

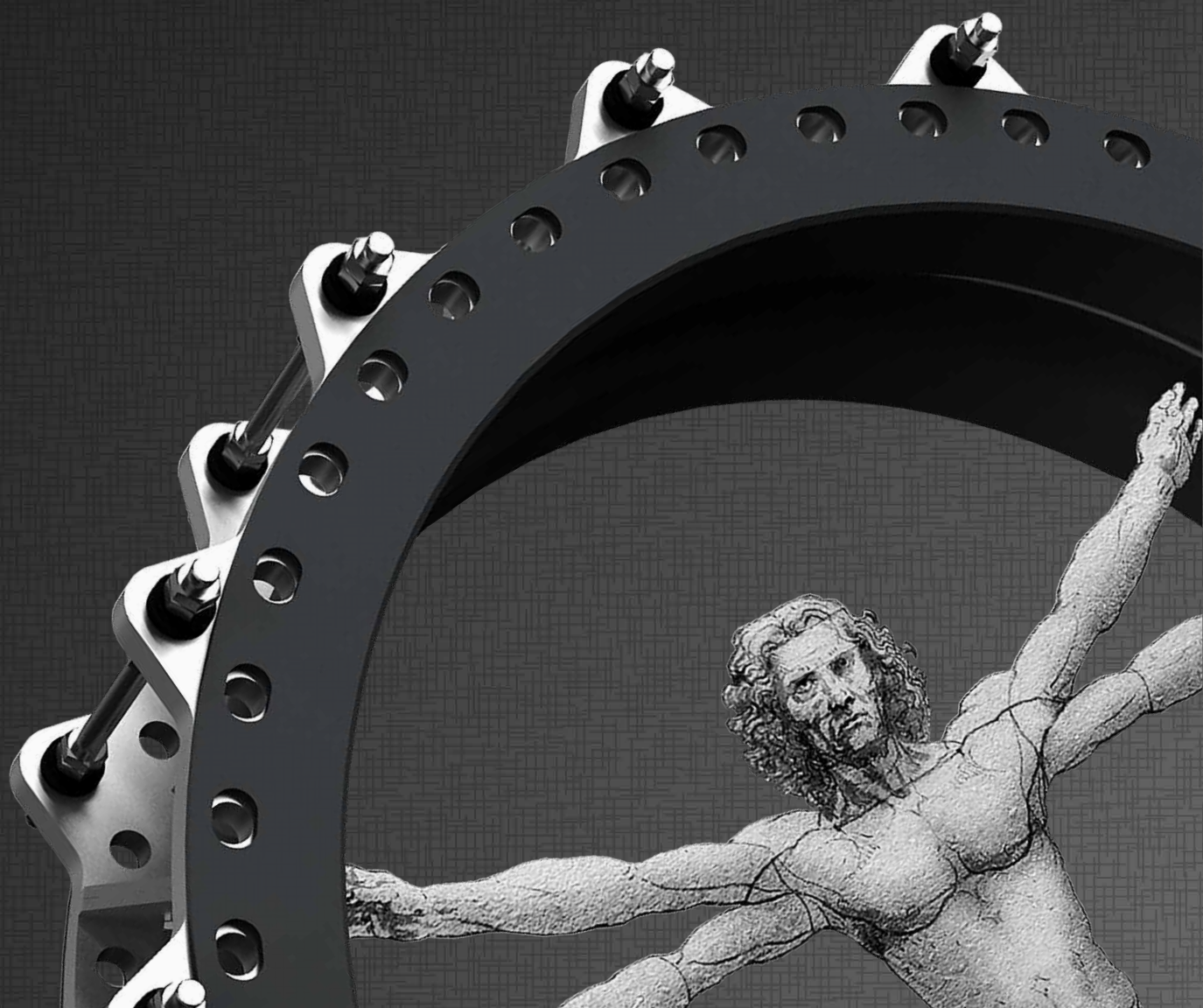


THE MASTER OF THE RUBBER EXPANSION JOINT





RUBBER EXPANSION JOINTS



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ditec –

A POWERFUL PARTNER - FOCUSED ON SOLUTIONS

Through specialisation, our company has positioned itself as a worldwide leading manufacturer of rubber and textile expansion joints. As a developer and manufacturer, we focus on our customers' demands. We make the seemingly impossible possible – with a high degree of technical expertise and commitment, combined with decades of experience. We rise to every challenge.

In our state-of-the-art production plant in Kitzingen, we produce tailor-made solutions and serial items. Each rubber expansion joint is individually designed and its tolerance is precisely calculated with reference to the Pressure Equipment Directive. Even when the specific requirements in terms of operating parameters vary only slightly, it is only by taking these into account accurately that a long service life and failure-free use of your expansion joint solution can be guaranteed.

Just describe your needs to us, and we will provide you with personalised advice. With your project team, we develop an efficient solution for you - both in the field of standard devices and for special applications - with our characteristic combination of know-how, innovation and flexibility.

You can rely on your order to be processed rapidly and on schedule – even if it is urgent. We provide support not only as a supplier, but also as problem solvers.

This catalogue provides you with an overview of our product range and an invaluable base of technical details and planning tools.





ditec – **INNOVATION - MADE IN GERMANY**

On a site extending to 17,600 m², we produce all expansion joints in the same place where we develop them. Our commitment to our German production location forms the core of our philosophy, which privileges the very highest quality above all else. Thanks to the high degree of vertical integration in our own product plant, we achieve highly efficient production processes.

Our design of models puts us in a position to respond rapidly to orders at extremely short notice, and to produce single pieces as well.

We have our own calendar plant and our own appropriately dimensioned vulcanisation plants. A metalworking company directly integrated in the production plant manufactures all the steel accessories we require. This concentration in a single location is evident: we are able to make all the essential components in-house and are therefore largely independent of vendors.





ditec – **A FAMILY COMPANY**

Established in 1973 in Kitzingen by Manfred Adam, the high-tech company is now managed in the second generation by siblings Gabriele and Christoph Adam. The ditec team currently numbers some 85 employees – meaning that their ranks have more than quadrupled over the past two decades. What remains unchanged is the spirit of cooperation and partnership within the family-owned business. The team spirit and concentrated know-how of our employees are the hallmarks of ditec.

Without the experience and sense of responsibility of every individual, a true manufacturing business like ours would be inconceivable. After all, we literally work hand-in-hand here.



Service

Our engineers possess in-depth knowledge of rubber and fabric materials and can provide industrial planners, designers and partners not just with products, but also with consulting services and individual technologies. Our performance and our success are based on the courage to provide solutions for the most extreme specifications.

Ask our employees about your new developments for elastic components! We advise you on the basis of innovative thinking and engineering services; we manufacture our products in keeping with certified quality guidelines that can help you turn your ideas into reality.

Our highly efficient manufacturing process for expansion joints addresses the following demands on the market:

- **abnormal dimensions,**
- **high temperatures,**
- **corrosive media and**
- **large movements**

Calculation is performed individually based on the operating conditions present. Internal dimension, installation length, shape and flange dimensions can be selected freely for both round and rectangular rubber and fabric expansion joints.

New designs are developed using 3D CAD computer programmes. We regularly perform component pressure tests. At your request, we will inspect the expansion joints installed in your facilities with respect to functionality and operational safety.

Our optimally equipped installation team will provide complete installation services for new construction or retrofitting activities; we can also appoint a field supervisor to train your workers and to support and monitor installation activities. Our technicians and installers are also authorised to access nuclear facilities, and can perform on-site project planning and assembly work.

We have trained representatives in almost all European countries as well as in many non-European countries who can provide you with expert on-site advice.

Certifications

Our quality management system in accordance with DIN EN ISO 9001 successfully passed an audit performed by TÜV Management Service GmbH in 1998. Since June 2008, our company has been certified in accordance with OHSAS 18001.

We possess a KTA 1401 certification and are an authorised nuclear supplier for the VGB consortium. All rubber expansion joints are calculated in keeping with Pressure Equipment Directive PED 2014/68/EU; we are CE-certified up to category III. The design and dimensioning are performed in accordance with all applicable international standards such as DIN, ANSI, AWWA and BS. Special dimensions can easily be accommodated at the customer's request.

In manufacturing steel accessory components, we adhere to the welding guidelines set forth in DIN EN ISO 3834-3, AD2000 Merkblatt HP 0 and EN 1090-2. Furthermore we prove welding procedure qualification reports (WPQR) for all our important weldings.

Numerous reviews have been performed by the German Technical Control Board or independent testing institutes for certain products and materials. These include:

- Prototype testing of wall seals
- R120 Fire protection bulkheads in accordance with DIN 4102, Section 11 and DIN EN 1366-3
- Material permits in keeping with the ATEX guideline
- Smoke escape expansion joints in accordance with DIN 18232
- Drinking water and food grade certifications for various rubber blends

Our quality consciousness and constant efforts to refine our products are reflected in numerous internal durability tests, laboratory investigations and tests performed by independent materials testing institutes. We generate the necessary design testing documentation and end documentation together with quality assurance professionals and independent experts. Depending on the requirements, all acceptances and pressure tests can be performed at our factory with the customer or their appointed expert present.



Company certificates:

- ▶ DIN EN ISO 9001 : 2015
- ▶ DIN EN ISO 3834-3
- ▶ OHSAS 18001
- ▶ KTA 1401
- ▶ IAEA-50-CQ & FRA/N/100/OL3 § 19
- ▶ § 19I WHG

Quality management system since 1998
Standard welding quality requirements since 2015
Safety and health certification since 2008
Approved Nuclear Power Plant supplier since 2000
AREVA approved supplier for Olkiluoto 3 (FIN)
German federal water act since 2001

Product certifications:

- ▶ PED 2014/68/EU Modul B + C1
- ▶ AD2000 HP 0
- ▶ EN1090-2 EX2
- ▶ WPQR
- ▶ GOST R & TR TS 010-2011 & 030-2013

Pressure Equipment Directive since 2003
Pressure Equipment Directive since 2015
Structural components and kits for steel structures since 2015
Welding procedure qualifications reports since 2015
Export certifications for ditec products to Russia since 2009





Technical information

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Applications

Expansion joints assimilate

- thermal growth,
- mechanical vibrations,
- acoustic oscillations
- and tensions

in pipelines, on armatures and on pumps.

