

WILLBRANDT Rubber Expansion Joint Type 49 S

■ partly in stock

DN 40 - DN 500

Type 49 S is a high corrugated, highly elastic rubber expansion joint with a corrugated shape that achieves very low inherent resistance. It is also characterised by its high movement absorption with a short installation length.

Type 49 S is mainly used in building technology, where it is used for expansion and vibration absorption and noise damping. It is also used in industrial applications, especially in the field of weighing technology. Due to its very low inherent resistance, it is ideal for decoupling scales/load cells.



Bellow design	High corrugated rubber bellow with reinforcement and shaped sealing bead with core ring, self-sealing (no additional seals required). Suitable for swiveling flanges.	Approvals/Conformity	CE (A2), FDA, BfR and EG 1935/2004 conform
Flange version	Both sides with swiveling flange made of galvanized steel with threaded holes, drilled according to DIN PN 10 (standard). Other materials and dimensions are possible.	Accessories	- Tie rods - Vacuum supporting spiral/rings - Guide sleeves - Potential equalisation - Flame-resistant protective covers - Dust and splash protection covers - Earth covers / sun protection covers Further information on page 99 - 105.
Vacuum resistance	- DN 40 to DN 250 up to -200 mbar - With vacuum supporting spiral/ring, vacuum-proof		

Specifications

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
white		NBR light	Polyamide	CR	-20	10	50	16	70	12	90	10	90	10	100	100	100
white-orange		EPDM light	Polyamide	CR	-40	10	50	16	70	12	90	10	90	10	100	100	100
white-blue		NBR light	Aramid	CR	-20	16	50	25	70	18	90	12	90	12	100	100	100
white-white-orange		EPDM light	Aramid	CR	-40	16	50	25	70	18	90	12	90	12	100	100	100
lilac		FPM	Aramid	ECO	-15	10	50	16	90	12	150	4	150	4	160	160	160

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 (page 107 - 117).

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Application

Type 49 S white (NBR)

With light colored inner rubber in food-grade quality for fatty and oily media (FDA, BfR and EG 1935/2004 conform). Not approved for drinking water.

Type 49 S white-orange (EPDM)

With light colored inner rubber in food-grade quality for fat and oil-free media (FDA, BfR and EG 1935/2004 conform). Not approved for drinking water.

Type 49 S white-blue (NBR)

Like type 49 S white, but with aramid fabric.

Type 49 S white-white-orange (EPDM)

Like type 49 S white-orange, but with aramid fabric.

Type 49 S lilac

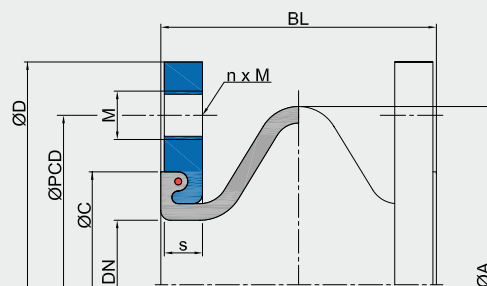
For flue gas desulphurisation systems and bio-diesel. Good resistance to benzene, xylene, toluene, fuels with an aromatic content of more than 50 %, aromatic/chlorinated hydrocarbons and mineral acids.

Not suitable for water or steam.

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 (see planning instructions).



Dimensions for design A

DN	Length BL	Bellows		ØD	ØPCD	Flange PN 10*2		s	ØC	Movement absorption*3				Weight kg
		ØA	WF*1			M	n			axial +	axial -	lateral ±	angular ± ∠°	
	mm	mm	mm ²	mm	mm			mm	mm	mm	mm	mm		
40	100	110	1800	150	110	M16	4	16	79	20	30	30	7	3.6
50	100	120	3500	165	125	M16	4	16	89	20	30	30	7	4.4
65	100	135	5600	185	145	M16	8	16	104	20	30	30	7	5.0
80	100	150	8700	200	160	M16	8	18	119	20	30	30	7	6.3
100	100	170	13000	220	180	M16	8	18	142	20	30	30	7	7.0
125	100	195	19000	250	210	M16	8	18	169	20	30	30	7	8.6
150	100	260	26300	285	240	M20	8	20	195	20	30	30	7	12.4
200	100	310	41600	340	295	M20	8	20	245	20	30	30	7	16.2
250	100	360	60700	395	350	M20	12	20	295	20	30	30	7	19.7
300	100	410	83000	445	400	M20	12	20	345	20	30	30	7	23.1
350	100	460	110000	505	460	M20	16	20	396	20	30	30	7	28.4
400	110	515	138500	565	515	M24	16	25	450	20	30	30	7	39.2
500	110	615	209100	670	620	M24	20	25	550	20	30	30	7	49.9

