



ITESA Chile[®]
INNOVACIÓN & TECNOLOGÍA

ANSI Catalogue

Our product range

Lined Pipes

Spacers

Flanged Elbows

Flanged Tees

Flanged Lateral Tees

Flanged Crosses

Instrument Tees

Reducers

Valves

Blind Flanges

Expansion Joints

Spectacle Blinds

Nozzle Liners / Dip Pipes

Hoses

Special Parts

Accessories

Technical Specifications

Lined Pipes (Class 150)

Our pipes are lined, totally stainless, with paste-extruded PTFE and fully automatically tested. Depending on the nominal pipe size, we produce pipes up to a total length of 6 metres.



Lined Pipes (Class 150)

Materials:

- carbon steel
- stainless steel

Lining materials:

- PTFE (virgin or conductive)
- PP PP (up to nominal pipe size NPS 12")

Flanges

- fix-loose
- fix-fix
- loose-loose

Other pressure rating:

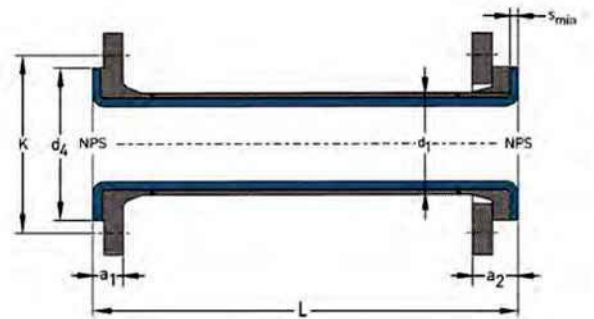
- Class 300

Special features:

- earthing stud/lug
- vent hole extension
- flange stopper

Optional extras:

- final painting
- non-destructive testing



NPS	L (mm)		d ₁ (mm)	d ₄ (mm)	K (mm)	s _{min} (mm)	a ₁ (mm)	a ₂ (mm)	No. of bolts x thread (UNC)	Weights	
	min.	max.								Pipe (ca. kg/m)	Pair of flanges (ca. kg)
½"	70	6000	26.7	34.9	60.3	3.0	14.6	18.2	4 x ½"	2.1	0.8
¾"	94	6000	26.7	42.9	69.9	3.0	16.2	19.7	4 x ½"	2.1	1.4
1"	98	6000	33.4	50.8	79.4	3.0	17.7	21.3	4 x ½"	3.0	2.0
1¼"	104	6000	42.2	63.5	88.9	3.0	19.3	22.9	4 x ½"	4.0	2.7
1½"	109	6000	48.3	73.0	98.4	3.0	20.9	24.5	4 x ½"	4.8	3.5
2"	115	6000	60.3	92.1	120.7	3.0	22.5	26.6	4 x ¾"	6.4	5.3
2½"	126	6000	73.0	104.8	139.7	3.0	25.7	30.5	4 x ¾"	9.8	8.4
3"	127	6000	88.9	127.0	152.4	3.0	27.3	32.4	4 x ¾"	12.8	10.2
4"	137	6000	114.3	157.2	190.5	3.0	27.3	32.9	8 x ¾"	18.1	14.3
5"	159	6000	141.3	185.7	215.9	4.0	28.3	34.5	8 x ¾"	25.1	18.2
6"	163	6000	168.3	215.9	241.3	4.5	30.4	37.0	8 x ¾"	32.8	22.6
8"	182	6000	219.1	269.9	298.5	5.0	34.0	41.8	8 x ¾"	49.2	37.3
10"	188	4000	273.0	323.8	362.0	7.5	38.1	47.0	12 x ¾"	72.8	50.7
12"	209	4000	323.8	381.0	431.8	5.0	37.2	47.1	12 x ¾"	84.0	77.0
14"	249	3000	355.6	412.8	476.3	5.0	40.4	55.0	12 x 1"	92.5	101.2
16"	261	3000	406.4	469.9	539.8	5.0	42.0	56.6	16 x 1"	106.2	128.9
18"	280	2000	457.0	533.4	577.9	5.0	45.1	59.7	16 x 1½"	119.8	144.6
20"	291	2000	508.0	584.2	635.0	5.0	48.3	62.9	20 x 1½"	133.5	177.6

Nominal pipe sizes over NPS 20"
up to NPS 1000" on request.

NPS	Lining thickness		Possible vacuum		
	standard	thick-walled	23°C	150°C	200°C
1"	●	●	☐	☐	☐
1½"	●	●	☐	☐	☐
2"	●	●	☐	☐	☐
3"	●	●	☐	☐	☐
4"	●	●	☐	☐	☐
6"	●	●	☐	☐	☐
8"	●	●	☐	☐	☐
10"	●	●	☐	☐	☐
10"	●	●	☐	☐	☐

Vacuum resistance:

- ☐ = full vacuum
- ☐ = limited vacuum
- ☐ = no vacuum

Please refer to the next higher nominal pipe size if your nominal pipe size is not listed.

- L = Total length
 - L_{min} = Minimum total length with flanges fix-loose
 - d₁ = Outer diameter of the pipe
 - d₄ = Raised face diameter
 - K = Bolt circle diameter
 - s_{min} = Minimum flare thickness
 - a₁ = Minimum length with fixed flange and s_{min}
 - a₂ = Minimum length with loose flange and s_{min}
- Technical data valid for the pressure rating Class 150.
a₁ and a₂ depend on construction type and lining thickness.

Spacers Form F (Class 150)

Flexible up to the last millimetre! For total lengths up to 25 mm we recommend Spacers Form F made of solid PTFE.



Spacers Form F (Class 150)

Materials:

- PTFE (virgin or conductive)
- PP (up to nominal pipe size NPS 12")

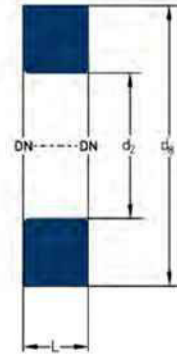
Other pressure rating:

- Class 300

Optional extras:

- reinforcement ring
- filled PTFE

Spacers Form F are also available as **Inclined Spacers** with various angles.



NPS	L (mm)		d ₂ = (mm)	d ₈ (mm)	Weights (ca. g/mm)
	min.	max.			
½"	10	15	15	44	2.9
¾"	10	20	15	54	4.5
1"	10	20	20	63	6.0
1¼"	10	20	29	73	7.6
1½"	10	20	35	83	9.6
2"	10	20	45	101	13.8
2½"	10	20	57	122	19.6
3"	10	20	70	133	21.6
4"	10	20	93	170	34.2
5"	10	20	119	194	39.6
6"	10	20	144	219	46.0
8"	10	20	191	273	64.2
10"	10	20	239	324	80.8
12"	10	20	290	405	135.0
14"	10	25	326	445	154.9
16"	10	25	372	510	205.5
18"	10	25	428	545	192.2
20"	10	25	470	600	234.9

Different nominal pipe sizes and total lengths on request.

L = Total length

d₂ = Inner diameter

d₈ = Outer diameter

Technical data valid for the pressure rating Class 150.

NPS	Lining thickness		Possible vacuum		
	standard	thick-walled	23° C	150° C	200° C
1"	●	●	▬	▬	▬
1½"	●	●	▬	▬	▬
2"	●	●	▬	▬	▬
3"	●	●	▬	▬	▬
4"	●	●	▬	▬	▬
6"	●	●	▬	▬	▬
8"	●	●	▬	▬	▬
10"	●	●	▬	▬	▬
10"	●	●	▬	▬	▬

Vacuum resistance:

▬ = full vacuum

▬ = limited vacuum

▬ = no vacuum

Please refer to the next higher nominal pipe size if your nominal pipe size is not listed.

Spacers Form G (Class 150)

For total lengths from 10 - 100 mm we reinforce the Spacers Form G with a resilient metal core.



Spacers Form G (Class 150)

Materials:

- carbon steel
- stainless steel

Lining materials:

- PTFE (virgin or conductive)
- PP (up to nominal pipe size NPS 12")

Other pressure rating:

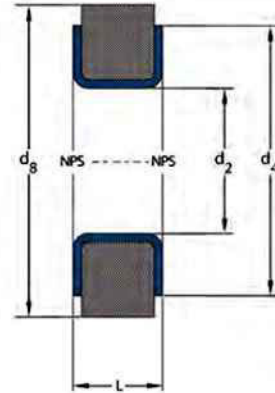
- Class 300

Special features:

- earthing stud/lug

Optional extras:

- final painting



NPS	L (mm)		d ₂ = (mm)	d ₄ (mm)	d ₅ (mm)	Weights at L _{max} (ca. kg/pc.)
	min.	max.				
1/2"	10	60	15	34.9	44	0.5
3/4"	10	60	15	42.9	54	0.9
1"	10	60	20	50.8	63	1.1
1 1/4"	10	60	29	63.5	73	1.4
1 1/2"	10	60	35	73.0	83	1.8
2"	10	60	45	92.1	101	2.6
2 1/2"	10	60	57	104.8	122	3.8
3"	10	70	70	127.0	133	4.9
4"	15	70	93	157.2	170	7.8
5"	15	70	119	185.7	194	8.5
6"	20	80	144	215.9	219	11.5
8"	20	80	191	269.9	273	15.8
10"	20	90	239	323.8	324	22.7
12"	20	90	290	381.0	405	38.3
14"	25	90	326	412.8	445	44.0
16"	25	90	372	469.9	510	58.7
18"	25	100	428	533.4	545	58.1
20"	25	100	470	584.2	600	75.4

Different nominal pipe sizes
and total lengths on request.

- L = Total length
- d₂ = Inner diameter
- d₄ = Raised face diameter
- d₅ = Outer diameter

Technical data valid for the pressure rating
Class 150.

NPS	Lining thickness		Possible vacuum		
	standard	thick-walled	23° C	150° C	200° C
1"	●	●	☐	☐	☐
1 1/2"	●	●	☐	☐	☐
2"	●	●	☐	☐	☐
3"	●	●	☐	☐	☐
4"	●	●	☐	☐	☐
6"	●	●	☐	☐	☐
8"	●	●	☐	☐	☐
10"	●	●	☐	☐	☐
12"	●	●	☐	☐	☐

Vacuum resistance:

- ☐ = full vacuum
- ☐ = limited vacuum
- ☐ = no vacuum

Please refer to the next
higher nominal pipe size
if your nominal pipe size
is not listed.

Spacers Form H (Class 150)

Spacers Form H with a total length up to 250 mm consist of a pressure-resistant, but lightweight metal core with interior lining.



Spacers Form H (Class 150)

Materials:

- carbon steel
- stainless steel

Lining materials:

- PTFE (virgin or conductive)
- PP (up to nominal pipe size NPS 12")

Other pressure rating:

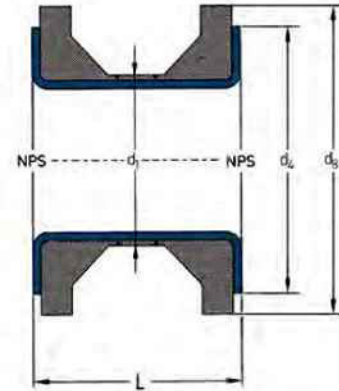
- Class 300

Special features:

- earthing stud/lug
- vent hole extension

Optional extras:

- final painting
- non-destructive testing



NPS	L (mm)		d ₁ (mm)	d ₂ (mm)	d ₃ (mm)	Weights at L _{max} (ca. kg/pc.)
	min.	max.				
½"	60	100	26.7	34.9	39.0	0.3
¾"	60	100	26.7	42.9	47.0	0.3
1"	60	100	33.4	50.8	54.0	0.4
1¼"	60	100	42.2	63.5	67.0	0.6
1½"	60	100	48.3	73.0	77.0	0.7
2"	60	100	60.3	92.1	97.0	1.0
2½"	60	100	73.0	104.8	108.0	1.4
3"	70	125	88.9	127.0	131.0	2.3
4"	70	125	114.3	157.2	161.0	3.2
5"	70	150	141.3	185.7	190.0	5.2
6"	80	150	168.3	215.9	219.0	6.6
8"	80	200	219.1	269.9	270.0	12.4
10"	80	200	273.0	323.8	324.0	17.0
12"	80	200	323.8	381.0	381.0	21.7
14"	80	250	355.6	412.8	413.0	31.4
16"	90	250	406.4	469.9	470.0	37.6
18"	100	250	457.0	533.4	533.4	44.8
20"	100	250	508.0	584.2	586.0	49.2

Different nominal pipe sizes and total lengths on request.

L = Total length
 d₁ = Outer diameter of the steel pipe
 d₂ = Raised face diameter
 d₃ = Outer diameter
 Technical data valid for the pressure rating Class 150.

NPS	Lining thickness		Possible vacuum		
	standard	thick-walled	23°C	150°C	200°C
1"	●	●	■	■	■
1½"	●	●	■	■	■
2"	●	●	■	■	■
3"	●	●	■	■	■
4"	●	●	■	■	■
6"	●	●	■	■	■
8"	●	●	■	■	■
10"	●	●	■	■	■
12"	●	●	■	■	■

Vacuum resistance:

- = full vacuum
- ▨ = limited vacuum
- = no vacuum

Please refer to the next higher nominal pipe size if your nominal pipe size is not listed.

Inclined Spacers (Class 150)

Flexible in every situation! The Inclined Spacers can be delivered in any angle, tapered on one side only or on both sides.



Inclined Spacers (Class 150)

Material:

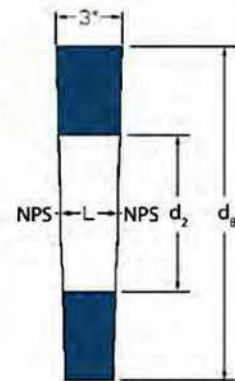
- PTFE (virgin or conductive)

Other pressure rating:

- Class 300

The standard angle for Inclined Spacer is 3°, other angles on request.

NPS	L (mm)	d ₂ ≈ (mm)	d ₃ (mm)	Weights (ca. kg/pc.)
1"	15	20	63	0.1
1¼"	15	29	73	0.1
1½"	15	35	83	0.1
2"	20	45	101	0.3
2½"	20	57	122	0.4
3"	20	70	133	0.4
4"	25	93	170	0.9
5"	25	119	194	1.0
6"	35	144	219	1.6
8"	35	191	273	2.2



Different nominal pipe sizes and total lengths on request.

L = Total length

d₂ = Inner diameter

d₃ = Outer diameter

Technical data valid for the pressure rating Class 150.

NPS	Lining thickness		Possible vacuum		
	standard	thick-walled	23° C	150° C	200° C
1"	●	●	■	■	■
1½"	●	●	■	■	■
2"	●	●	■	■	■
3"	●	●	■	■	■
4"	●	●	■	■	■
6"	●	●	■	■	■
8"	●	●	■	■	■

Vacuum resistance:

■ = full vacuum

▨ = limited vacuum

□ = no vacuum

Please refer to the next higher nominal pipe size if your nominal pipe size is not listed.

Flanged Elbows 30° / 60° (Class 150)

The manufacturing technology with paste-extruded PTFE liner assures an optimum flow and an exact fitting of the liner in the elbow segment.



Flanged Elbows 30° / 60° (Class 150)

Materials:

- carbon steel
- stainless steel

Lining materials:

- PTFE (virgin or conductive)
- PP (up to nominal pipe size NPS 12")

Flanges:

- fix-loose
- fix-fix
- loose-loose

Other pressure rating:

- Class 300

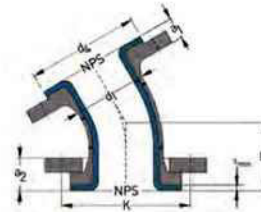
Special features:

- earthing stud/lug
- vent hole extension
- flange stopper

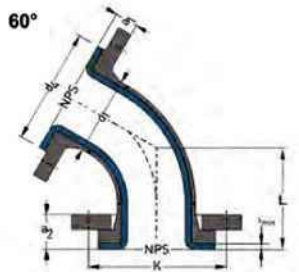
Optional extras:

- final painting
- non-destructive testing

30°



60°



NPS	L (mm)		d ₁ (mm)	d ₂ (mm)	K (mm)	s _{min} (mm)	a ₁ (mm)	a ₂ (mm)	No. of bolts x thread (UNC)	Weights	
	30°	60°								30° (ca. kg/pc.)	60° (ca. kg/pc.)
½"	45	60	26.7	34.9	60.3	3.0	14.6	22.2	4 x ½"	1.1	1.1
¾"	45	60	26.7	42.9	69.9	3.0	16.2	23.7	4 x ½"	1.7	1.8
1"	45	60	33.4	50.8	79.4	3.0	17.7	25.3	4 x ½"	2.3	2.5
1¼"	51	65	42.2	63.5	88.9	3.0	19.3	26.9	4 x ½"	3.1	3.4
1½"	57	70	48.3	73.0	98.4	4.0	21.9	29.5	4 x ½"	3.8	4.0
2"	64	80	60.3	92.1	120.7	3.0	22.5	30.1	4 x ⅝"	5.7	6.0
2½"	76	96	73.0	104.8	139.7	4.0	26.7	34.3	4 x ⅝"	9.0	9.5
3"	76	96	88.9	127.0	152.4	4.0	28.3	35.9	4 x ⅝"	11.0	11.7
4"	102	122	114.3	157.2	190.5	4.5	28.8	36.4	8 x ⅝"	15.8	17.0
5"	114	130	141.3	185.7	215.9	5.0	29.3	36.9	8 x ¾"	20.5	22.5
6"	127	135	168.3	215.9	241.3	5.0	30.9	38.4	8 x ¾"	26.0	29.1
8"	140	155	219.1	269.9	298.5	6.0	35.0	42.6	8 x ¾"	43.7	49.8
10"	165	185	273.0	323.8	362.0	6.0	36.6	46.2	12 x ⅞"	61.5	71.9
12"	190	215	323.8	381.0	431.8	5.0	37.2	46.8	12 x ⅞"	92.7	108.1
14"	190	245	355.6	412.8	476.3	6.0	41.4	51.0	12 x 1"	121.4	141.2
16"	203	275	406.4	469.9	539.8	7.0	44.0	58.6	16 x 1"	156.5	183.5
18"	240	302	457.0	533.4	577.9	5.0	45.1	59.7	16 x 1⅜"	177.6	210.1
20"	225	332	508.0	584.2	635.0	5.0	48.3	62.9	20 x 1⅜"	218.5	258.6

NPS	Lining thickness		Possible vacuum		
	standard	thick-walled	23° C	150° C	200° C
1"	●	●	■	■	■
1½"	●	●	■	■	■
2"	●	●	■	■	■
3"	●	●	■	■	■
4"	●	●	■	■	■
6"	●	●	■	■	■
8"	●	●	■	■	■
10"	●	●	■	■	■
12"	●	●	■	■	■

Vacuum resistance:

- = full vacuum
- (lighter) = limited vacuum
- = no vacuum

Please refer to the next higher nominal pipe size if your nominal pipe size is not listed.

Nominal pipe sizes over NPS 20"
up to NPS 1000" on request.

- L = Total length
 - d₁ = Outer diameter of the elbow
 - d₂ = Raised face diameter
 - K = Bolt circle diameter
 - s_{min} = Minimum flare thickness
 - a₁ = Minimum length with fixed flange and s_{min}
 - a₂ = Minimum length with loose flange and s_{min}
- Technical data valid for the pressure rating Class 150.
a₁ and a₂ depend on construction type and lining thickness.

Flanged Elbows 45° / 90° (Class 150)

The manufacturing technology with paste-extruded PTFE liner assures an optimum flow and an exact fitting of the liner in the elbow segment.



Flanged Elbows 45° / 90° (Class 150)

Materials:

- carbon steel
- stainless steel

Lining materials:

- PTFE (virgin or conductive)
- PP (up to nominal pipe size NPS 12")

Flanges:

- fix-loose
- fix-fix
- loose-loose

Other pressure rating:

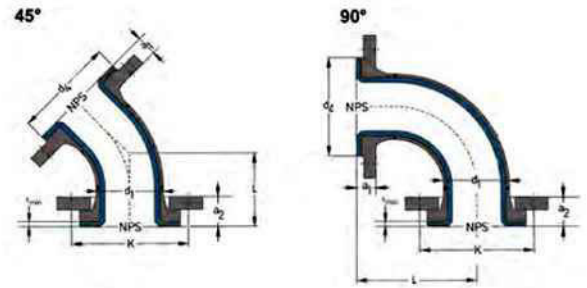
- Class 300

Special features:

- earthing stud/lug
- vent hole extension
- flange stopper

Optional extras:

- final painting
- non-destructive testing



NPS	L (mm)		d ₁ [mm]	d ₂ [mm]	K [mm]	s _{min} [mm]	a ₁ [mm]	a ₂ [mm]	No. of bolts x thread [UNC]	Weights		
	45°	90°								45° [ca. kg/pc.]	90° SR [ca. kg/pc.]	
		SR										LR
½"	44	65		26.7	34.9	60.3	3.0	14.6	22.2	4 x ½"	1.1	1.1
¾"	44	75		26.7	42.9	69.9	3.0	16.2	23.7	4 x ½"	1.7	1.8
1"	44	89	127	33.4	50.8	79.4	3.0	17.7	25.3	4 x ½"	2.4	2.6
1¼"	51	95	140	42.2	63.5	88.9	3.0	19.3	26.9	4 x ½"	3.2	3.5
1½"	57	102	152	48.3	73.0	98.4	4.0	21.9	29.5	4 x ½"	3.9	4.0
2"	64	114	165	60.3	92.1	120.7	3.0	22.5	30.1	4 x ⅝"	5.8	6.2
2½"	76	127	178	73.0	104.8	139.7	4.0	26.7	34.3	4 x ⅝"	9.3	10.0
3"	76	140	197	88.9	127.0	152.4	4.0	28.3	35.9	4 x ⅝"	11.4	12.3
4"	102	165	229	114.3	157.2	190.5	4.5	28.8	36.4	8 x ⅝"	16.4	18.1
5"	114	190	260	141.3	185.7	215.9	5.0	29.3	36.9	8 x ¾"	21.5	24.3
6"	127	203	292	168.3	215.9	241.3	5.0	30.9	38.4	8 x ¾"	27.5	31.7
8"	140	229	356	219.1	269.9	298.5	6.0	35.0	42.6	8 x ¾"	46.7	55.0
10"	165	279	419	273.0	323.8	362.0	6.0	36.6	46.2	12 x ⅞"	66.7	80.7
12"	190	305	483	323.8	381.0	431.8	5.0	37.2	46.8	12 x ⅞"	100.4	150.9
14"	190	356	546	355.6	412.8	476.3	6.0	41.4	51.0	12 x 1"	131.3	202.4
16"	203	381	610	406.4	469.9	539.8	7.0	44.0	58.6	16 x 1"	170.0	267.5
18"	216	419	673	457.0	533.4	577.9	5.0	45.1	59.7	16 x 1⅛"	193.8	312.5
20"	241	457	737	508.0	584.2	635.0	5.0	48.3	62.9	20 x 1⅛"	238.6	469.0

NPS	Lining thickness		Possible vacuum		
	standard	thick-walled	23°C	150°C	200°C
1"	●	●	■	■	■
1½"	●	●	■	■	■
2"	●	●	■	■	■
3"	●	●	■	■	■
4"	●	●	■	■	■
6"	●	●	■	■	■
8"	●	●	■	■	■
10"	●	●	■	■	■
12"	●	●	■	■	■

Vacuum resistance:

- = full vacuum
- ▨ = limited vacuum
- = no vacuum

Please refer to the next higher nominal pipe size if your nominal pipe size is not listed.