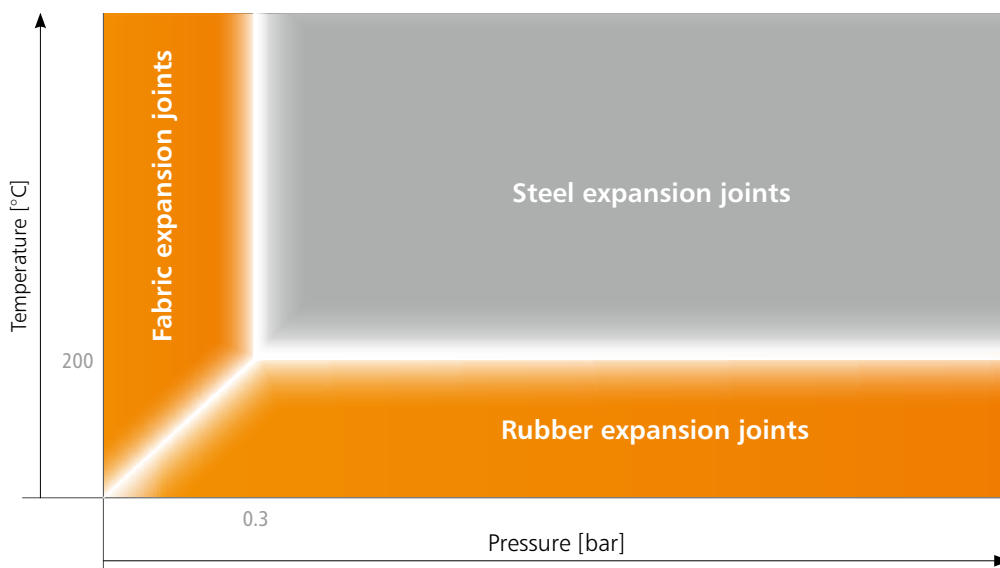
They are also used

- for sound insulation,
- as dismantling joints on pipeline armatures,
- to assimilate assembly tolerances and
- to seal pipeline wall penetrations.

Typical industries where expansion joints are used:

- Power plants
- Rubbish and slurry incineration facilities
- The chemical industry
- Pharmaceutical and refinery technology
- Gas and water supply
- Apparatus, machine tool and engine construction
- The cement and mineral processing industry
- Shipbuilding
- Ventilation, air conditioning and building technology
- Smelters, steel mills and roller mills
- The paper and food processing industries
- Loading technology

Fabric and rubber expansion joints as well as steel expansion joints are used in nearly all industries. Their usage limitations depend on the operating pressure and temperature, as shown in the following diagram:



Fabric expansion joints can be used for pressures of up to 0.3 bar and, as long as the duct has an internal lining, up to a temperature of 1200 °C. The application area of rubber expansion joints ranges up to temperatures of 200 °C and to pressures of over 0.3 bar, depending on the rubber grade. Temperatures of over 200 °C and high pressures are the classic application area of steel expansion joints. The transitions between the individual types are naturally fluid. The darker the colour, the deeper you are getting in the application range of the respective expansion joint variant.

We concentrate on the production of rubber and fabric expansion joints and specialise in offering technically mature expansion joint solutions for even the most demanding transition areas.

Lateral expansion joint
type U110M
in the cooling water system of a
coal-fired power plant.
NB 2600, 4 bar



Rubber expansion joints
type U110M
as dismantling joints
NB 2000, 6 bar

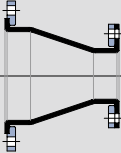


Lateral expansion joint
type U110R
on the pump pressure side of a
lye pipe in a paper factory.
NB 125, 5 bar



Applications > Overview of rubber expansion joints

	Universal    			Lateral 		Angular 	
Bellows shape	with full faced rubber flanges	with swivel flanges	for clamped fixing	with full faced rubber flanges	with swivel flanges	with full faced rubber flanges	with swivel flanges
without arch 	U100A  ▶ Page 48	D100A  ▶ Page 102	B100  ▶ Page 124	U100x  ▶ Page 152	D100x  ▶ Page 184		
with one arch 	U110A  ▶ Page 52	D110A  ▶ Page 106	B110  ▶ Page 128	U110  ▶ Page 158	D110x  ▶ Page 190	U110F  ▶ Page 214	D110F  ▶ Page 222
with two arches 	U120A  ▶ Page 62	D120A  ▶ Page 112	B120  ▶ Page 134	U120x  ▶ Page 168	D120x  ▶ Page 198	on request	on request
with three or more arches 	U130A  ▶ Page 72	on request	B130  ▶ Page 140	on request	on request		
with one arch and flanges with threaded holes 	on request	D210A  ▶ Page 118		on request	D210x  ▶ Page 206	on request	on request
with one arch and support rings at the arch foot 	U216A  ▶ Page 80			U216x  ▶ Page 178			

	Universal 			Lateral 		Angular 	
Bellows shape	with full faced rubber flanges	with swivel flanges	for clamped fixing	with full faced rubber flanges	with swivel flanges	with full faced rubber flanges	with swivel flanges
in a conical design 	U300A  ▶ Page 84		B300  ▶ Page 146	on request	on request		
with one arch facing inward 	U400A  ▶ Page 90			on request			
rectangular, without arch 	U900A  ▶ Page 96						
rectangular, with one arch 	U910A  ▶ Page 98						

Wall seals			
Expansion joints without arch	Expansion joints with arch	Membranes without steam barrier	Membranes with steam barrier
W100x  ▶ Page 230	W110x  ▶ Page 230	W200x  ▶ Page 238	W300x  ▶ Page 238

Special expansion joints	
Individual manufacturing for example:	
Dog Bone  ▶ Page 244	Elbow  ▶ Page 248

Applications >Type key

	Type		Arches	Support ring variant ▶ page 42		Tie rod variant for type U and D ▶ page 41	
Rubber expansion joints	U1	Expansion joint with full face rubber flange	0	0	Without	A	No tie rod
	U2	Expansion joint with full face rubber flange and support rings at the arch foot	1	1	On the inside of the arch apex	B	Exterior: rubber bushings
	U3	Expansion joint with full face rubber flange, conical	2	2	Embedded in the arch apex	C	Exterior: rubber bushings Interior: thrust limiter
	U4	Expansion joint with full face rubber flange and one arch facing inward	3	3	External in the arch trough	E	Exterior: spherical bearings/ball disks
	U9	Expansion joints with full face rubber flange, rectangular	...	4	Internally in the arch apex, externally in the arch trough	F	Hinge tie rod
	D1	Expansion joint with swivel flange		5	Embedded in the arch apex external in the arch trough	G	Cardan joint tie rod
	D2	Expansion joint with swivel flange with threaded holes		6	Embedded in the arch foot	M	Exterior: spherical bearings/ball disks Interior: spherical bearings/ball disks
	D3	Expansion joint with swivel flange, conical				S	Exterior: spherical bearings/ball disks Interior: thrust limiter
	B1	Belt expansion joint for clamped fixing				R	Segment tie rod Exterior: rubber bushings
	B3	Belt expansion joint for clamped fixing, conical				K	Segment tie rod Exterior: spherical bearings/ball disks
	UD1	Expansion joint with full face rubber flange and swivel flange				L	Segment tie rod Exterior: spherical bearings/ball disks Interior: spherical bearings/ball disks
	UB1	Expansion joint with full face rubber flange and for clamped fixing				Fixing variant for type W	
	W1	Wall sealing expansion joint				SS	On D1: Clamp On D1-2: Clamp
	W2	Wall sealing membrane				FS	On D1: Flange On D1-2: Clamp
	W3	Wall sealing membrane with steam barrier				SF	On D1: Clamp On D1-2: Flange
	X1	Special expansion joints				FF	On D1: Flange On D1-2: Flange
Example U110A	U1	with full faced rubber flange	1 arch	0	without support ring	A	no tie rod



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joints

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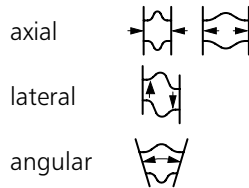
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STANDARD FLANGE FLANGE WITH BOLT COVER

Pipeline planning > Rubber expansion joint variants

Expansion joints take over



movements as a result of thermal changes in pipeline length, prevent the transfer of mechanical vibrations from machines, apparatus or pumps on the connected pipeline and compensate for tensions or assembly imprecision.

The potential axial, lateral and angular movements are specified for the respective expansion joint systems. In the event of simultaneous axial extension and lateral displacement, the values drop as follows:

$$\text{Permitted lateral displacement for axial extension} = \text{lat max} \times \left(1 - \frac{\text{ax STR eff}}{\text{ax STR max}} \right)$$

Permitted lateral displacement for axial compression =

$$\text{lat max} \times \text{lat\%} + \left[(\text{lat max} - \text{lat max} \times \text{lat\%}) \times \left(1 - \frac{\text{ax STA eff} - \text{ax STA max} \times \text{ax STA\%}}{\text{ax STR max} - \text{ax STA max} \times \text{ax STA\%}} \right) \right]$$

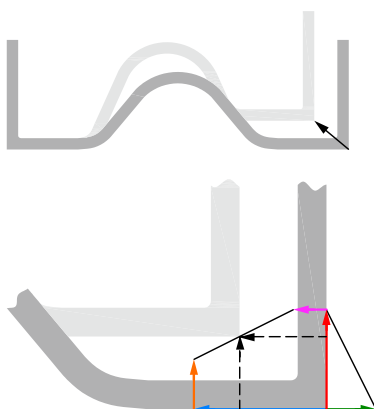
(if: $\text{ax STA eff} - \text{ax STA max} \times \text{ax STA\%} = \text{negative} \Rightarrow \text{insert } 0$)

$$\text{Permitted axial extension} = \text{ax STR max} \times \left(1 - \frac{\text{lat eff}}{\text{lat max}} \right)$$

Permitted axial compression =

$$\text{ax STA max} \times \text{ax STA\%} + \left[(\text{ax STA max} - \text{ax STA max} \times \text{ax STA\%}) \times \left(1 - \frac{\text{lat eff} - \text{lat max} \times \text{lat\%}}{\text{lat max} - \text{lat max} \times \text{lat\%}} \right) \right]$$

(if: $\text{lat eff} - \text{lat max} \times \text{lat\%} = \text{negative} \Rightarrow \text{insert } 0$)



ax STA max

ax STR max

lat max

ax%

lat%

maximum axial compression

maximum axial extension

maximum lateral displacement

maximum axial compression in the case of 100%

lateral displacement (25% of ax STA max)

maximum lateral displacement in the case of

100% axial compression (50% of lat max)

Example

Wanted is the maximum possible lateral displacement for an axial compression of 25 mm for an expansion joint with:

ax STA max = 40 mm

ax STR max = 15 mm

lat max = 30 mm

Permitted lateral displacement for axial compression =

$$\text{lat max} \times \text{lat\%} + \left[(\text{lat max} - \text{lat max} \times \text{lat\%}) \times \left(1 - \frac{\text{ax STA eff} - \text{ax STA max} \times \text{ax STA\%}}{\text{ax STR max} - \text{ax STA max} \times \text{ax STA\%}} \right) \right]$$

Permitted lateral displacement for axial compression at 25 mm =

$$30 \text{ mm} \times 50\% + \left[(30 \text{ mm} - 30 \text{ mm} \times 50\%) \times \left(1 - \frac{25 \text{ mm} - 40 \text{ mm} \times 25\%}{40 \text{ mm} - 40 \text{ mm} \times 25\%} \right) \right]$$

Permitted lateral displacement for axial compression at 25 mm = 22,5 mm



Universal expansion joint

Movement: 



- Bellows:** Expansion joint with one or more moulded arches.
- Tie rod:** None
- Pressure:** The pressure from the active bellows cross-section causes stress on the adjacent pipeline anchors. In order to reduce the forces, a lower arch can be used for small movements.
- Stiffness rate:** Movements give rise to forces that rise under pressure and need to be taken into account in dimensioning the pipeline. Axial and lateral stiffness rates to move the expansion joint under pressure can be found in the appendix; you may also enquire directly with us.

