Compensator TYPE KP04

Description:

A compensator is always used when vibrations in a system have to be absorbed.

Product features:

- Suitable for liquid and gaseous media
- electrically conductive
- Compensation of alignment errors, compensation of assembly inaccuracies
- rotating flanges in steel or stainless steel
- Versions with vacuum support ring (made of stainless steel 1.4571), PTFE-lining or guide pipe (made of stainless steel 1.4571)

Connection:
DN25 – DN300

Construction:
straight form

Pressure:
0 – 16 bar – depending on temperature

Type:	Compensator with rubber sleeve		
Connection:	Flange DIN EN 1092-1		
Flange material:	Stainless steel (up to 1.4571, above 1.4541) and steel (galvanized) 235JR		
Sleeve:	bellows 00	EPDM	-40°C up to +100°C (briefly until 120°C)
	bellows 01	NBR	-20°C up to +90°C (briefly until +100 C°)
Pressure:	PN16		
Versions:	Guide pipe: only axial movements possible & use of additional seal required		
	Vacuum support ring: movement absorption reduced by approx. 50%		
	PTFE-lining: max. operating pressure 6 bar & movement absorption reduced by approx. 50%		
Approvals:	Version PTFE-lining with FDA authorisation		

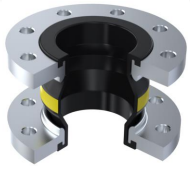
Temperature-dependent pressure and movement areas: EPDM / NBR

Operating temperature max.	Range of motion max.	Temperature-dependent operating pressure for bellows	
		PN10	PN16
50°C	100%	10 bar	16 bar
70°C	80%	8 bar	12 bar
100°C	60%	6 bar	10 bar

Possible uses:

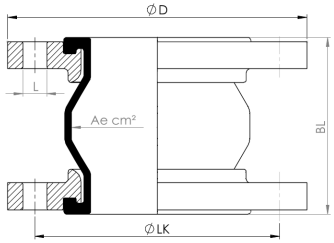
EPDM	Water, cold and warm service water. Sea water, cooling water, weak acids and bases, salt solutions, technical alcohols, esters and ketones
NBR	Mineral oil products, fuel-ethanol mixtures and DIN EN fuels, city and natural gas (NO LPG!)

Construction of rubber bellows:



	EPDM	NBR
inner layer:	Butyl (IIR)/ EPDM, seamless, low-diffusion	NBR (Nitril), seamless, abrasion resistant
pressure carrier:	PA textile cord, butyl-rubberized	PA textile cord
outer layer:	EPDM, ozone resistant, heat resistant	Chloroprene CR
Labelling	red ring	yellow ring

Dimensions:



			bellows		Permissible movement recording nominal[5]				Permissible negative pressure (vacuum stability)		
nominal size		length	nominal pressure	effective cross cut	axial[4]		lateral	angular	without VSD	with VSD[2]	with VSD+S[3]
DN		BL	PN	Ae	Δxc	Δxe	Δy	Δycc			
mm	in	mm	bar	cm²	mm	mm	mm	degree	mbar	mbar	mbar
25[1]	1"	130	16	15	-30	+20	±30	±30	Max. -1000	max. -1000	max. -1000
32	1 ¼"	130	16	15	-30	+20	±30	±30			
40	1 ½"	130	16	20	-30	+20	±30	±30			
50	2"	130	16	30	-30	+20	±30	±30			
65	2 ½"	130	16	50	-30	+20	±30	±30	-700		
80	3"	130	16	85	-30	+20	±30	±30	-600		
100	4"	130	16	125	-30	+20	±30	±20	-400		
125	5"	130	16	185	-30	+20	±30	±20	-300		
150	6"	130	16	250	-30	+20	±30	±20	-300		
200	8"	130	16	400	-25	+30	±30	±10	-300		
250	10"	130	16	600	-10	+30	±15	±5	-200		
300	12"	130	16	800	-10	+30	±15	±5	-100		

1) Bellows DN32 are used for rubber compensators DN25
2) VSD... vacuum support ring made of material 1.4571
3) VSD+S... vacuum support ring with lock (screw connection) made of 1.4571
4) Axial movement absorption Δxc = compression and Δxe= expansion
5) If motion is captured at the same time, Δxc/Δxe, Δy und Δa must be reduced proportionately. The sum of all shares may not exceed 100%.