Nominal pipe sizes over NPS 20"
up to NPS 1000" on request.

- L = Total length
 - d₁ = Outer diameter of the elbow
 - d₂ = Raised face diameter
 - K = Bolt circle diameter
 - s_{min} = Minimum flare thickness
 - a₁ = Minimum length with fixed flange and s_{min}
 - a₂ = Minimum length with loose flange and s_{min}
- Technical data valid for the pressure rating Class 150.
a₁ and a₂ depend on construction type and lining thickness.

Types of Flanged Elbows 90°:

- from nominal pipe size NPS 12" as two-part component
- from nominal pipe size NPS 20" as three-part component

Flanged Tees (Class 150)

The one-piece design with PFA or PP lining assures a perfect flow in the base body and at the outlet. The manufacturing of our one-piece Flanged Tees is done by injection moulding. For Flanged Tees with nominal pipe

sizes larger than NPS, 4", we rely on our approved paste liner. Both manufacturing technologies assure a special smooth and easy-to-clean surface.



Flanged Tees (Class 150)

Materials:

- carbon steel
- stainless steel

Lining materials:

- up to nominal pipe size NPS₁ 4" (one-piece): PFA
- up to nominal pipe size NPS₁ 4" (one-piece): PP
- from nominal pipe size NPS₁ 5" (one-piece): on request
- from nominal pipe size NPS₁ 5" (two-piece): PTFE (virgin or conductive)

Flanges (reading order A-B-C):

- combinations of fixed flanges
- combinations of loose flanges
- combinations of fixed and loose flanges

Other pressure rating:

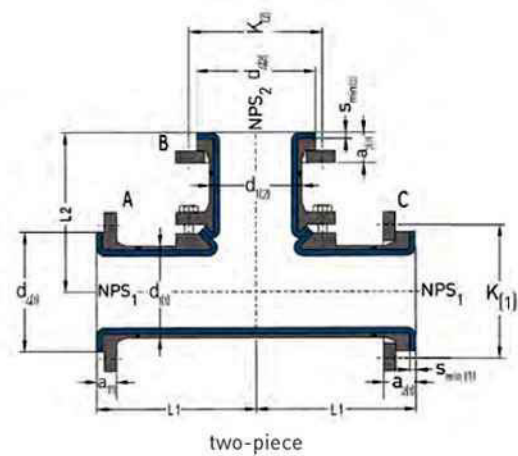
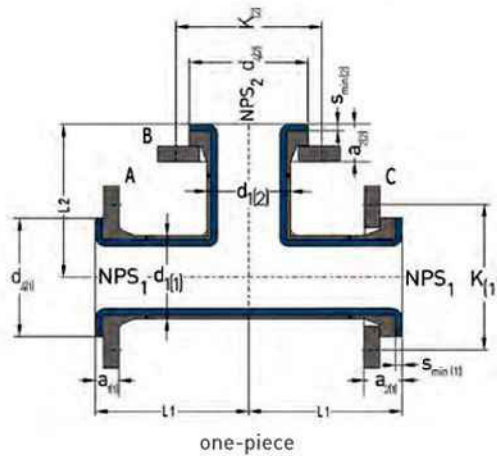
- Class 300

Special features:

- earthing stud/lug
- vent hole extension
- flange stopper

Optional extras:

- final painting
- non-destructive testing



NPS ₁	NPS ₂	L ₁ (mm)	L ₂ (mm)	d ₁₁₁ (mm)	d ₁₁₂ (mm)	K ₁₁ (mm)	s _{min11} (mm)	a ₁₁₁ (mm)	a ₂₁₁ (mm)	d ₁₂₁ (mm)	d ₁₂₂ (mm)	K ₁₂ (mm)	s _{min12} (mm)	a ₁₁₂ (mm)	a ₂₁₂ (mm)	No. of bolts x thread (UNC)		Wt. (ca. kg/pc.)
																NPS ₁	NPS ₂	
1/2"	1/2"	65	65	26.7	34.9	60.3	4.0	15.6	19.2	26.7	34.9	60.3	4.0	15.6	19.2	4 x 1/2"	4 x 1/2"	1.5
3/4"	1/2"	75	75	26.7	42.9	69.9	4.0	17.2	20.7	26.7	34.9	60.3	4.0	15.6	19.2	4 x 1/2"	4 x 1/2"	2.3
3/4"	3/4"	75	75	26.7	42.9	69.9	4.0	17.2	20.7	26.7	42.9	69.9	4.0	17.2	20.7	4 x 1/2"	4 x 1/2"	2.7
1"	1/2"	89	89	33.4	50.8	79.4	4.0	18.7	22.3	26.7	34.9	60.3	4.0	15.6	19.2	4 x 1/2"	4 x 1/2"	3.2
1"	3/4"	89	89	33.4	50.8	79.4	4.0	18.7	22.3	26.7	42.9	69.9	4.0	17.2	20.7	4 x 1/2"	4 x 1/2"	3.5
1"	1"	89	89	33.4	50.8	79.4	4.0	18.7	22.3	33.4	50.8	79.4	4.0	18.7	22.3	4 x 1/2"	4 x 1/2"	3.9
1 1/4"	1/2"	95	95	42.2	63.5	88.9	4.0	20.3	23.9	26.7	34.9	60.3	4.0	15.6	19.2	4 x 1/2"	4 x 1/2"	4.1
1 1/4"	3/4"	95	95	42.2	63.5	88.9	4.0	20.3	23.9	26.7	42.9	69.9	4.0	17.2	20.7	4 x 1/2"	4 x 1/2"	4.4
1 1/4"	1"	95	95	42.2	63.5	88.9	4.0	20.3	23.9	33.4	50.8	79.4	4.0	18.7	22.3	4 x 1/2"	4 x 1/2"	4.8
1 1/4"	1 1/4"	95	95	42.2	63.5	88.9	4.0	20.3	23.9	42.2	63.5	88.9	4.0	20.3	23.9	4 x 1/2"	4 x 1/2"	5.3
1 1/2"	3/4"	102	102	48.3	73.0	98.4	4.0	21.9	25.5	26.7	42.9	69.9	4.0	17.2	20.7	4 x 1/2"	4 x 1/2"	4.7
1 1/2"	1"	102	102	48.3	73.0	98.4	4.0	21.9	25.5	33.4	50.8	79.4	4.0	18.7	22.3	4 x 1/2"	4 x 1/2"	5.0
1 1/2"	1 1/4"	102	102	48.3	73.0	98.4	4.0	21.9	25.5	42.2	63.5	88.9	4.0	20.3	23.9	4 x 1/2"	4 x 1/2"	5.4
1 1/2"	1 1/2"	102	102	48.3	73.0	98.4	4.0	21.9	25.5	48.3	73.0	98.4	4.0	21.9	25.5	4 x 1/2"	4 x 1/2"	5.8
2"	1"	114	114	60.3	92.1	120.7	4.0	23.5	27.6	33.4	50.8	79.4	4.0	18.7	22.3	4 x 5/8"	4 x 1/2"	7.1
2"	1 1/4"	114	114	60.3	92.1	120.7	4.0	23.5	27.6	42.2	63.5	88.9	4.0	20.3	23.9	4 x 5/8"	4 x 1/2"	7.5
2"	1 1/2"	114	114	60.3	92.1	120.7	4.0	23.5	27.6	48.3	73.0	98.4	4.0	21.9	25.5	4 x 5/8"	4 x 1/2"	7.9
2"	2"	114	114	60.3	92.1	120.7	4.0	23.5	27.6	60.3	92.1	120.7	4.0	23.5	27.6	4 x 5/8"	4 x 5/8"	8.9

continued on the next page

Flanged Tees (Class 150)

NPS ₁	NPS ₂	L ₁ (mm)	L ₂ (mm)	d ₁₁₁ (mm)	d ₄₁₁ (mm)	K ₁₁₁ (mm)	s _{min (1)} (mm)	a ₁₁₁ (mm)	a ₂₁₁ (mm)	d ₁₂₁ (mm)	d ₄₂₁ (mm)	K ₁₂₁ (mm)	s _{min (2)} (mm)	a ₁₂₁ (mm)	a ₂₂₁ (mm)	No. of bolts x thread [UNC]		Wt. (ca. kg/pc.)
																NPS ₁	NPS ₂	
2½"	1"	127	127	73.0	104.8	139.7	4.0	26.7	31.5	33.4	50.8	79.4	4.0	18.7	22.3	4 x ⅝"	4 x ½"	10.7
2½"	1¼"	127	127	73.0	104.8	139.7	4.0	26.7	31.5	42.2	63.5	88.9	4.0	20.3	23.9	4 x ⅝"	4 x ½"	11.2
2½"	1½"	127	127	73.0	104.8	139.7	4.0	26.7	31.5	48.3	73.0	98.4	4.0	21.9	25.5	4 x ⅝"	4 x ½"	11.6
2½"	2"	127	127	73.0	104.8	139.7	4.0	26.7	31.5	60.3	92.1	120.7	4.0	23.5	27.6	4 x ⅝"	4 x ⅝"	12.6
2½"	2½"	127	127	73.0	104.8	139.7	4.0	26.7	31.5	73.0	104.8	139.7	4.0	26.7	31.5	4 x ⅝"	4 x ⅝"	14.3
3"	1"	140	140	88.9	127.0	152.4	4.0	28.3	33.4	33.4	50.8	79.4	4.0	18.7	22.3	4 x ⅝"	4 x ½"	13.2
3"	1½"	140	140	88.9	127.0	152.4	4.0	28.3	33.4	48.3	73.0	98.4	4.0	21.9	25.5	4 x ⅝"	4 x ½"	14.1
3"	2"	140	140	88.9	127.0	152.4	4.0	28.3	33.4	60.3	92.1	120.7	4.0	23.5	27.6	4 x ⅝"	4 x ⅝"	15.1
3"	2½"	140	140	88.9	127.0	152.4	4.0	28.3	33.4	73.0	104.8	139.7	4.0	26.7	31.5	4 x ⅝"	4 x ⅝"	16.9
3"	3"	140	140	88.9	127.0	152.4	4.0	28.3	33.4	88.9	127.0	152.4	4.0	28.3	33.4	4 x ⅝"	4 x ⅝"	18.0
4"	1"	165	165	114.3	157.2	190.5	4.0	28.3	33.9	33.4	50.8	79.4	4.0	18.7	22.3	8 x ⅝"	4 x ½"	18.8
4"	2"	165	165	114.3	157.2	190.5	4.0	28.3	33.9	60.3	92.1	120.7	4.0	23.5	27.6	8 x ⅝"	4 x ⅝"	20.8
4"	2½"	165	165	114.3	157.2	190.5	4.0	28.3	33.9	73.0	104.8	139.7	4.0	26.7	31.5	8 x ⅝"	4 x ⅝"	22.6
4"	3"	165	165	114.3	157.2	190.5	4.0	28.3	33.9	88.9	127.0	152.4	4.0	28.3	33.4	8 x ⅝"	4 x ⅝"	23.8
4"	4"	165	165	114.3	157.2	190.5	4.0	28.3	33.9	114.3	157.2	190.5	4.0	28.3	33.9	8 x ⅝"	8 x ⅝"	26.3
5"	2½"	190	190	141.3	185.7	215.9	5.0	29.3	35.5	73.0	104.8	139.7	3.0	25.7	30.5	8 x ¾"	4 x ⅝"	43.2
5"	3"	190	190	141.3	185.7	215.9	5.0	29.3	35.5	88.9	127.0	152.4	3.0	27.3	32.4	8 x ¾"	4 x ⅝"	46.3
5"	4"	190	190	141.3	185.7	215.9	5.0	29.3	35.5	114.3	157.2	190.5	3.0	27.3	32.9	8 x ¾"	8 x ⅝"	52.1
5"	5"	190	190	141.3	185.7	215.9	5.0	29.3	35.5	141.3	185.7	215.9	4.0	28.3	34.5	8 x ¾"	8 x ¾"	58.6
6"	3"	203	203	168.3	215.9	241.3	7.0	32.9	39.5	88.9	127.0	152.4	3.0	27.3	32.4	8 x ¾"	4 x ⅝"	53.1
6"	4"	203	203	168.3	215.9	241.3	7.0	32.9	39.5	114.3	157.2	190.5	3.0	27.3	32.9	8 x ¾"	8 x ⅝"	59.0
6"	5"	203	203	168.3	215.9	241.3	7.0	32.9	39.5	141.3	185.7	215.9	4.0	28.3	34.5	8 x ¾"	8 x ¾"	65.6
6"	6"	203	203	168.3	215.9	241.3	7.0	32.9	39.5	168.3	215.9	241.3	4.5	30.4	37.0	8 x ¾"	8 x ¾"	77.3
8"	4"	229	229	219.1	269.9	298.5	6.0	35.0	42.8	114.3	157.2	190.5	3.0	27.3	32.9	8 x ¾"	8 x ⅝"	79.2
8"	5"	229	229	219.1	269.9	298.5	6.0	35.0	42.8	141.3	185.7	215.9	4.0	28.3	34.5	8 x ¾"	8 x ¾"	86.0
8"	6"	229	229	219.1	269.9	298.5	6.0	35.0	42.8	168.3	215.9	241.3	4.5	30.4	37.0	8 x ¾"	8 x ¾"	97.9
8"	8"	229	229	219.1	269.9	298.5	6.0	35.0	42.8	219.1	269.9	298.5	5.0	34.0	41.8	8 x ¾"	8 x ¾"	115.4
10"	5"	279	279	273.0	323.8	362.0	7.5	38.1	47.0	141.3	185.7	215.9	4.0	28.3	34.5	12 x ⅞"	8 x ¾"	112.4
10"	6"	279	279	273.0	323.8	362.0	7.5	38.1	47.0	168.3	215.9	241.3	4.5	30.4	37.0	12 x ⅞"	8 x ¾"	124.7
10"	8"	279	279	273.0	323.8	362.0	7.5	38.1	47.0	219.1	269.9	298.5	5.0	34.0	41.8	12 x ⅞"	8 x ¾"	143.0
10"	10"	279	279	273.0	323.8	362.0	7.5	38.1	47.0	273.0	323.8	362.0	7.5	38.1	47.0	12 x ⅞"	12 x ⅞"	165.2
12"	6"	305	305	323.8	381.0	431.8	7.5	39.7	49.6	168.3	215.9	241.3	4.5	30.4	37.0	12 x ⅞"	8 x ¾"	159.5
12"	8"	305	305	323.8	381.0	431.8	7.5	39.7	49.6	219.1	269.9	298.5	5.0	34.0	41.8	12 x ⅞"	8 x ¾"	178.3
12"	10"	305	305	323.8	381.0	431.8	7.5	39.7	49.6	273.0	323.8	362.0	7.5	38.1	47.0	12 x ⅞"	12 x ⅞"	201.0
12"	12"	305	305	323.8	381.0	431.8	7.5	39.7	49.6	323.8	381.0	431.8	5.0	37.2	47.1	12 x ⅞"	12 x ⅞"	223.7
14"	8"	356	356	355.6	412.8	476.3	10.0	45.4	60.0	219.1	269.9	298.5	5.0	34.0	41.8	12 x 1"	8 x ¾"	215.3
14"	10"	356	356	355.6	412.8	476.3	10.0	45.4	60.0	273.0	323.8	362.0	7.5	38.1	47.0	12 x 1"	12 x ⅞"	239.0
14"	12"	356	356	355.6	412.8	476.3	10.0	45.4	60.0	323.8	381.0	431.8	5.0	37.2	47.1	12 x 1"	12 x ⅞"	262.5
14"	14"	356	356	355.6	412.8	476.3	10.0	45.4	60.0	355.6	412.8	476.3	5.0	40.4	55.0	12 x 1"	12 x 1"	304.7

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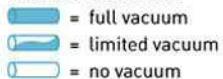
Flanged Tees (Class 150)

NPS ₁	NPS ₂	L ₁ (mm)	L ₂ (mm)	d ₁₍₁₎ (mm)	d ₂₍₁₎ (mm)	K ₁₍₁₎ (mm)	s _{min(1)} (mm)	a ₁₍₁₎ (mm)	a ₂₍₁₎ (mm)	d ₁₍₂₎ (mm)	d ₂₍₂₎ (mm)	K ₁₍₂₎ (mm)	s _{min(2)} (mm)	a ₁₍₂₎ (mm)	a ₂₍₂₎ (mm)	No. of bolts x thread (UNC)		Wt. (ca. kg/pc.)
																NPS ₁	NPS ₂	
16"	10"	381	381	406.4	469.9	539.8	7.0	44.0	58.6	273.0	323.8	362.0	7.5	38.1	47.0	16 x 1"	12 x 7/8"	283.3
16"	12"	381	381	406.4	469.9	539.8	7.0	44.0	58.6	323.8	381.0	431.8	5.0	37.2	47.1	16 x 1"	12 x 7/8"	307.2
16"	14"	381	381	406.4	469.9	539.8	7.0	44.0	58.6	355.6	412.8	476.3	5.0	40.4	55.0	16 x 1"	12 x 1"	349.6
16"	16"	381	381	406.4	469.9	539.8	7.0	44.0	58.6	406.4	469.9	539.8	5.0	42.0	56.6	16 x 1"	16 x 1"	402.5
18"	12"	419	419	457.0	533.4	577.9	8.0	48.1	62.7	323.8	381.0	431.8	5.0	37.2	47.1	16 x 1 1/8"	12 x 7/8"	336.3
18"	14"	419	419	457.0	533.4	577.9	8.0	48.1	62.7	355.6	412.8	476.3	5.0	40.4	55.0	16 x 1 1/8"	12 x 1"	379.0
18"	16"	419	419	457.0	533.4	577.9	8.0	48.1	62.7	406.4	469.9	539.8	5.0	42.0	56.6	16 x 1 1/8"	16 x 1"	432.7
18"	18"	419	419	457.0	533.4	577.9	8.0	48.1	62.7	457.0	533.4	577.9	5.0	45.1	59.7	16 x 1 1/8"	16 x 1 1/8"	469.9
20"	12"	457	457	508.0	584.2	635.0	8.0	51.3	65.9	323.8	381.0	431.8	5.0	37.2	47.1	20 x 1 1/8"	12 x 7/8"	389.3
20"	14"	457	457	508.0	584.2	635.0	8.0	51.3	65.9	355.6	412.8	476.3	5.0	40.4	55.0	20 x 1 1/8"	12 x 1"	432.4
20"	16"	457	457	508.0	584.2	635.0	8.0	51.3	65.9	406.4	469.9	539.8	5.0	42.0	56.6	20 x 1 1/8"	16 x 1"	486.8
20"	18"	457	457	508.0	584.2	635.0	8.0	51.3	65.9	457.0	533.4	577.9	5.0	45.1	59.7	20 x 1 1/8"	16 x 1 1/8"	524.3
20"	20"	457	457	508.0	584.2	635.0	8.0	51.3	65.9	508.0	584.2	635.0	5.0	48.3	62.9	20 x 1 1/8"	20 x 1 1/8"	571.1

Different nominal pipe sizes and total lengths on request.

- L = Total length
 - d₁ = Outer diameter of the pipe
 - d₂ = Raised face diameter
 - K = Bolt circle diameter
 - s_{min} = Minimum flare thickness
 - a₁ = Minimum length with fixed flange and s_{min}
 - a₂ = Minimum length with loose flange and s_{min}
- Technical data valid for the pressure rating Class 150.
a1 and a2 depend on construction type and lining thickness.

NPS ₁	Lining thickness		Possible vacuum		
	standard	thick-walled	23° C	150° C	200° C
1"	●	●	■	■	■
1 1/2"	●	●	■	■	■
2"	●	●	■	■	■
3"	●	●	■	■	■
4"	●	●	■	■	■
6"	●	●	■	■	■
8"	●	●	■	■	■
10"	●	●	■	■	■
12"	●	●	■	■	■

Vacuum resistance:

 ■ = full vacuum
 ■ = limited vacuum
 □ = no vacuum
 Please refer to the next higher nominal pipe size if your nominal pipe size is not listed.

Flanged Lateral Tees 45° (Class 150)

The one-piece design with PFA or PP lining offers a low-resistance flow through the entire component by a streamlined geometry.