Lateral expansion joint

Movement: 



- Bellows:** Expansion joint with one or more moulded arches.
- Tie rod:** Several threaded rods mounted around the circumference receive pressure from the active bellows cross-section.
- Pressure:** The tie rods assimilate the axial stresses of the expansion joint.
- Stiffness rate:** Movements give rise to forces that rise under pressure and which need to be taken into account in dimensioning the pipeline. Lateral stiffness rates to move the expansion joint under pressure can be found in the technical appendix; you may also enquire directly with us.
- Friction:** Frictional forces arise in the tie rod bearings and must be overcome in addition to the stiffness rates.

Angular expansion joint

Movement: 



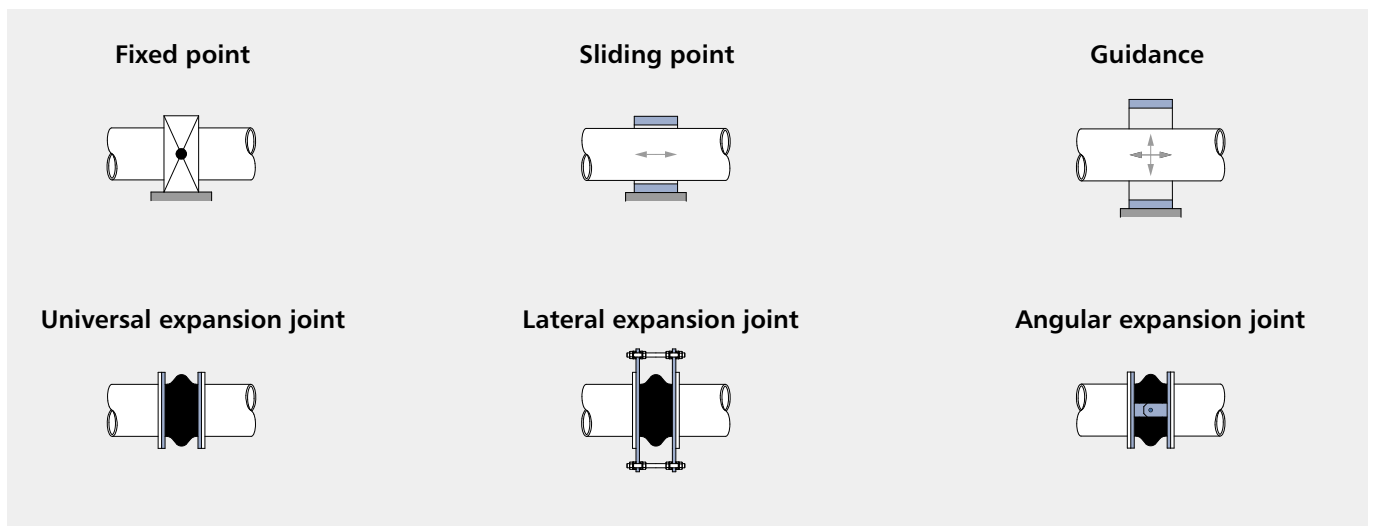
- Bellows:** Expansion joint with one moulded arch.
- Joint:** The angular joints bear the pressure forces from the active bellows cross-section. Angular joints for movement on one plane. Cardan joints for movement on two planes.
- Pressure:** The joints bear the axial reaction forces of the expansion joint.
- Friction:** Frictional forces arise in the joint bearings and must be overcome in addition to the stiffness rates.

Pipeline planning > Mounting of expansion joints, sliding points and fixed points

The pressure in the line gives rise to forces that may lead to line instability if no sliding points and fixed points are provided. If movements occur in different directions inside a pipeline, these need to be divided by planning anchors at suitable intervals. If stable anchors are not possible, the expansion joints need to be mounted such that the axial movement is diverted and can be received by tied lateral expansion joints. The correct mounting of universal, lateral and angular expansion joints is crucial to the functionality of the entire pipeline system.

Pipeline systems should be fitted with ventilation equipment at high points and draining equipment at low points in order to avoid uncontrolled water ingress or vacuum.

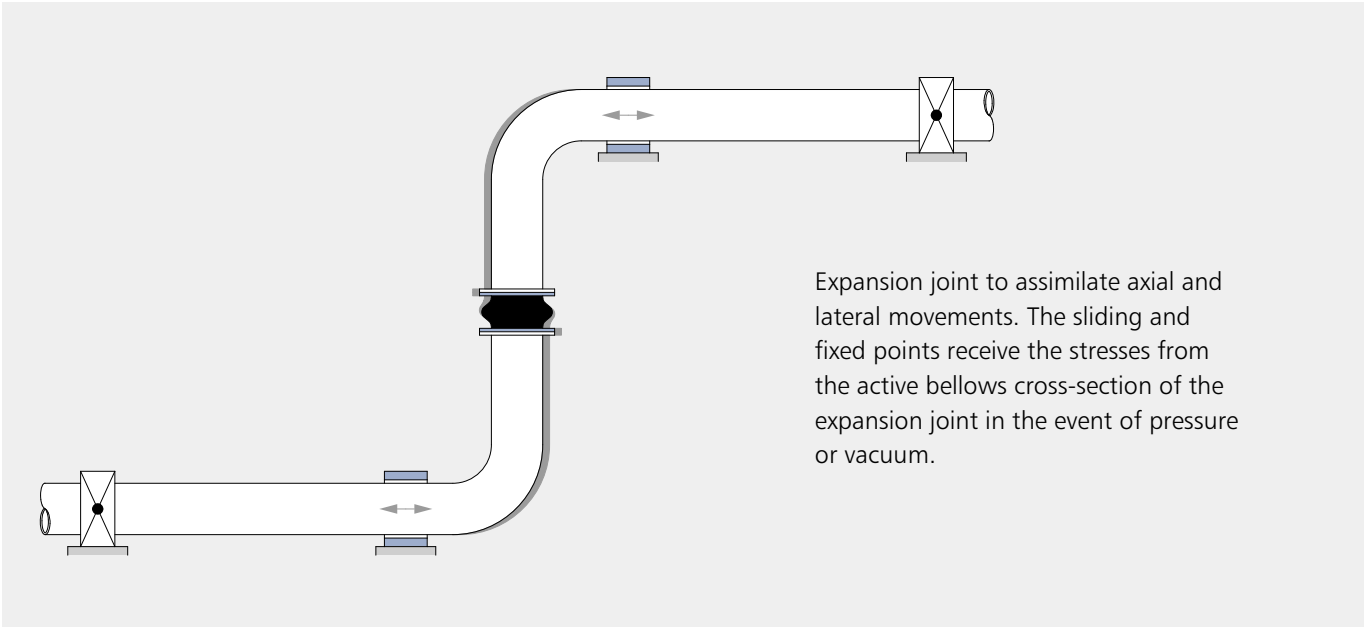
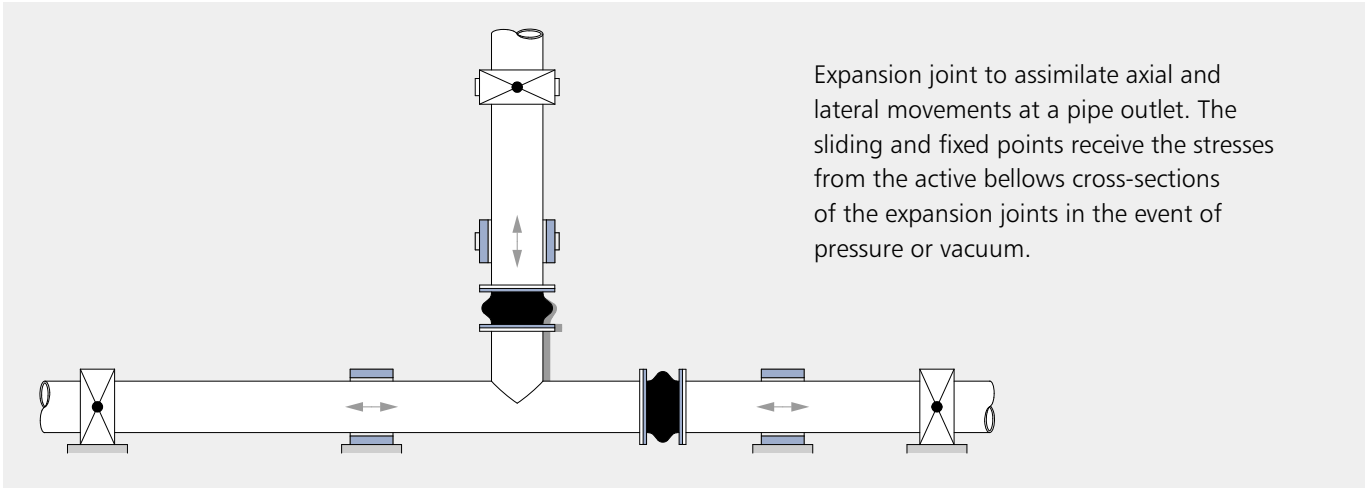
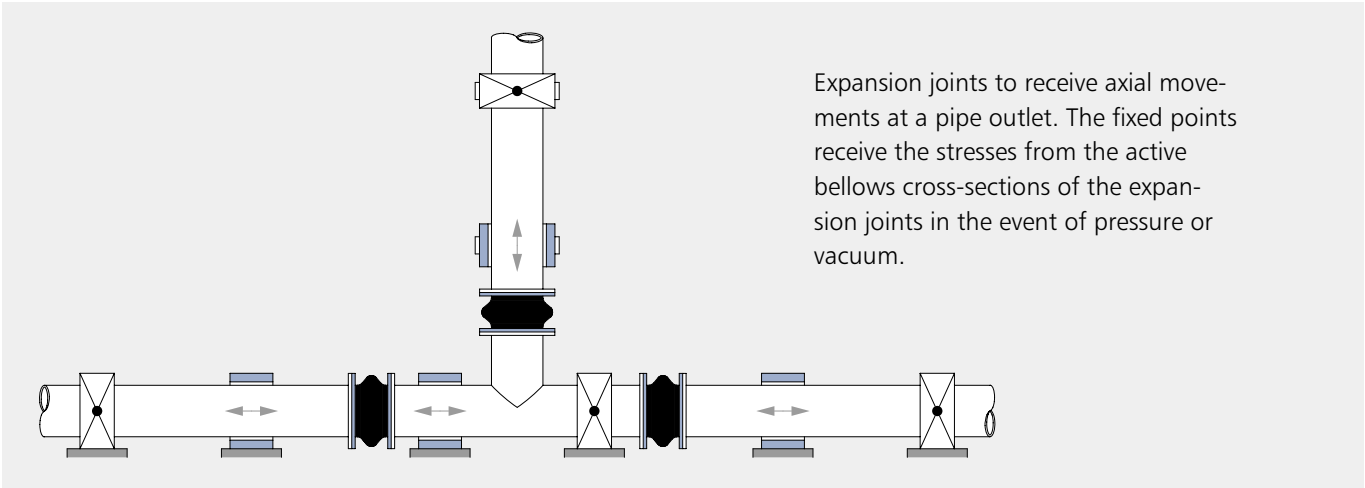
Pressure and vacuum safety mechanisms in the lines prevent the expansion joints from being overloaded. Likewise, the medium temperature should be monitored using appropriate means. Information about the maximum operating temperatures and pressures is specified based on the respective expansion joint types.



