

TOMBO™ BRAND

NAFLON™ Bellows

Fluoropolymer Universal Expansion Joint



NAFLON™ Bellows

NAFLON bellows are mainly used to absorb the thermal expansion and contraction of pipelines.

When designing piping systems for various industrial facilities, it is necessary to fully consider the absorption of the thermal expansion or contraction of pipe lines, correction of the misalignment between equipment and a pipe axis due to aging, and the absorption of vibrations and noises produced between pipelines and vibration sources including pumps.

Although metal bellows and rubber bellows have been commonly used as expansion pipe joints for those purposes, these joints are not satisfactory in terms of corrosion proofing and durability, especially in the presence of strong corrosive acids, alkalis, or chlorinated solvents. NAFLON bellows, which we introduce here, are versatile expansion joints manufactured with fluororesin (PTFE or PFA) which has many excellent characteristics including chemical resistance and heat resistance.

Fluororesin has corrosion resistance to almost all chemicals and has features such as nonadhesiveness, a low friction coefficient, and weather resistance, which other plastics do not have. In addition, it has outstanding durability against repeated stress.

Taking advantage of these strong points of fluoropolymers, we provide NAFLON bellows in many types including the five basic types of TOMBO No. 9060 through 9064, which enable you to freely select the proper type according to your installation method and operating conditions.

NICHIAS's NAFLON Bellows will deliver high performance as an expansion joint for a long time in processes involving strong corrosive liquids, thus assuring trouble-free operation.

* When you use or select our products, please consult our sales or technical department for detailed information after filling out your operation conditions in the "Inquiry Form" on page 21.

* TOMBO is a registered trademark or trademark of NICHIAS Corporation.

* Product names with TM are registered trademarks or trademarks of NICHIAS Corporation.

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General Features

● Excellent chemical resistance

This product has excellent corrosion resistance to almost all chemicals including acids, alkalis, solvents, and liquid mixtures of these chemicals, and undergoes no change.

● Excellent elasticity

Since the main body of the bellows is manufactured from fluororesin, this product is highly flexible and has excellent durability against fatigue from flexing.

Product Types and

Product No.	TOMBO No.9061-S,SV	
Product Name	NAFLON PTFE Expansion Joint	
Product Structure	PTFE tube is formed to U-shaped convolution valleys, and flanges are attached to both sides. This product is good for applications requiring displacement.	
Materials	Bellows	PTFE
	Reinforcing Ring	SUS304
Dimensions	Size	25~600A
	No. of convolutions	3 convolutions, 5 convolutions
Maximum Service Temperature	150°C	
Vacuum Specifications	-SV type (using support rings) (200A - 600A x 3 convolutions)	
Comparison of Features	Heat Resistance	B
	Pressure Resistance	B
	Softness	B
	Displacement	A

* Performance Rating : A→excellent, B→good,

* When you make a selection, please consult our

● **High nonadhesiveness makes internal washing easy.**

Because of the nonadhesive property of fluoro resin, when handling a sticky liquid, internal washing can be performed easily and the amount of time for post processing can be reduced.

● **Tolerant for long-term storage and use**

Fluoro resin is so excellent in weather resistance that it exhibits almost no aging and degradation symptoms, which makes this product suitable for long-term use.

Selection Guideline

	TOMBO No.9061-GY,GYV	TOMBO No.9061-HW	TOMBO No.9062-S,L-SV	TOMBO No.9063-S,L-SV
	NAFLON PTFE Expansion Joint (Reinforcing Ring FRP Type)	NAFLON PTFE Expansion Joint (Heavy Wall Type)	NAFLON PTFE Expansion Joint (Stainless Steel Shroudins Type)	NAFLON PTFE Expansion Joint (Heat Resistance Type)
	The stainless steel of the 9061-S reinforcing rings is replaced with FRP. This product is a suitable solution against corrosion of stainless steel reinforcing rings when used with chloric or muriatic liquids.	The bellows section of 9061-S is thickened to improve pressure resistance. This product can be used for vacuum applications without vacuum support rings.	SUS thin wall pipe shrouded with a PTFE tube is formed to U-shaped convolution valleys, and flanges are attached to both sides. This product is good for applications requiring heat resistance and pressure resistance. In addition, the 9062-L type with a long face-to-face length is also available.	PTFE tube is formed to U-shaped convolution valleys, and flanges are attached to both sides. Using U-shaped control rings, heat resistance and pressure resistance are improved. This product is good for applications requiring heat resistance and displacement. In addition, the 9063-L type with a long face-to-face length is also available.
	PTFE FRP	PTFE SUS304	PTFE+SUS304 —	PTFE AC7A
	25~600A	25~150A	50~600A	50~500A(9063-L:50~400A)
	3 convolutions, 5 convolutions	3 convolutions	50 - 100A: 5 convolutions, 8 convolutions, 10 convolutions 125 - 350A: 3 convolutions, 5 convolutions, 8 convolutions, 10 convolutions 400 - 600A: 3 convolutions, 5 convolutions, 7 convolutions	3 convolutions, 5 convolutions
	150°C	150°C	200°C	3 convolutions: 200°C 5 convolutions: 180°
	-GYV type (using support rings) (200A - 600A x 3 convolutions)	Available	-SV and -LV types (using support rings) (3 convolutions and 5 convolutions only)	-SV and -LV types (using support rings) (3 convolutions and 5 convolutions only)
	B	B	A	A
	B	A	A	A
	B	B	C	B
	A	A	C	B

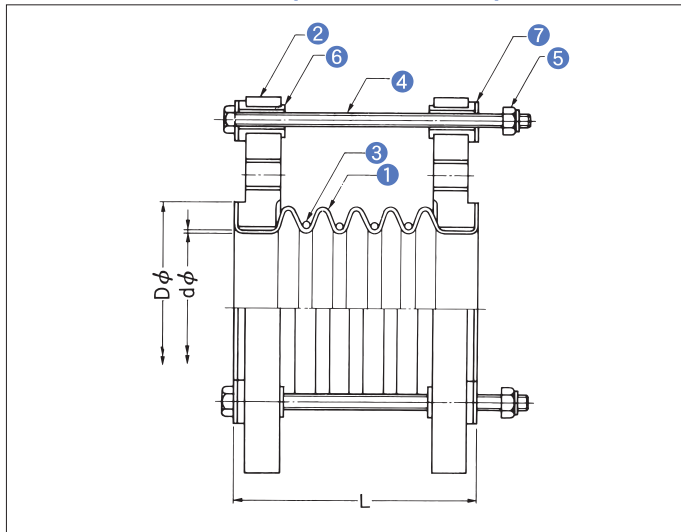
C→standard.* This evaluation is determined based on comparisons among the bellows products of our company. sales or technical department for detailed information after filling out your operation conditions in the "Inquiry Form" provided on page 19.



TOMBO™ No.9061-S

NAFLON™ PTFE Expansion Joint

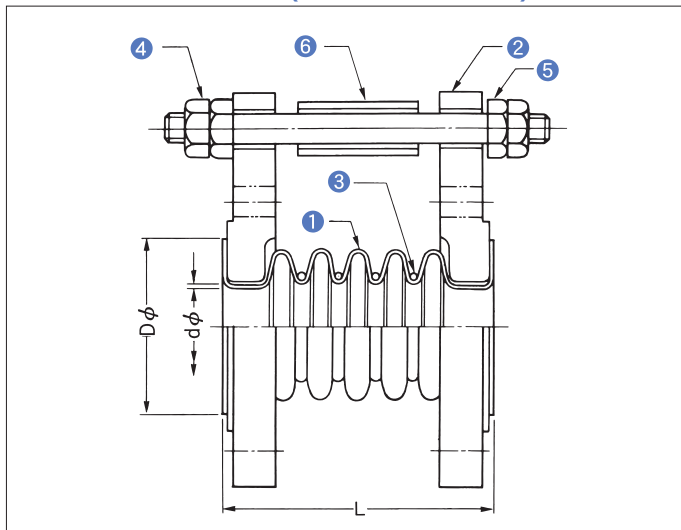
Construction (25A-300A)



Parts No.	Name	Standard Specifications
1	Bellows	PTFE
2	Flange Corresponding to JIS 10K	FCD450
3	Reinforcing Ring	SUS304
4	Limit Bolt	SS400 (Unichro-plated)
5	U Nut	SS400 (Unichro-plated)
6	Grommet	Chloroprene Rubber
7	Washer	SS400 (Unichro-plated)

- Notes common to the two types of 25A to 300A and 350A to 600A
 - * The holes for the flange bolts are tapped holes in the standard specifications. However, the holes on both sides are drilled holes only for the 350A to 600A with 5 convolutions.
 - * The Fire Service Law and the High Pressure Gas Safety Law cannot be applied.
 - * The sizes of the tapped holes are matched to fit the sizes of the bolts used for JIS 10K flanges.
 - * For vacuum applications, refer to page 18.
 - * The limit bolts are set at the standard face-to-face distance (length) before shipment. Taking into account axial displacement, adjust the limit bolts within the allowable range of expansion and contraction by using page 20 as a reference.
 - * ANSI, other flange standards, and other materials can be manufactured.
 - * Strength against internal thrust is not guaranteed by design.

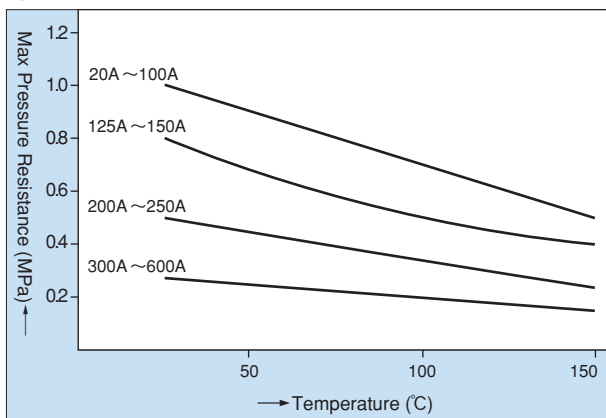
Construction (350A-600A)



Parts No.	Name	Standard Specifications
1	Bellows	PTFE
2	Flange Corresponding to JIS 10K	SS400
3	Reinforcing Ring	SUS304
4	Limit Bolt	SS400 (Unichro-plated)
5	Hexagon Nut	SS400 (Unichro-plated)
6	Stopper	SS400 (Unichro-plated)

Operating Pressure

● TOMBO No.9061-S with 3 Convolution

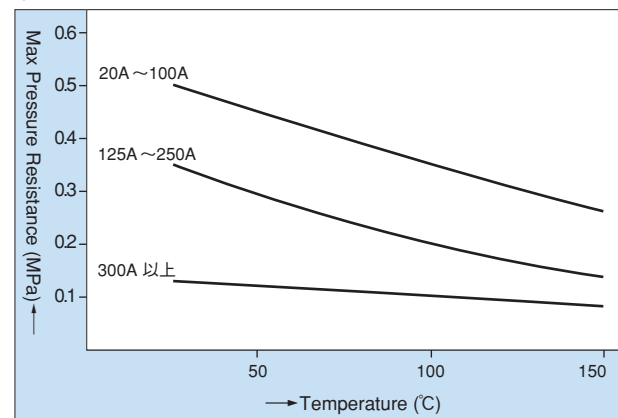


Measured by NICHIAS

- The operating pressure table shows the values for the standard face-to-face lengths. When using the product at the maximum expansion and the maximum displacement, use the values obtained by multiplying the following coefficients.