*1 WF = effective area

*2 Other standards/dimensions possible.

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

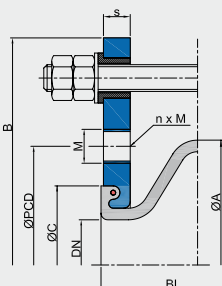
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Bracings

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

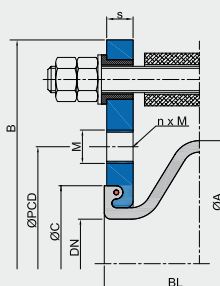
Design B*

Tie rods, mounted in rubber bushing



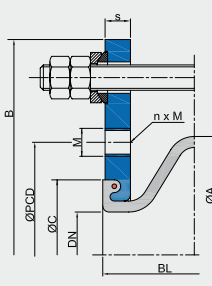
Design C*

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



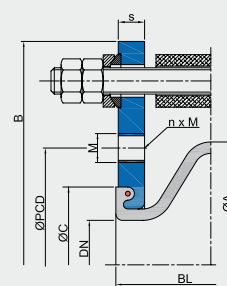
Design E

Tie rods, outside with spherical washers/conical sockets



Design S

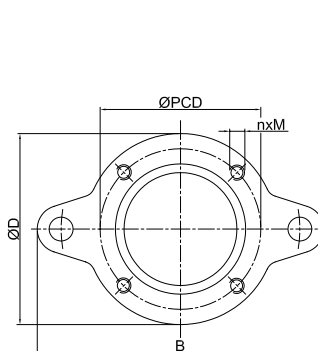
Tie rods, outside with spherical washers/conical sockets, inside with thrust limiters (plastic bushing)



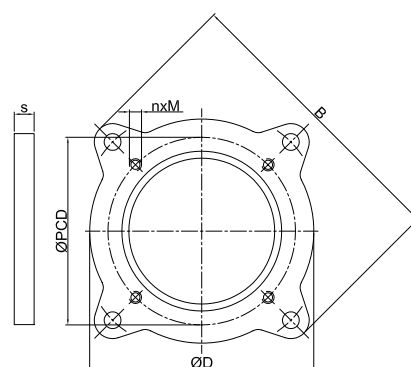
* Note: Design B and C only up to DN 200 PN 10. The lateral movement absorption is reduced by around 50 %.

Flange dimensions for designs with tie rods

DN	Length BL	Flange PN 10 (example dimensions)						
		B	ØD	ØPCD	M	n	s	ØC
	mm	mm	mm	mm			mm	mm
40	100	240	150	110	M16	4	16	79
50	100	255	165	125	M16	4	16	89
65	100	275	185	145	M16	8	16	104
80	100	290	200	160	M16	8	18	119
100	100	310	220	180	M16	8	18	142
125	100	340	250	210	M16	8	18	169
150	100	375	285	240	M20	8	20	195
200	100	440	340	295	M20	8	20	245
250	100	509	395	350	M20	12	20	295
300	100	559	445	400	M20	12	20	345
350	100	619	505	460	M20	16	20	396
400	110	700	565	515	M24	16	25	450
500	110	810	670	620	M24	20	25	550