Universal expansion joints for axial, lateral and angular movement

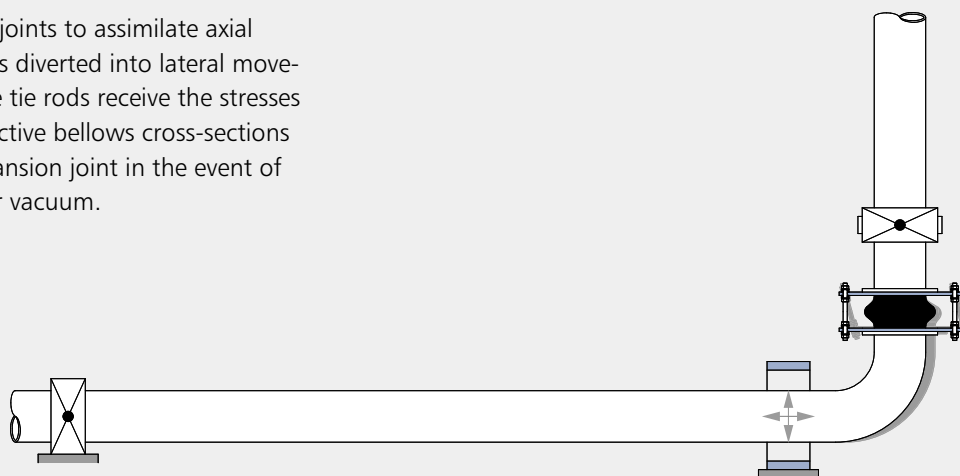
Expansion joint to receive axial movements along the pipeline axis. The fixed points receive the stresses from the active bellows cross-section of the expansion joint in the event of pressure or vacuum. In the event of large axial movements, the pipeline should be subdivided into several sections using sliding and fixed points.



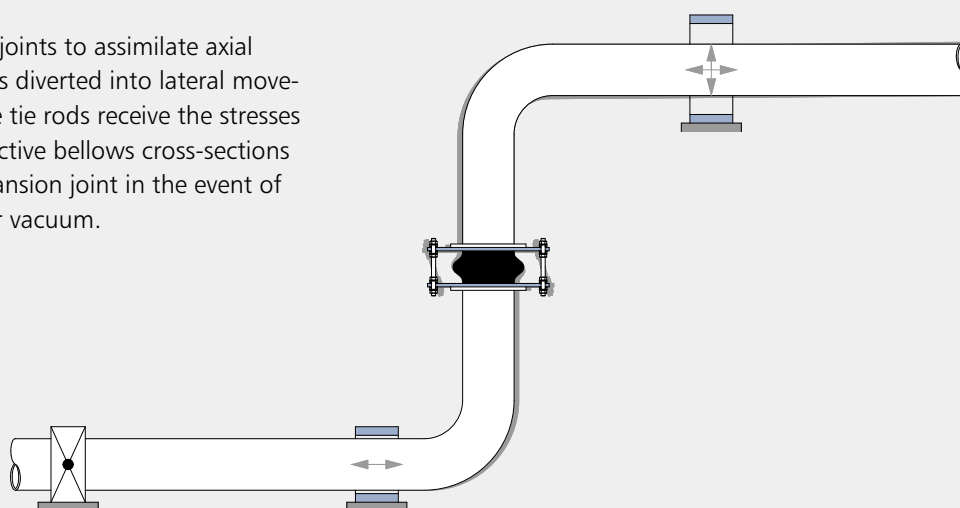


Lateral expansion joints for lateral movement

Expansion joints to assimilate axial movements diverted into lateral movements. The tie rods receive the stresses from the active bellows cross-sections of the expansion joint in the event of pressure or vacuum.

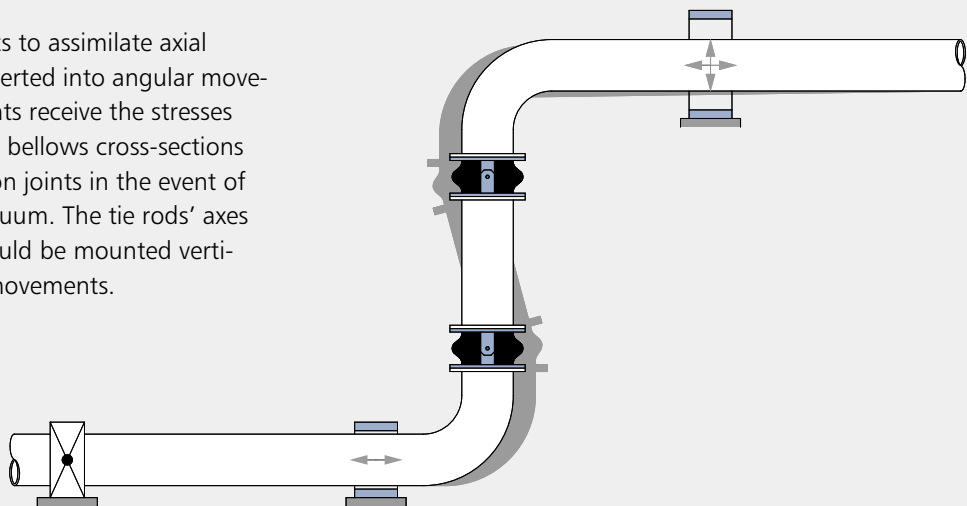


Expansion joints to assimilate axial movements diverted into lateral movements. The tie rods receive the stresses from the active bellows cross-sections of the expansion joint in the event of pressure or vacuum.

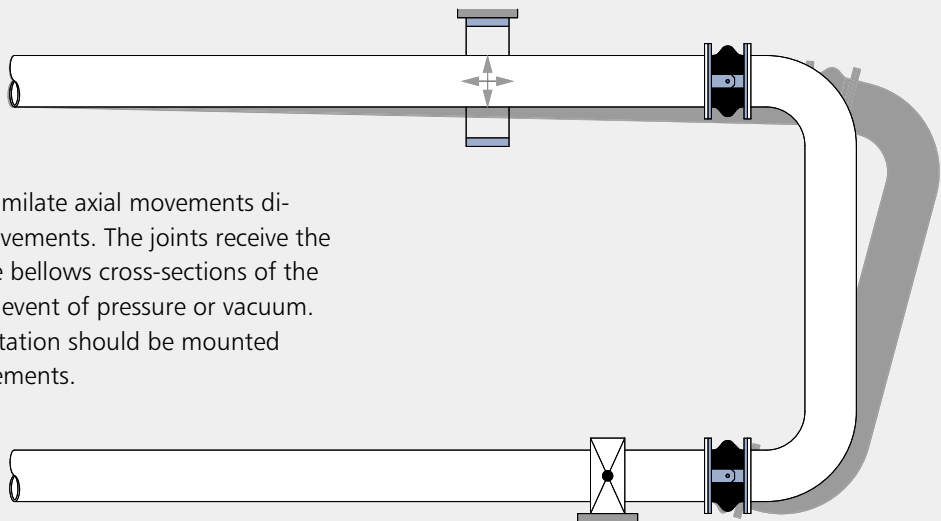


Angular expansion joints for angular movement

Expansion joints to assimilate axial movements diverted into angular movements. The joints receive the stresses from the active bellows cross-sections of the expansion joints in the event of pressure or vacuum. The tie rods' axes of rotation should be mounted vertically for axial movements.

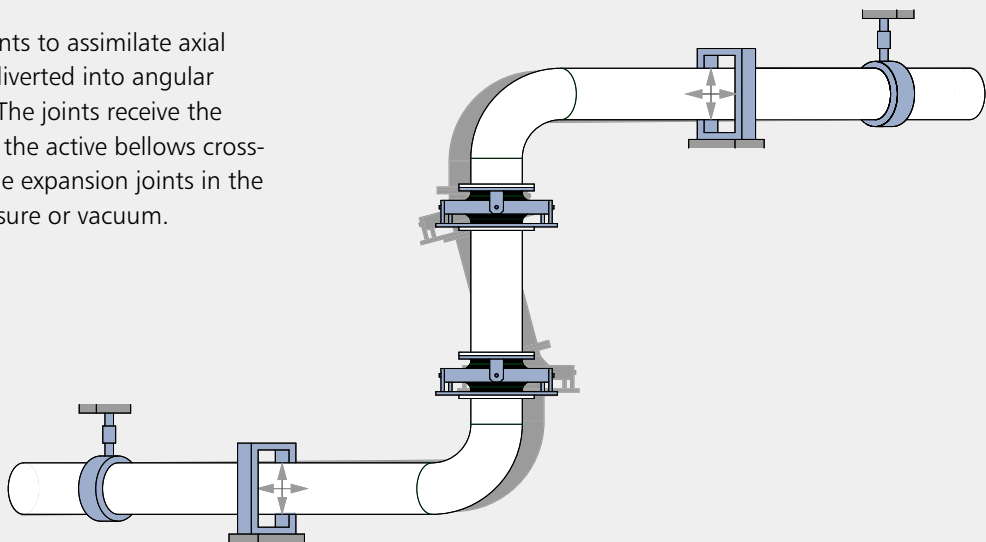


Expansion joints to assimilate axial movements diverted into angular movements. The joints receive the stresses from the active bellows cross-sections of the expansion joints in the event of pressure or vacuum. The tie rods' axes of rotation should be mounted vertically for axial movements.