At the maximum expansion: 0.7 At the maximum displacement: 0.5

● TOMBO No.9061-S with 5 Convolution



Measured by NICHIAS

- Refer to page 23 for cases where expansion or contraction and axis displacement occur at the same time.
- The maximum service temperature is 150°C.

Standard dimensions

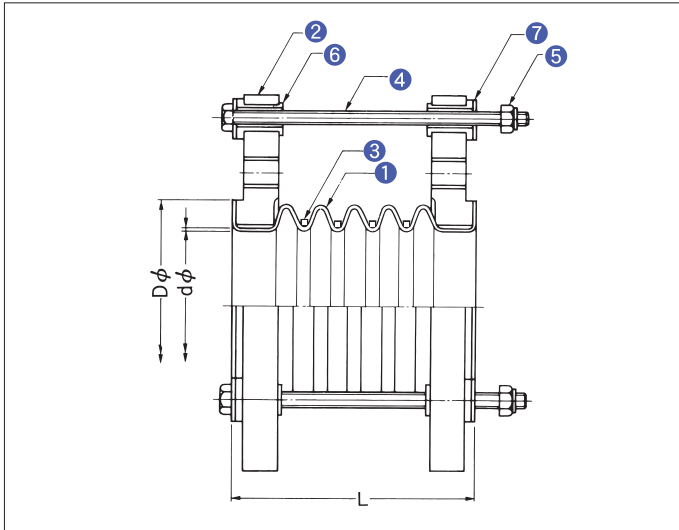
Product code	Diameter nominal A (B)	Face-to-face length (mm)	Amount of expansion and contraction (mm)	Axial displacement (mm)	Dimension of expansion parts (mm)		
					Numbers of standard convolutions	Inner diameter d ϕ	Flared Diameter D ϕ
9061-S-25-3 9061-S-25-5	25 (1)	45 65	± 10 ± 13	6 13	3 5	25	50
9061-S-32-3 9061-S-32-5	32 (1 ^{1/4})	50 70	± 10 ± 13	6 13	3 5	32	62
9061-S-40-3 9061-S-40-5	40 (1 ^{1/2})	50 75	± 13 ± 15	6 13	3 5	38	73
9061-S-50-3 9061-S-50-5	50 (2)	70 100	± 19 ± 25	10 13	3 5	49	92
9061-S-65-3 9061-S-65-5	65 (2 ^{1/2})	75 115	± 19 ± 25	10 13	3 5	63	105
9061-S-80-3 9061-S-80-5	80 (3)	85 125	± 19 ± 25	10 13	3 5	73	120
9061-S-100-3 9061-S-100-5	100 (4)	85 125	± 19 ± 25	13 16	3 5	97	145
9061-S-125-3 9061-S-125-5	125 (5)	100 140	+ 20 - 30 + 30 - 40	3 10	3 5	119	175
9061-S-150-3 9061-S-150-5	150 (6)	100 150	+ 20 - 30 + 30 - 45	3 10	3 5	145	205
9061-S-200-3 9061-S-200-5	200 (8)	110 155	+ 20 - 30 + 35 - 50	3 10	3 5	196	255
9061-S-250-3 9061-S-250-5	250 (10)	120 175	+ 15 - 35 + 20 - 60	3 10	3 5	244	315
9061-S-300-3 9061-S-300-5	300 (12)	120 175	+ 15 - 35 + 20 - 60	3 10	3 5	292	360
9061-S-350-3 9061-S-350-5	350 (14)	130 190	+ 15 - 40 + 20 - 70	3 10	3 5	322	405
9061-S-400-3 9061-S-400-5	400 (16)	150 225	+ 15 - 50 + 20 - 80	3 10	3 5	372	465
9061-S-450-3 9061-S-450-5	450 (18)	155 235	+ 20 - 50 + 25 - 90	3 10	3 5	422	520
9061-S-500-3 9061-S-500-5	500 (20)	160 240	+ 20 - 50 + 25 - 90	3 10	3 5	472	575
9061-S-550-3 9061-S-550-5	550 (22)	175 265	+ 20 - 55 + 25 - 100	3 10	3 5	522	630
9061-S-600-3 9061-S-600-5	600 (24)	175 265	+ 20 - 55 + 25 - 100	3 10	3 5	572	680



TOMBO™ No.9061-GY

NAFLON™ PTFE Expansion Joint (Reinforcing Ring FRP Type)

Construction (25A-300A)

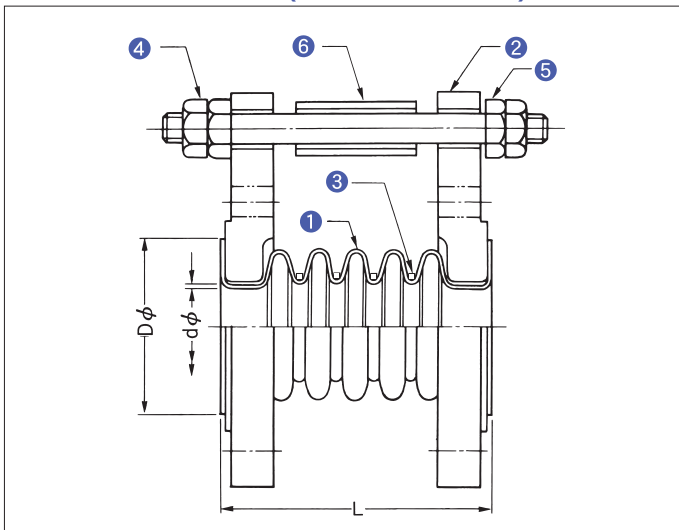


Parts No.	Name	Standard Specifications
1	Bellows	PTFE
2	Flange Corresponding to JIS 10K	FCD450
3	Reinforcing Ring	FRP
4	Limit Bolt	SS400 (Unichro-plated)
5	U Nut	SS400 (Unichro-plated)
6	Grommet	Chloroprene Rubber
7	Washer	SS400 (Unichro-plated)

● Notes common to the two types of 25A to 300A and 350A to 600A

- * The holes for the flange bolts are tapped holes in the standard specifications. However, the holes on both sides are drilled holes only for the 350A to 600A with 5 convolutions.
- * The Fire Service Law and the High Pressure Gas Safety Law cannot be applied.
- * The sizes of the tapped holes are matched to fit the sizes of the bolts used for JIS 10K flanges.
- * For vacuum applications, refer to page 18.
- * The limit bolts are set at the standard face-to-face distance (length) before shipment. Taking into account axial displacement, adjust the limit bolts within the allowable range of expansion and contraction by using page 20 as a reference.
- * ANSI, other flange standards, and other materials can be manufactured.
- * Strength against internal thrust is not guaranteed by design.

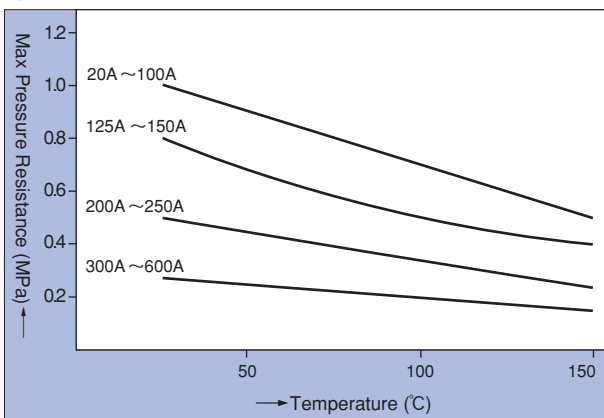
Construction (350A-600A)



Parts No.	Name	Standard Specifications
1	Bellows	PTFE
2	Flange Corresponding to JIS 10K	SS400
3	Reinforcing Ring	FRP
4	Limit Bolt	SS400 (Unichro-plated)
5	Hexagon Nut	SS400 (Unichro-plated)
6	Stopper	SS400 (Unichro-plated)

Operating Pressure

● TOMBO No.9061-GY with 3 Convolution

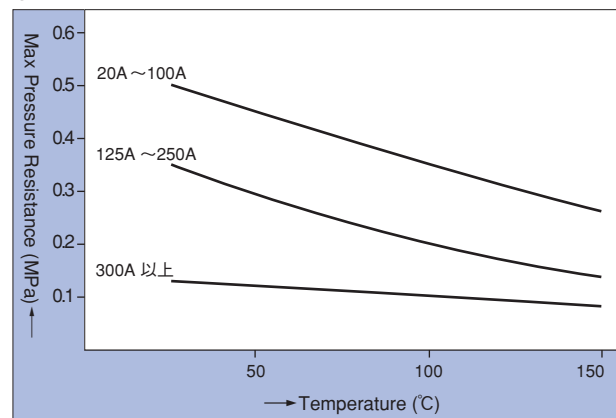


Measured by NICHIAS

● The operating pressure table shows the values for the standard face-to-face lengths. When using the product at the maximum expansion and the maximum displacement, use the values obtained by multiplying the following coefficients.

At the maximum expansion: 0.7 At the maximum displacement: 0.5

● TOMBO No.9061-GY with 5 Convolution



Measured by NICHIAS

● Refer to page 23 for cases where expansion or contraction and axis displacement occur at the same time.

● The maximum service temperature is 150°C.

Standard dimensions

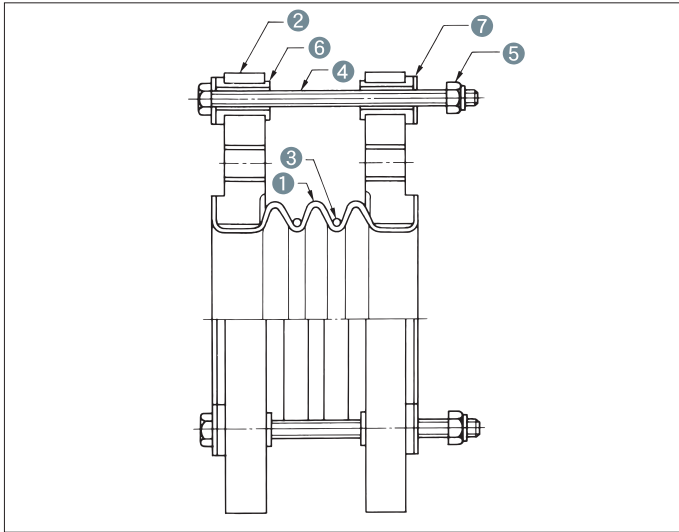
Product code	Diameter nominal A (B)	Face-to-face length (mm)	Amount of expansion and contraction (mm)	Axial displacement (mm)	Dimension of expansion parts (mm)		
					Numbers of standard convolutions	Inner diameter d ϕ	Flared Diameter D ϕ
9061-GY-25-3 9061-GY-25-5	25 (1)	45 65	± 10 ± 13	6 13	3 5	25	50
9061-GY-32-3 9061-GY-32-5	32 (1 $\frac{1}{4}$)	50 70	± 10 ± 13	6 13	3 5	32	62
9061-GY-40-3 9061-GY-40-5	40 (1 $\frac{1}{2}$)	50 75	± 13 ± 15	6 13	3 5	38	73
9061-GY-50-3 9061-GY-50-5	50 (2)	70 100	± 19 ± 25	10 13	3 5	49	92
9061-GY-65-3 9061-GY-65-5	65 (2 $\frac{1}{2}$)	75 115	± 19 ± 25	10 13	3 5	63	105
9061-GY-80-3 9061-GY-80-5	80 (3)	85 125	± 19 ± 25	10 13	3 5	73	120
9061-GY-100-3 9061-GY-100-5	100 (4)	85 125	± 19 ± 25	13 16	3 5	97	145
9061-GY-125-3 9061-GY-125-5	125 (5)	100 140	+ 20 - 30 + 30 - 40	3 10	3 5	119	175
9061-GY-150-3 9061-GY-150-5	150 (6)	100 150	+ 20 - 30 + 30 - 45	3 10	3 5	145	205
9061-GY-200-3 9061-GY-200-5	200 (8)	110 155	+ 20 - 30 + 35 - 50	3 10	3 5	196	255
9061-GY-250-3 9061-GY-250-5	250 (10)	120 175	+ 15 - 35 + 20 - 60	3 10	3 5	244	315
9061-GY-300-3 9061-GY-300-5	300 (12)	120 175	+ 15 - 35 + 20 - 60	3 10	3 5	292	360
9061-GY-350-3 9061-GY-350-5	350 (14)	130 190	+ 15 - 40 + 20 - 70	3 10	3 5	322	405
9061-GY-400-3 9061-GY-400-5	400 (16)	150 225	+ 15 - 50 + 20 - 80	3 10	3 5	372	465
9061-GY-450-3 9061-GY-450-5	450 (18)	155 235	+ 20 - 50 + 25 - 90	3 10	3 5	422	520
9061-GY-500-3 9061-GY-500-5	500 (20)	160 240	+ 20 - 50 + 25 - 90	3 10	3 5	472	575
9061-GY-550-3 9061-GY-550-5	550 (22)	175 265	+ 20 - 55 + 25 - 100	3 10	3 5	522	630
9061-GY-600-3 9061-GY-600-5	600 (24)	175 265	+ 20 - 55 + 25 - 100	3 10	3 5	572	680