Flanged Lateral Tees 45° (Class 150)

Materials:

- carbon steel
- stainless steel

Lining materials:

- PFA (virgin or conductive)
- PP

Flanges (reading order A-B-C):

- combinations of fixed flanges
- combinations of loose flanges
- combinations of fixed and loose flanges

Other pressure rating:

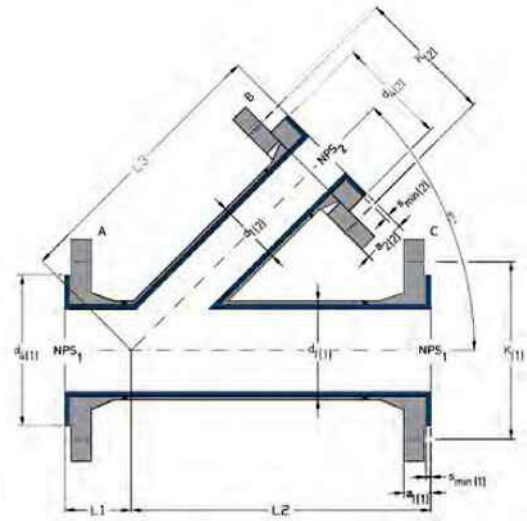
- Class 300

Special features:

- earthing stud/lug
- vent hole extension
- flange stopper

Optional extras:

- final painting
- non-destructive testing



NPS ₁	NPS ₂	L ₁ [mm]	L ₂ =L ₃ [mm]	d ₁₍₁₎ [mm]	d ₄₍₁₎ [mm]	K ₁₍₁₎ [mm]	s _{min(1)} [mm]	a ₁₍₁₎ [mm]	a ₂₍₁₎ [mm]	d ₁₍₂₎ [mm]	d ₄₍₂₎ [mm]	K ₁₍₂₎ [mm]	s _{min(2)} [mm]	a ₁₍₂₎ [mm]	a ₂₍₂₎ [mm]	No. of bolts x thread (UNC)		Wt. [ca. kg/pc.]
																NPS ₁	NPS ₂	
1"	1"	44	146	33.4	50.8	79.4	4.0	18.7	22.3	33.4	50.8	79.4	4.0	18.7	22.3	4 x 1/2"	4 x 1/2"	3.9
1 1/2"	1 1/2"	51	178	48.3	73.0	98.4	4.0	21.9	25.5	48.3	73.0	98.4	4.0	21.9	25.5	4 x 1/2"	4 x 1/2"	6.9
2"	1"	64	203	60.3	92.1	120.7	4.0	23.5	27.6	33.4	50.8	79.4	4.0	18.7	22.3	4 x 5/8"	4 x 1/2"	8.3
2"	1 1/2"	64	203	60.3	92.1	120.7	4.0	23.5	27.6	48.3	73.0	98.4	4.0	21.9	25.5	4 x 5/8"	4 x 1/2"	9.3
2"	2"	64	203	60.3	92.1	120.7	4.0	23.5	27.6	60.3	92.1	120.7	4.0	23.5	27.6	4 x 5/8"	4 x 5/8"	10.5
3"	1"	76	254	88.9	127.0	152.4	4.0	28.3	33.4	33.4	50.8	79.4	4.0	18.7	22.3	4 x 5/8"	4 x 1/2"	15.5
3"	2"	76	254	88.9	127.0	152.4	4.0	28.3	33.4	60.3	92.1	120.7	4.0	23.5	27.6	4 x 5/8"	4 x 5/8"	17.7
3"	3"	76	254	88.9	127.0	152.4	4.0	28.3	33.4	88.9	127.0	152.4	4.0	28.3	33.4	4 x 5/8"	4 x 5/8"	21.3
4"	1"	76	305	114.3	157.2	190.5	4.0	28.3	33.9	33.4	50.8	79.4	4.0	18.7	22.3	8 x 5/8"	4 x 1/2"	21.8
4"	2"	76	305	114.3	157.2	190.5	4.0	28.3	33.9	60.3	92.1	120.7	4.0	23.5	27.6	8 x 5/8"	4 x 5/8"	24.2
4"	3"	76	305	114.3	157.2	190.5	4.0	28.3	33.9	88.9	127.0	152.4	4.0	28.3	33.4	8 x 5/8"	4 x 5/8"	28.0
4"	4"	76	305	114.3	157.2	190.5	4.0	28.3	33.9	114.3	157.2	190.5	4.0	28.3	33.9	8 x 5/8"	8 x 5/8"	31.1

continued on the next page




Flanged Lateral Tees 45° (Class 150)

NPS ₁	NPS ₂	Possible flanges							
		fix-fix-fix	fix-fix-loose	fix-loose-fix	loose-fix-fix	fix-loose-loose	loose-loose-fix	loose-fix-Los	loose-loose-loose
1"	1"	●	-	-	●	-	-	-	-
1½"	1½"	●	●	●	●	-	●	●	-
2"	1"	●	●	●	●	●	●	●	●
2"	1½"	●	●	●	●	-	●	●	-
2"	2"	●	-	-	●	-	-	-	-
3"	1"	●	●	●	●	●	●	●	●
3"	2"	●	●	●	●	●	●	●	●
3"	3"	●	-	-	●	-	-	-	-
4"	1"	●	●	●	●	●	●	●	●
4"	2"	●	●	●	●	●	●	●	●
4"	3"	●	●	●	●	-	●	●	-
4"	4"	●	-	-	●	-	-	-	-

Different nominal pipe sizes and total lengths on request.

- L = Total length
 - d₁ = Outer diameter of the pipe
 - d₂ = Raised face diameter
 - K = Bolt circle diameter
 - s_{min} = Minimum flare thickness
 - a₁ = Minimum length with fixed flange and s_{min}
 - a₂ = Minimum length with loose flange and s_{min}
- Technical data valid for the pressure rating Class 150.
a₁ and a₂ depend on construction type and lining thickness.

NPS ₁	Lining thickness		Possible vacuum		
	standard	thick-walled	23° C	150° C	200° C
1"	●	●	☐	☐	☐
1½"	●	●	☐	☐	☐
2"	●	●	☐	☐	☐
3"	●	●	☐	☐	☐
4"	●	●	☐	☐	☐

Vacuum resistance:
 = full vacuum
 = limited vacuum
 = no vacuum
 Please refer to the next higher nominal pipe size if your nominal pipe size is not listed.

Flanged Crosses (Class 150)

The one-piece design with PFA or PP lining assures a perfect flow in all four directions. The manufacturing of our one-piece Flanged Crosses is done by injection moulding. For Flanged Crosses with nominal pipe sizes

larger than NPS 4", we rely on our approved paste liner. Both manufacturing technologies assure a specially smooth and easy-to-clean surface.



Flanged Crosses (Class 150)

Materials:

- carbon steel
- stainless steel

Lining materials:

- up to nominal pipe size NPS₁ 4" (one-piece): PFA
- up to nominal pipe size NPS₁ 4" (one-piece): PP
- from nominal pipe size NPS₁ 5" (one-piece): on request
- from nominal pipe size NPS₁ 5" (three-piece): PTFE (virgin or conductive)

Flanges (reading order A-B-C-D):

- combinations of fixed flanges
- combinations of loose flanges
- combinations of fixed and loose flanges

Other pressure rating:

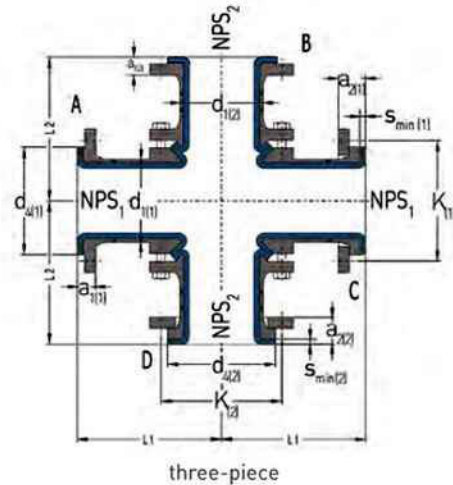
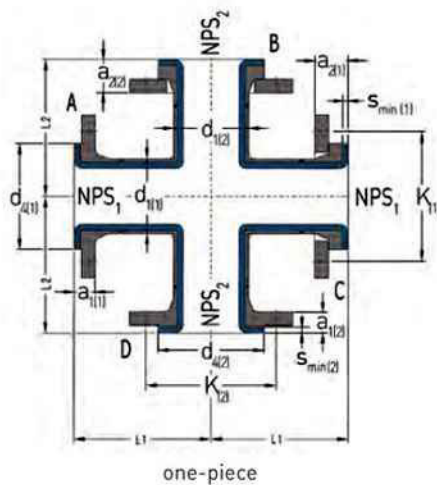
- Class 300

Special features:

- earthing stud/lug
- vent hole extension
- flange stopper

Optional extras:

- final painting
- non-destructive testing



NPS ₁	NPS ₂	L ₁ (mm)	L ₂ (mm)	d ₁₍₁₎ (mm)	d ₂₍₁₎ (mm)	K ₁₍₁₎ (mm)	s _{min(1)} (mm)	a ₁₍₁₎ (mm)	a ₂₍₁₎ (mm)	d ₁₍₂₎ (mm)	d ₂₍₂₎ (mm)	K ₂₍₂₎ (mm)	s _{min(2)} (mm)	a ₁₍₂₎ (mm)	a ₂₍₂₎ (mm)	No. of bolts x thread (UNC)		Wt. (ca. kg/pc.)
																NPS ₁	NPS ₂	
1/2"	1/2"	65	65	26.7	34.9	60.3	4.0	15.6	19.2	26.7	34.9	60.3	4.0	15.6	19.2	4 x 1/2"	4 x 1/2"	2.3
3/4"	1/2"	75	75	26.7	42.9	69.9	4.0	17.2	20.7	26.7	34.9	60.3	4.0	15.6	19.2	4 x 1/2"	4 x 1/2"	3.2
3/4"	3/4"	75	75	26.7	42.9	69.9	4.0	17.2	20.7	26.7	42.9	69.9	4.0	17.2	20.7	4 x 1/2"	4 x 1/2"	3.9
1"	1/2"	89	89	33.4	50.8	79.4	4.0	18.7	22.3	26.7	34.9	60.3	4.0	15.6	19.2	4 x 1/2"	4 x 1/2"	4.1
1"	3/4"	89	89	33.4	50.8	79.4	4.0	18.7	22.3	26.7	42.9	69.9	4.0	17.2	20.7	4 x 1/2"	4 x 1/2"	4.9
1"	1"	89	89	33.4	50.8	79.4	4.0	18.7	22.3	33.4	50.8	79.4	4.0	18.7	22.3	4 x 1/2"	4 x 1/2"	5.7
1 1/4"	1/2"	95	95	42.2	63.5	88.9	4.0	20.3	23.9	26.7	34.9	60.3	4.0	15.6	19.2	4 x 1/2"	4 x 1/2"	5.2
1 1/4"	3/4"	95	95	42.2	63.5	88.9	4.0	20.3	23.9	26.7	42.9	69.9	4.0	17.2	20.7	4 x 1/2"	4 x 1/2"	5.9
1 1/4"	1"	95	95	42.2	63.5	88.9	4.0	20.3	23.9	33.4	50.8	79.4	4.0	18.7	22.3	4 x 1/2"	4 x 1/2"	6.8
1 1/4"	1 1/4"	95	95	42.2	63.5	88.9	4.0	20.3	23.9	42.2	63.5	88.9	4.0	20.3	23.9	4 x 1/2"	4 x 1/2"	7.7
1 1/2"	3/4"	102	102	48.3	73.0	98.4	4.0	21.9	25.5	26.7	42.9	69.9	4.0	17.2	20.7	4 x 1/2"	4 x 1/2"	6.0
1 1/2"	1"	102	102	48.3	73.0	98.4	4.0	21.9	25.5	33.4	50.8	79.4	4.0	18.7	22.3	4 x 1/2"	4 x 1/2"	6.7
1 1/2"	1 1/4"	102	102	48.3	73.0	98.4	4.0	21.9	25.5	42.2	63.5	88.9	4.0	20.3	23.9	4 x 1/2"	4 x 1/2"	7.5
1 1/2"	1 1/2"	102	102	48.3	73.0	98.4	4.0	21.9	25.5	48.3	73.0	98.4	4.0	21.9	25.5	4 x 1/2"	4 x 1/2"	8.4
2"	1"	114	114	60.3	92.1	120.7	4.0	23.5	27.6	33.4	50.8	79.4	4.0	18.7	22.3	4 x 5/8"	4 x 1/2"	9.0
2"	1 1/4"	114	114	60.3	92.1	120.7	4.0	23.5	27.6	42.2	63.5	88.9	4.0	20.3	23.9	4 x 5/8"	4 x 1/2"	9.8
2"	1 1/2"	114	114	60.3	92.1	120.7	4.0	23.5	27.6	48.3	73.0	98.4	4.0	21.9	25.5	4 x 5/8"	4 x 1/2"	10.7
2"	2"	114	114	60.3	92.1	120.7	4.0	23.5	27.6	60.3	92.1	120.7	4.0	23.5	27.6	4 x 5/8"	4 x 5/8"	12.8

continued on the next page

Flanged Crosses (Class 150)

NPS ₁	NPS ₂	L ₁ [mm]	L ₂ [mm]	d ₁₍₁₎ [mm]	d ₂₍₁₎ [mm]	K ₁₍₁₎ [mm]	s _{min(1)} [mm]	a ₁₍₁₎ [mm]	a ₂₍₁₎ [mm]	d ₁₍₂₎ [mm]	d ₂₍₂₎ [mm]	K ₂₍₂₎ [mm]	s _{min(2)} [mm]	a ₁₍₂₎ [mm]	a ₂₍₂₎ [mm]	No. of bolts x thread (UNC)		Wt. [ca. kg/pc.]
																NPS ₁	NPS ₂	
2½"	1"	127	127	73.0	104.8	139.7	4.0	26.7	31.5	33.4	50.8	79.4	4.0	18.7	22.3	4 x ¾"	4 x ½"	12.9
2½"	1¼"	127	127	73.0	104.8	139.7	4.0	26.7	31.5	42.2	63.5	88.9	4.0	20.3	23.9	4 x ¾"	4 x ½"	13.8
2½"	1½"	127	127	73.0	104.8	139.7	4.0	26.7	31.5	48.3	73.0	98.4	4.0	21.9	25.5	4 x ¾"	4 x ½"	14.7
2½"	2"	127	127	73.0	104.8	139.7	4.0	26.7	31.5	60.3	92.1	120.7	4.0	23.5	27.6	4 x ¾"	4 x ¾"	16.9
2½"	2½"	127	127	73.0	104.8	139.7	4.0	26.7	31.5	73.0	104.8	139.7	4.0	26.7	31.5	4 x ¾"	4 x ¾"	20.6
3"	1"	140	140	88.9	127.0	152.4	4.0	28.3	33.4	33.4	50.8	79.4	4.0	18.7	22.3	4 x ¾"	4 x ½"	15.6
3"	1½"	140	140	88.9	127.0	152.4	4.0	28.3	33.4	48.3	73.0	98.4	4.0	21.9	25.5	4 x ¾"	4 x ½"	17.5
3"	2"	140	140	88.9	127.0	152.4	4.0	28.3	33.4	60.3	92.1	120.7	4.0	23.5	27.6	4 x ¾"	4 x ¾"	19.7
3"	2½"	140	140	88.9	127.0	152.4	4.0	28.3	33.4	73.0	104.8	139.7	4.0	26.7	31.5	4 x ¾"	4 x ¾"	23.4
3"	3"	140	140	88.9	127.0	152.4	4.0	28.3	33.4	88.9	127.0	152.4	4.0	28.3	33.4	4 x ¾"	4 x ¾"	25.8
4"	1"	165	165	114.3	157.2	190.5	4.0	28.3	33.9	33.4	50.8	79.4	4.0	18.7	22.3	8 x ¾"	4 x ½"	21.7
4"	2"	165	165	114.3	157.2	190.5	4.0	28.3	33.9	60.3	92.1	120.7	4.0	23.5	27.6	8 x ¾"	4 x ¾"	25.9
4"	2½"	165	165	114.3	157.2	190.5	4.0	28.3	33.9	73.0	104.8	139.7	4.0	26.7	31.5	8 x ¾"	4 x ¾"	29.9
4"	3"	165	165	114.3	157.2	190.5	4.0	28.3	33.9	88.9	127.0	152.4	4.0	28.3	33.4	8 x ¾"	4 x ¾"	32.4
4"	4"	165	165	114.3	157.2	190.5	4.0	28.3	33.9	114.3	157.2	190.5	4.0	28.3	33.9	8 x ¾"	8 x ¾"	37.6
5"	2½"	190	190	141.3	185.7	215.9	5.0	29.3	35.5	73.0	104.8	139.7	3.0	25.7	30.5	8 x ¾"	4 x ¾"	51.1
5"	3"	190	190	141.3	185.7	215.9	5.0	29.3	35.5	88.9	127.0	152.4	3.0	27.3	32.4	8 x ¾"	4 x ¾"	55.5
5"	4"	190	190	141.3	185.7	215.9	5.0	29.3	35.5	114.3	157.2	190.5	3.0	27.3	32.9	8 x ¾"	8 x ¾"	64.2
5"	5"	190	190	141.3	185.7	215.9	5.0	29.3	35.5	141.3	185.7	215.9	4.0	28.3	34.5	8 x ¾"	8 x ¾"	73.5
6"	3"	203	203	168.3	215.9	241.3	7.0	32.9	39.5	88.9	127.0	152.4	3.0	27.3	32.4	8 x ¾"	4 x ¾"	63.0
6"	4"	203	203	168.3	215.9	241.3	7.0	32.9	39.5	114.3	157.2	190.5	3.0	27.3	32.9	8 x ¾"	8 x ¾"	71.8
6"	5"	203	203	168.3	215.9	241.3	7.0	32.9	39.5	141.3	185.7	215.9	4.0	28.3	34.5	8 x ¾"	8 x ¾"	81.3
6"	6"	203	203	168.3	215.9	241.3	7.0	32.9	39.5	168.3	215.9	241.3	4.5	30.4	37.0	8 x ¾"	8 x ¾"	96.3
8"	4"	229	229	219.1	269.9	298.5	6.0	35.0	42.8	114.3	157.2	190.5	3.0	27.3	32.9	8 x ¾"	8 x ¾"	94.0
8"	5"	229	229	219.1	269.9	298.5	6.0	35.0	42.8	141.3	185.7	215.9	4.0	28.3	34.5	8 x ¾"	8 x ¾"	103.9
8"	6"	229	229	219.1	269.9	298.5	6.0	35.0	42.8	168.3	215.9	241.3	4.5	30.4	37.0	8 x ¾"	8 x ¾"	119.4
8"	8"	229	229	219.1	269.9	298.5	6.0	35.0	42.8	219.1	269.9	298.5	5.0	34.0	41.8	8 x ¾"	8 x ¾"	147.2
10"	5"	279	279	273.0	323.8	362.0	7.5	38.1	47.0	141.3	185.7	215.9	4.0	28.3	34.5	12 x ¾"	8 x ¾"	133.7
10"	6"	279	279	273.0	323.8	362.0	7.5	38.1	47.0	168.3	215.9	241.3	4.5	30.4	37.0	12 x ¾"	8 x ¾"	150.0
10"	8"	279	279	273.0	323.8	362.0	7.5	38.1	47.0	219.1	269.9	298.5	5.0	34.0	41.8	12 x ¾"	8 x ¾"	179.6
10"	10"	279	279	273.0	323.8	362.0	7.5	38.1	47.0	273.0	323.8	362.0	7.5	38.1	47.0	12 x ¾"	12 x ¾"	212.9
12"	6"	305	305	323.8	381.0	431.8	7.5	39.7	49.6	168.3	215.9	241.3	4.5	30.4	37.0	12 x ¾"	8 x ¾"	188.2
12"	8"	305	305	323.8	381.0	431.8	7.5	39.7	49.6	219.1	269.9	298.5	5.0	34.0	41.8	12 x ¾"	8 x ¾"	218.7
12"	10"	305	305	323.8	381.0	431.8	7.5	39.7	49.6	273.0	323.8	362.0	7.5	38.1	47.0	12 x ¾"	12 x ¾"	253.2
12"	12"	305	305	323.8	381.0	431.8	7.5	39.7	49.6	323.8	381.0	431.8	5.0	37.2	47.1	12 x ¾"	12 x ¾"	293.3
14"	8"	356	356	355.6	412.8	476.3	10.0	45.4	60.0	219.1	269.9	298.5	5.0	34.0	41.8	12 x 1"	8 x ¾"	261.4
14"	10"	356	356	355.6	412.8	476.3	10.0	45.4	60.0	273.0	323.8	362.0	7.5	38.1	47.0	12 x 1"	12 x ¾"	298.1
14"	12"	356	356	355.6	412.8	476.3	10.0	45.4	60.0	323.8	381.0	431.8	5.0	37.2	47.1	12 x 1"	12 x ¾"	339.9
14"	14"	356	356	355.6	412.8	476.3	10.0	45.4	60.0	355.6	412.8	476.3	5.0	40.4	55.0	12 x 1"	12 x 1"	397.2

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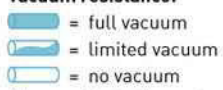
Flanged Crosses (Class 150)

NPS ₁	NPS ₂	L ₁ (mm)	L ₂ (mm)	d ₁₍₁₎ (mm)	d ₄₍₁₎ (mm)	K ₍₁₎ (mm)	s _{min (1)} (mm)	a ₁₍₁₎ (mm)	a ₂₍₁₎ (mm)	d ₁₍₂₎ (mm)	d ₄₍₂₎ (mm)	K ₍₂₎ (mm)	s _{min (2)} (mm)	a ₁₍₂₎ (mm)	a ₂₍₂₎ (mm)	No. of bolts x thread (UNC)		Wt. [ca. kg/pc.]
																NPS ₁	NPS ₂	
16"	10"	381	381	406.4	469.9	539.8	7.0	44.0	58.6	273.0	323.8	362.0	7.5	38.1	47.0	16 x 1"	12 x 7/8"	347.4
16"	12"	381	381	406.4	469.9	539.8	7.0	44.0	58.6	323.8	381.0	431.8	5.0	37.2	47.1	16 x 1"	12 x 7/8"	390.1
16"	14"	381	381	406.4	469.9	539.8	7.0	44.0	58.6	355.6	412.8	476.3	5.0	40.4	55.0	16 x 1"	12 x 1"	447.9
16"	16"	381	381	406.4	469.9	539.8	7.0	44.0	58.6	406.4	469.9	539.8	5.0	42.0	56.6	16 x 1"	16 x 1"	521.8
18"	12"	419	419	457.0	533.4	577.9	8.0	48.1	62.7	323.8	381.0	431.8	5.0	37.2	47.1	16 x 1 1/8"	12 x 7/8"	424.8
18"	14"	419	419	457.0	533.4	577.9	8.0	48.1	62.7	355.6	412.8	476.3	5.0	40.4	55.0	16 x 1 1/8"	12 x 1"	483.3
18"	16"	419	419	457.0	533.4	577.9	8.0	48.1	62.7	406.4	469.9	539.8	5.0	42.0	56.6	16 x 1 1/8"	16 x 1"	558.8
18"	18"	419	419	457.0	533.4	577.9	8.0	48.1	62.7	457.0	533.4	577.9	5.0	45.1	59.7	16 x 1 1/8"	16 x 1 1/8"	605.2
20"	12"	457	457	508.0	584.2	635.0	8.0	51.3	65.9	323.8	381.0	431.8	5.0	37.2	47.1	20 x 1 1/8"	12 x 7/8"	485.4
20"	14"	457	457	508.0	584.2	635.0	8.0	51.3	65.9	355.6	412.8	476.3	5.0	40.4	55.0	20 x 1 1/8"	12 x 1"	544.6
20"	16"	457	457	508.0	584.2	635.0	8.0	51.3	65.9	406.4	469.9	539.8	5.0	42.0	56.6	20 x 1 1/8"	16 x 1"	621.7
20"	18"	457	457	508.0	584.2	635.0	8.0	51.3	65.9	457.0	533.4	577.9	5.0	45.1	59.7	20 x 1 1/8"	16 x 1 1/8"	668.7
20"	20"	457	457	508.0	584.2	635.0	8.0	51.3	65.9	508.0	584.2	635.0	5.0	48.3	62.9	20 x 1 1/8"	20 x 1 1/8"	738.9

Different nominal pipe sizes and total lengths on request.