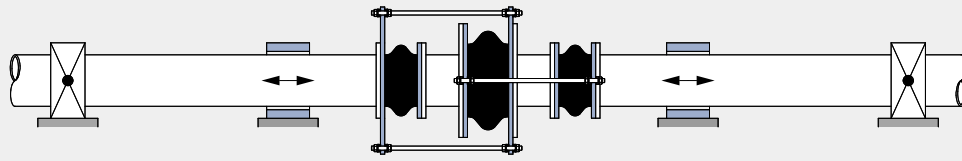


Cardan joint expansion joints

Expansion joints to assimilate axial movements diverted into angular movements. The joints receive the stresses from the active bellows cross-sections of the expansion joints in the event of pressure or vacuum.

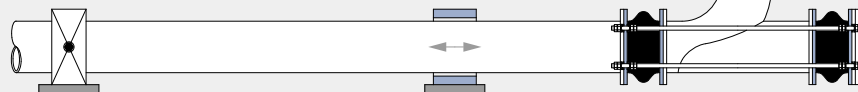


Pressure balanced expansion joints

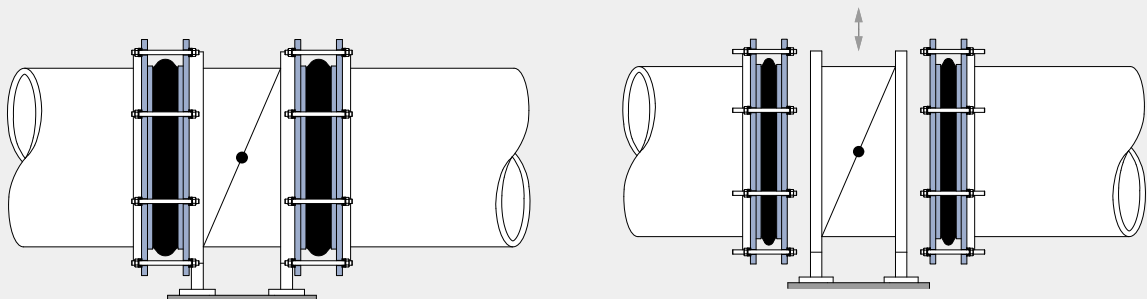


Expansion joints for the assimilation of axial movements without transferring stresses resulting from pressure or vacuum to the adjacent fixed points, apparatus or machines. The difference between the active bellows cross-sections of a large and small expansion joint corresponds to the active bellows cross-section surface area of a small expansion joint. If the tie rods are installed so that they intersect, the stresses will cancel each other out. Only axial forces of the expansion joints are induced in case of movements.

Expansion joints for the assimilation of axial movements in a pipeline elbow without transferring stresses resulting from pressure or vacuum to the adjacent fixed points. Corner-balanced expansion joints are used if only axial expansion is possible due to the course of the pipeline or due to lack of space, and when it is uneconomical to use a fixed point to accommodate the stresses. Only axial forces of the expansion joints are induced in case of movements. These are only axial forces for movements in direction of the expansion joint axis and only lateral forces for movements transverse to the expansion joint axis.



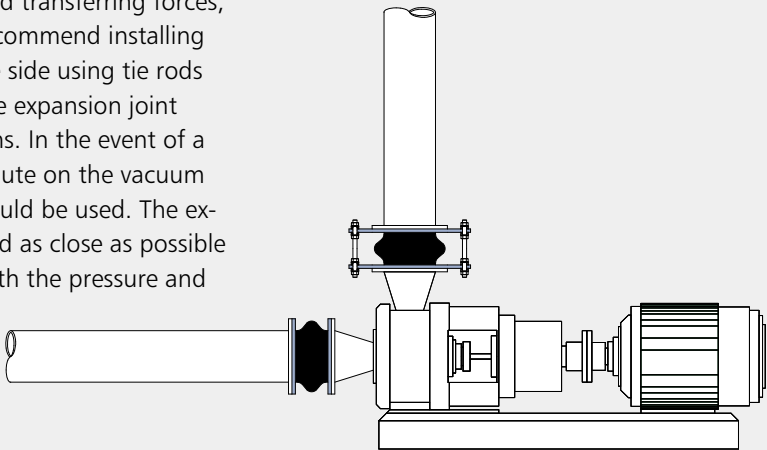
Expansion joints in the form of "dismantling joints"



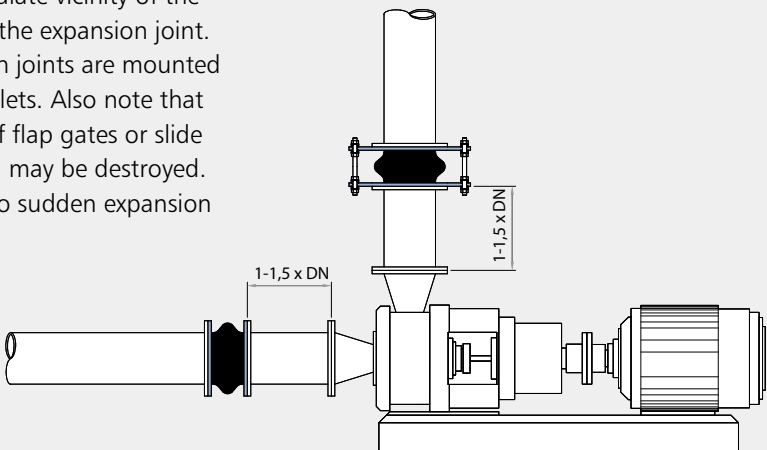
In order to compensate for installation imprecision or to simplify connection and disconnection, tied expansion joints can be used. On the one hand, the tie rods prevent the transfer of stresses to the connected armature. On the other hand, after the flange connection is loosened using the tie rod flange, the rubber bellows can be compressed by its maximum potential axial movement capability in order to create clearance for dismantling of the armature.

Pump connection

Expansion joints are used to disconnect pumps from pipeline systems in order to avoid transferring forces, tensions and oscillations. We recommend installing expansion joints on the pressure side using tie rods in order to avoid transferring the expansion joint stresses to the pump connections. In the event of a vacuum exceeding 0.8 bar absolute on the vacuum side, a vacuum support ring should be used. The expansion joints should be installed as close as possible to the pump connections on both the pressure and vacuum sides.



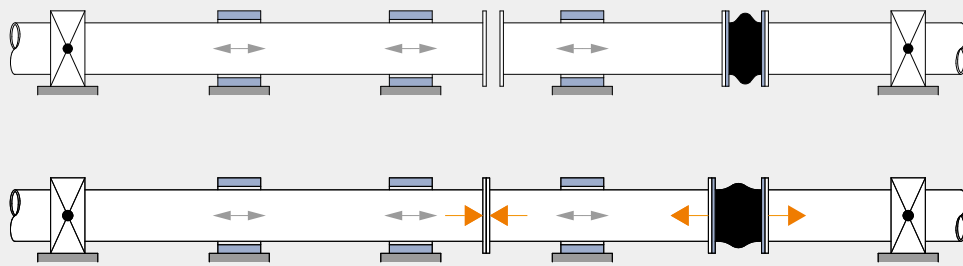
For the transport of abrasive media (liquids containing solids), a distance of 1 to 1.5 x the nominal pipeline diameter should be maintained between the pump connections and the expansion joint. Bouncing and turbulence in the immediate vicinity of the pump connection may damage the expansion joint. This also applies when expansion joints are mounted in the vicinity of elbows and outlets. Also note that expansion joints in the vicinity of flap gates or slide valves that are only partly closed may be destroyed. Pump cavitation may also lead to sudden expansion joint failure.



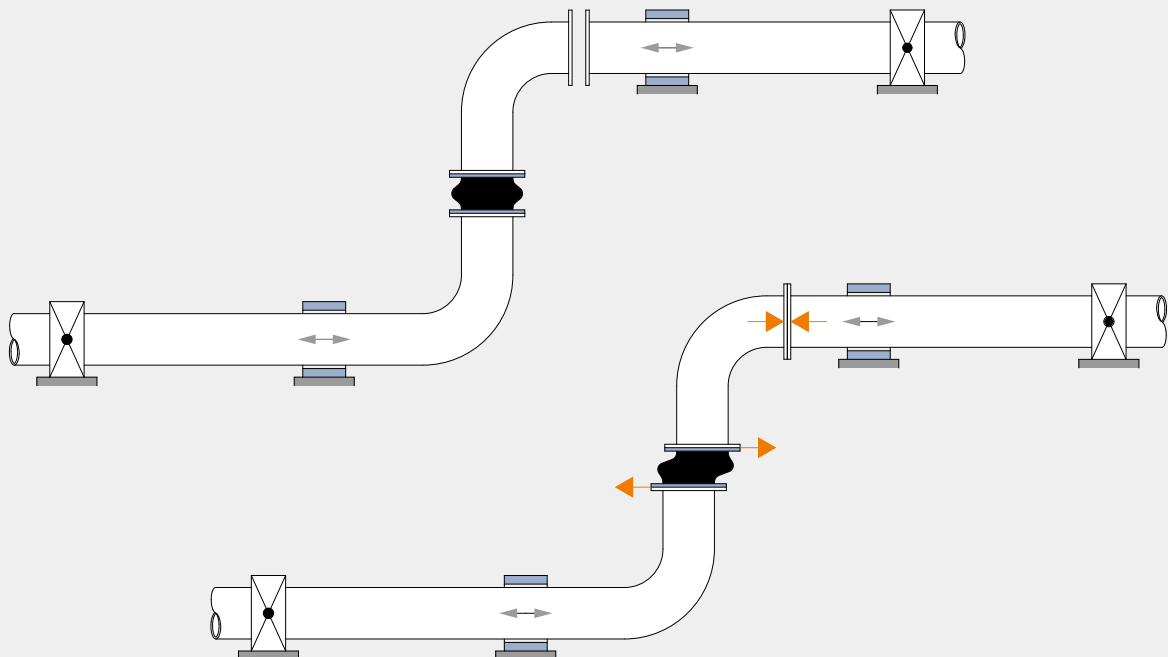
Expansion joint pre-load

Large axial and lateral movements can be reduced by presetting the line against the direction of movement.

In order to increase axial movement, the expansion joint can be pre-loaded to its maximum extension during installation. There is a risk, however, that for expansion joints with swivel flanges, the sealing bead will spring free of the groove of the backing flange and that for expansion joints with full-faced rubber flanges, the latter cannot be positioned so as to be congruent with the pipe flange. If pre-loads of more than 10 mm are needed, a flange connection will need to be disconnected at another location. Now the expansion joint can be installed free of tension and the flange disconnection sites that were opened before can be closed again.