DN 40 - 200



DN 250 - 500

Axial stiffness rates

DN	Length BL mm	Stiffness rates (average value form full way)								
		0 bar N/mm	1 bar N/mm	2.5 bar N/mm	3 bar N/mm	6 bar N/mm	10 bar N/mm	12 bar N/mm	16 bar N/mm	25 bar N/mm
40	100	14	30	56	62	116	180	210	264	390
50	100	12	30	66	76	142	220	260	332	512
65	100	14	45	87	99	189	286	346	414	621
80	100	33	75	135	150	258	396	460	555	796
100	100	28	80	156	176	320	480	563	684	998
125	100	30	95	186	218	374	580	672	819	1216
150	100	35	68	144	248	320	528	626	792	1192
200	100	42	90	178	204	370	594	702	908	1385
250	100	20	112	224	256	480	768	906	1136	1680
300	100	22	108	236	277	520	854	1019	1338	2071
350	100	28	128	270	310	570	940	1136	1510	2369
400	110	44	140	296	342	646	1052	1296	1660	2587
500	110	46	172	354	416	792	1264	1524	2000	3116

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

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Lateral stiffness rates

DN	Length BL mm	Stiffness rates (average value form full way)								
		0 bar N/mm	1 bar N/mm	2.5 bar N/mm	3 bar N/mm	6 bar N/mm	10 bar N/mm	12 bar N/mm	16 bar N/mm	25 bar N/mm
40	100	11	17	27	30	45	63	68	79	109
50	100	17	35	47	54	79	107	117	138	191
65	100	21	37	61	61	96	136	150	177	250
80	100	32	56	92	94	144	204	225	266	376
100	100	38	77	112	123	180	243	266	312	430
125	100	45	88	133	150	225	315	348	415	586
150	100	48	80	116	123	188	265	292	347	489
200	100	103	155	221	238	343	473	526	633	894
250	100	126	208	179	308	442	603	659	771	1067
300	100	167	267	337	400	550	750	836	1008	1421
350	100	137	263	385	418	587	833	922	1100	1562
400	110	187	293	423	457	633	900	996	1187	1686
500	110	203	380	536	573	840	1140	1249	1466	2029

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

Angular stiffness torque

DN	Length BL mm	Stiffness torque (averages value from full way)								
		0 bar Nm/°	1 bar Nm/°	2.5 bar Nm/°	3 bar Nm/°	6 bar Nm/°	10 bar Nm/°	12 bar Nm/°	16 bar Nm/°	25 bar Nm/°
40	100	0.1	0.3	0.6	0.6	1.2	1.8	1.6	1.7	1.8
50	100	0.2	0.4	0.9	1.0	1.9	2.9	2.1	2.3	2.4
65	100	0.3	0.8	1.6	1.8	3.5	5.3	3.5	3.7	3.9
80	100	0.8	1.9	3.4	3.8	6.5	10.0	4.3	4.6	4.9
100	100	1.0	2.9	5.7	6.4	11.6	17.4	8.8	9.5	10.1
125	100	1.6	5.0	9.8	11.4	19.6	30.4	14.0	15.0	16.0
150	100	0.7	5.9	12.5	21.5	27.8	45.9	25.3	27.1	28.9
200	100	5.7	12.1	24.0	27.5	49.9	80.0	51.3	55.0	58.6
250	100	4.0	22.1	44.3	50.6	94.9	151.8	83.5	89.4	95.3
300	100	5.9	28.8	62.9	73.8	138.6	227.6	119.0	127.4	135.8
350	100	9.9	45.1	95.2	109.3	201.0	331.4	209.7	224.5	239.4
400	110	19.7	62.8	132.8	153.5	289.9	472.1	329.3	352.5	375.8
500	110	30.9	115.4	237.5	279.1	531.3	848.0	580.8	624.9	662.9

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	For design F
		Frictional force N/bar	Frictional moment Nm/bar
40	100	10	0.2
50	100	19	0.4
65	100	30	0.6
80	100	46	1.0
100	100	69	1.5
125	100	101	2.1
150	100	139	3.9
200	100	220	6.2
250	100	322	11.4
300	100	440	15.6
350	100	291	20.6
400	110	395	31.2
500	110	597	78.4

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

Important information

Various bolt packs (SU) are available for the standard design. 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 information in the technical instructions.