

WILLBRANDT Rubber Compensator Type 49

Type 49 is a heavy duty rubber compensator of a highly flexible design. Its high corrugation allows an extremely short overall length with excellent noise and vibration absorbing characteristics as well as high expansion absorption in all directions at very low movement forces.

Design:

High corrugated bellow body with integral sealing profile (therefore self-sealing without additional gasket) for mating with swivel flanges. The flanges are provided with threaded holes as the bellow is supported on the flange.



Details for DN 32 - DN 80

Bellow colour code	Bellow colour ring	Design of the bellow			Permissible operating pressure				Short-term C°	Electrical resistance [Ohm cm]
		Core inner	Reinforcing material	Cover outer	°C bar	°C bar	°C bar	°C bar		
A red	red-red	EPDM	Aramide	EPDM	-40 16	70 20	100 16	120 10	150	3 x 10 ³
blue	red	IIR	Nylon cord	EPDM	-40 16	50 20	70 16	100 10	120	7 x 10 ⁶
yellow	yellow	NBR	Nylon cord	CR	-20 16	50 20	70 16	90 10	100	1 x 10 ²
white	white	NBR	Nylon cord	CR	-20 16	50 20	70 16	90 10	100	1 x 10 ⁹
green	green	CSM	Nylon cord	CSM	-20 16	50 20	70 16	100 10	110	3 x 10 ¹¹
black EPDM		IIR	Nylon cord	EPDM	-40 10	50 10	70 8	100 6	110	7 x 10 ⁶

Suitable for vacuum up to 0.8 bar abs. without supporting ring (2 m suction)

Suitable for vacuum up to 0 bar abs. with supporting ring (10 m suction)

All compensators can be delivered with earthing straps.

Details for DN 100 - DN 500

Bellow colour code	Bellow colour ring	Design of the bellow			Permissible operating pressure				Short-term C°	Electrical resistance [Ohm cm]
		Core inner	Reinforcing material	Cover outer	°C bar	°C bar	°C bar	°C bar		
A red	red-red	EPDM	Aramide	EPDM	-40 16	70 25	100 18	120 12	150	3 x 10 ³
blue	red	IIR	Nylon cord	EPDM	-40 16	50 25	70 18	100 12	120	7 x 10 ⁶
yellow	yellow	NBR	Nylon cord	CR	-20 16	50 25	70 18	90 12	100	1 x 10 ²
white	white	NBR	Nylon cord	CR	-20 16	50 25	70 18	90 12	100	1 x 10 ⁹
green	green	CSM	Nylon cord	CSM	-20 16	50 25	70 18	100 12	110	3 x 10 ¹¹
black EPDM		IIR	Nylon cord	EPDM	-40 10	50 10	70 8	100 6	110	7 x 10 ⁶

Suitable for vacuum up to 0.8 bar abs. without supporting ring (2 m suction)

Suitable for vacuum up to 0 bar abs. with supporting ring (10 m suction)

All compensators can be delivered with earthing straps.

PED 97/23/EG



Approvals:

- Type 49 A-red **with TÜV/DIN 4809** for heating installation, Technical Control Number **3 E001**
- Type 49 white with quality assurance as per DIN 7725 Suitable for foodstuff - RAL-C 53
- Type 49 blue with Drinking Water Approval RAL-C 52 and 1986 Federal Health Bureau KTW Rubber Committee
- Type 49 all Ship Licence with or without flame protective cover, depending on installation location.

Flange: (Design A)

Swivel flanges on both sides with integral rubber profile, so that an additional gasket is not required (self-sealing). The flange holes are DIN PN 10 standard, with threaded bolt-holes. Other flange specifications in accordance with DIN, ASA, BS. Special flanges are also available.

The flange is produced with appropriate threaded holes; through-bolts cannot be used.

Flange material:

Standard S 235 JRG2 (RSt37-2) zinc plated and yellow passivated.

Other materials available on request.

Application:

Type 49 A-red For heating systems, as per DIN 4809
For continuous duty in warm and hot water heating at 100 °C/110 °C and 10bar/6bar working pressure over life.
Not suitable for oil-related media.