In order to increase lateral movement, the expansion joint can be pre-loaded to its maximum lateral displacement against the direction of flow during installation. During operation, it will move back to the opposite side through the zero point. In this way, the lateral movement can be increased by up to 100%. There is a risk, however, that for expansion joints with swivel flanges, the sealing bead will spring free of the groove of the backing flange and that for expansion joints with full-faced rubber flanges, the latter cannot be positioned so as to be congruent with the pipe flange. If pre-loads of more than 5 mm are needed, a flange connection will need to be disconnected at another location. Now the expansion joint can be installed free of tension and the flange disconnection sites that were opened before can be closed again.



Expansion joint technology > Bellows construction

Our rubber expansion joints are designed based on the Pressure Equipment Directive PED 2014/68/EU for the specified operating conditions.

An expansion joint is constructed as follows:

- medium-resistant internal layer (bore)
- pressure-resistant fabric insert
- weather, ozone and UV-resistant external layer (cover)

Suitable rubber blends and fabric grades are available to meet your specific requirements.

The dimensions and movements listed for the expansion joint types are values that are commonly found on the market, yet they are not binding and can be adjusted to suit your application.

In this catalogue, we distinguish between:

Expansion joint variants

- Universal expansion joints
- Lateral expansion joints
- Angular expansion joints
- Wall seals
- Special expansion joints

Fixing variants

- Full faced rubber flanges
- Swivel flanges
- Clamped fixing

Bellows shape

- Cylindrical
- Single or multiple arches
- Conical

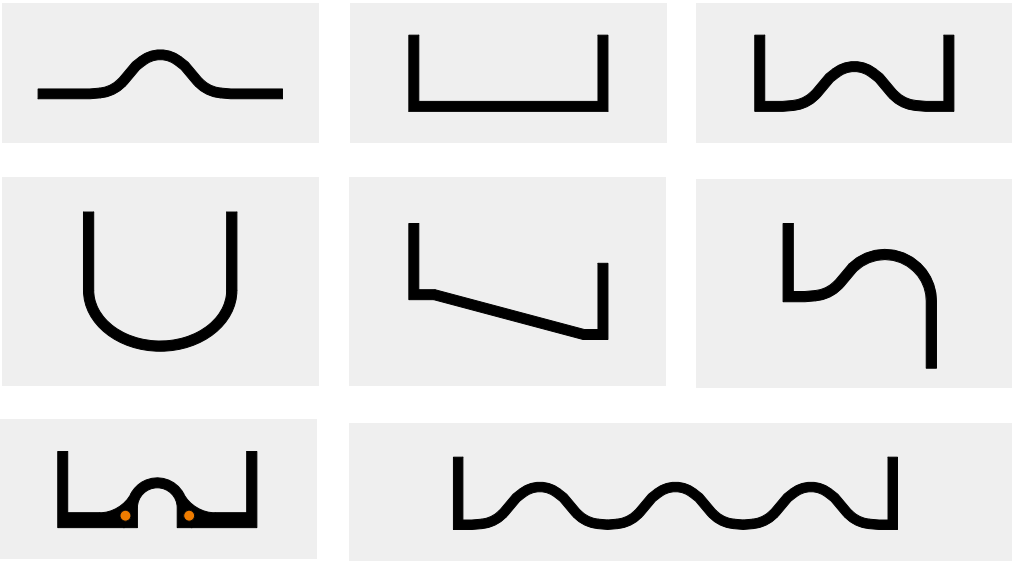
Support ring variants

- Internal
- Embedded
- External

Bellows cross-sections

Dimensions, pressure and movement require special designs. Our manufacturing process allows us to produce a great variety of bellows cross-sections in order to provide optimal

solutions to any application you may have. The designs shown are simply a rough overview.



In order to avoid turbulence and deposits, the arch of the expansion joint can be filled with foam rubber to make the inside of the bellows hydrodynamic. A filled arch significantly restricts the expansion joint’s ability to move, however. Most of the expansion joints shown in the catalogue have hydrodynamic, self-cleaning arch contours which help to constantly flush out solid matter. A filled arch is therefore only needed for rare applications.

Rubber grades

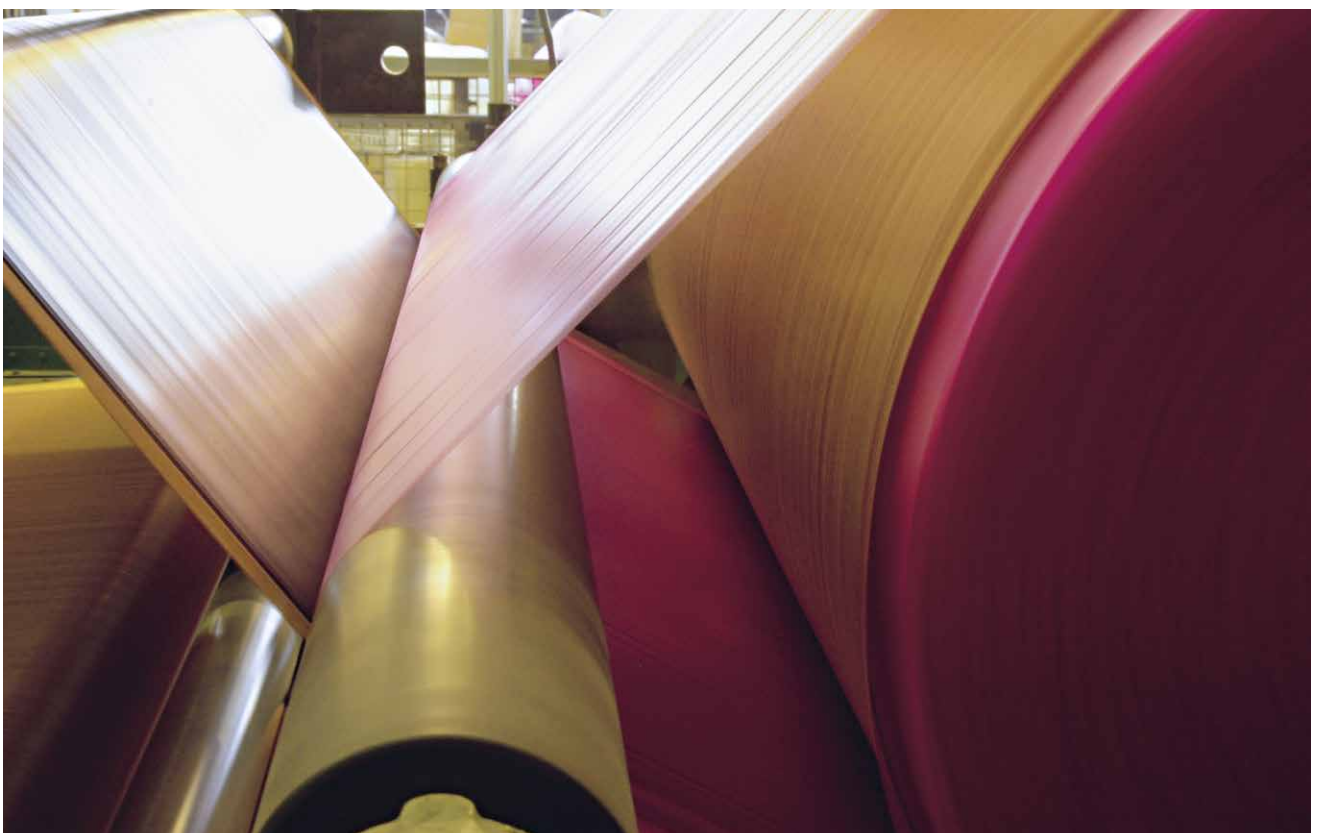
The rubber blends adapted to our requirements are obtained from reputable manufacturers. We work with them continuously to further develop and optimize the blends.

The physical and chemical properties are specified in detail in the materials datasheets and every batch of rubber delivered is subjected to extensive goods receipt inspections.

The expansion joint bellows are made using individual rubber films and reinforcements and are vulcanised after moulding. Vulcanisation refers to cross-linking the rubber by subjecting it to high pressure and temperature. The rubber is converted from its original plastic state into an elastic state by molecular bridge bonding using sulphur or peroxides.

All rubber grades are subject to natural aging that reduces elasticity and raises Shore hardness. Under normal conditions, one can assume that the Shore hardness increases on average by 1° Shore A per year. This value may rise at higher temperatures. For this reason, we recommend that you inspect the Shore hardness at regular intervals and replace the expansion joints when the value reaches approximately 80° Shore A. Assuming a Shore hardness of approximately 60° Shore A, the component lifetime will be 15 to 20 years. Wear and external influences such as UV radiation and ozone damage are also involved here.

We will select the appropriate rubber grade for your application from a wide variety of different blends depending on the composition of the medium and the operating temperature:



Rubber grade	General characteristics and applications
EPDM	• Operating temperature: sulfur cured –40 °C to +100 °C, peroxide cured –40 °C to +120 °C • Excellent aging, UV, ozone and weather-resistance • Highly vapour-resistant • Highly soak-resistant and chemical-resistant to dilute acids, bases, acetone and alcohol • Not suitable for aliphatic, aromatic or chlorinated hydrocarbons • Standard blend: conductive with ATEX certification
EPDMbeige	• Food grade quality • Non conductive
EPDMtw	• For drinking water
EPDMaf	• Good wear resistancy
IIR	• Operating temperature –20 °C to +100 °C • Highly gas-tight • Highly resistant to many dilute acids and bases • Not very resistant to aliphatic, aromatic and chlorinated hydrocarbons
CSM	• Operating temperature –20 °C to +100 °C • Excellent weather-resistance • Favourable fire protection behaviour • Very good to excellent resistance to oxidising chemicals • Good oil-resistance, including at high oil temperatures and resistant to many alloyed oils
NBR	• Operating temperature –30 °C to +100 °C • Good heat and aging resistance, especially if air is kept out (e. g. in oil) • Excellent soak-resistance against non-polar or slightly polar media, e. g. fuels, • Mineral oils, lubricants, plant and animal fats or oils • Not resistant to esters, ketones, aromatic and chlorinated hydrocarbons
NBRbeige	• Food grade quality • Non conductive
CR	• Operating temperature –20 °C to +90 °C • Very good UV, ozone and weather-resistance • Good flame resistance • Adequate resistance to paraffinic, naphthenic and high-molecular oils • Chemical resistance against alkalis, dilute acids, aqueous salt solutions and reductive agents • Not suitable for oxidising materials and concentrated mineral acids
NR	• Operating temperature –20 °C to +70 °C • Satisfactory heat, aging and ozone resistance • High tensile strength at high elasticity up to 600% • Very good abrasion resistance • Not very resistant to hot water or steam • Low soaking by aliphates and other solvents • Not resistant to chlorinated hydrocarbons, aromatic, esters and ketones
FPM	• Operating temperature –20 °C to +180 °C • Excellent aging, UV, ozone and weather resistance • Excellent general chemical resistance, also to hot oils, aliphates, aromatics and • Chlorinated hydrocarbons • Highly gas-tight • Non conductive
FPMbeige	• Food grade quality • Non-conductive
Q (Silicon)	• Operating temperature –60 °C to +200 °C • Excellent resistance to aging, UV, ozone and weather • Very good radiation resistance • Can be delivered as food grade • Should not be used with steam over 120 °C • Satisfactory resistance to engine and transmission oils of an aliphatic nature • Not resistant to fuels, chlorinated hydrocarbons, esters, ketones or ether • Highly susceptible to acids and bases • Satisfactory gas-tightness

PTFE lining

If it is not possible to select a rubber grade that will endure for the long term due to the corrosiveness of the medium or the diversity of materials being conveyed, we can provide an expansion joint with an interior lining of PTFE. It is firmly

connected to the exterior rubber bellow. A detailed specification of the operating conditions is required when considering employing a PTFE-lined rubber expansion joint.