- L = Total length
 - d₁ = Outer diameter of the pipe
 - d₄ = Raised face diameter
 - K = Bolt circle diameter
 - s_{min} = Minimum flare thickness
 - a₁ = Minimum length with fixed flange and s_{min}
 - a₂ = Minimum length with loose flange and s_{min}
- Technical data valid for the pressure rating Class 150.
a₁ and a₂ depend on construction type and lining thickness.

NPS ₁	Lining thickness		Possible vacuum		
	standard	thick-walled	23° C	150° C	200° C
1"	●	●	☐	☐	☐
1 1/2"	●	●	☐	☐	☐
2"	●	●	☐	☐	☐
3"	●	●	☐	☐	☐
4"	●	●	☐	☐	☐
6"	●	●	☐	☐	☐
8"	●	●	☐	☐	☐
10"	●	●	☐	☐	☐
12"	●	●	☐	☐	☐

Vacuum resistance:

 ☐ = full vacuum
 ☐ = limited vacuum
 ☐ = no vacuum
 Please refer to the next higher nominal pipe size if your nominal pipe size is not listed.

Instrument Tees (Class 150)

Instrument Tees, also known as gauge connections, are the one-piece solution with PFA or PP lining for the connection to your measuring devices. In case of narrow space, also useable as short tee.



Instrument Tees (Class 150)

Materials:

- carbon steel
- stainless steel

Lining materials:

- PFA (virgin or conductive)
- PP

Other pressure rating:

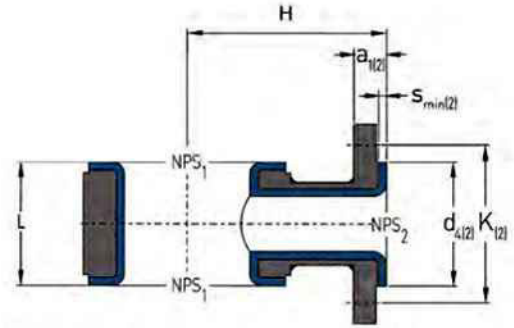
- Class 300

Special features:

- earthing stud/lug
- vent hole extension

Optional extras:

- final painting



NPS ₁	NPS ₂	L	H	d ₄₍₂₎	K ₍₂₎	s _{min(2)}	a ₁₍₂₎	No. of bolts x thread [UNC]	Weights
		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	NPS ₂	(ca. kg/piece)
1"	½"	50	90	34.9	60.3	4.0	15.6	4 x ½"	1.5
1"	¾"	50	90	42.9	69.9	4.0	17.2	4 x ½"	1.8
1"	1"	50	90	50.8	79.4	4.0	18.7	4 x ½"	2.1
1¼"	½"	50	100	34.9	60.3	4.0	15.6	4 x ½"	1.4
1¼"	¾"	50	100	42.9	69.9	4.0	17.2	4 x ½"	1.7
1¼"	1"	50	100	50.8	79.4	4.0	18.7	4 x ½"	2.0
1½"	½"	50	110	34.9	60.3	4.0	15.6	4 x ½"	2.1
1½"	¾"	50	110	42.9	69.9	4.0	17.2	4 x ½"	2.4
1½"	1"	50	110	50.8	79.4	4.0	18.7	4 x ½"	2.7
1½"	1½"	75	110	73.0	98.4	4.0	21.9	4 x ½"	4.4
2"	½"	50	115	34.9	60.3	4.0	15.6	4 x ½"	2.8
2"	¾"	50	115	42.9	69.9	4.0	17.2	4 x ½"	3.1
2"	1"	50	115	50.8	79.4	4.0	18.7	4 x ½"	3.4
2"	1½"	75	115	73.0	98.4	4.0	21.9	4 x ½"	5.5
2"	2"	90	115	92.1	120.7	4.0	23.5	4 x 5/8"	7.2
2½"	½"	50	125	34.9	60.3	4.0	15.6	4 x ½"	2.9
2½"	¾"	50	125	42.9	69.9	4.0	17.2	4 x ½"	3.2
2½"	1"	50	125	50.8	79.4	4.0	18.7	4 x ½"	3.5
2½"	1½"	75	125	73.0	98.4	4.0	21.9	4 x ½"	5.7
2½"	2"	90	125	92.1	120.7	4.0	23.5	4 x 5/8"	7.4
3"	½"	50	135	34.9	60.3	4.0	15.6	4 x ½"	4.0
3"	¾"	50	135	42.9	69.9	4.0	17.2	4 x ½"	4.3
3"	1"	50	135	50.8	79.4	4.0	18.7	4 x ½"	4.6
3"	1½"	75	135	73.0	98.4	4.0	21.9	4 x ½"	7.4
3"	2"	90	135	92.1	120.7	4.0	23.5	4 x 5/8"	9.6
4"	½"	50	150	34.9	60.3	4.0	15.6	4 x ½"	5.0
4"	¾"	50	150	42.9	69.9	4.0	17.2	4 x ½"	5.3
4"	1"	50	150	50.8	79.4	4.0	18.7	4 x ½"	5.6
4"	1½"	75	150	73.0	98.4	4.0	21.9	4 x ½"	9.0
4"	2"	90	150	92.1	120.7	4.0	23.5	4 x 5/8"	13.7
5"	½"	50	160	34.9	60.3	4.0	15.6	4 x ½"	6.5
5"	¾"	50	160	42.9	69.9	4.0	17.2	4 x ½"	6.8
5"	1"	50	160	50.8	79.4	4.0	18.7	4 x ½"	7.1
5"	1½"	75	160	73.0	98.4	4.0	21.9	4 x ½"	11.4
5"	2"	90	160	92.1	120.7	4.0	23.5	4 x 5/8"	14.4




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Instrument Tees [Class 150]

NPS ₁	NPS ₂	L [mm]	H [mm]	d _{fl(z)} [mm]	K _{fl(z)} [mm]	s _{min(z)} [mm]	a _{fl(z)} [mm]	No. of bolts x thread [UNC] NPS ₂	Weights [ca. kg/piece]
6"	½"	50	180	34.9	60.3	4.0	15.6	4 x ½"	7.9
6"	¾"	50	180	42.9	69.9	4.0	17.2	4 x ½"	8.2
6"	1"	50	180	50.8	79.4	4.0	18.7	4 x ½"	8.5
6"	1½"	75	180	73.0	98.4	4.0	21.9	4 x ½"	13.5
6"	2"	90	180	92.1	120.7	4.0	23.5	4 x ⅝"	17.0
8"	½"	50	210	34.9	60.3	4.0	15.6	4 x ½"	10.5
8"	¾"	50	210	42.9	69.9	4.0	17.2	4 x ½"	10.8
8"	1"	50	210	50.8	79.4	4.0	18.7	4 x ½"	11.2
8"	1½"	75	210	73.0	98.4	4.0	21.9	4 x ½"	17.7
8"	2"	90	210	92.1	120.7	4.0	23.5	4 x ⅝"	22.1
10"	1"	50	240	50.8	79.4	4.0	18.7	4 x ½"	13.5
10"	1½"	75	240	73.0	98.4	4.0	21.9	4 x ½"	21.4
10"	2"	90	240	92.1	120.7	4.0	23.5	4 x ⅝"	26.6
12"	1"	50	340	50.8	79.4	4.0	18.7	4 x ½"	22.7
12"	1½"	75	340	73.0	98.4	4.0	21.9	4 x ½"	30.3
12"	2"	90	340	92.1	120.7	4.0	23.5	4 x ⅝"	37.5
14"	1"	90	375	50.8	79.4	4.0	18.7	4 x ½"	47.0
14"	1½"	110	375	73.0	98.4	4.0	21.9	4 x ½"	2.9
14"	2"	120	375	92.1	120.7	4.0	23.5	4 x ⅝"	65.5
16"	1"	90	390	50.8	79.4	4.0	18.7	4 x ½"	53.3
16"	1½"	110	390	73.0	98.4	4.0	21.9	4 x ½"	66.6
16"	2"	120	390	92.1	120.7	4.0	23.5	4 x ⅝"	73.9
18"	1"	90	425	50.8	79.4	4.0	18.7	4 x ½"	49.9
18"	1½"	110	425	73.0	98.4	4.0	21.9	4 x ½"	62.4
18"	2"	120	425	92.1	120.7	4.0	23.5	4 x ⅝"	69.3
20"	1"	90	450	50.8	79.4	4.0	18.7	4 x ½"	74.0
20"	1½"	110	450	73.0	98.4	4.0	21.9	4 x ½"	92.5
20"	2"	120	450	92.1	120.7	4.0	23.5	4 x ⅝"	102.3

NPS ₁	Lining thickness		Possible vacuum		
	standard	thick-walled	23°C	150°C	200°C
1"	●	●	☐	☐	☐
1½"	●	●	☐	☐	☐
2"	●	●	☐	☐	☐
3"	●	●	☐	☐	☐
4"	●	●	☐	☐	☐
6"	●	●	☐	☐	☐
8"	●	●	☐	☐	☐
10"	●	●	☐	☐	☐
12"	●	●	☐	☐	☐

Vacuum resistance:

-  = full vacuum
-  = limited vacuum
-  = no vacuum

Please refer to the next higher nominal pipe size if your nominal pipe size is not listed.

Different nominal pipe sizes and total lengths on request.

- L = Total length
- H = Overall height
- d_{fl} = Raised face diameter
- K = Bolt circle diameter
- s_{min} = Minimum flare thickness
- a_{fl} = Minimum length with fixed flange and s_{min}

Technical data valid for the pressure rating Class 150.

a_{fl} depends on construction type and lining thickness.

Reducing Flanges (Class 150)

We have a custom-made solution for transitions between all nominal pipe sizes. Depending on the reduction, lined with PTFE, PFA or PP.



Reducing Flanges (Class 150)

Materials:

- carbon steel
- stainless steel

Lining materials:

- PTFE (virgin or conductive)
- PFA (virgin or conductive)
- PP

Other pressure rating:

- Class 300

Special features:

- earthing stud/lug

Optional extras:

- final painting

Form K1 (concentric):

- NPS₁: through holes
- NPS₂: threaded holes

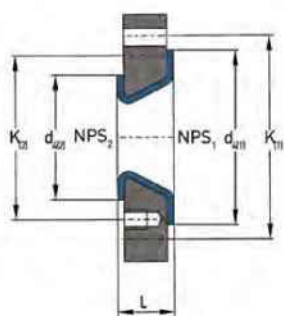
Form K2 (concentric):

- NPS₁: threaded holes
- NPS₂: threaded holes

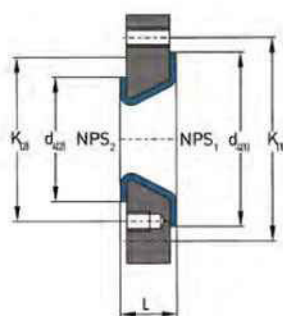
Form K3 (concentric):

- NPS₁: threaded holes
- NPS₂: threaded holes on centre line

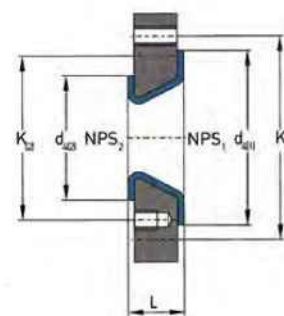
Excentric Reducing Flanges – Form E2 and E3 according to DIN 2848 – on request.



Form K1



Form K2



Form K3

NPS ₁	NPS ₂	L (mm)	Form	d _{d11} (mm)	K ₁₁ (mm)	d _{d21} (mm)	K ₂₁ (mm)	Lining materials	No. of bolts x thread (UNC)		Weights (ca. kg/piece)
									NPS ₁	NPS ₂	
¾"	½"	35	K3	42.9	69.9	34.9	60.3	PTFE	4 x ½"	4 x ½"	1.8
1"	½"	35	K3	50.8	79.4	34.9	60.3	PTFE	4 x ½"	4 x ½"	2.2
1"	¾"	35	K3	50.8	79.4	42.9	69.9	PTFE	4 x ½"	4 x ½"	2.1
1¼"	¾"	35	K3	63.5	88.9	42.9	69.9	PTFE	4 x ½"	4 x ½"	2.5
1¼"	1"	35	K3	63.5	88.9	50.8	79.4	PTFE	4 x ½"	4 x ½"	2.5
1½"	¾"	35	K2	73.0	98.4	42.9	69.9	PFA	4 x ½"	4 x ½"	3.1
1½"	1"	35	K3	73.0	98.4	50.8	79.4	PTFE	4 x ½"	4 x ½"	3.0
1½"	1¼"	35	K3	73.0	98.4	63.5	88.9	PTFE	4 x ½"	4 x ½"	3.0
2"	¾"	35	K2	92.1	120.7	42.9	69.9	PFA	4 x ⅝"	4 x ½"	4.2
2"	1"	35	K2	92.1	120.7	50.8	79.4	PFA	4 x ⅝"	4 x ½"	4.2
2"	1¼"	35	K3	92.1	120.7	63.5	88.9	PTFE	4 x ⅝"	4 x ½"	3.8
2"	1½"	35	K3	92.1	120.7	73.0	98.4	PTFE	4 x ⅝"	4 x ½"	3.8
2½"	¾"	35	K2	104.8	139.7	42.9	69.9	PFA	4 x ⅝"	4 x ½"	5.8
2½"	1"	35	K2	104.8	139.7	50.8	79.4	PFA	4 x ⅝"	4 x ½"	5.7
2½"	1¼"	35	K2	104.8	139.7	63.5	88.9	PFA	4 x ⅝"	4 x ½"	5.6
2½"	1½"	35	K3	104.8	139.7	73.0	98.4	PTFE	4 x ⅝"	4 x ½"	5.3
2½"	2"	35	K3	104.8	139.7	92.1	120.7	PTFE	4 x ⅝"	4 x ⅝"	5.2
3"	1"	35	K1	127.0	152.4	50.8	79.4	PFA	4 x ⅝"	4 x ½"	6.4
3"	1¼"	35	K2	127.0	152.4	63.5	88.9	PFA	4 x ⅝"	4 x ½"	6.4
3"	1½"	35	K2	127.0	152.4	73.0	98.4	PFA	4 x ⅝"	4 x ½"	6.3
3"	2"	35	K2	127.0	152.4	92.1	120.7	PTFE	4 x ⅝"	4 x ⅝"	5.9
3"	2½"	35	K2	127.0	152.4	104.8	139.7	PTFE	4 x ⅝"	4 x ⅝"	5.8

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Reducing Flanges (Class 150)

NPS ₁	NPS ₂	L (mm)	Form	d ₄₁₁ (mm)	K ₁₁₁ (mm)	d ₄₂₁ (mm)	K ₁₂₁ (mm)	Lining materials	No. of bolts x thread (UNC)		Weights (ca. kg/piece)
									NPS ₁	NPS ₂	
4"	1"	45	K1	157.2	190.5	50.8	79.4	PFA	8 x 5/8"	4 x 1/2"	11.6
4"	1 1/4"	45	K1	157.2	190.5	63.5	88.9	PFA	8 x 5/8"	4 x 1/2"	11.6
4"	1 1/2"	45	K1	157.2	190.5	73.0	98.4	PFA	8 x 5/8"	4 x 1/2"	11.5
4"	2"	45	K2	157.2	190.5	92.1	120.7	PFA	8 x 5/8"	4 x 5/8"	11.4
4"	2 1/2"	45	K2	157.2	190.5	104.8	139.7	PTFE	8 x 5/8"	4 x 5/8"	10.7
4"	3"	45	K3	157.2	190.5	127.0	152.4	PTFE	8 x 5/8"	4 x 5/8"	10.5
5"	1"	45	K1	185.7	215.9	50.8	79.4	PFA	8 x 3/4"	4 x 1/2"	13.8
5"	1 1/4"	45	K1	185.7	215.9	63.5	88.9	PFA	8 x 3/4"	4 x 1/2"	13.4
5"	1 1/2"	45	K1	185.7	215.9	73.0	98.4	PFA	8 x 3/4"	4 x 1/2"	13.4
5"	2"	45	K1	185.7	215.9	92.1	120.7	PFA	8 x 3/4"	4 x 5/8"	13.1
5"	2 1/2"	45	K2	185.7	215.9	104.8	139.7	PFA	8 x 3/4"	4 x 5/8"	12.8
5"	3"	45	K2	185.7	215.9	127.0	152.4	PTFE	8 x 3/4"	4 x 5/8"	11.8
5"	4"	45	K3	185.7	215.9	157.2	190.5	PTFE	8 x 3/4"	8 x 5/8"	11.4
6"	1"	45	K1	215.9	241.3	50.8	79.4	PFA	8 x 3/4"	4 x 1/2"	16.3
6"	1 1/4"	45	K1	215.9	241.3	63.5	88.9	PFA	8 x 3/4"	4 x 1/2"	16.6
6"	1 1/2"	45	K1	215.9	241.3	73.0	98.4	PFA	8 x 3/4"	4 x 1/2"	16.5
6"	2"	45	K1	215.9	241.3	92.1	120.7	PFA	8 x 3/4"	4 x 5/8"	16.5
6"	2 1/2"	45	K1	215.9	241.3	104.8	139.7	PFA	8 x 3/4"	4 x 5/8"	16.1
6"	3"	45	K1	215.9	241.3	127.0	152.4	PFA	8 x 3/4"	4 x 5/8"	15.6
6"	4"	45	K2	215.9	241.3	157.2	190.5	PTFE	8 x 3/4"	8 x 5/8"	13.7
6"	5"	45	K3	215.9	241.3	185.7	215.9	PTFE	8 x 3/4"	8 x 3/4"	13.5
8"	2"	45	K1	269.9	298.5	92.1	120.7	PFA	8 x 3/4"	4 x 5/8"	24.9
8"	2 1/2"	45	K1	269.9	298.5	104.8	139.7	PFA	8 x 3/4"	4 x 5/8"	26.0
8"	3"	45	K1	269.9	298.5	127.0	152.4	PFA	8 x 3/4"	4 x 5/8"	24.9
8"	4"	45	K1	269.9	298.5	157.2	190.5	PFA	8 x 3/4"	8 x 5/8"	25.0
8"	5"	45	K1	269.9	298.5	185.7	215.9	PTFE	8 x 3/4"	8 x 3/4"	23.1
8"	6"	45	K2	269.9	298.5	215.9	241.3	PTFE	8 x 3/4"	8 x 3/4"	21.9
10"	2 1/2"	45	K1	323.8	362.0	104.8	139.7	PFA	12 x 7/8"	4 x 5/8"	39.2
10"	3"	45	K1	323.8	362.0	127.0	152.4	PFA	12 x 7/8"	4 x 5/8"	37.5
10"	4"	45	K1	323.8	362.0	157.2	190.5	PFA	12 x 7/8"	8 x 5/8"	36.3
10"	5"	45	K1	323.8	362.0	185.7	215.9	PTFE	12 x 7/8"	8 x 3/4"	30.4
10"	6"	45	K1	323.8	362.0	215.9	241.3	PTFE	12 x 7/8"	8 x 3/4"	30.4
10"	8"	45	K2	323.8	362.0	269.9	298.5	PTFE	12 x 7/8"	8 x 3/4"	27.5
12"	3"	50	K1	381.0	431.8	127.0	152.4	PTFE	12 x 7/8"	4 x 5/8"	55.1
12"	4"	50	K1	381.0	431.8	157.2	190.5	PTFE	12 x 7/8"	8 x 5/8"	53.4
12"	5"	50	K1	381.0	431.8	185.7	215.9	PTFE	12 x 7/8"	8 x 3/4"	51.0
12"	6"	50	K1	381.0	431.8	215.9	241.3	PTFE	12 x 7/8"	8 x 3/4"	50.8
12"	8"	50	K1	381.0	431.8	269.9	298.5	PTFE	12 x 7/8"	8 x 3/4"	48.9
12"	10"	50	K2	381.0	431.8	323.8	362.0	PTFE	12 x 7/8"	12 x 7/8"	46.7
14"	4"	50	K1	412.8	476.3	157.2	190.5	PTFE	12 x 1"	8 x 5/8"	64.3
14"	5"	50	K1	412.8	476.3	185.7	215.9	PTFE	12 x 1"	8 x 3/4"	62.9
14"	6"	50	K1	412.8	476.3	215.9	241.3	PTFE	12 x 1"	8 x 3/4"	62.6
14"	8"	50	K1	412.8	476.3	269.9	298.5	PTFE	12 x 1"	8 x 3/4"	60.8
14"	10"	50	K1	412.8	476.3	323.8	362.0	PTFE	12 x 1"	12 x 7/8"	56.2
14"	12"	50	K2	412.8	476.3	381.0	431.8	PTFE	12 x 1"	12 x 7/8"	53.1

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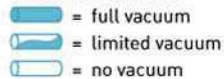
Reducing Flanges (Class 150)

NPS ₁	NPS ₂	L (mm)	Form	d ₄₁₁ (mm)	K ₁₁₁ (mm)	d ₄₂₁ (mm)	K ₁₂₁ (mm)	Lining materials	No. of bolts x thread (UNC)		Weights (ca. kg/piece)
									NPS ₁	NPS ₂	
16"	5"	50	K1	469.9	539.8	185.7	215.9	PTFE	16 x 1"	8 x 3/4"	84.1
16"	6"	50	K1	469.9	539.8	215.9	241.3	PTFE	16 x 1"	8 x 3/4"	81.7
16"	8"	50	K1	469.9	539.8	269.9	298.5	PTFE	16 x 1"	8 x 3/4"	76.7
16"	10"	50	K1	469.9	539.8	323.8	362.0	PTFE	16 x 1"	12 x 7/8"	76.4
16"	12"	50	K1	469.9	539.8	381.0	431.8	PTFE	16 x 1"	12 x 7/8"	68.3
16"	14"	50	K2	469.9	539.8	412.8	476.3	PTFE	16 x 1"	12 x 1"	63.6
18"	6"	50	K1	533.4	577.9	215.9	241.3	PTFE	16 x 1 1/8"	8 x 3/4"	80.2
18"	8"	50	K1	533.4	577.9	269.9	298.5	PTFE	16 x 1 1/8"	8 x 3/4"	78.4
18"	10"	50	K1	533.4	577.9	323.8	362.0	PTFE	16 x 1 1/8"	12 x 7/8"	76.1
18"	12"	50	K1	533.4	577.9	381.0	431.8	PTFE	16 x 1 1/8"	12 x 7/8"	73.8
18"	14"	50	K1	533.4	577.9	412.8	476.3	PTFE	16 x 1 1/8"	12 x 1"	72.2
18"	16"	50	K2	533.4	577.9	469.9	539.8	PTFE	16 x 1 1/8"	16 x 1"	69.4
20"	6"	50	K1	584.2	635.0	215.9	241.3	PTFE	20 x 1 1/8"	8 x 3/4"	115.0
20"	8"	50	K1	584.2	635.0	269.9	298.5	PTFE	20 x 1 1/8"	8 x 3/4"	110.3
20"	10"	50	K1	584.2	635.0	323.8	362.0	PTFE	20 x 1 1/8"	12 x 7/8"	104.5
20"	12"	50	K1	584.2	635.0	381.0	431.8	PTFE	20 x 1 1/8"	12 x 7/8"	100.5
20"	14"	50	K1	584.2	635.0	412.8	476.3	PTFE	20 x 1 1/8"	12 x 1"	95.2
20"	16"	50	K1	584.2	635.0	469.9	539.8	PTFE	20 x 1 1/8"	16 x 1"	87.6

Different nominal pipe sizes and total lengths on request.