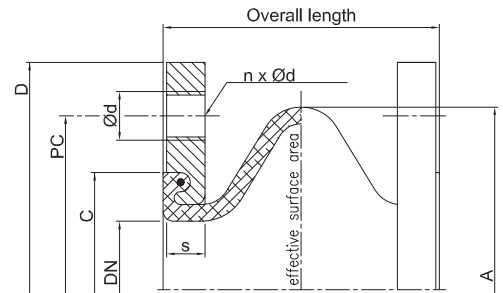
Type 49 blue For drinking water / warm water
For cold and warm water, also with the addition of chemicals for water treatment. Industrial water, acids, lyes, alcohols, esters and ketones. Not suitable for oil-related media.

Type 49 white For the food and beverage industry
Also suitable for oil- and fat-containing foodstuff.

Type 49 green For chemical plants
For heavy chemical use.

Type 49 yellow For oil, fuel, gas
Application range: natural and town gas, blast furnace gas, fuels, lubricants, heating, cooling water emulsions.

Type 49 black For water pipes
For cold and warm water, water with detergents, sea water, swimming pool water, waste water.
Not suitable for oil-related media.



DN	Overall length mm	Bellows		Flange PN 10					Movement absorption				ØC mm	Weight kg
		ØA mm	Eff. surface cm ²	ØD mm	ØPC mm	Ød	n	s mm	axial + mm	axial - mm	lat. +/- mm	∠ °* +/-		
32	100	110	18	140	100	M16	4	16	20	30	30	7	79	3.0
40	100	110	18	150	110	M16	4	16	20	30	30	7	79	3.6
50	100	120	35	165	125	M16	4	16	20	30	30	7	89	4.4
65	100	135	56	185	145	M16	4	16	20	30	30	7	104	5.3
80	100	150	87	200	160	M16	8	18	20	30	30	7	119	6.5
100	100	170	130	220	180	M16	8	18	20	30	30	7	142	7.3
125	100	195	190	250	210	M16	8	18	20	30	30	7	169	8.9
150	100	260	263	285	240	M20	8	20	20	30	30	7	195	12.3
175	100	310	416	315	270	M20	8	20	20	30	30	7	245	16.2
200	100	310	416	340	295	M20	8	20	20	30	30	7	245	16.2
250	100	360	607	395	350	M20	12	20	20	30	30	7	295	20.3
300	100	410	830	445	400	M20	12	20	20	30	30	7	345	23.1
350	100	460	1100	505	460	M20	16	20	20	30	30	7	396	30.1
400	110	515	1385	565	515	M24	16	25	20	30	30	7	450	43.2
500	110	615	2091	670	620	M24	20	25	20	30	30	7	550	53.8

Permissible % of indicated movement relative to temperature:
up to 50°C ~ 100%
up to 70°C ~ 80%
up to 90°C ~ 70%

* Only valid for an assembly shortened by about 10 mm (90/100mm).

Note:
For aggressive media please refer to the resistance table.
The bellows must not be painted or insulated.
See further installation information in Annex.

Accessories:

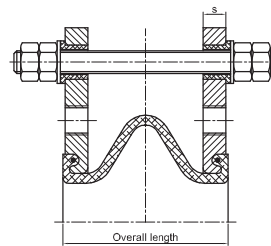
Tie bar/Restraints See page 50
Deflector sleeve See page 52
Flameproof protective covers See page 52
Earth Covers See page 53

Tie bar (Standard Designs B + C):

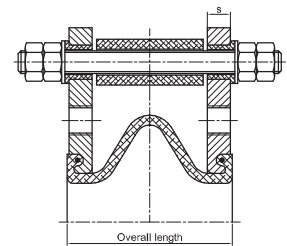
Since the rubber bellow is a soft flexible component, it must be observed that under pressure the compensator will always try to move in the axial direction because of its reaction force (cross section area x working pressure).

It must be ensured by constructive measures on the piping (roller bearing, restraining or anchor points) or tie bars directly on the compensator that any over-extension of the bellow is avoided.

See our range of tie bars on pages 50/51.