TOMBO™ No.9061-HW

NAFLON™ PTFE Expansion Joint (Heavy Wall Type)

Construction

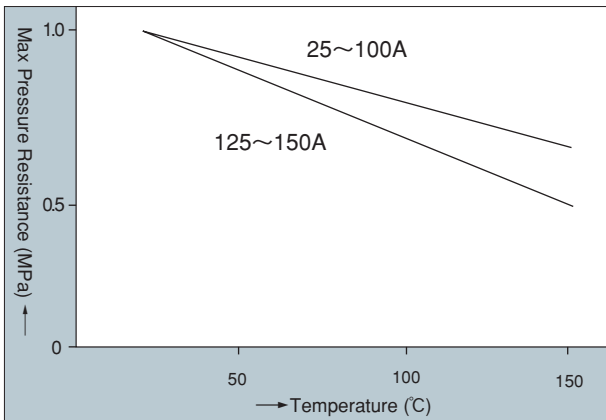


Parts No.	Name	Standard Specifications
①	Bellows	PTFE
②	Flange Corresponding to JIS 10K	FCD450
③	Reinforcing Ring	SUS304
④	Limit Bolt	SS400 (Unichro-plated)
⑤	U Nut	SS400 (Unichro-plated)
⑥	Grommet	Chloroprene Rubber
⑦	Washer	SS400 (Unichro-plated)

- * The holes for the flange bolts are tapped holes in the standard specifications. The sizes of the tapped holes are matched to fit the sizes of the bolts used for JIS 10K flanges.
- * The Fire Service Law and the High Pressure Gas Safety Law cannot be applied.
- * For the maximum service temperature, refer to page 17.
- * The limit bolts are set at the standard face-to-face distance (length) before shipment. Taking into account axial displacement, adjust the limit bolts within the allowable range of expansion and contraction by using page 20 as a reference.
- * ANSI, other flange standards, and other materials can be manufactured.
- * Strength against internal thrust is not guaranteed by design.

Operating Pressure

● TOMBO No.9061-HW with 3 Convolutions



Measured by NICHIAS

- The operating pressure table shows the values for the standard face-to-face lengths. When using the product at the maximum expansion and the maximum displacement, use the values obtained by multiplying the following coefficients.
 - At the maximum expansion: 0.7
 - At the maximum displacement: 0.5
- Refer to page 20 for cases where expansion or contraction and axis displacement occur at the same time.
- The maximum service temperature is 150°C.

Standard dimensions

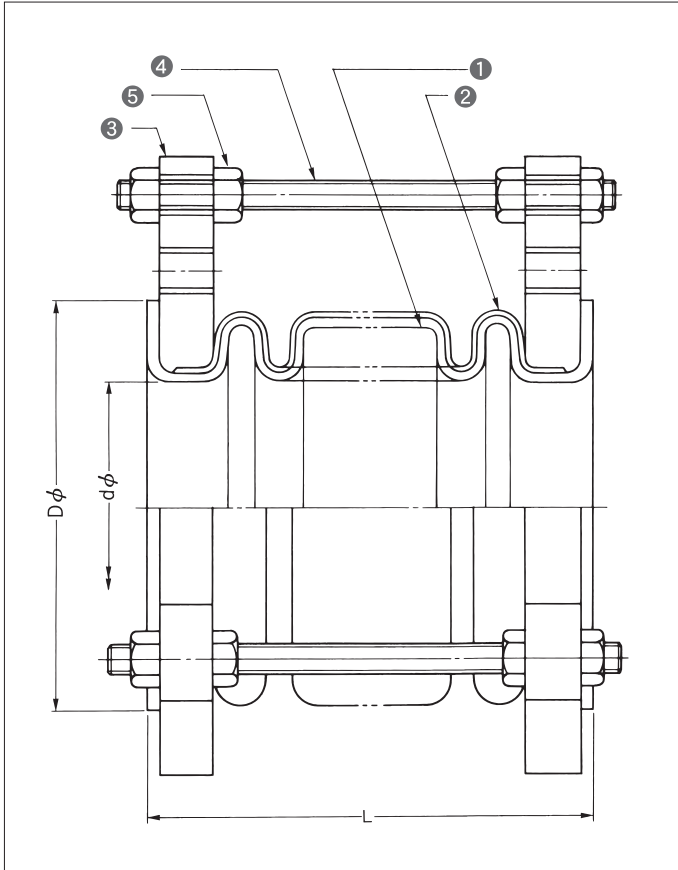
Product code	Diameter nominal A (B)	Face-to-face length (mm)	Amount of expansion and contraction (mm)	Axial displacement (mm)	Dimension of expansion parts (mm)		
					Numbers of standard convolutions	Inner diameter d ϕ	Flared Diameter D ϕ
9061—HW— 25—3	25A (1)	50	± 10	5	3	24	50
9061—HW— 32—3	32A (1 $\frac{1}{4}$)	50	+10 -5	5	3	32	62
9061—HW— 40—3	40A (1 $\frac{1}{2}$)	55	± 10	5	3	36	73
9061—HW— 50—3	50A (2)	70	± 15	8	3	49	92
9061—HW— 65—3	65A (2 $\frac{1}{2}$)	80	± 10	5	3	63	105
9061—HW— 80—3	80A (3)	100	+25 -20	8	3	74	120
9061—HW—100—3	100A (4)	100	+25 -20	12	3	95	145
9061—HW—125—3	125A (5)	100	+25 -15	12	3	118	175
9061—HW—150—3	150A (6)	100	+25 -10	12	3	144	205



TOMBO™ No.9062-S

NAFLON™ PTFE Expansion Joint (Stainless Steel Shrouding Type)

Construction

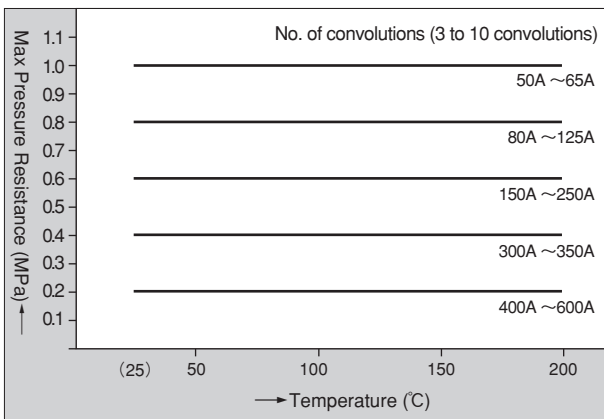


Parts No.	Name	Standard Specifications
①	Bellows	PTFE
②	Bellows	SUS304
③	Flange Corresponding to JIS 10K	SS400
④	Shipping Bolt	SS400
⑤	Nut	SS400

- * The JIS 10K flange is standard, but the ANSI 150LB type is also available.
- * When using an ANSI standard 150 lb plate flange, the face-to-face distance will change. Please contact us regarding this matter.
- * The holes for the flange bolts are tapped holes.
- * Products with a number of convolutions other than the ones in the standard can be manufactured.
- * In the event of displacement caused by an earthquake, the maximum allowable displacement is obtained by multiplying values up to 1.5.
- * This product cannot be used with halogen system liquid and atmosphere.
- * This product cannot be used for the purpose of absorbing vibrations from pumps.
- * **The shipping bolts are set to adjust the face-to-face distances. Remove them after installing the bellows.**
- * Using the bellows with the shipping bolts still attached may cause damage.
- * The Fire Service Law and the High Pressure Gas Safety Law cannot be applied.
- * For vacuum applications, refer to page 18.
- * For products with flanges made of SUS304, the standard material for its lugs, shipping bolts, and nuts is SS400.
- * Strength against internal thrust is not guaranteed by design.

Operating Pressure

● TOMBO No.9062-S



Measured by NICHIAS

- The same operating pressure is used for products with 3 to 10 convolutions.
- The operating pressure table shows the values for the standard face-to-face lengths. When using the product at the maximum expansion and the maximum displacement, use the values obtained by multiplying the following coefficients.
 - At the maximum expansion: 0.7
 - At the maximum displacement: 0.5
- Refer to page 20 for cases where expansion or contraction and axis displacement occur at the same time.
- The maximum service temperature is 200°C.