L = Total length
d₄ = Raised face diameter
K = Bolt circle diameter
Technical data valid for the pressure rating Class 150.

NPS	Lining thickness		Possible vacuum		
	standard	thick-walled	23°C	150°C	200°C
1"	●		■	■	■
1 1/2"	●		■	■	■
2"	●		■	■	■
3"	●		■	■	■
4"	●		■	■	■
6"	●		■	■	■
8"	●		■	■	■
10"	●		■	■	■
12"	●		■	■	■

Vacuum resistance:

■ = full vacuum
□ = limited vacuum
□ = no vacuum
Please refer to the next higher nominal pipe size if your nominal pipe size is not listed.

Flanged Reducers concentric (Class 150)

Concentric Flanged Reducers are the universal solution for all changes of the nominal pipe size. Depending on the nominal width, the reducers are lined with PTFE, PFA or PP.



Flanged Reducers concentric (Class 150)

Materials:

- carbon steel
- stainless steel

Lining materials:

- PTFE (virgin or conductive)
- PFA (virgin or conductive)
- PP

Flanges:

- fix-fix
- fix-loose
- loose-loose

Other pressure rating:

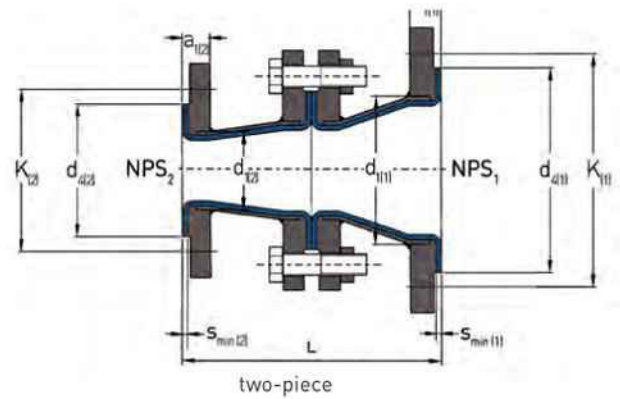
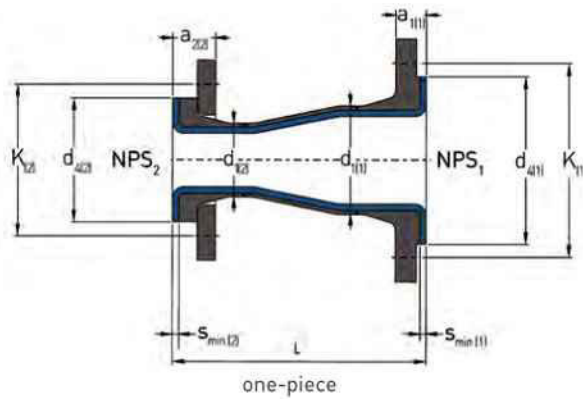
- Class 300

Special features:

- earthing stud/ lug
- vent hole extension

Optional extras:

- final painting
- non-destructive testing



NPS ₁	NPS ₂	L (mm)	d _{1(I)} (mm)	d _{4(I)} (mm)	K _{1(I)} (mm)	s _{min(I)} (mm)	a _{1(I)} (mm)	a _{2(I)} (mm)	d _{1(I)} (mm)	d _{4(I)} (mm)	K _{1(I)} (mm)	s _{min(I)} (mm)	a _{1(I)} (mm)	a _{2(I)} (mm)	Lining materials	No. of bolts x thread (UNC)		Wt. (ca. kg/pc.)
																NPS ₁	NPS ₂	
¾"	½"	114	26.7	42.9	69.9	3.0	16.2	19.7	26.7	34.9	60.3	3.0	14.6	18.2	PTFE	4 x ½"	4 x ½"	1.5
1"	½"	114	33.4	50.8	79.4	3.0	17.7	21.3	26.7	34.9	60.3	3.0	14.6	18.2	PTFE	4 x ½"	4 x ½"	1.9
1"	¾"	114	33.4	50.8	79.4	3.0	17.7	21.3	26.7	42.9	69.9	3.0	16.2	19.7	PTFE	4 x ½"	4 x ½"	2.2
1¼"	¾"	114	42.2	63.5	88.9	3.0	19.3	22.9	26.7	42.9	69.9	3.0	16.2	19.7	PTFE	4 x ½"	4 x ½"	2.7
1¼"	1"	114	42.2	63.5	88.9	3.0	19.3	22.9	33.4	50.8	79.4	3.0	17.7	21.3	PTFE	4 x ½"	4 x ½"	3.0
1½"	¾"	114	48.3	73.0	98.4	4.0	21.9	25.5	26.7	42.9	69.9	4.0	17.2	20.7	PFA	4 x ½"	4 x ½"	2.9
1½"	1"	114	48.3	73.0	98.4	3.0	20.9	24.5	33.4	50.8	79.4	3.0	17.7	21.3	PTFE	4 x ½"	4 x ½"	3.3
1½"	1¼"	114	48.3	73.0	98.4	3.0	20.9	24.5	42.2	63.5	88.9	3.0	19.3	22.9	PTFE	4 x ½"	4 x ½"	3.7
2"	1"	127	60.3	92.1	120.7	4.0	23.5	27.6	33.4	50.8	79.4	4.0	18.7	22.3	PFA	4 x ⅝"	4 x ½"	4.5
2"	1¼"	127	60.3	92.1	120.7	3.0	22.5	26.6	42.2	63.5	88.9	3.0	19.3	22.9	PTFE	4 x ⅝"	4 x ½"	5.0
2"	1½"	127	60.3	92.1	120.7	3.0	22.5	26.6	48.3	73.0	98.4	3.0	20.9	24.5	PTFE	4 x ⅝"	4 x ½"	5.0
2½"	1¼"	140	73.0	104.8	139.7	4.0	26.7	31.5	42.2	63.5	88.9	4.0	20.3	23.9	PFA	4 x ⅝"	4 x ½"	6.4
2½"	1½"	140	73.0	104.8	139.7	4.0	26.7	31.5	48.3	73.0	98.4	4.0	21.9	25.5	PTFE	4 x ⅝"	4 x ½"	6.6
2½"	2"	140	73.0	104.8	139.7	4.0	26.7	31.5	60.3	92.1	120.7	4.0	23.5	27.6	PTFE	4 x ⅝"	4 x ⅝"	7.6
3"	1"	152	88.9	127.0	152.4	4.0	28.3	33.4	33.4	50.8	79.4	4.0	18.7	22.3	PFA	4 x ⅝"	4 x ½"	7.0
3"	1½"	152	88.9	127.0	152.4	4.0	28.3	33.4	48.3	73.0	98.4	4.0	21.9	25.5	PFA	4 x ⅝"	4 x ½"	7.9
3"	2"	152	88.9	127.0	152.4	3.0	27.3	32.4	60.3	92.1	120.7	3.0	22.5	26.6	PTFE	4 x ⅝"	4 x ⅝"	8.7
3"	2½"	152	88.9	127.0	152.4	3.0	27.3	32.4	73.0	104.8	139.7	3.0	25.7	30.5	PTFE	4 x ⅝"	4 x ⅝"	10.5
4"	2"	178	114.3	157.2	190.5	4.0	28.3	33.9	60.3	92.1	120.7	4.0	23.5	27.6	PFA	8 x ⅝"	4 x ⅝"	11.4
4"	2½"	178	114.3	157.2	190.5	4.5	28.8	34.4	73.0	104.8	139.7	4.5	27.2	32.0	PTFE	8 x ⅝"	4 x ⅝"	13.3
4"	3"	178	114.3	157.2	190.5	4.5	28.8	34.4	88.9	127.0	152.4	4.5	28.8	33.9	PTFE	8 x ⅝"	4 x ⅝"	14.3
5"	2½"	203	141.3	185.7	215.9	4.0	28.3	34.5	73.0	104.8	139.7	4.0	26.7	31.5	PFA	8 x ¾"	4 x ⅝"	15.6
5"	3"	203	141.3	185.7	215.9	4.0	28.3	34.5	88.9	127.0	152.4	4.0	28.3	33.4	PFA	8 x ¾"	4 x ⅝"	16.6
5"	4"	203	141.3	185.7	215.9	4.5	28.8	35.0	114.3	157.2	190.5	4.5	28.8	34.4	PTFE	8 x ¾"	8 x ⅝"	19.0

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Flanged Reducers concentric (Class 150)

NPS ₁	NPS ₂	L (mm)	d ₁₍₁₎ (mm)	d ₁₍₁₎ (mm)	K ₁₍₁₎ (mm)	s _{min(1)} (mm)	a ₁₍₁₎ (mm)	a ₂₍₁₎ (mm)	d ₁₍₂₎ (mm)	d ₁₍₂₎ (mm)	K ₁₍₂₎ (mm)	s _{min(2)} (mm)	a ₁₍₂₎ (mm)	a ₂₍₂₎ (mm)	Lining materials	No. of bolts x thread (UNC)		Wt. (ca. kg/pc.)
																NPS ₁	NPS ₂	
6"	3"	229	168.3	215.9	241.3	4.0	29.9	36.5	88.9	127.0	152.4	4.0	28.3	33.4	PFA	8 x 3/4"	4 x 5/8"	20.4
6"	4"	229	168.3	215.9	241.3	6.0	31.9	38.5	114.3	157.2	190.5	6.0	30.3	35.9	PTFE	8 x 3/4"	8 x 5/8"	22.9
6"	5"	229	168.3	215.9	241.3	6.0	31.9	38.5	141.3	185.7	215.9	6.0	30.3	36.5	PTFE	8 x 3/4"	8 x 3/4"	24.0
8"	4"	279	219.1	269.9	298.5	6.0	35.0	42.8	114.3	157.2	190.5	6.0	30.3	35.9	PTFE	8 x 3/4"	8 x 5/8"	46.3
8"	5"	279	219.1	269.9	298.5	6.0	35.0	42.8	141.3	185.7	215.9	6.0	30.3	36.5	PTFE	8 x 3/4"	8 x 3/4"	51.6
8"	6"	279	219.1	269.9	298.5	6.0	35.0	42.8	168.3	215.9	241.3	6.0	31.9	38.5	PTFE	8 x 3/4"	8 x 3/4"	39.2
10"	5"	305	273.0	323.8	362.0	6.0	36.6	45.5	141.3	185.7	215.9	6.0	30.3	36.5	PTFE	12 x 7/8"	8 x 3/4"	62.1
10"	6"	305	273.0	323.8	362.0	6.0	36.6	45.5	168.3	215.9	241.3	6.0	31.9	38.5	PTFE	12 x 7/8"	8 x 3/4"	70.4
10"	8"	305	273.0	323.8	362.0	6.0	36.6	45.5	219.1	269.9	298.5	6.0	35.0	42.8	PTFE	12 x 7/8"	8 x 3/4"	60.1
12"	6"	356	323.8	381.0	431.8	6.0	38.2	48.1	168.3	215.9	241.3	6.0	31.9	38.5	PTFE	12 x 7/8"	8 x 3/4"	89.1
12"	8"	356	323.8	381.0	431.8	6.0	38.2	48.1	219.1	269.9	298.5	6.0	35.0	42.8	PTFE	12 x 7/8"	8 x 3/4"	105.6
12"	10"	356	323.8	381.0	431.8	6.0	38.2	48.1	273.0	323.8	362.0	6.0	36.6	45.5	PTFE	12 x 7/8"	12 x 7/8"	88.4
14"	8"	406	355.6	412.8	476.3	7.5	42.9	57.5	219.1	269.9	298.5	7.5	36.5	44.3	PTFE	12 x 1"	8 x 3/4"	123.2
14"	10"	406	355.6	412.8	476.3	7.5	42.9	57.5	273.0	323.8	362.0	7.5	38.1	47.0	PTFE	12 x 1"	12 x 7/8"	136.1
14"	12"	406	355.6	412.8	476.3	7.5	42.9	57.5	323.8	381.0	431.8	7.5	39.7	49.6	PTFE	12 x 1"	12 x 7/8"	122.3
16"	10"	457	406.4	469.9	539.8	7.5	44.5	59.1	273.0	323.8	362.0	7.5	38.1	47.0	PTFE	16 x 1"	12 x 7/8"	157.4
16"	12"	457	406.4	469.9	539.8	7.5	44.5	59.1	323.8	381.0	431.8	7.5	39.7	49.6	PTFE	16 x 1"	12 x 7/8"	188.3
16"	14"	457	406.4	469.9	539.8	7.5	44.5	59.1	355.6	412.8	476.3	7.5	42.9	57.5	PTFE	16 x 1"	12 x 1"	157.9
18"	10"	483	457.0	533.4	577.9	8.0	48.1	62.7	273.0	323.8	362.0	8.0	38.6	47.5	PTFE	16 x 1 1/8"	12 x 7/8"	170.2
18"	12"	483	457.0	533.4	577.9	8.0	48.1	62.7	323.8	381.0	431.8	8.0	40.2	50.1	PTFE	16 x 1 1/8"	12 x 7/8"	201.3
18"	14"	483	457.0	533.4	577.9	8.0	48.1	62.7	355.6	412.8	476.3	8.0	43.4	58.0	PTFE	16 x 1 1/8"	12 x 1"	171.0
20"	12"	508	508.0	584.2	635.0	8.0	51.3	65.9	323.8	381.0	431.8	8.0	40.2	50.1	PTFE	20 x 1 1/8"	12 x 7/8"	224.1
20"	14"	508	508.0	584.2	635.0	8.0	51.3	65.9	355.6	412.8	476.3	8.0	43.4	58.0	PTFE	20 x 1 1/8"	12 x 1"	255.3
20"	16"	508	508.0	584.2	635.0	8.0	51.3	65.9	406.4	469.9	539.8	8.0	45.0	59.6	PTFE	20 x 1 1/8"	16 x 1"	211.3

The nominal pipe size combinations printed in bold are manufactured in two parts with flanges fix-fix or fix-loose in which the loose flange is generally on the NPS₁ side.

Different nominal pipe sizes and total lengths on request.

- L = Total length
 - d₁ = Outer diameter of the pipe
 - d_r = Raised face diameter
 - K = Bolt circle diameter
 - s_{min} = Minimum flare thickness
 - a₁ = Minimum length with fixed flange and s_{min}
 - a₂ = Minimum length with loose flange and s_{min}
- Technical data valid for the pressure rating Class 150.
a₁ and a₂ depend on construction type and lining thickness.

NPS ₁	Lining thickness		Possible vacuum		
	standard	thick-walled	23°C	150°C	200°C
1"	●		■	■	□
1 1/2"	●	●	■	■	□
2"	●	●	■	■	□
3"	●	●	■	■	□
4"	●	●	■	■	□
6"	●	●	■	■	□
8"	●	●	■	■	□
10"	●	●	■	■	□
12"	●	●	■	■	□

Bitte Rücksprache

Vacuum resistance:
 ■ = full vacuum
 ■ (lighter) = limited vacuum
 □ = no vacuum
 Please refer to the next higher nominal pipe size if your nominal pipe size is not listed.

Flanged Reducers excentric (Class 150)

In case of horizontal installation, excentric Flanged Reducers enable the complete draining of pipe sections. Depending on the nominal width, the reducers are lined with PTFE, PFA or PP.



Flanged Reducers excentric (Class 150)

Materials:

- carbon steel
- stainless steel

Lining materials:

- PTFE (virgin or conductive)
- PFA (virgin or conductive)
- PP

Flanges:

- fix-fix
- fix-loose
- loose-loose

Other pressure rating:

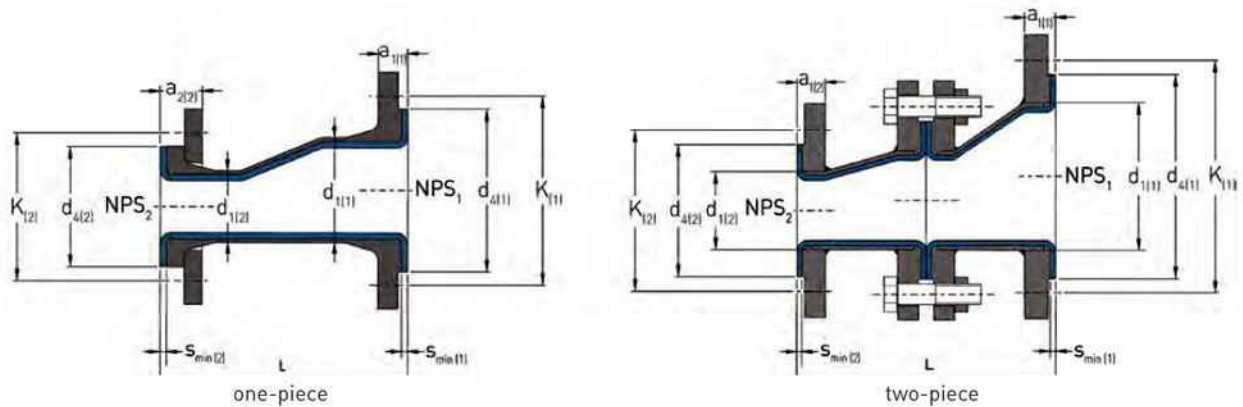
- Class 150

Special features:

- earthing stud/ lug
- vent hole extension

Optional extras:

- final painting
- non-destructive testing



NPS ₁	NPS ₂	L (mm)	d ₁₁₁ (mm)	d ₁₁₂ (mm)	K ₁₁₁ (mm)	s _{min 11} (mm)	a ₁₁₁ (mm)	a ₂₁₁ (mm)	d ₁₂₁ (mm)	d ₁₂₂ (mm)	K ₁₂₁ (mm)	s _{min 12} (mm)	a ₁₂₁ (mm)	a ₂₁₂ (mm)	Lining materials	No. of bolts x thread (UNC)		Wt. (ca. kg/pc.)
																NPS ₁	NPS ₂	
¾"	½"	114	26.7	42.9	69.9	3.0	16.2	19.7	26.7	34.9	60.3	3.0	14.6	18.2	PTFE	4 x ½"	4 x ½"	1.5
1"	½"	114	33.4	50.8	79.4	3.0	17.7	21.3	26.7	34.9	60.3	3.0	14.6	18.2	PTFE	4 x ½"	4 x ½"	1.9
1"	¾"	114	33.4	50.8	79.4	3.0	17.7	21.3	26.7	42.9	69.9	3.0	16.2	19.7	PTFE	4 x ½"	4 x ½"	2.3
1¼"	¾"	114	42.2	63.5	88.9	3.0	19.3	22.9	26.7	42.9	69.9	3.0	16.2	19.7	PTFE	4 x ½"	4 x ½"	2.7
1¼"	1"	114	42.2	63.5	88.9	3.0	19.3	22.9	33.4	50.8	79.4	3.0	17.7	21.3	PTFE	4 x ½"	4 x ½"	3.1
1½"	¾"	114	48.3	73.0	98.4	4.0	21.9	25.5	26.7	42.9	69.9	4.0	17.2	20.7	PFA	4 x ½"	4 x ½"	3.0
1½"	1"	114	48.3	73.0	98.4	3.0	20.9	24.5	33.4	50.8	79.4	3.0	17.7	21.3	PTFE	4 x ½"	4 x ½"	3.3
1½"	1¼"	114	48.3	73.0	98.4	3.0	20.9	24.5	42.2	63.5	88.9	3.0	19.3	22.9	PTFE	4 x ½"	4 x ½"	3.7
2"	1"	127	60.3	92.1	120.7	4.0	23.5	27.6	33.4	50.8	79.4	4.0	18.7	22.3	PFA	4 x ⅝"	4 x ½"	4.5
2"	1¼"	127	60.3	92.1	120.7	3.0	22.5	26.6	42.2	63.5	88.9	3.0	19.3	22.9	PTFE	4 x ⅝"	4 x ½"	5.0
2"	1½"	127	60.3	92.1	120.7	3.0	22.5	26.6	48.3	73.0	98.4	3.0	20.9	24.5	PTFE	4 x ⅝"	4 x ½"	5.1
2½"	1¼"	140	73.0	104.8	139.7	4.0	26.7	31.5	42.2	63.5	88.9	4.0	20.3	23.9	PFA	4 x ⅝"	4 x ½"	6.3
2½"	1½"	140	73.0	104.8	139.7	4.0	26.7	31.5	48.3	73.0	98.4	4.0	21.9	25.5	PTFE	4 x ⅝"	4 x ½"	6.6
2½"	2"	140	73.0	104.8	139.7	4.0	26.7	31.5	60.3	92.1	120.7	4.0	23.5	27.6	PTFE	4 x ⅝"	4 x ⅝"	7.6
3"	1"	152	88.9	127.0	152.4	4.0	28.3	33.4	33.4	50.8	79.4	4.0	18.7	22.3	PFA	4 x ⅝"	4 x ½"	7.0
3"	1½"	152	88.9	127.0	152.4	4.0	28.3	33.4	48.3	73.0	98.4	4.0	21.9	25.5	PFA	4 x ⅝"	4 x ½"	7.8
3"	2"	152	88.9	127.0	152.4	3.0	27.3	32.4	60.3	92.1	120.7	3.0	22.5	26.6	PTFE	4 x ⅝"	4 x ⅝"	8.7
3"	2½"	152	88.9	127.0	152.4	3.0	27.3	32.4	73.0	104.8	139.7	3.0	25.7	30.5	PTFE	4 x ⅝"	4 x ⅝"	10.5
4"	2"	178	114.3	157.2	190.5	4.0	28.3	33.9	60.3	92.1	120.7	4.0	23.5	27.6	PFA	8 x ⅝"	4 x ⅝"	11.3
4"	2½"	178	114.3	157.2	190.5	4.5	28.8	34.4	73.0	104.8	139.7	4.5	27.2	32.0	PTFE	8 x ⅝"	4 x ⅝"	13.2
4"	3"	178	114.3	157.2	190.5	4.5	28.8	34.4	88.9	127.0	152.4	4.5	28.8	33.9	PTFE	8 x ⅝"	4 x ⅝"	14.2
5"	2½"	203	141.3	185.7	215.9	4.0	28.3	34.5	73.0	104.8	139.7	4.0	26.7	31.5	PFA	8 x ¾"	4 x ⅝"	15.5
5"	3"	203	141.3	185.7	215.9	4.0	28.3	34.5	88.9	127.0	152.4	4.0	28.3	33.4	PFA	8 x ¾"	4 x ⅝"	16.5
5"	4"	203	141.3	185.7	215.9	4.5	28.8	35.0	114.3	157.2	190.5	4.5	28.8	34.4	PTFE	8 x ¾"	8 x ⅝"	18.9

