350	200	120	17.0
400	200	160	22.9
450	250	226	40.5
500	250	266	63.5
600	250	634	138.5

Warning: Deviations (+/-25 %) in the frictional force may occur due to use of different materials and manufacturing processes.

Important information

Please note the appropriate fixed point constructions and plain bearings in your piping system!
For more information please refer to our planning instructions. Regarding the bracing, please refer to the technical appendix.