Flange dimensions:

		Flange					
Nominal size		Outside-diam .	Drilling pattern according to EN 1092	Bolt circle diameter	Number of holes	Hole diameter	Weight
DN		D	PN	Lk	n	L	G
mm	in	mm	-	mm	-	mm	kg
25	1"	115	40	85	4	14	1,9
32	1 ¼"	140	40	100	4	18	3,4
40	1 ½"	150	40	110	4	18	4,0
50	2"	165	16	125	4	18	4,6
65	2 ½"	185	16	145	4	18	5,3
80	3"	200	16	160	8	18	6,9
100	4"	220	16	180	8	18	8,0
125	5"	250	16	210	8	18	9,9
150	6"	285	16	240	8	22	12,3
200	8"	340	10	295	8	22	16,5
200	8"	340	16	295	12	22	16,5
250	10"	395	10	350	12	22	21,6
250	10"	405	16	355	12	26	21,6
300	12"	445	10	400	12	22	29,3
300	12"	460	16	410	12	26	29,3

Adjustment forces:

Axially:

DN	Adjustment forces (Average values from full way) in N/mm					
	0 bar	2,5 bar	4 bar	6 bar	10 bar	16 bar
20	31	68	128	192	243	270
25	31	68	128	192	243	270
32	31	68	128	192	243	270
40	30	66	124	186	236	261
50	25	51	98	134	173	192
65	24	53	100	150	190	211
80	28	58	104	148	185	205
100	35	71	116	206	274	304
125	36	71	137	214	282	313
150	49	102	189	293	390	433
200	100	180	365	568	735	816
250	105	207	388	609	778	864
300	123	248	448	658	883	980

Attention: Deviations (+/-25%) of the adjustment forces may occur due to material and insert changes as well as manufacturing processes.

Laterally:

DN	Adjustment forces (Average values from full way) in N/mm					
	0 bar	2,5 bar	4 bar	6 bar	10 bar	16 bar
20	64	125	184	240	240	300
25	64	125	184	240	240	300
32	64	125	184	240	240	300
40	62	121	178	233	256	291
50	50	65	80	105	145	205
65	40	78	115	150	165	188
80	35	74	136	155	173	200
100	55	88	143	168	192	228
125	100	200	261	293	383	518
150	120	260	309	366	466	616
200	323	723	836	949	1219	1624
250	379	806	1022	1173	1479	1938
300	392	837	1068	1216	1542	2031

Attention: Deviations (+/-25%) of the adjustment forces may occur due to material and insert changes as well as manufacturing processes.

Compensators incl. equipment:

Version 1 - with cylindrical guide pipe

- Required for abrasive media or high flow rates

- Sediment in the bellows convolution is reduced

- Medium flows more directional and develops less turbulence

Important: An additional seal has to be used between guide pipe collar and counter flange. By using a cylindrical guide pipe only axial movements are possible.

Version 1 - with vacuum support ring

- Required for high levels of negative pressures or full vacuum

- Supports inner surface of the bellows curve

- The vacuum support ring is made of stainless steel just like the cylindrical guide pipe

Important: Using a support ring reduces the permitted movement absorption by approx. 50%.

Version 3 - with PTFE-lining

- Can lead to an increase in chemical resistance when using aggressive media

- Max. operating pressure is 6 bar independent of the flanges

- Protects the inside of the rubber bellows from media contact and can be used for a wide range of media

Important: The use of the PTFE lining reduces the permissible movement absorption by approx. 50%. Subsequent installation of the PTFE-lining is not possible

Options (on request):

- Other lengths on request
- VSD + S3
- Tension / tension rod length limiter
- joint tension
- flame retardant sleeves
- ground cover hoods
- Other flange standards and dimensions
- Compensators with conical guide pipe
- vacuum support ring or guide pipe made of stainless steel 1.4539
- PTFE-lining with PTFE-support ring for vacuum applications

Article number:

type	connection	option	bellows	size
KP04	**00 – steel**	**0 – standard**	**0 – EPDM**	05 – DN25
	01 – stainless steel	1 – guide pipe	1 – NBR	06 – DN32
		2 – vacuum support ring*		07 – DN40
		3 – PTFE lining**		08 – DN50
				09 – DN65
				10 – DN80
				11 – DN100
				12 – DN125
				13 – DN150
				14 – DN200 PN10
				14.1 – DN200 PN16
				15 – DN250 PN10
				15.1 – DN250 PN16
				16 – DN300 PN10
				16.1 – DN300 PN16
Example Nr. KP04000010:				
KP04	**00**	**0**	**0**	**10**

Compensator with steel flange and EPDM sleeve
Connection: Steel flange DIN EN 1902-1 PN16
Cuff: EPDM
Size: DN80

* available starting with DN50
** available starting with DN40

Illustration similar, subject to technical and dimensional changes.