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Flanged Reducers excentric (Class 150)

NPS ₁	NPS ₂	L (mm)	d ₁₍₁₎ (mm)	d ₄₍₁₎ (mm)	K ₁₍₁₎ (mm)	s _{min(1)} (mm)	a ₁₍₁₎ (mm)	a ₂₍₁₎ (mm)	d ₁₍₂₎ (mm)	d ₄₍₂₎ (mm)	K ₁₍₂₎ (mm)	s _{min(2)} (mm)	a ₁₍₂₎ (mm)	a ₂₍₂₎ (mm)	Lining materials	No. of bolts x thread (UNC)		Wt. (ca. kg/pc.)
																NPS ₁	NPS ₂	
6"	3"	229	168.3	215.9	241.3	4.0	29.9	36.5	88.9	127.0	152.4	4.0	28.3	33.4	PFA	8 x 3/4"	4 x 5/8"	20.2
6"	4"	229	168.3	215.9	241.3	6.0	31.9	38.5	114.3	157.2	190.5	6.0	30.3	35.9	PTFE	8 x 3/4"	8 x 5/8"	22.7
6"	5"	229	168.3	215.9	241.3	6.0	31.9	38.5	141.3	185.7	215.9	6.0	30.3	36.5	PTFE	8 x 3/4"	8 x 3/4"	23.9
8"	4"	279	219.1	269.9	298.5	6.0	35.0	42.8	114.3	157.2	190.5	6.0	30.3	35.9	PTFE	8 x 3/4"	8 x 5/8"	46.0
8"	5"	279	219.1	269.9	298.5	6.0	35.0	42.8	141.3	185.7	215.9	6.0	30.3	36.5	PTFE	8 x 3/4"	8 x 3/4"	51.3
8"	6"	279	219.1	269.9	298.5	6.0	35.0	42.8	168.3	215.9	241.3	6.0	31.9	38.5	PTFE	8 x 3/4"	8 x 3/4"	38.9
10"	5"	305	273.0	323.8	362.0	6.0	36.6	45.5	141.3	185.7	215.9	6.0	30.3	36.5	PTFE	12 x 7/8"	8 x 3/4"	61.6
10"	6"	305	273.0	323.8	362.0	6.0	36.6	45.5	168.3	215.9	241.3	6.0	31.9	38.5	PTFE	12 x 7/8"	8 x 3/4"	69.8
10"	8"	305	273.0	323.8	362.0	6.0	36.6	45.5	219.1	269.9	298.5	6.0	35.0	42.8	PTFE	12 x 7/8"	8 x 3/4"	59.4
12"	6"	356	323.8	381.0	431.8	6.0	38.2	48.1	168.3	215.9	241.3	6.0	31.9	38.5	PTFE	12 x 7/8"	8 x 3/4"	88.4
12"	8"	356	323.8	381.0	431.8	6.0	38.2	48.1	219.1	269.9	298.5	6.0	35.0	42.8	PTFE	12 x 7/8"	8 x 3/4"	104.8
12"	10"	356	323.8	381.0	431.8	6.0	38.2	48.1	273.0	323.8	362.0	6.0	36.6	45.5	PTFE	12 x 7/8"	12 x 7/8"	87.4
14"	8"	406	355.6	412.8	476.3	7.5	42.9	57.5	219.1	269.9	298.5	7.5	36.5	44.3	PTFE	12 x 1"	8 x 3/4"	122.1
14"	10"	406	355.6	412.8	476.3	7.5	42.9	57.5	273.0	323.8	362.0	7.5	38.1	47.0	PTFE	12 x 1"	12 x 7/8"	134.9
14"	12"	406	355.6	412.8	476.3	7.5	42.9	57.5	323.8	381.0	431.8	7.5	39.7	49.6	PTFE	12 x 1"	12 x 7/8"	121.0
16"	10"	457	406.4	469.9	539.8	7.5	44.5	59.1	273.0	323.8	362.0	7.5	38.1	47.0	PTFE	16 x 1"	12 x 7/8"	156.0
16"	12"	457	406.4	469.9	539.8	7.5	44.5	59.1	323.8	381.0	431.8	7.5	39.7	49.6	PTFE	16 x 1"	12 x 7/8"	186.8
16"	14"	457	406.4	469.9	539.8	7.5	44.5	59.1	355.6	412.8	476.3	7.5	42.9	57.5	PTFE	16 x 1"	12 x 1"	156.3
18"	10"	483	457.0	533.4	577.9	8.0	48.1	62.7	273.0	323.8	362.0	8.0	38.6	47.5	PTFE	16 x 1 1/8"	12 x 7/8"	168.5
18"	12"	483	457.0	533.4	577.9	8.0	48.1	62.7	323.8	381.0	431.8	8.0	40.2	50.1	PTFE	16 x 1 1/8"	12 x 7/8"	199.5
18"	14"	483	457.0	533.4	577.9	8.0	48.1	62.7	355.6	412.8	476.3	8.0	43.4	58.0	PTFE	16 x 1 1/8"	12 x 1"	169.1
20"	12"	508	508.0	584.2	635.0	8.0	51.3	65.9	323.8	381.0	431.8	8.0	40.2	50.1	PTFE	20 x 1 1/8"	12 x 7/8"	222.1
20"	14"	508	508.0	584.2	635.0	8.0	51.3	65.9	355.6	412.8	476.3	8.0	43.4	58.0	PTFE	20 x 1 1/8"	12 x 1"	253.1
20"	16"	508	508.0	584.2	635.0	8.0	51.3	65.9	406.4	469.9	539.8	8.0	45.0	59.6	PTFE	20 x 1 1/8"	16 x 1"	209.0

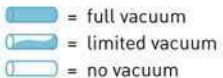
The nominal pipe size combinations printed in bold are manufactured in two parts with flanges fix-fix or fix-loose in which the loose flange is generally on the NPS₁ side.

Different nominal pipe sizes and total lengths on request.

- L = Total length
 - d₁ = Outer diameter of the pipe
 - d₄ = Raised face diameter
 - K = Bolt circle diameter
 - s_{min} = Minimum flare thickness
 - a₁ = Minimum length with fixed flange and s_{min}
 - a₂ = Minimum length with loose flange and s_{min}
- Technical data valid for the pressure rating Class 150. a₁ and a₂ depend on construction type and lining thickness.

NPS ₁	Lining thickness		Possible vacuum		
	standard	thick-walled	23° C	150° C	200° C
1"	●		☐	☐	☐
1 1/2"	●	●	☐	☐	☐
2"	●		☐	☐	☐
3"	●		☐	☐	☐
4"	●		☐	☐	☐
6"	●		☐	☐	☐
8"	●		☐	☐	☐
10"	●	●	☐	☐	☐
12"	●		☐	☐	☐

Please confer with us.

Vacuum resistance:

 ☐ = full vacuum
 ☐ = limited vacuum
 ☐ = no vacuum
 Please refer to the next higher nominal pipe size if your nominal pipe size is not listed.

Ball Check Valves (Class 150)

Ball Check Valves for horizontal or vertical installation reliably prevent the reverse flow of working medium. At the same time, they offer the least possible resistance in the direction of flow.



Ball Check Valves (Class 150)

Materials:

- carbon steel
- stainless steel

Lining material:

- PTFE (virgin or conductive)

Other pressure rating:

- Class 300

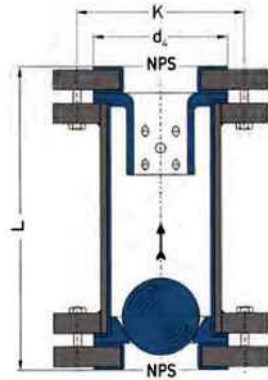
Special features:

- earthing stud/lug
- vent hole extension

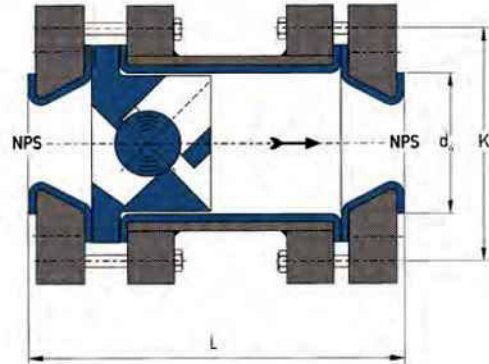
Optional extras:

- final painting
- non-destructive testing

Form A
vertical



Form B
horizontal



NPS	L (mm)		d _r (mm)	K (mm)	No. of bolts x thread (UNC)	Weights (ca. kg/piece)	
	Form A	Form B				Form A	Form B
1"	178	178	50.8	79.4	4 x 1/2"	4.7	17.3
1 1/4"	190	190	63.5	88.9	4 x 1/2"	6.8	25.1
1 1/2"	204	204	73.0	98.4	4 x 1/2"	8.7	32.0
2"	228	228	92.1	120.7	4 x 5/8"	10.3	37.9
2 1/2"	254	254	104.8	139.7	4 x 5/8"	17.3	63.9
3"	280	280	127.0	152.4	4 x 5/8"	19.5	72.1
4"	330	330	157.2	190.5	8 x 5/8"	23.4	86.7
5"	380	380	185.7	215.9	8 x 3/4"	34.0	125.6
6"	406	406	215.9	241.3	8 x 3/4"	45.7	168.8
8"	458	458	269.9	298.5	8 x 3/4"	70.5	260.8

Different nominal pipe sizes and total lengths on request.

L = Total length
 d_r = Raised face diameter
 K = Bolt circle diameter
 Technical data valid for the pressure rating Class 150.

NPS	Lining thickness		Possible vacuum		
	standard	thick-walled	23° C	150° C	200° C
1"	●		▬	▬	▬
1 1/4"	●		▬	▬	▬
1 1/2"	●	●	▬	▬	▬
2"	●		▬	▬	▬
2 1/2"	●	●	▬	▬	▬
3"	●		▬	▬	▬
3 1/2"	●	●	▬	▬	▬
4"	●		▬	▬	▬
4 1/2"	●	●	▬	▬	▬
6"	●		▬	▬	▬
6 1/2"	●	●	▬	▬	▬
8"	●		▬	▬	▬
8 1/2"	●	●	▬	▬	▬

Vacuum resistance:

- ▬ = full vacuum
- ▬ = limited vacuum
- ▬ = no vacuum

Please refer to the next higher nominal pipe size if your nominal pipe size is not listed.

Bull's Eye Sight Indicators (Class 150)

Our Bull's Eye Sight Indicators – manufactured with high-quality borosilicate glasses – offer you the right view at any time.



Bull's Eye Sight Indicators (Class 150)

Materials:

- carbon steel
- stainless steel

Lining materials:

- up to nominal pipe size NPS 4": PFA (virgin or conductive)
- from nominal pipe size NPS 5": PTFE (virgin or conductive)
- up to nominal pipe size NPS 12": PP

Flange:

- fix-fix
- fix-loose
- loose-loose

Other pressure rating:

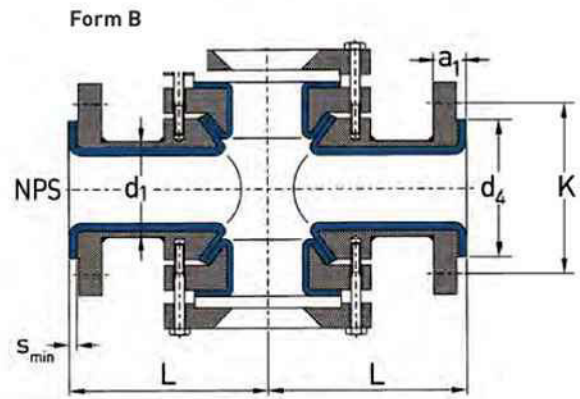
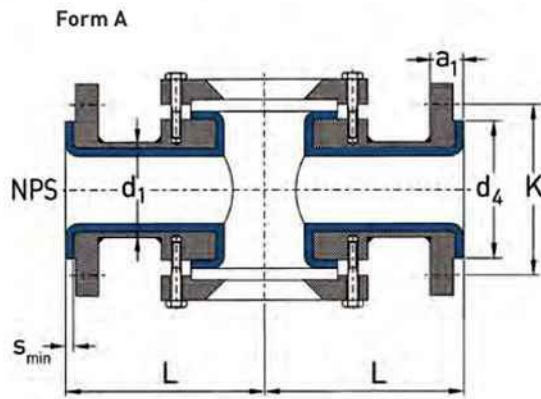
- Class 300

Special features:

- earthing stud/lug
- vent hole extension
- flange stopper

Optional extras:

- final painting
- non-destructive testing



NPS	L (mm)	Form	d ₁ (mm)	d ₄ (mm)	K (mm)	s _{min} (mm)	a ₁ (mm)	a ₂ (mm)	No. of bolts x thread (UNC)	Weights (ca. kg/ piece)
1"	89	A	33.4	50.8	79.4	4.0	18.7	22.3	4 x 1/2"	6.1
1 1/4"	95	A	42.2	63.5	88.9	4.0	20.3	23.9	4 x 1/2"	9.6
1 1/2"	102	A	48.3	73.0	98.4	4.0	21.9	25.5	4 x 1/2"	11.3
2"	114	A	60.3	92.1	120.7	4.0	23.5	27.6	4 x 3/8"	15.5
2 1/2"	127	A	73.0	104.8	139.7	4.0	26.7	31.5	4 x 3/8"	20.7
3"	140	A	88.9	127.0	152.4	4.0	28.3	33.4	4 x 3/8"	24.4
4"	165	A	114.3	157.2	190.5	4.0	28.3	33.9	8 x 3/8"	32.2
5"	190	B	141.3	185.7	215.9	5.0	29.3	35.5	8 x 3/4"	62.7
6"	203	B	168.3	215.9	241.3	7.0	31.9	38.5	8 x 3/4"	82.5
8"	229	B	219.1	269.9	298.5	6.0	35.0	42.8	8 x 3/4"	118.2
10"	280	B	273.0	323.8	362.0	7.5	38.1	47.0	12 x 7/8"	164.0
12"	305	B	323.8	381.0	431.8	7.5	39.7	49.6	12 x 7/8"	213.1
14"	356	B	355.6	412.8	476.3	10.0	45.4	60.0	12 x 1"	296.3
16"	381	B	406.4	469.9	539.8	7.0	44.0	58.6	16 x 1"	393.7

Different nominal pipe sizes and total lengths on request.

L = Total length
 d₁ = Outer diameter of the pipe
 d₄ = Raised face diameter
 K = Bolt circle diameter
 s_{min} = Minimum flare thickness
 a₁ = Mindestlänge bei Minimum length with fixed flange and s_{min}
 a₂ = Minimum length with loose flange and s_{min}
 Technical data valid for the pressure rating Class 150.
 a₁ and a₂ depend on construction type and lining thickness.

NPS	Lining thickness		Possible vacuum		
	standard	thick-walled	23°C	150°C	200°C
1"	●	●	■	■	■
1 1/4"	●	●	■	■	■
1 1/2"	●	●	■	■	■
2"	●	●	■	■	■
3"	●	●	■	■	■
4"	●	●	■	■	■

NPS	Lining thickness		Possible vacuum		
	standard	thick-walled	23°C	150°C	200°C
6"	●	●	■	■	■
8"	●	●	■	■	■
10"	●	●	■	■	■
12"	●	●	■	■	■

Vacuum resistance:

- = full vacuum
- (lighter) = limited vacuum
- = no vacuum

Please refer to the next higher nominal pipe size if your nominal pipe size is not listed.

PTFE Expansion Joints, 1 convolute (Class 150)

Our PTFE Expansion Joints are highly flexible and provide compensation of vibrations and heat-induced expansion in your production line. PTFE Expansion Joints with 1 convolute allow high working pressures.



PTFE Expansion Joints, 2 convolutes (Class 150)

Flange materials:

- carbon steel
- stainless steel

Lining materials::

- PTFE (virgin or conductive)

Flanges:

- loose-loose

Other pressure ratings:

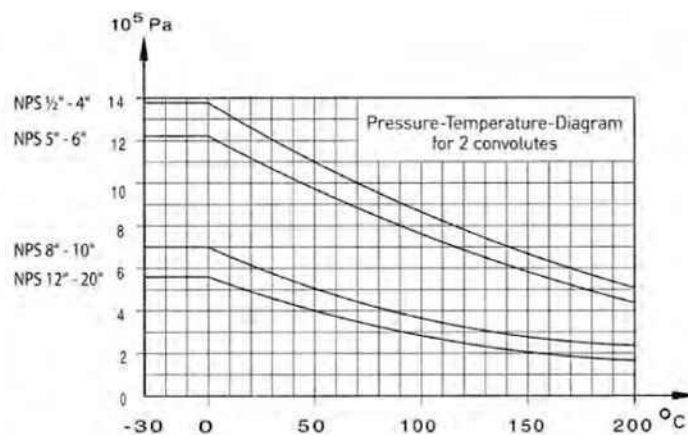
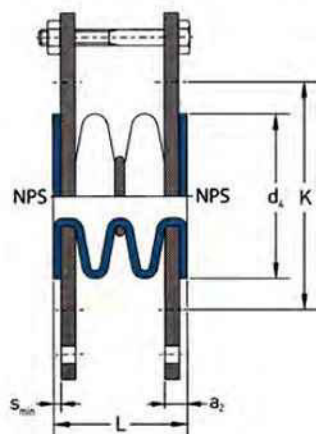
- on request

Special features:

- limit bolts/hole extensions
- earthing stud/lug

Optional extras:

- final painting



NPS	L [mm]	Stroke ± [mm]	La- teral offset [mm]	Angular offset max. [°]	Vacuum resistance at				d ₄ [mm]	K [mm]	s _{min} [mm]	a ₂ [mm]	No. of bolts x thread (UNC)	Weights [ca. kg/ pc.]
					[10 ⁵ Pa]	max. [°C]	[10 ⁵ Pa]	max. [°C]						
1/2"	28	4	2	7	-1.00	200	-	-	34.9	60.3	3.0	11.0	4 x 1/2"	1.0
3/4"	28	4	2	7	-1.00	200	-	-	42.9	69.9	3.0	11.0	4 x 1/2"	1.2
1"	35	6	3	7	-1.00	200	-	-	50.8	79.4	3.0	11.0	4 x 1/2"	1.5
1 1/4"	35	6	3	7	-1.00	200	-	-	63.5	88.9	3.0	13.0	4 x 1/2"	1.9
1 1/2"	35	6	3	7	-1.00	200	-	-	73.0	98.4	3.0	13.0	4 x 1/2"	2.3
2"	40	6	3	7	-1.00	200	-	-	92.1	120.7	4.0	16.0	4 x 5/8"	3.7
2 1/2"	57	9	5	7	-1.00	200	-	-	104.8	139.7	4.0	16.0	4 x 5/8"	5.0
3"	57	9	5	7	-1.00	200	-	-	127.0	152.4	4.0	16.0	4 x 5/8"	5.7
4"	67	13	6	7	-1.00	200	-	-	157.2	190.5	5.0	20.0	8 x 5/8"	9.0
5"	83	13	6	7	-1.00	150	-	-	185.7	215.9	4.5	19.5	8 x 3/4"	10.8
6"	75	13	6	7	-1.00	150	-	-	215.9	241.3	5.0	23.0	8 x 3/4"	14.2
8"	102	13	6	7	-1.00	50	-0.80	150	269.9	298.5	5.0	25.0	8 x 3/4"	23.1
10"	145	15	6	7	-0.93	45	-0.66	100	323.8	362.0	7.5	29.5	12 x 7/8"	32.1
12"	145	20	10	7	-0.85	45	-0.33	100	381.0	431.8	6.0	31.0	12 x 7/8"	54.2
14"	145	20	10	7	-0.85	45	-0.33	100	412.8	476.3	7.5	32.5	12 x 1"	68.1
16"	145	25	10	7	-0.85	45	-0.33	100	469.9	539.8	7.5	32.5	16 x 1"	63.9
18"	145	25	10	7	-0.66	45	-0.30	100	533.4	577.9	8.0	33.0	16 x 1 1/8"	77.6
20"	145	25	10	7	-0.20	45	-0.13	100	584.2	635.0	8.0	33.0	20 x 1 1/8"	80.2

The above shown diagram is only valid at neutral position of the PTFE Expansion Joint with limit bolts in place. The types of travel stroke, lateral offset and angular offset are maximum allowable movements in only one direction. For superpositioned movement the single types of travel need to be limited. The figures stated are average and apply to room temperature.

Different nominal pipe sizes and total lengths on request.

- L = Total length
 - d₄ = Raised face diameter
 - K = Bolt circle diameter
 - s_{min} = Minimum flare thickness
 - a₂ = Minimum length with loose flange and s_{min}
- Technical data valid for the pressure rating Class 150.