Standard dimensions

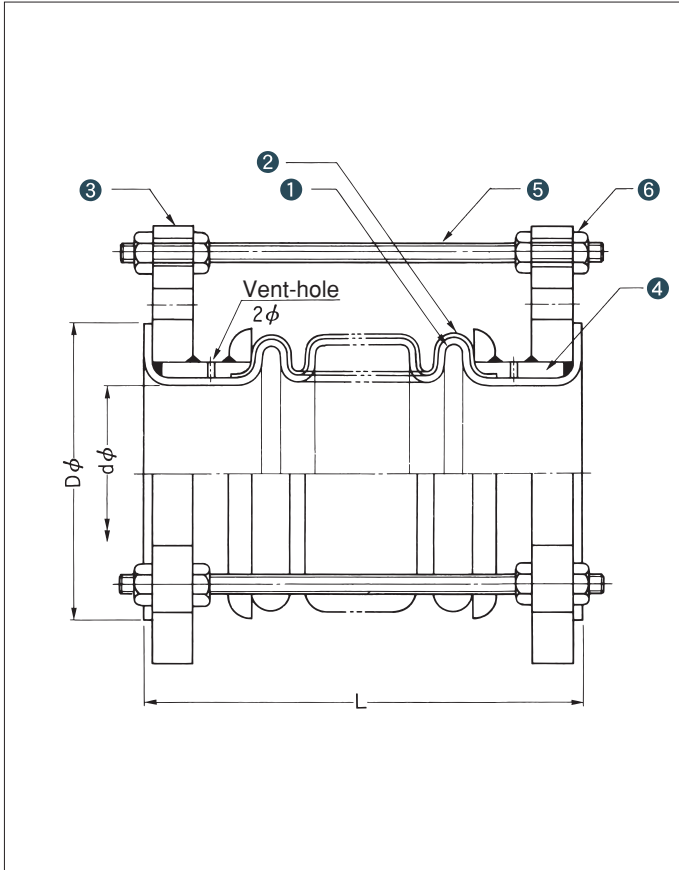
Product code	Diameter nominal A (B)	Face-to-face length (mm)	Amount of expansion and contraction (mm)	Axial displacement (mm)	Reaction force (kg/mm)	Dimension of expansion parts (mm)		
						Numbers of standard convolutions	Inner diameter $d \phi$	Flared Diameter $D \phi$
9062-S-50-5 9062-S-50-8 9062-S-50-10	50 (2)	100 135 160	± 4 ± 6 ± 8	2 5 9	77 48 38	5 8 10	46	95
9062-S-65-5 9062-S-65-8 9062-S-65-10	65 (2 ^{1/2})	105 140 165	± 4 ± 6 ± 8	2 5 8	91 57 46	5 8 10	60	115
9062-S-80-5 9062-S-80-8 9062-S-80-10	80 (3)	110 155 185	± 6 ± 9 ± 12	2 6 10	63 40 32	5 8 10	74	125
9062-S-100-5 9062-S-100-8 9062-S-100-10	100 (4)	110 155 185	± 6 ± 9 ± 12	2 5 8	77 48 40	5 8 10	98	150
9062-S-125-3 9062-S-125-5 9062-S-125-8 9062-S-125-10	125 (5)	110 160 235 285	± 10 ± 17 ± 27 ± 35	2 7 19 25	48 22 14 12	3 5 8 10	120	180
9062-S-150-3 9062-S-150-5 9062-S-150-8 9062-S-150-10	150 (6)	125 185 275 335	± 11 ± 19 ± 31 ± 39	2 8 22 35	35 16 10 8	3 5 8 10	145	210
9062-S-200-3 9062-S-200-5 9062-S-200-8 9062-S-200-10	200 (8)	125 185 275 335	± 12 ± 19 ± 31 ± 39.5	2 7 18 29	43 19 12 10	3 5 8 10	193	260
9062-S-250-3 9062-S-250-5 9062-S-250-8 9062-S-250-10	250 (10)	130 190 280 340	± 12 ± 19 ± 31 ± 39	2 6 15 24	50 23 14 11	3 5 8 10	242	320
9062-S-300-3 9062-S-300-5 9062-S-300-8 9062-S-300-10	300 (12)	145 215 320 390	± 16 ± 27 ± 43 ± 54	2 8 21 32	32 17 11 9	3 5 8 10	294	365
9062-S-350-3 9062-S-350-5 9062-S-350-8 9062-S-350-10	350 (14)	150 220 325 395	± 16 ± 27 ± 43 ± 56	2 7 19 30	36 19 12 10	3 5 8 10	327	410
9062-S-400-3 9062-S-400-5 9062-S-400-7	400 (16)	190 290 390	± 29 ± 48 ± 68	5 15 31	25 15 11	3 5 7	375	470
9062-S-450-3 9062-S-450-5 9062-S-450-7	450 (18)	195 295 395	± 29 ± 48 ± 68	5 14 28	27 17 12	3 5 7	425	525
9062-S-500-3 9062-S-500-5 9062-S-500-7	500 (20)	195 295 395	± 29 ± 48 ± 68	2 12 25	30 18 13	3 5 7	474	580
9062-S-550-3 9062-S-550-5 9062-S-550-7	550 (22)	200 300 400	± 29 ± 48 ± 68	2 11 22	32 19 14	3 5 7	524	635
9062-S-600-3 9062-S-600-5 9062-S-600-7	600 (24)	200 300 400	± 29 ± 48 ± 68	2 11 22	35 21 15	3 5 7	574	685



TOMBO No.9062-L

NAFLON™ PTFE Expansion Joint (Stainless Steel Shrouding Long Type)

Construction

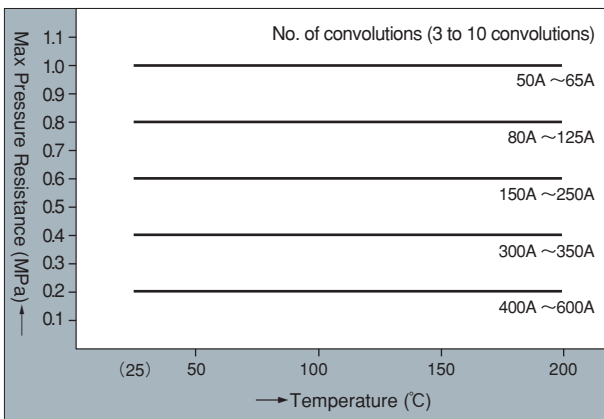


Parts No.	Name	Standard Specifications
①	Bellows	PTFE
②	Bellows	SUS304
③	Flange Corresponding to JIS 10K	SS400
④	End Tube	SGP
⑤	Shipping Bolt	SS400
⑥	Nut	SS400

- * The JIS 10K flange is standard, but the ANSI 150LB type is also available.
- * The holes for the flange bolts are drilled holes.
- * Products with a number of convolutions other than the ones in the standard can be manufactured.
- * In the event of displacement caused by an earthquake, the maximum allowable displacement is obtained by multiplying values up to 1.5.
- * This product cannot be used with halogen system liquid and atmosphere.
- * This product cannot be used for the purpose of absorbing vibrations from pumps.
- * **The shipping bolts are set to adjust the face-to-face distances. Remove them after installing the bellows.**
- * Using the bellows with the shipping bolts still attached may cause damage.
- * The Fire Service Law and the High Pressure Gas Safety Law cannot be applied.
- * For vacuum applications, refer to page 18.
- * For products with flanges made of SUS304, the standard material for its lugs, shipping bolts, and nuts is SS400.
- * Strength against internal thrust is not guaranteed by design.

Operating Pressure

● TOMBO No.9062-L



Measured by NICHIAS

- The same operating pressure is used for products with 3 to 10 convolutions.
- The operating pressure table shows the values for the standard face-to-face lengths. When using the product at the maximum expansion and the maximum displacement, use the values obtained by multiplying the following coefficients.
 - At the maximum expansion: 0.7
 - At the maximum displacement: 0.5
- Refer to page 20 for cases where expansion or contraction and axis displacement occur at the same time.
- The maximum service temperature is 200°C.

Standard dimensions

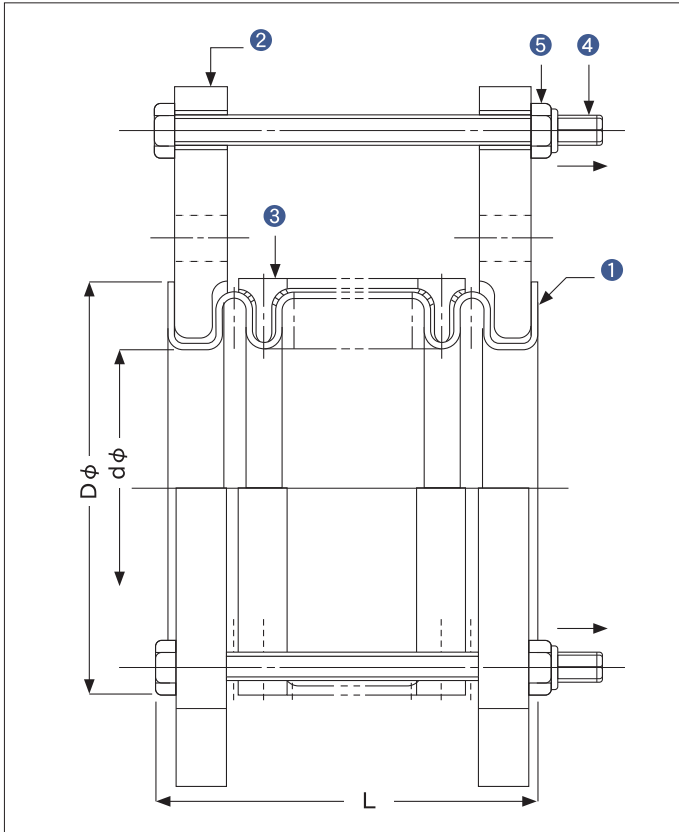
Product code	Diameter nominal A (B)	Face-to-face length (mm)	Amount of expansion and contraction (mm)	Axial displacement (mm)	Reaction force (kg/mm)	Dimension of expansion parts (mm)		
						Numbers of standard convolutions	Inner diameter d ϕ	Flared Diameter D ϕ
9062-L-50-5 9062-L-50-8 9062-L-50-10	50 (2)	170 205 230	± 4 ± 6 ± 8	2 5 9	77 48 38	5 8 10	46	95
9062-L-65-5 9062-L-65-8 9062-L-65-10	65 (2 $\frac{1}{2}$)	180 215 240	± 4 ± 6 ± 8	2 5 8	91 57 46	5 8 10	60	115
9062-L-80-5 9062-L-80-8 9062-L-80-10	80 (3)	200 245 275	± 6 ± 9 ± 12	2 6 10	63 40 32	5 8 10	74	125
9062-L-100-5 9062-L-100-8 9062-L-100-10	100 (4)	200 245 275	± 6 ± 9 ± 12	2 5 8	77 48 46	5 8 10	98	150
9062-L-125-3 9062-L-125-5 9062-L-125-8 9062-L-125-10	125 (5)	205 255 330 380	± 10 ± 17 ± 27 ± 35	2 7 19 25	48 22 14 12	3 5 8 10	120	180
9062-L-150-3 9062-L-150-5 9062-L-150-8 9062-L-150-10	150 (6)	225 285 375 435	± 11 ± 19 ± 31 ± 39	2 8 22 35	35 16 10 8	3 5 8 10	145	210
9062-L-200-3 9062-L-200-5 9062-L-200-8 9062-L-200-10	200 (8)	235 295 385 445	± 12 ± 19 ± 31 ± 39.5	2 7 18 29	43 19 12 10	3 5 8 10	193	260
9062-L-250-3 9062-L-250-5 9062-L-250-8 9062-L-250-10	250 (10)	245 305 395 455	± 12 ± 19 ± 31 ± 39	2 6 15 24	50 23 14 11	3 5 8 10	242	320
9062-L-300-3 9062-L-300-5 9062-L-300-8 9062-L-300-10	300 (12)	280 350 455 525	± 16 ± 27 ± 43 ± 54	2 8 21 32	32 17 11 9	3 5 8 10	294	365
9062-L-350-3 9062-L-350-5 9062-L-350-8 9062-L-350-10	350 (14)	280 350 455 525	± 16 ± 27 ± 43 ± 56	2 7 19 30	36 19 12 10	3 5 8 10	327	410
9062-L-400-3 9062-L-400-5 9062-L-400-7	400 (16)	375 475 575	± 29 ± 48 ± 68	5 15 31	25 15 11	3 5 7	375	470
9062-L-450-3 9062-L-450-5 9062-L-450-7	450 (18)	385 485 585	± 29 ± 48 ± 68	5 14 28	27 17 12	3 5 7	425	525
9062-L-500-3 9062-L-500-5 9062-L-500-7	500 (20)	400 500 600	± 29 ± 48 ± 68	2 12 25	30 18 13	3 5 7	474	580
9062-L-550-3 9062-L-550-5 9062-L-550-7	550 (22)	425 525 625	± 29 ± 48 ± 68	2 11 22	32 19 14	3 5 7	524	635
9062-L-600-3 9062-L-600-5 9062-L-600-7	600 (24)	425 525 625	± 29 ± 48 ± 68	2 11 22	35 21 15	3 5 7	574	685



