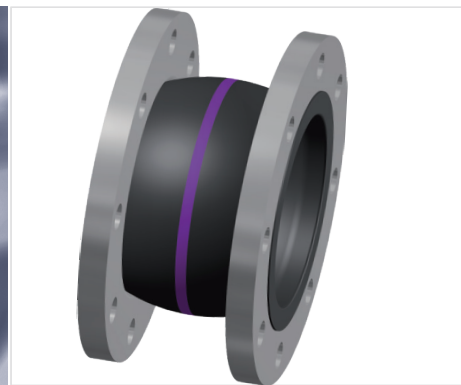




TYPE 51 WILLBRANDT RUBBER EXPANSION JOINT

Type 51 is a low-corrugated rubber expansion joint. Its low corrugation helps to achieve very low flow resistance. It reduces up to 70 % incoming energy. It is also characterised by its high level of pressure resistance. Type 51 is produced in four rubber qualities, which means that a suitable rubber compound is available for almost every application (see material descriptions on the following pages).

Type 51 is primarily used in industrial plants to absorb expansion, vibration and to insulate sound.

Bellow design

Low-corrugated rubber bellow with reinforcement and shaped sealing bead with core ring, self-sealing (no additional seals required). Suitable for

swiveling flanges.

Vacuum resistance

- DN 32 to 50 vacuum-resistant without additional accessories
- DN 65 to 250 up to -200 mbar without additional accessories
- DN 300 to 1000 not vacuum-resistant without additional accessories
- DN 65 to 1000 vacuum-resistant with vacuum supporting spiral/ring

Flange version

Both sides with swiveling flange made of galvanized steel with clearance holes, drilled according to DIN PN 10 (standard). Other materials and

dimensions are possible.

Accessories

- Guide sleeves
- Potential equalisation
- Flame-resistant protective covers
- Dust and splash protection covers
- Earth cover/sun protection hoods
- Segment tie rods

SPECIFICATIONS FOR DN 32 - DN 600

Bellow		Bellow design			Permissible operating data				
Colour code	Colour marking	Core (inner)	Reinforce-ment	Cover (outer)	°C bar	°C bar	°C bar	Short term °C	
Red-blue		IIR-D	Aramid	EPDM	80 25	120 16	130 10	140	
Green-blue		CSM	Aramid	CSM	50 25	90 16	120 10	100	
Lilac		FPM	Aramid	ECO	50 25	100 16	150 4	160	
Yellow-blue		NBR	Aramid	CR	50 25	90 16	120 10	100	

Bursting pressure: 75 bar

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 wastewater 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.

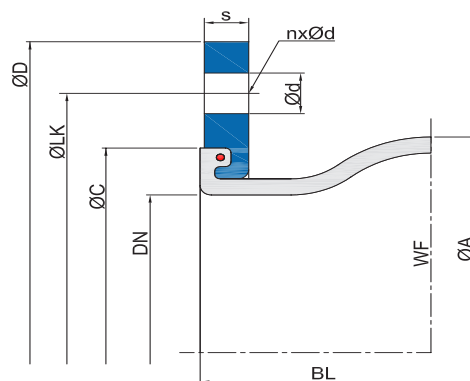
Type 51 yellow-blue

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

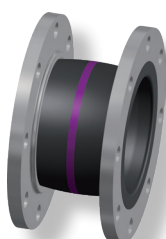
DESIGN A - WITHOUT TIE RODS

Can be used for movement absorption in any direction (for combined movements, see the movement diagram in the technical appendix), noise and vibration insulation.

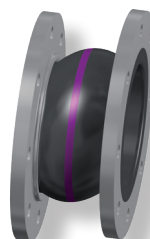
The expansion joints reaction force must be absorbed via suitable piping.



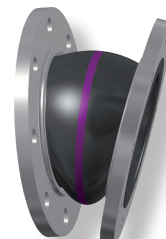
axial -



axial +



lateral +/-



angular +/-

DIMENSIONS FOR DESIGN A

DN	BL mm	Bellow		Flange PN 10*2						Movement absorption				Weight
		ØA mm	WF*1 mm ²	ØD mm	ØPCD mm	Ød mm	n	s mm	ØC mm	AX		LA +/- mm	AN ∠° +/-	
32	130	81	2700	140	100	18	4	15	79	10	20	15	20	3,2
40	130	86	2700	150	110	18	4	15	79	10	20	15	20	3,6
50	130	96	3200	165	125	18	4	15	88	10	20	15	20	3,8
65	130	110	5300	185	145	18	8	15	104	10	20	15	20	5,4
80	130	122	8500	200	160	18	8	15	119	15	20	15	20	7,0
100	130	142	12800	220	180	18	8	15	142	15	20	15	20	8,0
125	130	170	18700	250	210	18	8	18	169	15	20	15	20	9,7
150	130	196	25900	285	240	23	8	18	195	15	20	15	20	13,0
200	130	256	40900	340	295	23	8	20	244	15	20	15	15	16,6
250	130	306	59900	395	350	23	12	20	295	15	20	15	10	21,9
300	130	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	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

Permissible degree of utilisation for movement areas:

up to 50°C - utilisation ~ 100 %

up to 70°C - utilisation ~ 75 %

up to 90°C - utilisation ~ 60 %

*1 WF = effective area

*2 Other standards/dimensions possible.