PTFE Expansion Joints, 2 convolutes (Class 150) – new design

Designs:

- up to nominal pipe size NPS 4" with two ears
- from nominal pipe size NPS 5" with three ears
- up to nominal pipe size NPS 2 1/2" with threaded holes
- from nominal pipe size NPS 3" with through holes

Flange materials:

- carbon steel
- stainless steel

Lining material:

- PTFE (virgin or conductive)

Flanges:

- loose-loose

Other pressure ratings:

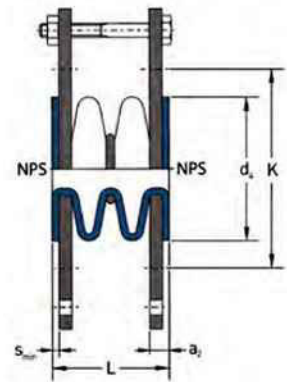
- on request

Special features:

- limit bolts/hole extensions
- earthing stud/lug

Optional extras:

- final painting



NPS	L (mm)	Stroke ± (mm)	Lateral offset (mm)	Angular offset max. [°]	d _r (mm)	K (mm)	s _{min} (mm)	a ₂ (mm)	No. of bolts x thread (UNC)	Weights (ca. kg/pc.)
1/2"	54	6	3	4	34.9	60.3	3.0	13.0	4 x 1/2"	1.1
3/4"	54	6	3	4	42.9	69.9	3.0	13.0	4 x 1/2"	1.3
1"	54	6	3	4	50.8	79.4	3.0	13.0	4 x 1/2"	1.5
1 1/4"	56	6	3	4	63.5	88.9	3.0	13.0	4 x 1/2"	1.7
1 1/2"	56	6	3	4	73.0	98.4	3.0	13.0	4 x 1/2"	2.0
2"	68	10	5	5	92.1	120.7	4.0	16.0	4 x 5/8"	3.3
2 1/2"	78	12	5	5	104.8	139.7	4.0	16.0	4 x 5/8"	4.2
3"	88	15	5	6	127.0	152.4	4.0	16.0	4 x 5/8"	5.0
4"	88	15	8	6	157.2	190.5	5.0	20.0	8 x 5/8"	7.9
5"	95	15	8	5	185.7	215.9	4.5	19.5	8 x 3/4"	10.0
6"	105	15	8	5	215.9	241.3	5.0	23.0	8 x 3/4"	13.1
8"	110	15	10	5	269.9	298.5	5.0	25.0	8 x 3/4"	21.5
10"	128	20	10	4	323.8	362.0	7.5	29.5	12 x 7/8"	29.2
12"	140	20	10	4	381.0	431.8	6.0	31.0	12 x 7/8"	50.6
14"	145	20	10	4	412.8	476.3	7.5	37.5	12 x 1"	67.6
16"	145	20	12	3	469.9	539.8	7.5	37.5	16 x 1"	82.1
20"	145	30	12	3	584.2	635.0	8.0	38.0	20 x 1 1/8"	98.5

NPS	Overpressure resistance (10 ⁵ Pa) at				Vacuum resistance (10 ⁵ Pa) at			
	23° C	100° C	150° C	200° C	23° C	100° C	150° C	200° C
1/2"	10.0	10.0	8.3	5.8	-1.00	-1.00	-1.00	-1.00
3/4"	10.0	10.0	8.3	5.8	-1.00	-1.00	-1.00	-1.00
1"	10.0	10.0	8.3	5.8	-1.00	-1.00	-1.00	-1.00
1 1/4"	10.0	10.0	8.3	5.8	-1.00	-1.00	-1.00	-1.00
1 1/2"	10.0	10.0	8.3	5.8	-1.00	-1.00	-1.00	-1.00
2"	10.0	10.0	8.3	5.8	-1.00	-1.00	-1.00	-1.00
2 1/2"	10.0	10.0	8.3	5.8	-1.00	-1.00	-1.00	-1.00
3"	10.0	10.0	8.3	5.8	-1.00	-1.00	-1.00	-1.00
4"	10.0	10.0	8.3	5.8	-1.00	-1.00	-1.00	-1.00
5"	10.0	9.2	6.9	4.8	-1.00	-1.00	-1.00	-0.80
6"	10.0	9.2	6.9	4.8	-1.00	-1.00	-1.00	-0.80
8"	10.0	7.7	5.8	4.0	-1.00	-1.00	-1.00	-0.70
10"	10.0	6.0	4.5	3.2	-1.00	-1.00	-0.80	-0.55
12"	10.0	6.0	4.5	3.2	-1.00	-1.00	-0.65	-0.45

Different nominal pipe sizes
and total lengths on request.

L = Total length

d_r = Raised face diameter

K = Bolt circle diameter

s_{min} = Minimum flare thickness

a₂ = Minimum length with loose flange and s_{min}

Technical data valid for the pressure rating Class 150.
a₂ depends on construction type and lining thickness.

The overpressure resistance is only valid at neutral position of the PTFE Expansion Joint with limit bolts in place. The types of travel stroke, lateral offset and angular offset are maximum allowable movements in only one direction. For superpositioned movement the single types of travel need to be limited. The figures stated are average and apply to room temperature.

PTFE Expansion Joints, 3 convolutes (Class 150)

Our PTFE Expansion Joints are highly flexible and provide compensation of vibrations and heat-induced expansion in your production line. PTFE Expansion Joints with 3 convolutes are the standard solution for most of the applications.



PTFE Expansion Joints, 3 convolutes (Class 150)

Flange materials:

- carbon steel
- stainless steel

Lining materials:

- PTFE (virgin or conductive)

Flanges:

- loose-loose

Other pressure ratings:

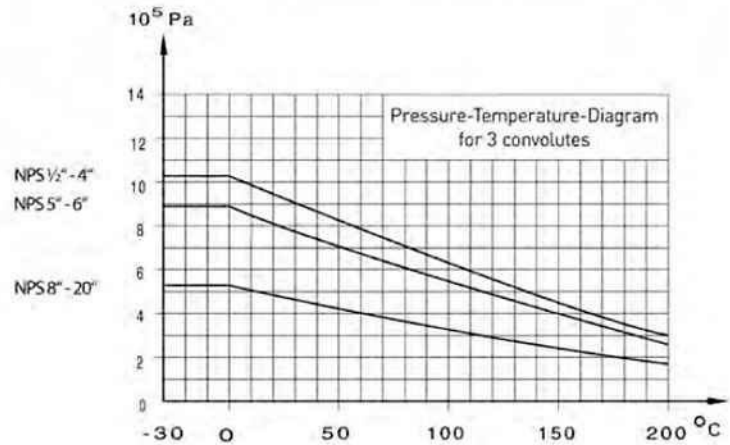
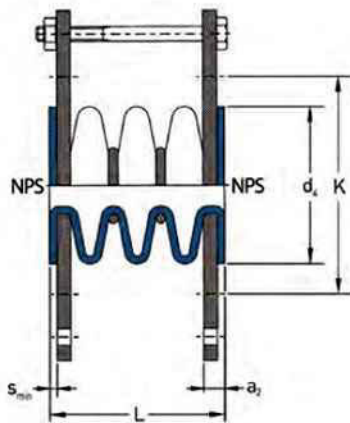
- on request

Special features:

- limit bolts/hole extensions
- earthing stud/lug

Optional extras:

- final painting



NPS	L (mm)	Stroke ± (mm)	La- teral offset (mm)	Angular offset max. [°]	Vacuum resistance at				d ₁ (mm)	K (mm)	s _{min} (mm)	a ₂ (mm)	No. of bolts x thread (UNC)	Weights (ca. kg/ pc.)
					[10 ⁵ Pa]	max. [°C]	[10 ⁵ Pa]	max. [°C]						
1/2"	37	6	4	14	-1.00	200	-	-	34.9	60.3	3.0	11.0	4 x 1/2"	1.0
3/4"	37	6	4	14	-1.00	200	-	-	42.9	69.9	3.0	11.0	4 x 1/2"	1.3
1"	46	13	6	14	-1.00	200	-	-	50.8	79.4	3.0	11.0	4 x 1/2"	1.5
1 1/4"	46	13	6	14	-1.00	200	-	-	63.5	88.9	3.0	13.0	4 x 1/2"	2.0
1 1/2"	46	13	6	14	-1.00	200	-	-	73.0	98.4	3.0	13.0	4 x 1/2"	2.3
2"	56	15	9	14	-1.00	200	-	-	92.1	120.7	4.0	16.0	4 x 5/8"	3.8
2 1/2"	77	19	9	14	-1.00	200	-	-	104.8	139.7	4.0	16.0	4 x 5/8"	5.1
3"	77	25	13	14	-1.00	200	-	-	127.0	152.4	4.0	16.0	4 x 5/8"	5.7
4"	91	25	13	14	-1.00	200	-	-	157.2	190.5	5.0	20.0	8 x 5/8"	9.2
5"	111	25	14	14	-1.00	150	-	-	185.7	215.9	4.5	19.5	8 x 3/4"	11.0
6"	130	28	14	14	-1.00	150	-	-	215.9	241.3	5.0	23.0	8 x 3/4"	14.7
8"	137	28	14	14	-1.00	50	-0.80	150	269.9	298.5	5.0	25.0	8 x 3/4"	23.5
10"	190	30	14	14	-0.93	45	-0.66	100	323.8	362.0	7.5	29.5	12 x 7/8"	33.1
12"	190	30	15	14	-0.85	45	-0.33	100	381.0	431.8	6.0	31.0	12 x 7/8"	55.1
14"	190	32	18	14	-0.85	45	-0.33	100	412.8	476.3	7.5	32.5	12 x 1"	69.4
16"	190	35	20	14	-0.85	45	-0.33	100	469.9	539.8	7.5	32.5	16 x 1"	65.4
18"	190	30	20	14	-0.66	45	-0.30	100	533.4	577.9	8.0	33.0	16 x 1 1/8"	79.4
20"	190	30	25	14	-	-	-0.13	100	584.2	635.0	8.0	33.0	20 x 1 1/8"	82.2

The above shown diagram is only valid at neutral position of the PTFE Expansion Joint with limit bolts in place. The types of travel stroke, lateral offset and angular offset are maximum allowable movements in only one direction. For superpositioned movement the single types of travel need to be limited. The figures stated are average and apply to room temperature.

Different nominal pipe sizes and total lengths on request.

- L = Total length
 - d₁ = Raised face diameter
 - K = Bolt circle diameter
 - s_{min} = Minimum flare thickness
 - a₂ = Minimum length with loose flange and s_{min}
- Technical data valid for the pressure rating Class 150.

PTFE Expansion Joints, 3 convolutes (Class 150) – new design

Designs:

- up to nominal pipe size NPS 4" with two ears
- from nominal pipe size NPS 5" with three ears
- up to nominal pipe size NPS 2 1/2" with threaded holes
- from nominal pipe size NPS 3" with through holes

Flange materials:

- carbon steel
- stainless steel

Lining material:

- PTFE (virgin or conductive)

Flanges:

- loose-loose

Other pressure levels:

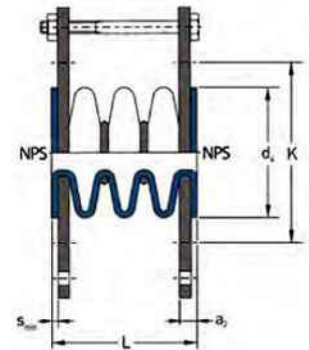
- on request

Special features:

- limit bolts/hole extensions
- earthing stud/lug

Optional extras:

- final painting



NPS	L (mm)	Stroke ± (mm)	Lateral offset (mm)	Angular offset max. (°)	d _k (mm)	K (mm)	s _{min} (mm)	a ₂ (mm)	No. of bolts x thread (UNC)	Weights (ca. kg/pc.)
1/2"	70	10	6	6	34.9	60.3	3.0	13.0	4 x 1/2"	1.1
3/4"	70	10	6	6	42.9	69.9	3.0	13.0	4 x 1/2"	1.3
1"	70	10	6	6	50.8	79.4	3.0	13.0	4 x 1/2"	1.5
1 1/4"	75	10	6	6	63.5	88.9	3.0	13.0	4 x 1/2"	1.7
1 1/2"	80	15	6	6	73.0	98.4	3.0	13.0	4 x 1/2"	2.0
2"	85	15	9	8	92.1	120.7	4.0	16.0	4 x 5/8"	3.3
2 1/2"	100	20	9	8	104.8	139.7	4.0	16.0	4 x 5/8"	4.3
3"	110	20	13	10	127.0	152.4	4.0	16.0	4 x 5/8"	5.1
4"	110	25	13	10	157.2	190.5	5.0	20.0	8 x 5/8"	8.1
5"	120	25	14	10	185.7	215.9	4.5	19.5	8 x 3/4"	10.1
6"	130	25	14	8	215.9	241.3	5.0	23.0	8 x 3/4"	13.3
8"	140	40	22	13	269.9	298.5	5.0	25.0	8 x 3/4"	21.8
10"	165	30	14	6	323.8	362.0	7.5	29.5	12 x 7/8"	29.9
12"	175	30	15	6	381.0	431.8	6.0	31.0	12 x 7/8"	51.2
14"	190	30	15	6	412.8	476.3	7.5	37.5	12 x 1"	68.7
16"	190	35	15	6	449.9	539.8	7.5	37.5	16 x 1"	83.3
20"	190	35	20	5	584.2	635.0	8.0	38.0	20 x 1 1/8"	100.1

NPS	Overpressure resistance (10 ⁵ Pa) at				Vacuum resistance (10 ⁵ Pa) at			
	23° C	100° C	150° C	200° C	23° C	100° C	150° C	200° C
1/2"	10.0	10.0	7.5	5.3	-1.00	-1.00	-1.00	-1.00
3/4"	10.0	10.0	7.5	5.3	-1.00	-1.00	-1.00	-1.00
1"	10.0	10.0	7.5	5.3	-1.00	-1.00	-1.00	-1.00
1 1/4"	10.0	10.0	7.5	5.3	-1.00	-1.00	-1.00	-1.00
1 1/2"	10.0	10.0	7.5	5.3	-1.00	-1.00	-1.00	-1.00
2"	10.0	10.0	7.5	5.3	-1.00	-1.00	-1.00	-1.00
2 1/2"	10.0	8.3	6.3	4.7	-1.00	-1.00	-1.00	-1.00
3"	10.0	8.3	6.3	4.7	-1.00	-1.00	-1.00	-1.00
4"	10.0	8.3	6.3	4.7	-1.00	-1.00	-1.00	-1.00
5"	10.0	6.9	5.2	3.6	-1.00	-1.00	-1.00	-0.80
6"	10.0	6.9	5.2	3.6	-1.00	-1.00	-1.00	-0.80
8"	9.3	4.9	3.7	3.1	-1.00	-1.00	-0.80	-0.55
10"	7.2	3.2	2.4	1.7	-1.00	-1.00	-0.70	-0.45
12"	7.2	3.2	2.4	1.7	-1.00	-1.00	-0.50	-0.35

Different nominal pipe sizes and total lengths on request.

L = Total length

d_k = Raised face diameter

K = Bolt circle diameter

s_{min} = Minimum flare thickness

a₂ = Minimum length with loose flange and s_{min}

Technical data valid for the pressure rating Class 150.

a₂ depends on construction type and lining thickness.

The overpressure resistance is only valid at neutral position of the PTFE Expansion Joint with limit bolts in place. The types of travel stroke, lateral offset and angular offset are maximum allowable movements in only one direction. For superpositioned movement the single types of travel need to be limited. The figures stated are average and apply to room temperature.

PTFE Expansion Joints, 4 convolutes (Class 150)

Our PTFE Expansion Joints are highly flexible and provide compensation of vibrations and heat-induced expansion in your production line. The possible absorption of movement is increased by a higher number of convolutes.



PTFE Expansion Joints, 4 convolutes (Class 150) – new design

Designs:

- up to nominal pipe size NPS 4" with two ears
- from nominal pipe size NPS 5" with three ears
- up to nominal pipe size NPS 2 1/2" with threaded holes
- from nominal pipe size NPS 3" with through holes

Flange materials:

- carbon steel
- stainless steel

Lining material:

- PTFE (virgin or conductive)

Flanges:

- loose-loose

Other pressure ratings:

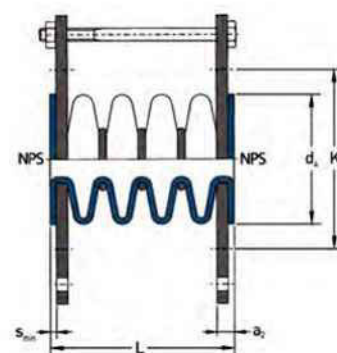
- on request

Special features:

- limit bolts/hole extensions
- earthing stud/lug

Optional extras:

- final painting



NPS	L (mm)	Stroke ± (mm)	Lateral offset (mm)	Angular offset max. (°)	d _r (mm)	K (mm)	s _{min} (mm)	a ₂ (mm)	No. of bolts x thread (UNC)	Weights (ca. kg/pc.)
1/2"	85	13	6	8	34.9	60.3	3.0	13.0	4 x 1/2"	1.1
3/4"	85	13	6	8	42.9	69.9	3.0	13.0	4 x 1/2"	1.3
1"	85	13	6	8	50.8	79.4	3.0	13.0	4 x 1/2"	1.6
1 1/4"	90	13	6	8	63.5	88.9	3.0	13.0	4 x 1/2"	1.8
1 1/2"	98	18	6	8	73.0	98.4	3.0	13.0	4 x 1/2"	2.1
2"	105	20	10	9	92.1	120.7	4.0	16.0	4 x 5/8"	3.4
2 1/2"	122	25	10	10	104.8	139.7	4.0	16.0	4 x 5/8"	4.3
3"	135	26	12	11	127.0	152.4	4.0	16.0	4 x 5/8"	5.2
4"	137	33	15	13	157.2	190.5	5.0	20.0	8 x 5/8"	8.2
5"	145	33	15	13	185.7	215.9	4.5	19.5	8 x 3/4"	10.5
6"	155	33	15	12	215.9	241.3	5.0	23.0	8 x 3/4"	13.6
8"	175	40	18	10	269.9	298.5	5.0	25.0	8 x 3/4"	22.2
10"	195	40	18	10	323.8	362.0	7.5	29.5	12 x 7/8"	30.7
12"	215	45	18	9	381.0	431.8	6.0	31.0	12 x 7/8"	51.7
14"	235	50	22	8	412.8	476.3	7.5	37.5	12 x 1"	70.0
16"	235	50	22	8	469.9	539.8	7.5	37.5	16 x 1"	84.7
20"	235	50	22	6	584.2	635.0	8.0	38.0	20 x 1 1/8"	102.2

NPS	Overpressure resistance (10 ⁵ Pa) at				Vacuum resistance (10 ⁵ Pa) at			
	23° C	100° C	150° C	200° C	23° C	100° C	150° C	200° C
1/2"	10.0	7.4	5.1	3.0	-1.00	-1.00	-1.00	-1.00
3/4"	10.0	7.4	5.1	3.0	-1.00	-1.00	-1.00	-1.00
1"	10.0	7.4	5.1	3.0	-1.00	-1.00	-1.00	-1.00
1 1/4"	10.0	7.4	5.1	3.0	-1.00	-1.00	-1.00	-1.00
1 1/2"	10.0	7.4	5.1	3.0	-1.00	-1.00	-1.00	-1.00
2"	10.0	7.4	5.1	3.0	-1.00	-1.00	-1.00	-1.00
2 1/2"	8.5	6.9	5.1	3.0	-1.00	-0.99	-0.98	-0.96
3"	8.0	6.6	4.9	2.9	-0.97	-0.96	-0.94	-0.93
4"	7.4	6.2	4.6	2.7	-0.96	-0.92	-0.89	-0.86
5"	6.8	5.7	4.3	2.5	-0.93	-0.88	-0.82	-0.77
6"	6.1	5.2	4.0	2.2	-0.91	-0.84	-0.77	-0.68
8"	5.1	4.5	3.4	1.8	-0.86	-0.77	-0.66	-0.54
10"	4.1	3.8	2.8	1.5	-0.81	-0.69	-0.56	-0.40
12"	3.3	3.0	2.4	1.1	-0.76	-0.62	-0.48	-0.28

Different nominal pipe sizes
and total lengths on request.

L = Total length

d_r = Raised face diameter

K = Bolt circle diameter

s_{min} = Minimum flare thickness

a₂ = Minimum length with loose flange and s_{min}

Technical data valid for the pressure rating Class 150.

a₂ depends on construction type and lining thickness.

The overpressure resistance is only valid at neutral position of the PTFE Expansion Joint with limit bolts in place. The types of travel stroke, lateral offset and angular offset are maximum allowable movements in only one direction. For superpositioned movement the single types of travel need to be limited. The figures stated are average and apply to room temperature.

PTFE Expansion Joints, 5 convolutes (Class 150)

Our PTFE Expansion Joints are highly flexible and provide compensation of vibrations and heat-induced expansion in your production line. PTFE Expansion Joints with 5 convolutes allow the maximum absorption of movement.