Reinforcements

The fabric inserts of the rubber bellows assimilate the pressure from the internal pressure or vacuum. The type, quantity and mounting of the reinforcements are designed in keeping with Pressure Equipment Directive PED 2016/68/EU. The reinforcement carriers are completely embedded in the bellows and are firmly connected to the rubber.

The following fabrics are used depending on the medium temperature:

up to 100 °C:	Nylon fabric Polyester fabric
up to 180 °C:	Kevlar fabric
up to 200 °C:	Glass fabric Steel mesh

Requirement specification

We need the following information in order to select a rubber expansion joint:

Expansion joint variants

- Universal expansion joint
- Lateral expansion joint
- Angular expansion joint
- Wall seal

Fixing type

- Full faced rubber flange
- Swivel flange
- Clamped fixing

Dimensions

- Nominal diameter
- Installation length
- Flange norm

Medium

- Composition
- Aggregation state
- Proportion of solids

Temperature

- Minimum and maximum operating temperature
- Accident temperature and duration
- Design temperature

Pressure

- Pressure and vacuum
- Pressure surge
- Alternating pressure
- Design pressure
- Test pressure

Movement

- Axial compression
- Axial extension
- Lateral displacement
- Angular movement
- Torsion
- Oscillation frequency and amplitude

Expansion joint technology > Fixing types

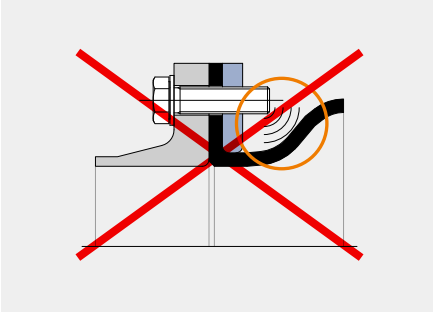
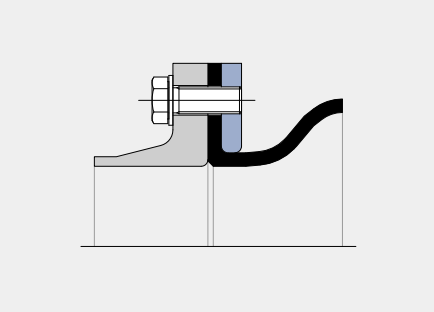
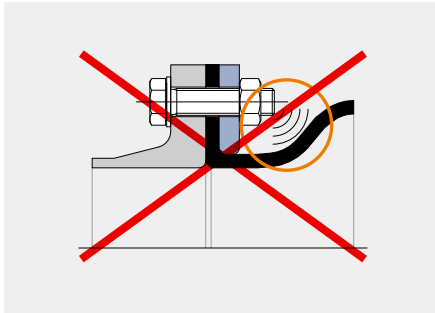
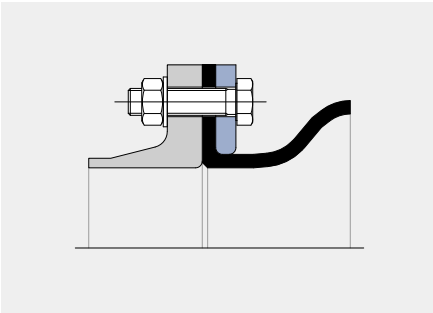
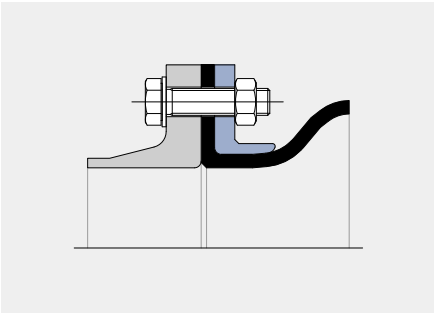
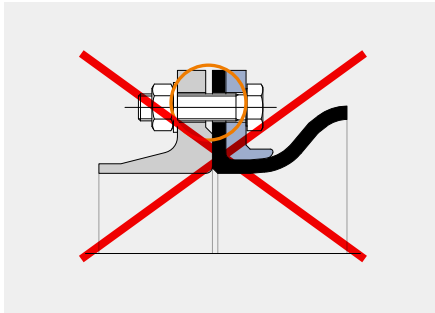
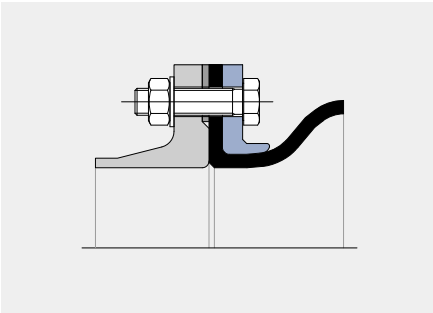
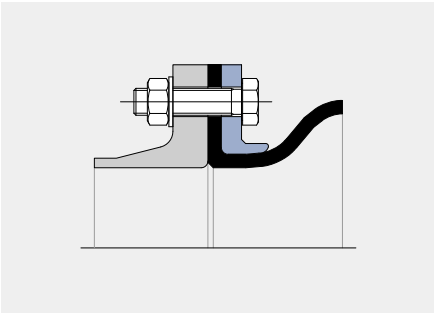
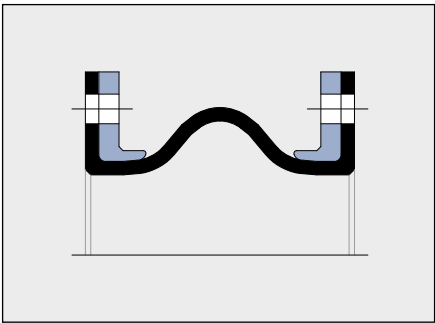
Flanged fixing

With full faced rubber flanges and backing flanges

The rubber flange of the bellows is moulded in an equal thickness to the flange diameter. The backing flanges are designed as press-on flanges with or without support collars. The manufacturing process is only economical for very large diameters. For transport reasons, the backing flanges can also be delivered in a split design.

The clamping of the expansion joints needs to be performed in keeping with the following illustrations in order to assure reliable sealing of the flange connection and to avoid damaging the expansion joint bellows.

An additional seal is not required.

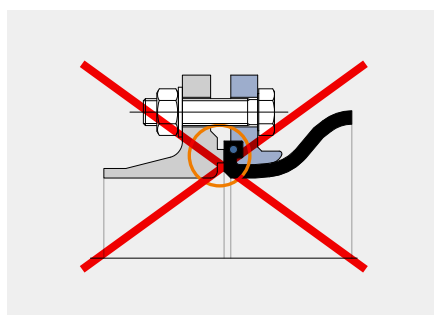
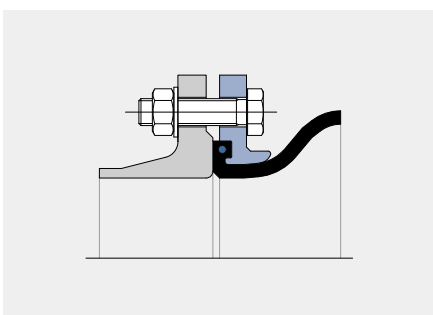
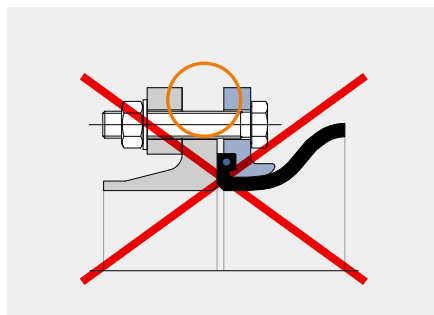
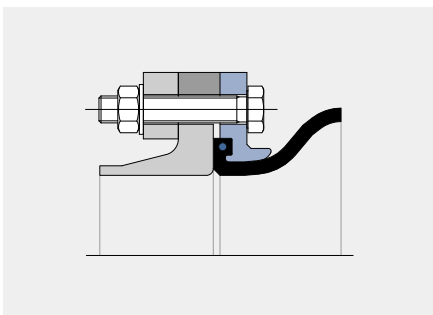
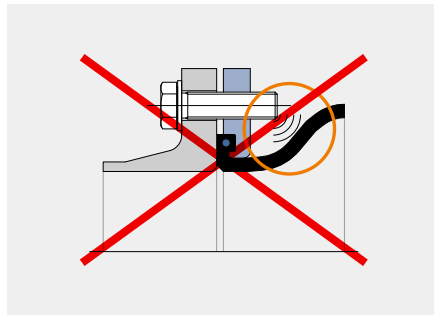
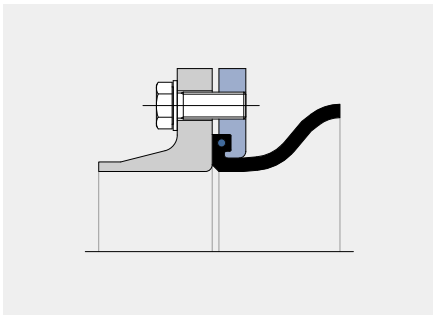
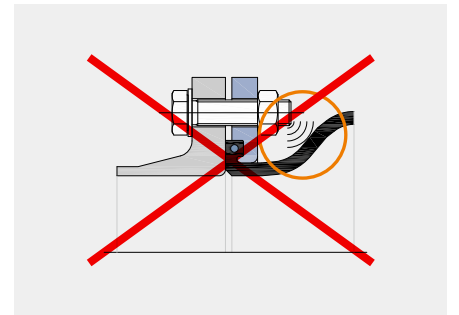
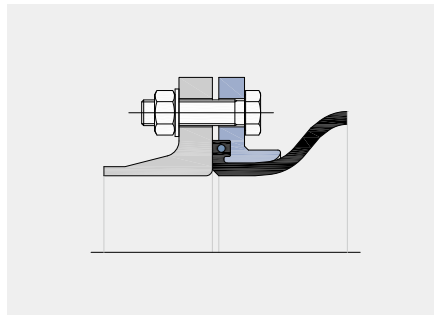
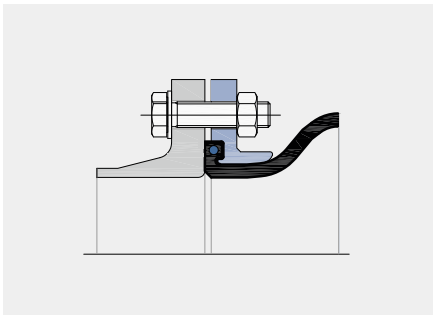
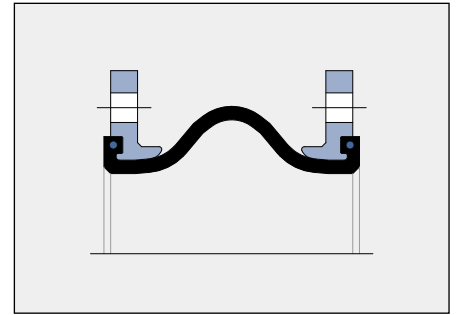