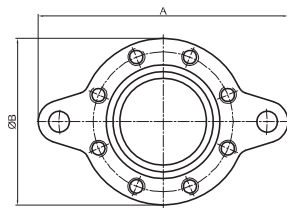


Design B

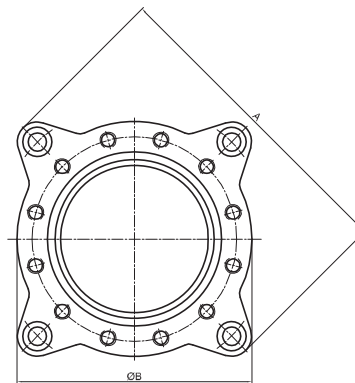


Design C

Flange shapes for tie bars as per designs B and C at 10 bar



DN 25 - 200



DN 250 - 500



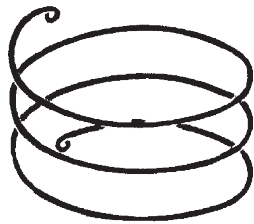
DN	Main dimension for PN 10			
	Overall length mm	s mm	A mm	ØB mm
32	100	16	230	140
40	100	16	240	150
50	100	16	255	165
65	100	16	275	185
80	100	18	290	200
100	100	18	310	220
125	100	18	340	250
150	100	20	375	285
175	100	20	405	315
200	100	20	440	340
250	100	20	509	395
300	100	20	559	445
350	100	20	619	505
400	110	25	700	565
500	110	25	810	670



Vacuum Supporting Rings:

WILLBRANDT type 49 compensators are suitable for vacuum. To prevent the compensator bellow being drawn together by suction at negative pressure, the insertion of a vacuum supporting ring is necessary for a pressure above 2m (0.8bar abs., 20% negative pressure).

DN	Art-No.
32 / 40	2149305132
50 / 65	2149305150
80 / 100 / 125	2149305212
150	2149305215
175 / 200	2149305217
250	2149305225
300	2149305230
350	2149305235
400	2149305240
500	2149305250



Bolt Packs SU:

Hexagon bolts according to DIN 933/8.8
Washers DIN 125

Selected bolt packs are available for connecting type 49 compensators to piping, so that by using DIN flanges, the bolt lengths are flush with the compensator bellow.

For installation, ensure smooth, burr-free surfaces on the rubber bellow using the U-washers for length correction (place under bolt head).

Accessory bolt packs			
DN	DIN-Norms		
	PN6	PN10	PN16
32	SU 1	SU 2	SU 2
40	SU 1	SU 2	SU 2
50	SU 1	SU 3	SU 3
65	SU 1	SU 3	SU 3
80	SU 4	SU 7	SU 7
100	SU 4	SU 7	SU 7
125	SU 5	SU 6	SU 6
150	SU 6	SU 10	SU 10
175	SU 6	SU 10	SU 10
200	SU 8	SU 10	SU 11
250	SU 9	SU 13	SU 17
300	SU 11	SU 14	SU 18
350	SU 12	SU 15	SU 19
400	SU 15	SU 19	SU 21
500	SU 16	SU 20	SU 22

Contents					
Bolt pack	Quantity	Bolts		Quantity	U-Washers
		kg	DIN 933/8.8		
SU 1	0.35	8	M 12X30	8	13
SU 2	0.62	8	M 16X30	8	17
SU 3	0.67	8	M 16X35	8	17
SU 4	0.68	8	M 16X35	16	17
SU 5	1.4	16	M 16X35	16	17
SU 6	1.5	16	M 16X40	16	17
SU 7	1.55	16	M 16X40	32	17
SU 8	2.6	16	M 16X45	16	17
SU 9	2.4	24	M 16X45	48	17
SU 10	2.7	16	M 20X45	16	21
SU 11	4.1	24	M 20X45	24	21
SU 12	4.2	24	M 20X45	48	21
SU 13	4.3	24	M 20X50	48	21
SU 14	4.2	24	M 20X50	24	21
SU 15	5.8	32	M 20X50	64	21
SU 16	7.3	40	M 20X50	80	21
SU 17	6.7	24	M 24X50	48	25
SU 18	6.6	24	M 24X50	24	25
SU 19	9.3	32	M 24X55	64	25
SU 20	11.7	40	M 24X55	80	25
SU 21	13.5	32	M 27X60	64	28
SU 22	22.0	40	M 30X60	80	31