PTFE Expansion Joints, 5 convolutes (Class 150)

Flange materials:

- carbon steel
- stainless steel

Lining materials:

- PTFE (virgin or conductive)

Flanges:

- loose-loose

Other pressure ratings:

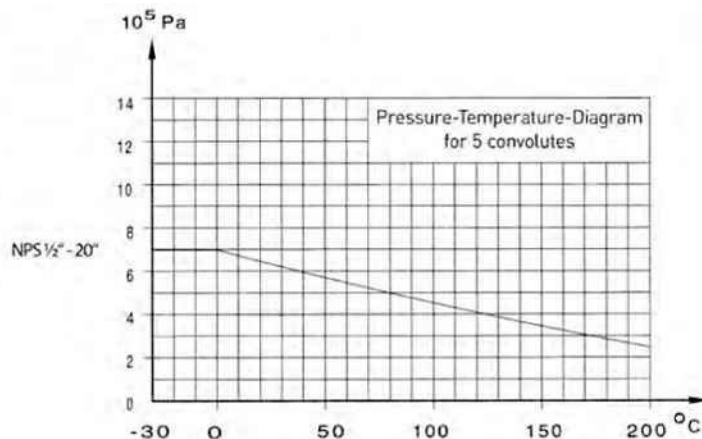
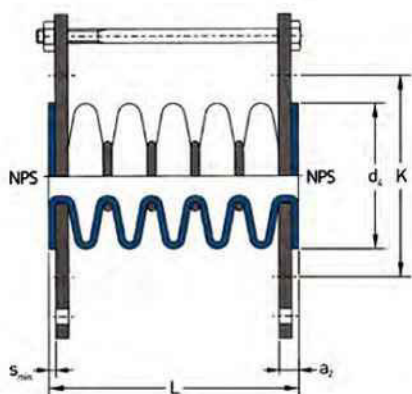
- on request

Special features:

- limit bolts/hole extensions
- earthing stud/lug

Optional extras:

- final painting



NPS	L (mm)	stroke ± (mm)	lateral offset (mm)	angular offset max. (°)	Vacuum resistance at				d _r (mm)	K (mm)	s _{min} (mm)	a ₂ (mm)	No. of bolts x thread (UNC)	Weights (ca. kg/ pc.)
					[10 ⁵ Pa]	max. (°C)	[10 ³ Pa]	max. (°C)						
1/2"	55	8	5	20	Please confer with us.				34.9	60.3	3.0	11.0	4 x 1/2"	1.0
3/4"	55	8	5	20					42.9	69.9	3.0	11.0	4 x 1/2"	1.3
1"	68	8	12	20					50.8	79.4	3.0	11.0	4 x 1/2"	1.5
1 1/4"	68	8	12	20					63.5	88.9	3.0	13.0	4 x 1/2"	2.0
1 1/2"	80	13	12	20					73.0	98.4	3.0	13.0	4 x 1/2"	2.3
2"	88	19	12	20					92.1	120.7	4.0	16.0	4 x 5/8"	3.8
2 1/2"	113	25	13	20					104.8	139.7	4.0	16.0	4 x 5/8"	5.2
3"	113	25	16	20					127.0	152.4	4.0	16.0	4 x 5/8"	5.9
4"	139	25	16	20					157.2	190.5	5.0	20.0	8 x 5/8"	9.4
5"	167	32	16	20					185.7	215.9	4.5	19.5	8 x 3/4"	11.3
6"	153	32	16	20					215.9	241.3	5.0	23.0	8 x 3/4"	14.9
8"	207	32	16	20					269.9	298.5	5.0	25.0	8 x 3/4"	24.2
10"	300	32	16	20					323.8	362.0	7.5	29.5	12 x 7/8"	35.4
12"	288	35	18	20					381.0	431.8	6.0	31.0	12 x 7/8"	56.9
14"	325	35	18	20					412.8	476.3	7.5	32.5	12 x 1"	73.1
16"	343	40	25	20					469.9	539.8	7.5	32.5	16 x 1"	70.2
18"	470	40	25	20					533.4	577.9	8.0	33.0	16 x 1 1/8"	89.9
20"	520	40	25	20					584.2	635.0	8.0	33.0	20 x 1 1/8"	96.7

The above shown diagram is only valid at neutral position of the PTFE Expansion Joint with limit bolts in place. The types of travel stroke, lateral offset and angular offset are maximum allowable movements in only one direction. For superpositioned movement the single types of travel need to be limited. The figures stated are average and apply to room temperature.

Different nominal pipe sizes and total lengths on request.

- L = Total length
 - d_r = Raised face diameter
 - K = Bolt circle diameter
 - s_{min} = Minimum flare thickness
 - a₂ = Minimum length with loose flange and s_{min}
- Technical data valid for the pressure rating Class 150.
a₂ depends on construction type and lining thickness.

PTFE Expansion Joints, 5 convolutes (Class 150) – new design

Designs:

- up to nominal pipe size NPS 4" with two ears
- from nominal pipe size NPS 5" with three ears
- up to nominal pipe size NPS 2 1/2" with threaded holes
- from nominal pipe size NPS 3" with through holes

Flange materials:

- carbon steel
- stainless steel

Lining material:

- PTFE (virgin or conductive)

Flanges:

- loose-loose

Other pressure ratings:

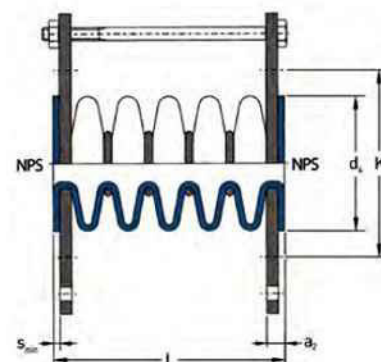
- on request

Special features:

- limit bolts/hole extensions
- earthing stud/lug

Optional extras:

- final painting



NPS	L (mm)	Stroke ± (mm)	Lateral offset (mm)	Angular offset max. (°)	d _r (mm)	K (mm)	s _{min} (mm)	a ₂ (mm)	No. of bolts x thread (UNC)	Weights (ca. kg/pc.)
1/2"	100	15	8	10	34.9	60.3	3.0	13.0	4 x 1/2"	1.1
3/4"	100	15	8	10	42.9	69.9	3.0	13.0	4 x 1/2"	1.3
1"	100	15	8	10	50.8	79.4	3.0	13.0	4 x 1/2"	1.6
1 1/4"	105	15	8	10	63.5	88.9	3.0	13.0	4 x 1/2"	1.8
1 1/2"	115	20	8	12	73.0	98.4	3.0	13.0	4 x 1/2"	2.1
2"	125	25	12	12	92.1	120.7	4.0	16.0	4 x 5/8"	3.4
2 1/2"	145	30	15	14	104.8	139.7	4.0	16.0	4 x 5/8"	4.4
3"	160	35	18	16	127.0	152.4	4.0	16.0	4 x 5/8"	5.2
4"	165	40	18	16	157.2	190.5	5.0	20.0	8 x 5/8"	8.3
5"	170	40	18	14	185.7	215.9	4.5	19.5	8 x 3/4"	10.4
6"	180	40	22	13	215.9	241.3	5.0	23.0	8 x 3/4"	13.7
8"	210	50	22	13	269.9	298.5	5.0	25.0	8 x 3/4"	22.5
10"	240	50	22	12	323.8	362.0	7.5	29.5	12 x 7/8"	31.3
12"	250	50	22	10	381.0	431.8	6.0	31.0	12 x 7/8"	52.4
14"	265	50	25	10	412.8	476.3	7.5	37.5	12 x 1"	70.5
16"	265	50	25	8	469.9	539.8	7.5	37.5	16 x 1"	85.4
20"	280	50	25	7	584.2	635.0	8.0	38.0	20 x 1 1/8"	103.5

NPS	Overpressure resistance (10 ⁵ Pa) at				Vacuum resistance (10 ⁵ Pa) at			
	23° C	100° C	150° C	200° C	23° C	100° C	150° C	200° C
1/2"	8.0	6.1	4.5	2.9	-1.00	-1.00	-1.00	-1.00
3/4"	8.0	6.1	4.5	2.9	-1.00	-1.00	-1.00	-1.00
1"	8.0	6.1	4.5	2.9	-1.00	-1.00	-1.00	-1.00
1 1/4"	8.0	6.1	4.5	2.9	-1.00	-1.00	-1.00	-1.00
1 1/2"	8.0	6.1	4.5	2.9	-1.00	-1.00	-1.00	-1.00
2"	7.9	6.1	4.5	2.9	-1.00	-1.00	-1.00	-1.00
2 1/2"	7.5	5.8	4.2	2.7	-0.98	-0.97	-0.94	-0.94
3"	7.1	5.5	4.0	2.5	-0.96	-0.93	-0.89	-0.88
4"	6.5	5.2	3.8	2.3	-0.92	-0.89	-0.83	-0.80
5"	5.9	4.7	3.5	2.1	-0.88	-0.83	-0.76	-0.72
6"	5.4	4.4	3.2	1.9	-0.84	-0.79	-0.69	-0.63
8"	4.4	3.8	2.8	1.5	-0.76	-0.70	-0.57	-0.48
10"	3.6	3.2	2.3	1.1	-0.69	-0.61	-0.48	-0.34
12"	3.0	2.6	1.8	1.0	-0.63	-0.54	-0.38	-0.20

Different nominal pipe sizes and total lengths on request.

L = Total length

d_r = Raised face diameter

K = Bolt circle diameter

s_{min} = Minimum flare thickness

a₂ = Minimum length with loose flange and s_{min}

Technical data valid for the pressure rating Class 150.

a₂ depends on construction type and lining thickness.

The overpressure resistance is only valid at neutral position of the PTFE Expansion Joint with limit bolts in place. The types of travel stroke, lateral offset and angular offset are maximum allowable movements in only one direction. For superpositioned movement the single types of travel need to be limited. The figures stated are average and apply to room temperature.

PTFE Lined Stainless Steel Expansion Joints (Class 150)

In case of high pressures and high temperatures, our PTFE Lined Stainless Steel Expansion Joints are the right choice for your pipes.

Stainless Steel Expansion Joints are the most stable expansion joints.



PTFE Lined Stainless Steel Expansion Joints (Class 150)

Flange materials:

- carbon steel
- stainless steel

Lining material:

- PTFE (virgin or conductive)

Bellow material:

- stainless steel

Flanges:

- loose-loose

Other pressure rating:

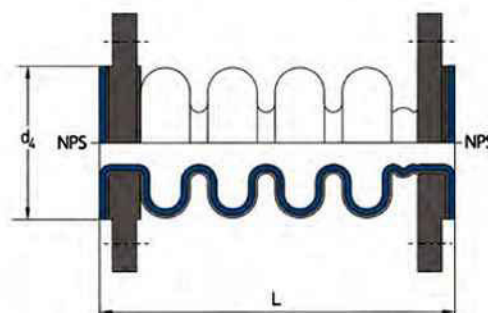
- Class 300

Special features:

- earthing stud/lug

Optional extras:

- final painting (flanges)



NPS	L (mm)	Stroke ± (mm)	Axial spring rate (N/mm)	Vacuum resistance (10 ⁵ Pa) at		d _r (mm)	No. of bolts x thread [UNC]	Weights (ca. kg/pc.)
				23° C	160° C			
1¼"	145	4.5	260	0.15	0.30	63.5	4 x ½"	4.0
1½"	220	9.0	130	0.15	0.30	63.5	4 x ½"	4.0
1½"	155	5.5	272	0.15	0.30	73.0	4 x ½"	5.0
1½"	240	11.0	136	0.15	0.30	73.0	4 x ½"	5.0
2"	177	6.5	276	0.15	0.30	92.1	4 x ¾"	6.0
2"	292	13.5	195	0.15	0.30	92.1	4 x ¾"	6.0
2½"	179	8.5	234	0.15	0.30	104.8	4 x ¾"	7.0
2½"	285	16.0	173	0.15	0.30	104.8	4 x ¾"	7.5
3"	183	10.0	220	0.15	0.30	127.0	4 x ¾"	7.5
3"	273	17.5	178	0.15	0.30	127.0	4 x ¾"	8.5
4"	178	10.0	365	0.15	0.30	157.2	8 x ¾"	10.0
4"	266	20.0	183	0.15	0.30	157.2	8 x ¾"	11.5
5"	221	14.5	290	0.25	0.40	185.7	8 x ¾"	13.0
5"	363	25.0	290	0.25	0.40	185.7	8 x ¾"	15.0
6"	248	15.0	560	0.25	0.40	215.9	8 x ¾"	17.0
6"	388	30.0	280	0.25	0.40	215.9	8 x ¾"	20.0
8"	246	21.0	412	0.35	0.50	269.9	8 x ¾"	24.0
8"	418	39.0	335	0.35	0.50	269.9	8 x ¾"	30.0
10"	243	22.0	525	0.40	0.60	323.8	12 x ¾"	32.0
10"	392	40.5	269	0.40	0.60	323.8	12 x ¾"	35.0
12"	287	27.5	480	0.50	0.75	381.0	12 x ¾"	37.0
12"	429	47.5	352	0.50	0.75	381.0	12 x ¾"	43.0
14"	296	30.0	460	0.50	0.75	412.8	12 x 1"	51.0
14"	407	46.0	378	0.50	0.75	412.8	12 x 1"	57.0
16"	290	26.0	713	0.70	0.90	469.9	16 x 1"	68.0
16"	434	52.0	357	0.70	0.90	469.9	16 x 1"	75.0
18"	328	35.0	548	0.70	0.90	533.4	16 x 1½"	76.0
18"	535	65.0	430	0.70	0.90	533.4	16 x 1½"	97.0
20"	309	28.0	955	-	-	584.2	20 x 1½"	97.0
20"	509	63.0	425	-	-	584.2	20 x 1½"	113.0
24"	336	35.0	548	-	-	692.2	20 x 1¼"	118.0
24"	484	63.0	305	-	-	692.2	20 x 1¼"	130.0

Different nominal pipe sizes and total lengths on request.

L = Total length

d_r = Raised face diameter

Technical data valid for the pressure rating Class 150.

PTFE Vacuum Expansion Joints (Class 150)

PTFE Vacuum Expansion Joints allow full vacuum, also in case of large nominal widths and high temperatures.



PTFE Vacuum Expansion Joints (Class 150)

Flange materials:

- carbon steel
- stainless steel

Lining material:

- PTFE (virgin or conductive)

Flanges:

- loose-loose

Other pressure ratings:

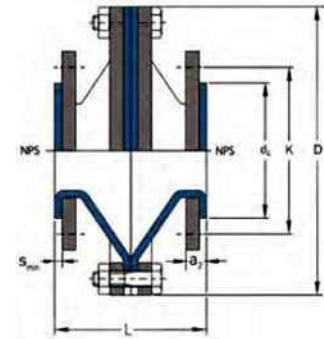
- on request

Special features:

- limit bolts/hole extensions
- earthing stud/lug

Optional extras:

- final painting



NPS	L (mm)	Stroke ± (mm)	D (mm)	d ₄ (mm)	K (mm)	s _{min} (mm)	a ₂ (mm)	No. of bolts x thread (UNC)	Weights (ca. kg/pc.)
4"	95	10	302	157.2	190.5	7.5	23.5	8 x 5/8"	15.7
6"	100	15	350	215.9	241.3	7.5	25.5	8 x 3/4"	20.0
8"	105	15	422	269.9	298.5	7.5	27.5	8 x 3/4"	29.7
10"	110	18	476	323.8	362.0	7.5	29.5	12 x 7/8"	37.6
12"	115	18	535	381.0	431.8	7.5	32.5	12 x 7/8"	57.4
14"	120	18	590	412.8	476.3	7.5	32.5	12 x 1"	66.8
16"	135	20	670	469.9	539.8	7.5	32.5	16 x 1"	76.8
18"	150	20	745	533.4	577.9	7.5	32.5	16 x 1 1/8"	82.2
20"	160	20	770	584.2	635.0	8.0	33.0	20 x 1 1/8"	91.8

Different nominal pipe sizes
and total lengths on request.

- L = Total length
- D = Outer diameter
- d₄ = Raised face diameter
- K = Bolt circle diameter
- s_{min} = Minimum flare thickness
- a₂ = Minimum length with loose flange and s_{min}

Technical data valid for the pressure rating Class 150.

a₂ depends on construction type and lining thickness.

The overpressure resistance is only valid at neutral position of the PTFE Vacuum Expansion Joint. The figures stated are average and apply to room temperature.

NPS	Overpressure resistance (10 ⁵ Pa) at		Vacuum resistance (10 ⁵ Pa) at
	23° C	200° C	200° C
4"	3.0	3.0	-1.0
6"	3.0	3.0	-1.0
6"	3.0	3.0	-1.0
8"	3.0	3.0	-1.0
10"	3.0	3.0	-1.0
12"	3.0	3.0	-1.0
14"	3.0	1.0	-1.0
16"	3.0	1.0	-1.0
18"	3.0	1.0	-1.0

PTFE Vacuum Expansion Joints (Class 150) – new design

Designs:

- up to nominal pipe size NPS 4" with two ears
- from nominal pipe size NPS 5" with three ears
- up to nominal pipe size NPS 2 1/2" with threaded holes
- from nominal pipe size NPS 3" with through holes

Flange materials:

- carbon steel
- stainless steel

Lining material:

- PTFE (virgin or conductive)

Flanges:

- loose-loose

Other pressure ratings:

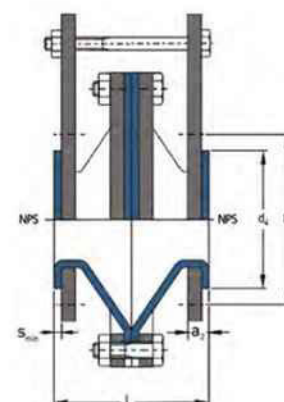
- on request

Special features:

- limit bolts/hole extensions
- earthing stud/lug

Optional extras:

- final painting



NPS	L (mm)	Stroke \pm (mm)	Lateral offset (mm)	Angular offset (mm)	d_r (mm)	K (mm)	s_{min} (mm)	a_2 (mm)	No. of bolts x thread (UNC)	Weights (ca. kg/pc.)
4"	150	12	3	4	157.2	190.5	7.5	22.5	8 x 5/8"	19.9
5"	150	12	4	4	185.7	215.9	7.5	22.5	8 x 3/4"	24.9
6"	150	12	4	4	215.9	241.3	7.5	25.5	8 x 3/4"	28.8
8"	150	15	5	4	269.9	298.5	7.5	27.5	8 x 3/4"	44.7
10"	150	15	6	4	323.8	362.0	7.5	29.5	12 x 7/8"	56.6
12"	150	20	7	4	381.0	431.8	7.5	32.5	12 x 7/8"	91.4
14"	160	20	7	4	412.8	476.3	7.5	37.5	12 x 1"	117.2
16"	160	20	8	3	469.9	539.8	7.5	37.5	16 x 1"	126.7
20"	160	20	9	3	584.2	635.0	8.0	38.0	20 x 1 1/8"	130.1
24"	170	Please determine the desired standard - ASME B 16.47 Series A/B or British Standard 3293 - when contacting our sales department.								
28"	170									
32"	170									
36"	170									
40"	170									

NPS	Overpressure resistance (10 ⁵ Pa) at		Vacuum resistance (10 ⁵ Pa) at
	23° C	200° C	200° C
4"	3.0	3.0	-1.0
5"	3.0	3.0	-1.0
6"	3.0	3.0	-1.0
8"	3.0	3.0	-1.0
10"	3.0	3.0	-1.0
12"	3.0	3.0	-1.0
14"	3.0	3.0	-1.0
16"	3.0	1.0	-1.0
18"	3.0	1.0	-1.0
20"	3.0	1.0	-1.0
24"	3.0	1.0	-1.0
28"	1.0	0.5	-1.0
32"	0.5	0.3	-1.0
36"	0.1	0.1	-1.0
40"	0.0	0.0	-1.0

Different nominal pipe sizes and total lengths on request.

- L = Total length
- d_r = Raised face diameter
- K = Bolt circle diameter
- s_{min} = Minimum flare thickness

Technical data valid for the pressure rating Class 150. a_2 depends on construction type and lining thickness.

The overpressure resistance is only valid at neutral position of the PTFE Vacuum Expansion Joint with limit bolts in place. The types of travel stroke, lateral offset and angular offset are maximum allowable movements in only one direction. For superpositioned movement the single types of travel need to be limited. The figures stated are average and apply to room temperature.

Spectacle Blinds (Class 150)

With Spectacle Blinds it is possible to separate pipe sections.



Spectacle Blinds (Class 150)

Materials:

- carbon steel
- stainless steel

Lining material:

- PFA (virgin or conductive)

Other pressure rating:

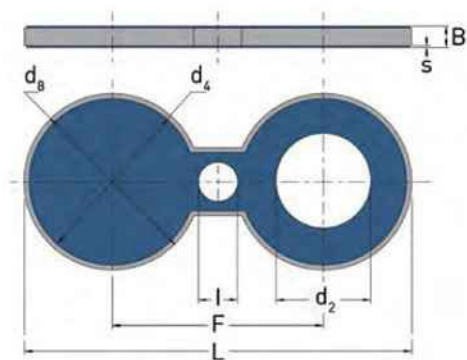
- Class 300

Special features:

- earthing stud/lug

Optional extras:

- final painting



NPS	L (mm)	B _{min} (mm)	d ₂ (mm)	d ₄ (mm)	d ₈ (mm)	s (mm)	F (mm)	l (mm)	Weights (ca. kg/pc.)
½"	100.5	17.2	14.9	34.9	40	4.0	60.5	15.7	0.3
¾"	117.9	18.7	14.9	42.9	48	4.0	69.9	15.7	0.4
1"	134.2	20.2	20.6	50.8	55	4.0	79.2	15.7	0.6
1¼"	156.9	21.7	29.0	63.5	68	4.0	88.9	15.7	0.9
1½"	173.6	23.7	34.9	73.0	75	4.0	98.6	15.7	1.3
2"	215.7	25.1	46.5	92.1	95	4.0	120.7	19.1	2.2
2½"	247.7	28.4	56.6	104.8	108	4.0	139.7	19.1	3.2
3"	282.3	29.9	71.9	127.0	130	4.0	152.3	19.1	4.6
4"	350.5	29.9	96.3	157.2	160	4.0	190.5	19.1	6.8
5"	405.9	29.9	122.1	185.7	190	4.0	215.9	22.4	9.2
6"	459.3	31.4	148.1	215.9	218	4.0	241.3	22.4	12.4
8"	572.5	34.4	196.7	269.9	274	4.0	298.5	22.4	21.0
10"	690.0	36.2	248.4	323.8	328	4.0	362.0	25.4	30.6
12"	816.8	37.8	298.8	381.0	385	4.0	431.8	25.4	43.5

Different nominal pipe sizes and total lengths on request.

- L = Total length
 - B_{min} = Minimum thickness
 - d₂ = Inner diameter
 - d₄ = Raised face diameter
 - d₈ = Outer diameter
 - s = Lining thickness
 - F = Distance of the circle centers
 - l = Quick-release axle diameter
- Technical data valid for the pressure rating Class 150.
B depend on construction type and lining thickness.

NPS	Lining thickness		Possible vacuum		
	standard	thick-walled	23° C	150° C	200° C
1"	●		■	■	■
		●	■	■	■
1½"	●		■	■	■
		●	■	■	■
2"	●		■	■	■
		●	■	■	■
3"	●		■	■	■
		●	■	■	■
4"	●		■	■	■
		●	■	■	■
6"	●		■	■	■
		●	■	■	■
8"	●		■	■	■
		●	■	■	■
10"	●		■	■	■
		●	■	■	■
12"	●		■	■	■
		●	■	■	■

Vacuum resistance:

- = full vacuum
- (lighter) = limited vacuum
- = no vacuum

Please refer to the next higher nominal pipe size if your nominal pipe size is not listed.