TOMBO™ No.9063-S

NAFLON™ PTFE Expansion Joint (Heat Resistance Type)

Construction

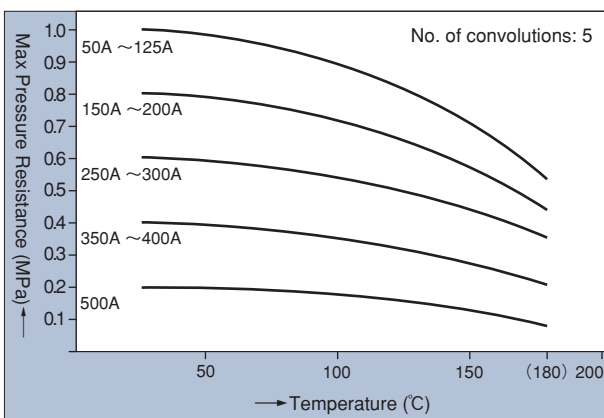
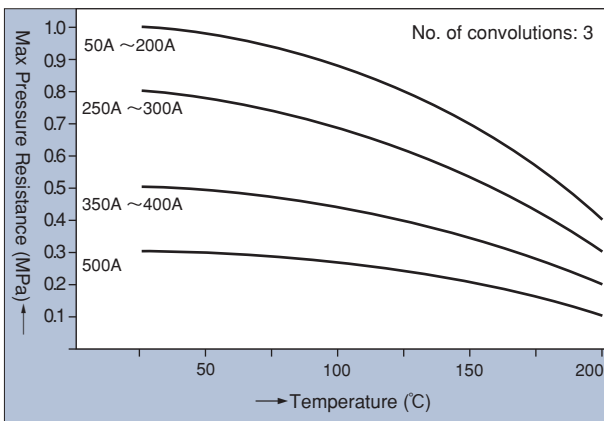


Parts No.	Name	Standard Specifications
①	Bellows	PTFE
②	Flange Corresponding to JIS 10K	SS400
③	Control Ring	AC7A
④	Limit Bolt	SS400 (Unichro-plated)
⑤	U Nut	SS400 (Unichro-plated)

- * The JIS 10K flange is standard, but the ANSI 150LB type is also available.
- * Flange thickness of ANSI150LB is same as JIS 10K Flange standard
- * The holes for the flange bolts are drilled holes. However, the holes for the flange bolts with 3 convolutions of 14B or less in size and ones with 4 convolutions of 5B or less in size are tapped holes.
- * Products with a number of convolutions other than the ones in the standard can be manufactured.
- * The Fire Service Law and the High Pressure Gas Safety Law cannot be applied.
- * For vacuum applications, refer to page 18.
- * For products with flanges made of SUS304, the material for its lugs, shipping bolts, and nuts is also SUS304.
- * The limit bolts are set at the standard face-to-face distance (length) before shipment. Taking into account axial displacement, adjust the limit bolts within the allowable range of expansion and contraction by using page 20 as a reference.
- * The limit bolt for products of nominal diameter of 200A or more consists of a full thread bolt and nuts at both ends.
- * If this product is used with halogen system liquid and atmosphere, the service life of the control ring may be shortened depending on the conditions such as temperature, pressure and environment. In this case, control rings made of SUS are available.
- * Strength against internal thrust is not guaranteed by design.

Operating Pressure

● TOMBO No.9063-S



- The operating pressure table shows the values for the standard face-to-face lengths. When using the product at the maximum expansion and the maximum displacement, use the values obtained by multiplying the following coefficients.
At the maximum expansion: 0.7
At the maximum displacement: 0.5
- Refer to page 20 for cases where expansion or contraction and axis displacement occur at the same time.
- The maximum service temperature is 200°C for 3 convolutions and 180° for five convolutions.

Standard dimensions

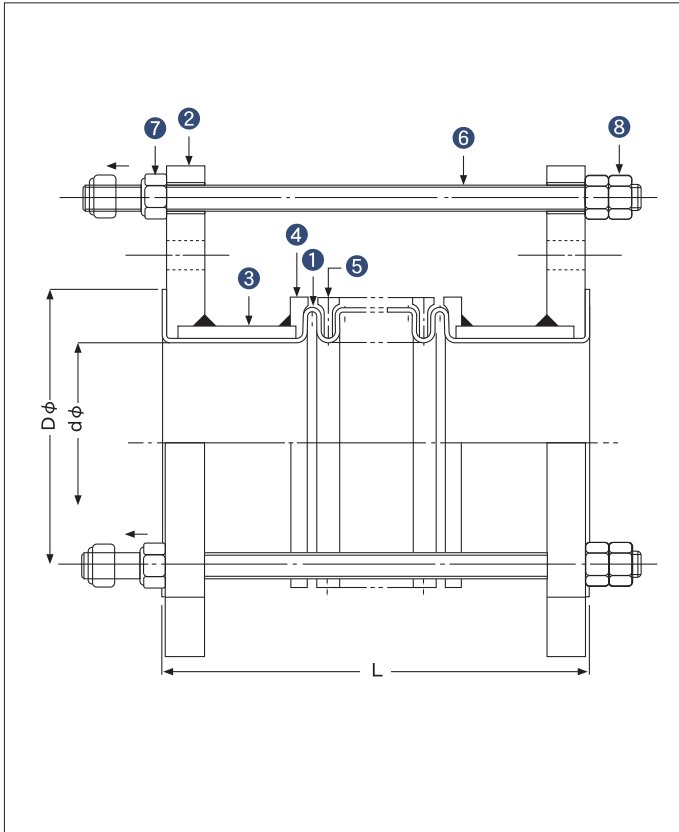
Product code	Diameter nominal A (B)	Face-to-face length (mm)	Amount of expansion and contraction (mm)	Axial displacement (mm)	Dimension of expansion parts (mm)		
					Numbers of standard convolutions	Inner diameter d ϕ	Flared Diameter D ϕ
9063-S-50-3 9063-S-50-5	50 (2)	75 105	+7 -15 +12 -24	3 15	3 5	46	95
9063-S-65-3 9063-S-65-5	65 (2 ¹ / ₃)	80 110	+7 -15 +12 -24	3 15	3 5	58	115
9063-S-80-3 9063-S-80-5	80 (3)	80 110	+7 -15 +12 -24	3 15	3 5	72	125
9063-S-100-3 9063-S-100-5	100 (4)	85 115	+9 -18 +15 -30	3 15	3 5	98	150
9063-S-125-3 9063-S-125-5	125 (5)	90 130	+9 -18 +15 -30	11 20	3 5	121	180
9063-S-150-3 9063-S-150-5	150 (6)	110 155	+10 -20 +17 -35	11 20	3 5	145	210
9063-S-200-3 9063-S-200-5	200 (8)	110 155	+10 -20 +17 -35	14 23	3 5	194	260
9063-S-250-3 9063-S-250-5	250 (10)	120 175	+12 -24 +20 -40	14 23	3 5	244	320
9063-S-300-3 9063-S-300-5	300 (12)	120 175	+12 -24 +20 -40	16 26	3 5	292	365
9063-S-350-3 9063-S-350-5	350 (14)	130 190	+13 -26 +22 -44	16 26	3 5	325	410
9063-S-400-3 9063-S-400-5	400 (16)	150 225	+13 -26 +22 -44	16 26	3 5	376	470
9063-S-500-3 9063-S-500-5	500 (20)	160 240	+13 -26 +22 -44	18 30	3 5	476	580



TOMBO™ No.9063-L

NAFLON™ PTFE Expansion Joint (Heat Resistance Long Type)

Construction

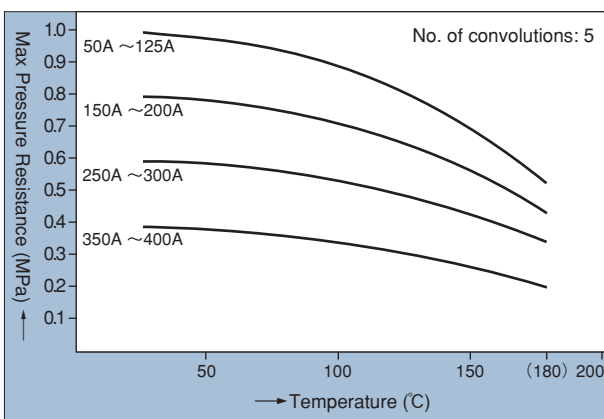
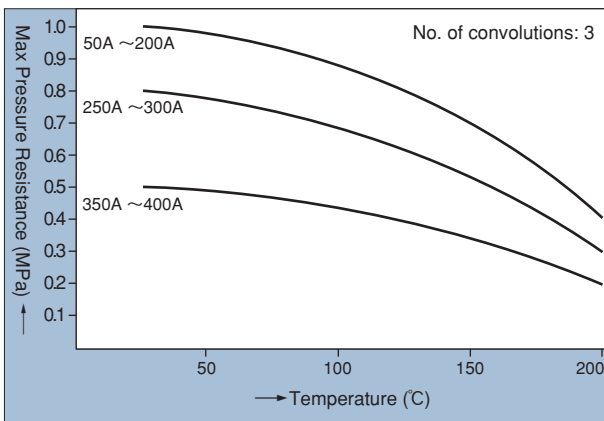


Parts No.	Name	Standard Specifications
①	Bellows	PTFE
②	Flange Corresponding to JIS 10K	SS400
③	End Tube	Carbon steel pipe (SGP)
④	Collar	SS400
⑤	Control Ring	AC7A
⑥	Limit Bolt	SS400 (Unichro-plated)
⑦	U Nut	SS400 (Unichro-plated)
⑧	Hexagon Nut	SS400

- * The JIS 10K flange is standard, but the ANSI 150LB type is also available.
- * The holes for the flange bolts are drilled holes.
- * Products with a number of convolutions other than the ones in the standard can be manufactured.
- * The Fire Service Law and the High Pressure Gas Safety Law cannot be applied.
- * Products with 6 convolutions or more are No.9063-B type.
- * If this product is used with halogen system liquid and atmosphere, the service life of the control ring may be shortened depending on the conditions such as temperature, pressure and environment. In this case, control rings made of SUS are available.
- * For products with flanges made of SUS304, the material for its lugs, shipping bolts, and nuts is also SUS304.
- * The limit bolts are set at the standard face-to-face distance (length) before shipment. Taking into account axial displacement, adjust the limit bolts within the allowable range of expansion and contraction by using page 20 as a reference.
- * Limit bolts of 125A or more are a full-thread screw with nuts fixed on both ends.
- * Strength against internal thrust is not guaranteed by design.

Operating Pressure

● TOMBO No.9063-L



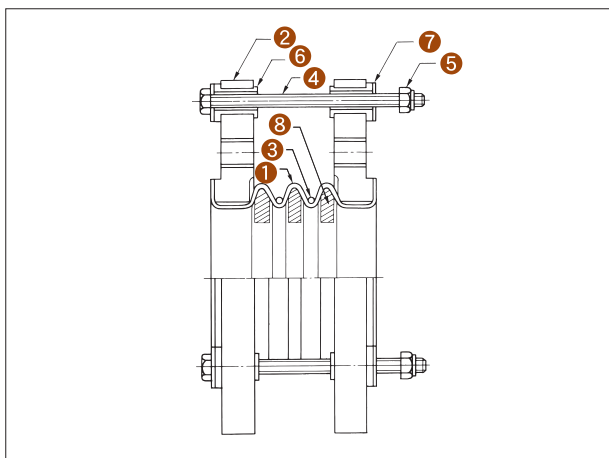
- The operating pressure table shows the values for the standard face-to-face lengths. When using the product at the maximum expansion and the maximum displacement, use the values obtained by multiplying the following coefficients.
At the maximum expansion: 0.7
At the maximum displacement: 0.5
- Refer to page 20 for cases where expansion or contraction and axis displacement occur at the same time.
- The maximum service temperature is 200°C for 3 convolutions and 180° for 5 convolutions.