Important information

Please note the appropriate fixed point constructions and plain bearings in your

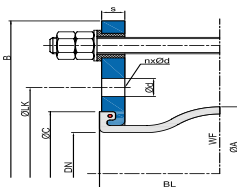
pipng system! For more information please refer to our installation instructions.

We will be happy to send you further information on the individual types and designs.

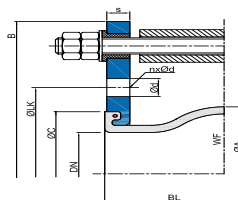
LENGHT LIMITERS

There is a selection of various lenght limiters/tie rods to absorb the reaction force and to protect the bellow from overstretching and collapsing:

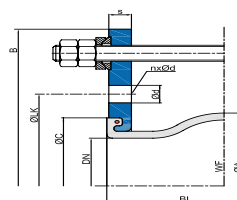
Design B*
with tie rods



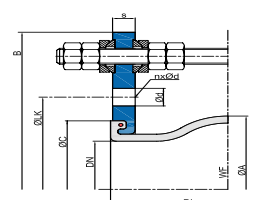
Design C*
with tie rods/thrust limiters



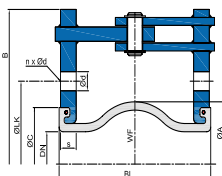
Design E
with tie rods and spherical washers/
conical sockets



Design M
with tie rods/thrust limiters and
spherical washers/conical sockets



Design F
with hinge

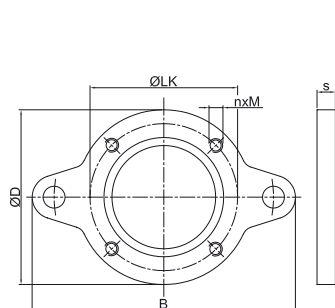


*Note: For Designs B and C the lateral movement absorption is reduced by around 50 %.

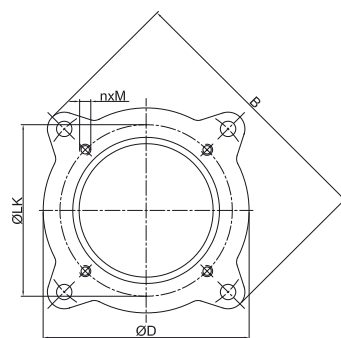
FLANGE DIMENSIONS FOR DESIGNS WITH TIE RODS

DN	Flange PN 10 (example dimensions)							
	BL mm	B mm	ØD mm	ØPCD mm	M	n	s mm	ØC mm
20	130	189	105	75	M10	4	14	60
25	130	205	115	85	M12	4	14	65
32	130	230	140	100	M16	4	15	65
40	130	240	150	110	M16	4	15	74
50	130	255	165	125	M16	4	16	86
65	130	275	185	145	M16	8	16	105
80	130	290	200	160	M16	8	18	118
100	130	310	220	180	M16	8	18	137
125	130	340	250	210	M16	8	18	166
150	130	375	285	240	M20	8	18	192
200	130	440	340	295	M20	8	20	252
250	130	509	395	350	M20	12	20	304
300	130	559	445	400	M20	12	22	354
350	200	619	505	460	M20	16	24	412
400	200	700	565	515	M24	16	25	470
450	250	760	615	565	M24	20	30	520
500	250	810	670	620	M24	20	30	570
600	250	930	780	725	M28	20	30	675

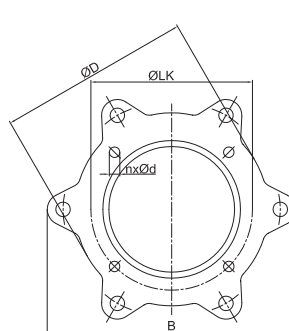
DN 32 - 200



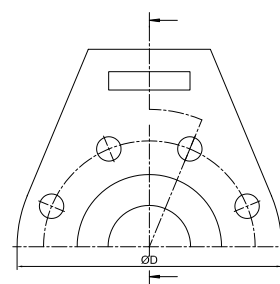
DN 250 - 900



DN 1000



DN 50 - 1000
(Design F)



AXIAL STIFFNESS RATES

DN	BL	Stiffness rates (average value from full way)						
		0 bar	2,5 bar	4 bar	6 bar	10 bar	16 bar	25 bar
	mm	N/mm	N/mm	N/mm	N/mm	N/mm	N/mm	N/mm
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	BL	Stiffness rates (average value from full way)						
		0 bar	2,5 bar	4 bar	6 bar	10 bar	16 bar	25 bar
	mm	N/mm	N/mm	N/mm	N/mm	N/mm	N/mm	N/mm
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

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pipng system! For more information please refer to our installation instructions.

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ANGULAR STIFFNESS TORQUE

DN	BL mm	Stiffnes rates (average 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
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	BL	for Designs E and M Frictional force	for Design F Frictional force
	mm	N/bar	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 stiffness torque may occur due to use

of different materials and manufacturing processes.

Important information

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