Standard dimensions

Product code	Diameter nominal A (B)	Face-to-face length (mm)	Amount of expansion and contraction (mm)	Axial displacement (mm)	Dimension of expansion parts (mm)		
					Numbers of standard convolutions	Inner diameter d ϕ	Flared Diameter D ϕ
9063-L-50-3 9063-L-50-5	50 (2)	190 220	+7 -15 +12 -24	3 15	3 5	46	95
9063-L-65-3 9063-L-65-5	65 (2 $\frac{1}{2}$)	195 225	+7 -15 +12 -24	3 15	3 5	61	115
9063-L-80-3 9063-L-80-5	80 (3)	205 235	+7 -15 +12 -24	3 15	3 5	72	125
9063-L-100-3 9063-L-100-5	100 (4)	205 240	+9 -18 +15 -30	3 15	3 5	98	150
9063-L-125-3 9063-L-125-5	125 (5)	220 260	+9 -18 +15 -30	11 20	3 5	121	180
9063-L-150-3 9063-L-150-5	150 (6)	260 305	+10 -20 +17 -35	11 20	3 5	145	210
9063-L-200-3 9063-L-200-5	200 (8)	260 305	+10 -20 +17 -35	14 23	3 5	194	260
9063-L-250-3 9063-L-250-5	250 (10)	280 335	+12 -24 +20 -40	14 23	3 5	244	320
9063-L-300-3 9063-L-300-5	300 (12)	280 335	+12 -24 +20 -40	16 26	3 5	292	365
9063-L-350-3 9063-L-350-5	350 (14)	320 380	+13 -26 +22 -44	16 26	3 5	325	410
9063-L-400-3 9063-L-400-5	400 (16)	340 415	+13 -26 +22 -44	16 26	3 5	376	470

Vacuum resistance NAFLON™ Bellows

■ TOMBO No.9061-SV (Vacuum resistance) (200~600A)



Parts No.	Name	Standard Specifications
①	Bellows	PTFE
②	Flange Corresponding to JIS 10K	FCD450
③	Control Ring	SUS304
④	Limit Bolt	SS400 (Unichro-plated)
⑤	U Nut	SS400 (Unichro-plated)
⑥	Grommet	CR
⑦	Washer	SS400 (Unichro-plated)
⑧	Support Ring	PTFE

* Face to face length shall be same as Tombo No. 9061

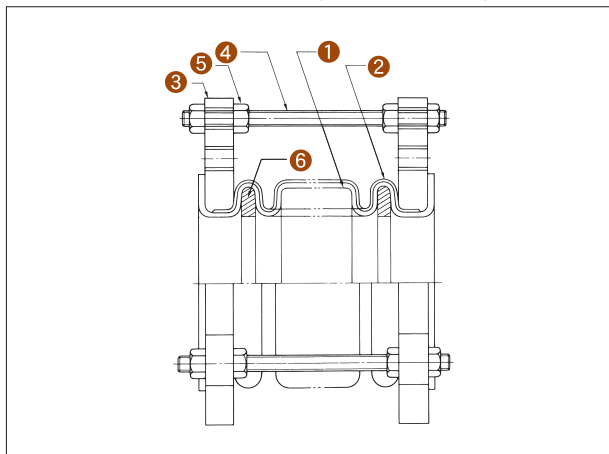
* Stopper bolt is attached with Stopper and Double nut from 350A to 600A. Flange material shall be SS400.

* Shrinkage allowance of certain size will be smaller than Tombo No. 9061. Please refer to Page17.

* Available only to 3 Convolutions.

* Strength against internal thrust is not guaranteed by design.

■ TOMBO No.9062-SV (Vacuum resistance)



Parts No.	Name	Standard Specifications
①	Bellows	PTFE
②	Bellows	SUS-304
③	Flange Corresponding to JIS 10K	SS400
④	Limit Bolt	SS400
⑤	Nut	SS400
⑥	Support Ring	PTFE

* Face to face length and expansion amount are same as TOMBO No. 9062S.

* TOMBO No. 9062-LV is installed in Sleeve inside straight point.

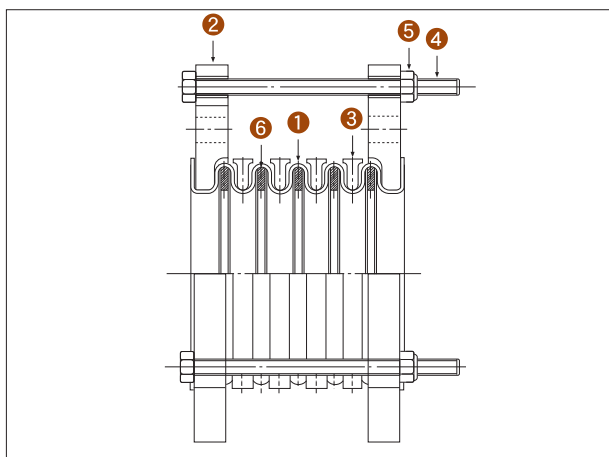
* Available to below 5 convolutions.

* Shipping bolts are used to adjust the face-to-face distance. After installing the bellows, remove the shipping bolts.

* Using the bellows with the shipping bolts still attached may cause damage.

* Strength against internal thrust is not guaranteed by design.

■ TOMBO No.9063-SV (Vacuum resistance)



Parts No.	Name	Standard Specifications
①	Bellows	PTFE
②	Flange Corresponding to JIS 10K	SS400
③	Control Ring	AC7A
④	Limit Bolt	SS400 (Unichro-plated)
⑤	U Nut	SS400 (Unichro-plated)
⑥	Support Ring	PTFE

* Face to face length shall be same as TOMBO No. 9063S.

* Shrinkage allowance of certain size will be smaller than TOMBO No. 9061. Please refer to Page17.

* Available to below 5 convolutions.

* Strength against internal thrust is not guaranteed by design.

Technical Data

Vacuum resistance and maximum operating temperature

TOMBO No.	No. of convolutions	Nominal diameter	Maximum operating temperature at 5 Torr abs
9061-HW	3 convolutions	25A~150A	150°C
9061-SV	3 convolutions	200A~600A	80°C
9062-SV	3 convolutions, 5 convolutions	50A~200A	170°C
		250A~350A	100°C
9063-SV	3 convolutions, 5 convolutions	50A~150A	150°C
		200A~350A	120°C

* Vacuum resistance and Maximum operating temperature under vacuum condition is not guaranteed value but test value. Please consult us before use.

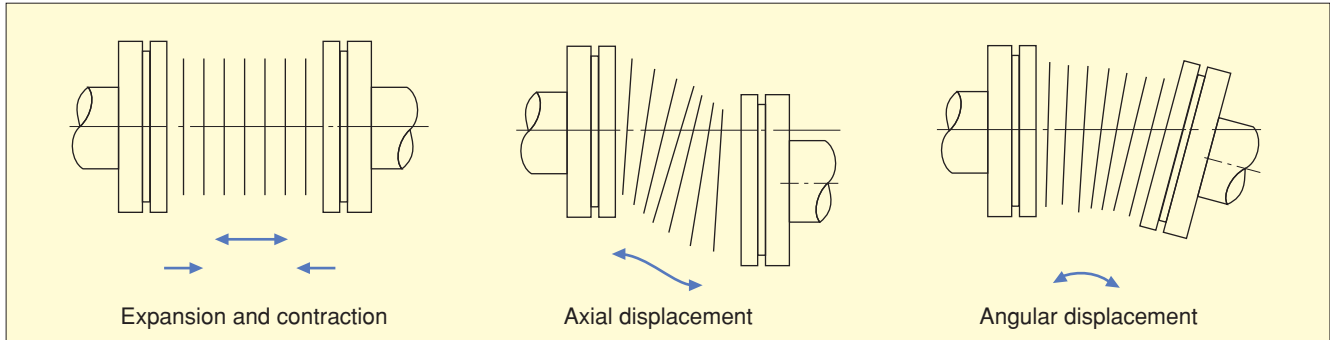
Variations in the amount of contraction of the vacuum-resistance products of the vacuum-proof products

Unit:mm

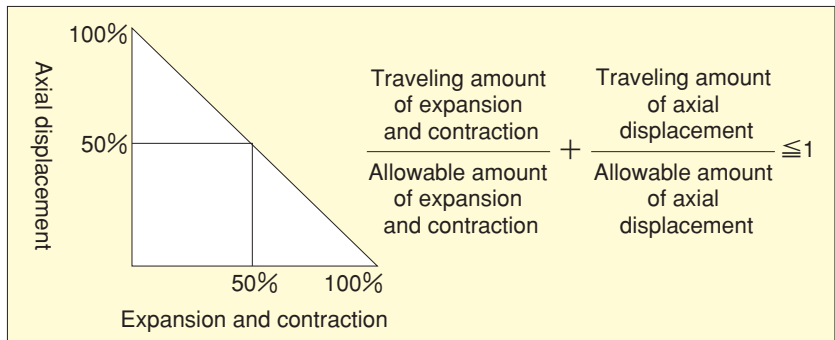
TOMBO No.	9061-HW		9061-SV		9062-SV		9063-SV	
	3 convolutions		3 convolutions		3 convolutions		5 convolutions	
No. of convolutions	3 convolutions		3 convolutions		3 convolutions		5 convolutions	
Nominal diameter	3 convolutions		3 convolutions		3 convolutions		5 convolutions	
25A	±10	—	—	—	—	—	—	—
32A	+10 -5	—	—	—	—	—	—	—
40A	±10	—	—	—	—	—	—	—
50A	±15	—	—	—	±4	±7	±12	±12
65A	±10	—	—	—	±4	±7	±12	±12
80A	+25 -20	—	—	—	±6	±7	±12	±12
100A	+25 -20	—	—	—	±6	+9 -7	+15 -10	+15 -10
125A	+25 -15	—	—	±10	±17	+9 -7	+15 -10	+15 -10
150A	+25 -10	—	—	±11	±19	+10 -12	+17 -20	+17 -20
200A	—	+20 -26	±12	±19	+10 -12	+17 -20	+17 -20	+17 -20
250A	—	+15 -26	±12	±19	±12	±20	±20	±20
300A	—	+15 -26	±16	±27	±12	+22 -20	+22 -20	+22 -20
350A	—	+15 -17	±16	±27	+13 -15	+22 -25	+22 -25	+22 -25
400A	—	+15 -20	—	—	—	—	—	—
450A	—	+20 -17	—	—	—	—	—	—
500A	—	+20 -18	—	—	—	—	—	—
550A	—	+20 -16	—	—	—	—	—	—
600A	—	+20 -16	—	—	—	—	—	—

Technical Data

Relation between the amount of expansion and contraction and axial displacement



* The amounts of expansion and contraction and axial displacement for each type of NAFLON™ bellows listed in the standard dimensions table are values based on the conditions that expansion and contraction and axial displacement occur separately.
When the two movements occur at the same time, use the products within the range shown in the right-hand figure.



Reference values of pitch and the amount of expansion and contraction per convolution

Unit: (mm)

Nominal diameter A (B)	TOMBO No.9062		TOMBO No.9063	
	Pitch	Ratio of expansion and contraction per convolution	Pitch	Ratio of expansion and contraction per convolution
50 (2)	10	±0.8	15	+2.5 -5
65 (2 1/2)	10	±0.8	16	+2.5 -5
80 (3)	15	±1.2	16	+2.5 -5
100 (4)	15	±1.2	17	+3 -6
125 (5)	25	±3.5	19	+3 -6
150 (6)	30	±4.0	24	+3.5 -7
200 (8)	30	±4.0	24	+3.5 -7
250 (10)	30	±4.0	27	+4 -8
300 (12)	35	±5.4	27	+4 -8
350 (14)	35	±5.4	32	+4.5 -9
400 (16)	50	±9.7	38	+4.5 -9
450 (18)	50	±9.7	—	—
500 (20)	50	±9.7	41	+4.5 -9
550 (22)	50	±9.7	—	—
600 (24)	50	±9.7	—	—

* The pitches and ratios of expansion and contraction in the above table are indicated for cases where the number of convolutions is changed to obtain a required ratio of expansion and contraction.
* Please contact us for details. Please note that the number of convolutions cannot be changed for the TOMBO No.9061 and TOMBO No.9064 types as they are manufactured using metallic molding.

Inquiry Form for Information of NAFLON™ Bellows

Name of your Company: _____ Date: Month Day, Year _____

Your Section: _____

Your Name: _____

T E L: _____ F A X: _____

E-MAIL: _____

Operating conditions

- **Applications:** general, food, nuclear energy, pharmaceutical, aerospace
Others ()
- **Applicable standards:** present/absent,
High Pressure Gas Safety Law, Fire Service Law
Others ()
- **Name of the equipment:** _____
- **Installation place:** indoor, outdoor _____
- **Installation purposes:** _____
- **Name of the liquid, compositions of the liquid:**

- **Flow velocity:** _____ m/sec
- **Dust, slurry:** present/absent _____
- **Temperature:** Maximum temperature: _____ °C
Normal temperature: _____ °C
- **Pressure:** Maximum pressure: _____ MPa
Normal pressure: _____ MPa
- **Displacement:** Expansion and contraction: _____ mm
Axial displacement: _____ mm
- **Desired service life:** _____ years

Product specifications

- **Size:** _____
- **Face-to-face distance:** _____ mm
- **Flange:** Material standard, specified ()
Standards JIS K
ANSI LB
- **Quantity:** _____
- **Drawing:** required, not required _____
- **Mill sheet:** required, not required _____
- **Inspection results sheet:** required, not required _____
- **Drawing:** required, not required _____
- **Specifications sheet:** required, not required _____

Layout plan

Please provide a simple drawing of the layout of your equipment including pumps and dampers in the space provided below.

Special instructions

Please write down any requests including special specifications in the space provided below.

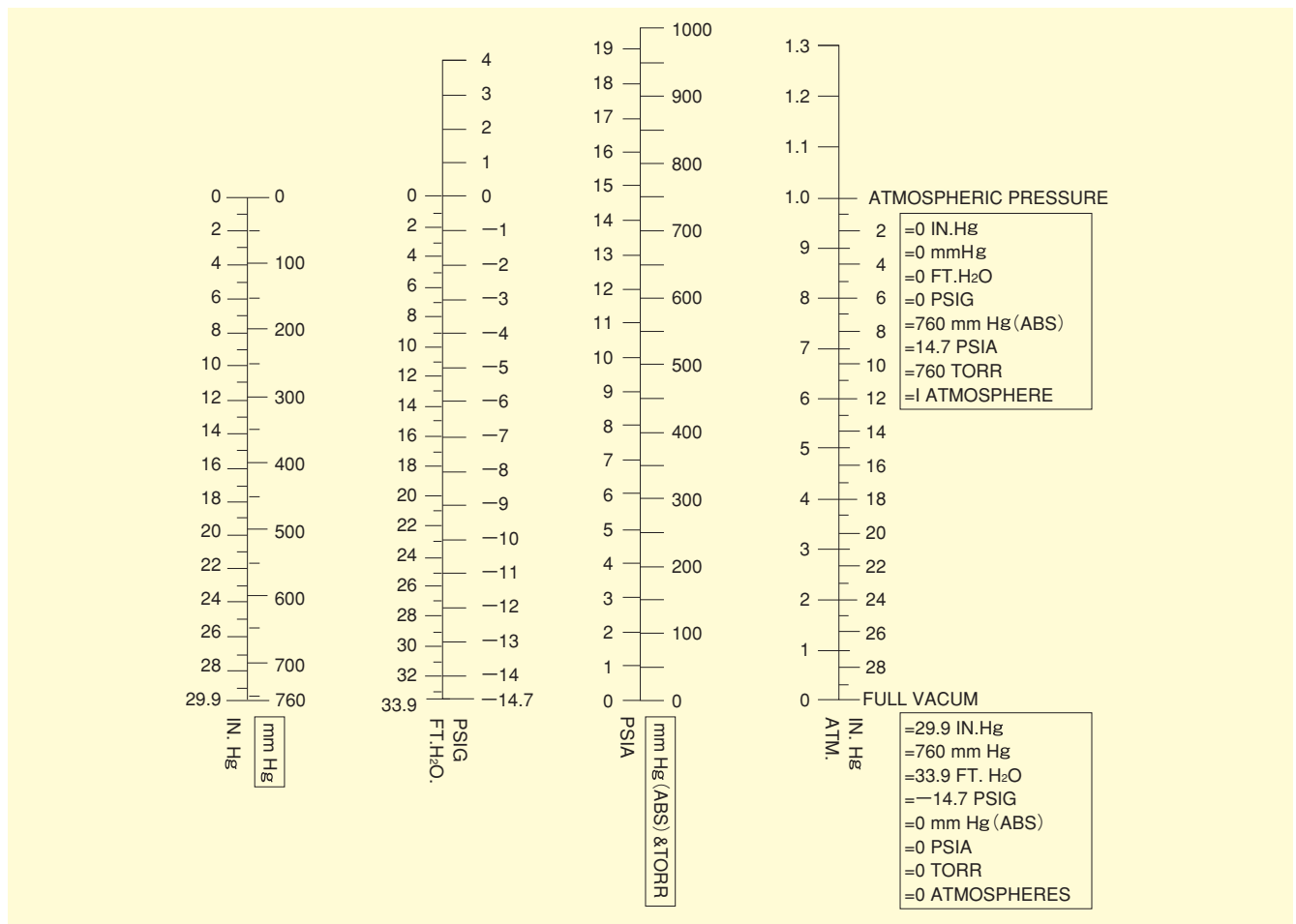
Reference Data

Amount of pipe expansion (Excerpt from EJMA)

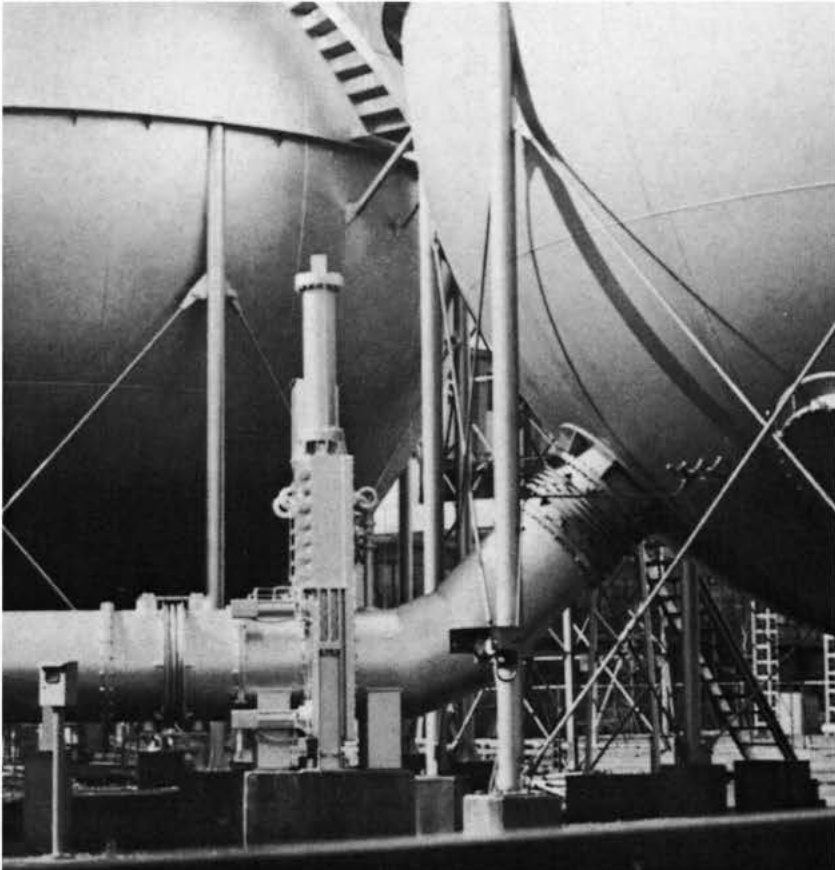
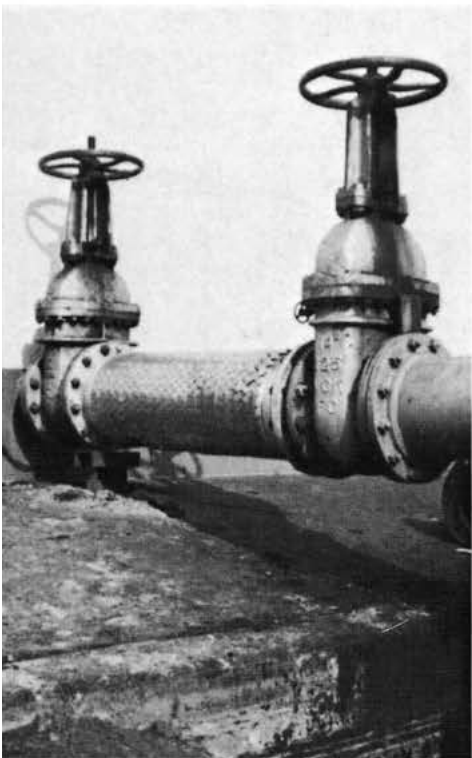
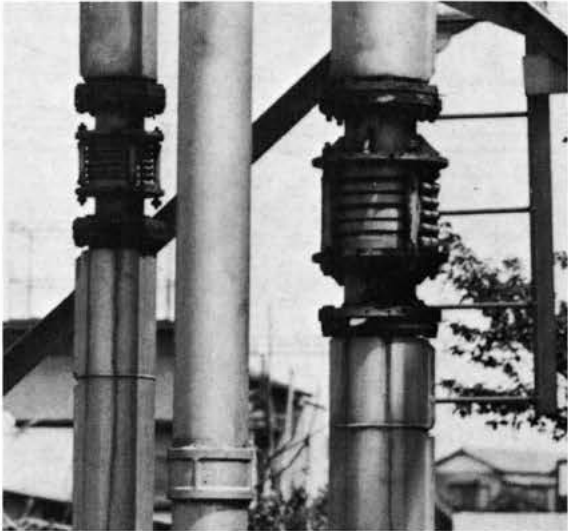
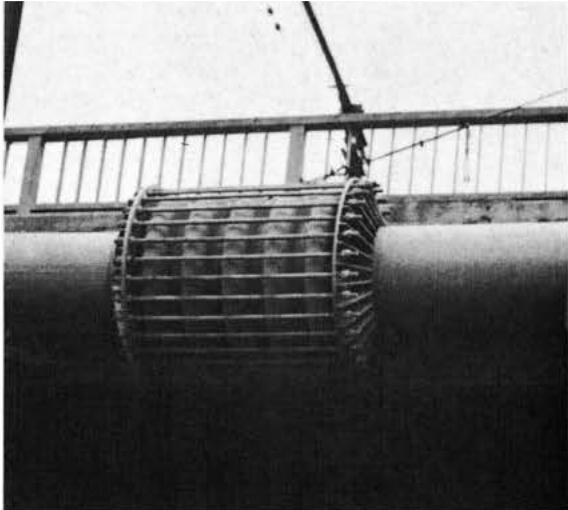
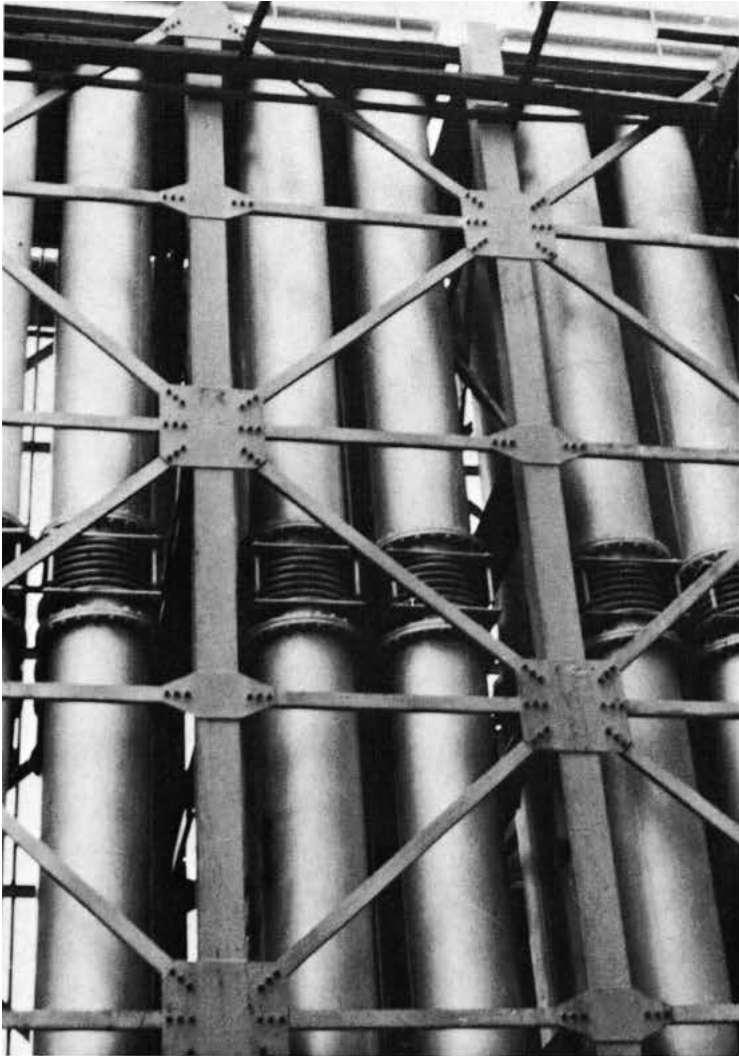
Amount of expansion per one-meter pipe used for the main piping at each temperature Unit: (mm)

Temperature (°C)	Copper pipe	Stainless steel	3 ¹ / ₂ nickel	Temperature (°C)	Copper pipe	Stainless steel	3 ¹ / ₂ nickel
-40	-0.645	-0.948	-0.602	140	1.403	2.021	1.312
-30	-0.545	-0.792	-0.504	150	1.527	2.193	1.423
-20	-0.435	-0.635	-0.407	160	1.660	2.367	1.535
-10	-0.330	-0.478	-0.309	170	1.790	2.545	1.652
0	-0.230	-0.326	-0.213	180	1.922	2.725	1.768
10	-0.117	-0.175	-0.117	190	2.059	2.905	1.886
20	-0.015	-0.016	-0.012	200	2.192	3.086	2.004
30	+0.103	+0.152	+0.099	210	2.328	3.268	2.132
40	0.218	0.321	0.209	220	2.470	3.449	2.263
50	0.328	0.488	0.318	230	2.606	3.634	2.396
60	0.442	0.654	0.424	240	2.743	3.816	2.526
70	0.553	0.824	0.533	250	2.880	3.996	2.658
80	0.670	0.994	0.643	260	3.017	4.175	2.784
90	0.784	1.162	0.749	270	3.160	4.355	2.918
100	0.917	1.332	0.862	280	3.309	4.535	3.050
110	1.044	1.504	0.989	290	3.454	4.723	3.193
120	1.153	1.674	1.087	300	3.602	4.909	3.337
130	1.270	1.847	1.199				

Conversion diagram showing degree of vacuum



Examples of execution



Please read this instruction manual carefully to use the products properly.

Also, make sure that this instruction manual is in the possession of the manager responsible for maintenance and inspection after the installation work is completed.

1. Cautions for Use

1) Conditions for Use

For an expansion joint selected from TOMBO No. 9061 NAFLON PTFE, TOMBO No. 9062 NAFLON (stainless steel lining type), and TOMBO No. 9063 NAFLON PTFE (hereafter all these types are collectively referred to as bellows), please ensure that the required system data such as pressure resistance, vacuum resistance, and absorptive capacities matches the data listed in the catalogue of NAFLON bellows.

2) Axial Misalignment

The bellows are not designed to correct an axial misalignment of pipes. The axial misalignment of the bellows may reduce its capacity to absorb displacement causing stress fatigue of the product material, which will result in a shorter service life of the product.

3) Anchoring

Always anchor a pipeline at places where it changes its direction. Mount the bellows as near as possible to these anchoring positions. Installation without anchoring may cause a displacement exceeding the permissible range due to an impelling force, which will result in a damage to the product.

4) Pipe Support

Always support a pipeline with hangers and anchors to avoid a load which may cause a displacement exceeding the allowable range.

5) Safety Measures

Bellows are used at high temperatures and high pressures for pipelines and equipment handling hazardous substances such as liquids and gases. Take every precaution to avoid disasters due to leakage of the liquid. Do not mount bellows in areas where inspection works (failure inspections including periodical inspection) cannot be performed. Mounting a safety cover is recommended when using bellows under severe conditions to protect workers from accidents in case of bellows damage.

2. Cautions for Installation

1) Protection of the Ends

● For expansion joints such as TOMBO No. 9061 NAFLON PTFE, TOMBO No. 9062 NAFLON (stainless steel shrouding type), and TOMBO No. 9063 NAFLON PTFE (hereafter all the types are collectively referred to as bellows), protective plates are mounted at the flared ends before shipping. Do not remove the protective plates other than for piping work.

Removing the protective plates on unnecessary occasions will damage the flared ends causing a flaw or a dent and reducing the seal performance, which may result in leakage during operation of the piping system.

● When performing piping work, always protect the flared ends with a soft cloth and remove dirt carefully. If dirt is caught at the flared ends, it may result in leakage during operation of the piping system.

2) Mounting Procedures

● The protruding length of the mounting bolts toward the

rear surface of the flange shall be 3mm or less to avoid damage to the main body of the bellows due to interference with the bolts if the main body of the bellows causes displacement or expansion.

● Always use a gasket when tightening a flange to reduce the contact surface pressure, and tighten bolts evenly and by turns in a diagonal manner to ensure a good seal.

● TOMBO bellows No. 9061 and No. 9063 are set to the standard face-to-face distance with the limit bolts when shipping. Adjust them within the maximum allowable range of expansion and contraction according to conditions for use in your company.

In addition, TOMBO bellows No. 9062 is mounted with shipping bolts used for adjustment of the face-to-face distance when performing piping work or setup work.

Always remove the shipping bolts after completing piping work to avoid damage at the mounting sections of the shipping bolts due to expansion and contraction of the pipes.

● After completing the mounting work of the bellows, blow air to remove foreign materials including scrap metal remaining at the bottoms of the convolutions of the bellow section in order to avoid damage to the main body of the bellows during operation of the piping system.

2) Gasket

When connecting the flange surfaces of the bellows, use of TOMBO No. 9010 NAFLON PTFE Cushion Gasket is recommended. Combining the gasket with TOMBO No. 9400 NAFLON Paste will achieve more reliable sealing (Selection shall be conducted after taking into consideration the type of liquid.)

3. Cautions for Storage

● Pay careful attention not to damage the products during transportation or storage

● When keeping the products for a long period of time, keep them in a cool and dark place and avoid direct sunlight.

● Pay careful attention not to expose the products to fire during storage

● Pay careful not to apply loads to the products

4. Cautions for Inspection

1) Periodical inspection

Perform the following periodical inspections two or more times per year for early detection of abnormalities and avoiding accidents.

<Joint sections>

● No leakage from the joint sections

● No looseness of the bolts

● No corrosion at the flange sections

<Main body of product>

● No abnormal deformations on the bellow section such as cracks and damage

● No damage to the limit bolts

● No corrosion of both the control rings and the stainless sections of TOMBO No. 9062 bellows



2) When removing from piping systems

When removing the products from the piping system, perform the removal after temperature is down to the ordinary level.

In addition, mount the protective plates immediately after removing the products from the piping systems to avoid deformation and damage to the flared sections.

Precautions for handling fluoropolymer products

DANGER

-  Never allow the product to come into direct contact with body tissues or fluids.
 -  Never administer (including by mistake) to humans.
-

CAUTION

- Do not use any product for any purpose other than those described in the catalog and specification.
 - For disposal, follow local regulations.
-

Handling precautions

Please note the following points in order to maintain the original function of the product.

- Use products within the service temperature range specified in the catalogue.
- In cases when using or processing the product at above the maximum service temperature, fluorinated gas will be generated. The room must be adequately ventilated so as to prevent inhalation of gas.
- Do not bring the product close to open flame or weld. It may cause damage to the product or cause leakage.

Please note the following points in order to maintain the original function of the product.

- Technical data given in this catalogue (to show the performance of the product) are all actual values measured in experiments or representative values; they are not guaranteed values. Please carefully consider in advance the suitability of the product for your intended purpose.
- Especially careful consideration is required when using acid, alkali, or other poisonous fluids. Please contact our technical staff for advice.
- Because of the nature of the materials, repeated loading, highly concentrated loading, or bending loading could affect the durability of the product. Always check the usage environment in advance.
- Fluoropolymer is self-lubricating by nature, but does become worn after some time. Periodical replacement is recommended for the parts where much friction is observed.
- Due to the nature of fluoropolymer, curing and change in size could occur or fluid could penetrate the fluoropolymer depending on the usage environment, which may not comply with the general specifications. Always check the usage environment in advance.

If you are unsure about any other issues, please contact our sales or technical staff for advice.

Using this product as part of a heat exchanger and exporting it may infringe upon security export controls. Please contact us for advice.



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⚠ Cautions

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- Because the stated material values may vary according to actual usage environments or circumstances, please consider such figures as indications for reference.
- The content of the catalog explains the features of the products when they are used alone. When actually using the products, please start using them after testing them under the actual usage environment.
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