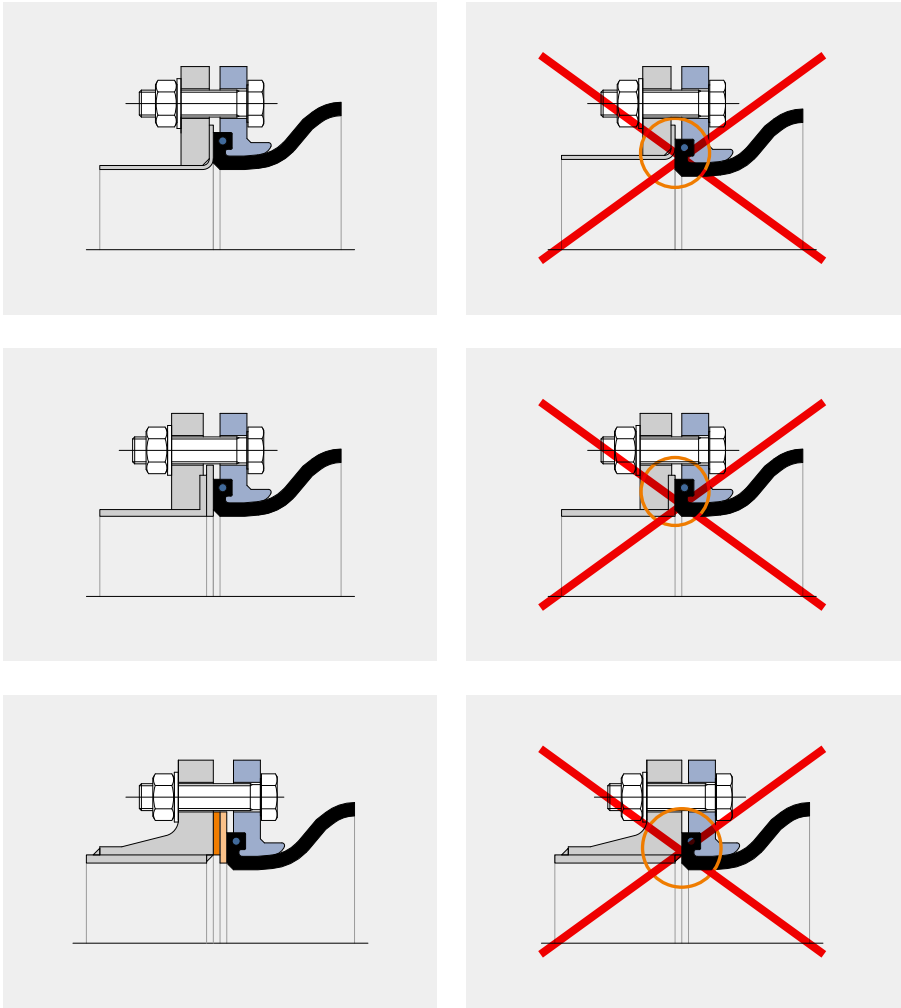
With self-sealing rubber bulges and swivel backing flanges

The rubber flange of the bellows is designed as a sealing bulge with an embedded steel core. The swivel backing flanges can be made with or without support collars and can be used to simplify the installation of the expansion joint for misaligned flange bores. Standard sizes are offered up to a nominal diameter of NB1200. For larger dimensions, the costs associated with turning the groove into the steel flange rise sharply.

The clamping of the expansion joints needs to be performed in keeping with the following illustrations in order to assure reliable sealing of the flange connection and to avoid damaging the expansion joint bellows.

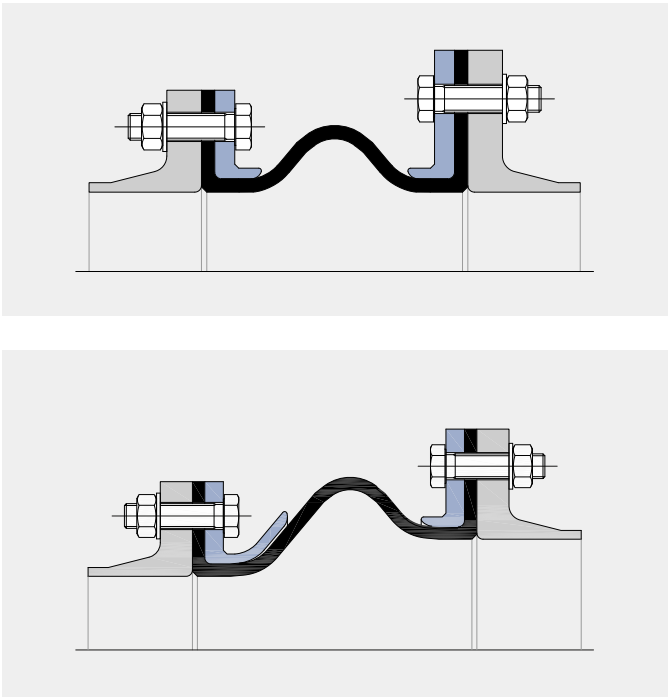
An additional seal is not required.





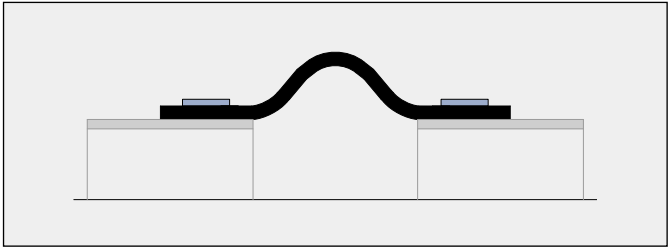
Different flange dimensions and nominal diameter jumps

The flange dimensions can be designed in keeping with all the international norms, such as DIN, ANSI, AWWA, BS or JIS. Special dimensions can be accommodated. This also applies to expansion joints with different flange dimensions or with nominal diameter jumps. The bores of the backing flanges can be manufactured as threaded holes or clearance holes as required.

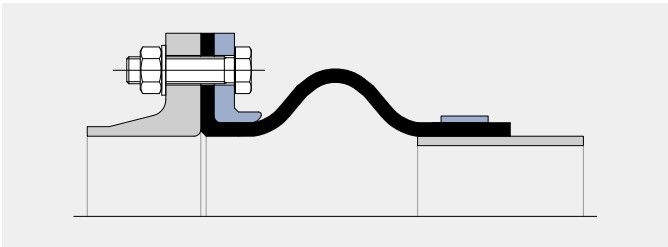


Clamped fixing

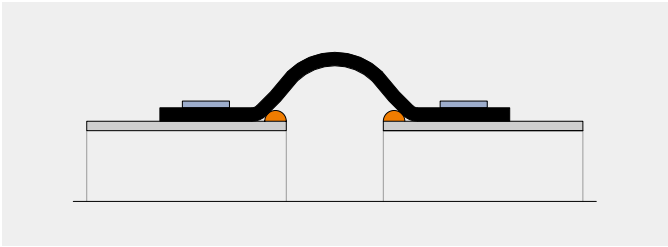
Belt expansion joints have cylindrical ends (sleeves) that are clamped to the pipeline ends using clamping clips.



If needed, the expansion joint can be made using flange fixing on one side and a sleeve on the other.



At higher pressures (1 bar) and greater nominal diameters (> NB 500), the fixing of a belt expansion joint may lead to sealing problems. There is also the risk that the expansion joint will be pulled off the pipeline. For this reason, we recommend that you attach a welding bead or a wire to the pipeline ends.



Clamping clips

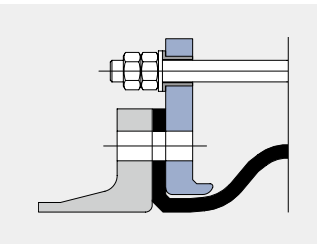
Design:	Depending on pressure and the nominal diameter, endless clamp belt, screw thread belt, small clamps or hinge bolt clamps. At higher pressures, 2 adjacent clamps per fastening side.	
Width:	Endless clamp belt:	¾"
	Screw thread belt:	½"
	Small clamp:	depending on Ø: 9–12 mm
	Hinge bolt clamp:	depending on Ø: 18–30 mm
Materials:	Endless clamp belt with screw lugs (tongs):	1.7300
	Screw thread belt with threaded screw lugs:	1.4310
	Small clamp, belt and housing:	1.4016 (Screw steel galvanised)
	Hinge bolt clamp, belt and housing:	1.4016 (Screw steel galvanised)

Expansion joint technology > Tie rod designs

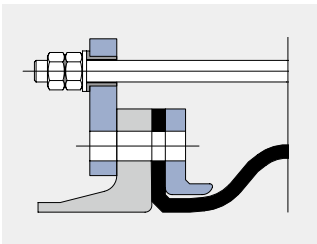
Rubber expansion joints exert force on the adjacent sliding or fixed point when under pressure (active bellows cross-section surface area x operating pressure). These can be eliminated by using lateral or angular expansion joints with tie rods, such that the bearings are unburdened accordingly.

- Tie rods:** Several threaded rods mounted around the circumference assimilate pressure from the active bellows cross-section. Pipe flanges need to be parallel aligned for lateral expansion joints.
- Pressure:** The tie rods assimilate the axial stresses of the expansion joint.
- Stiffness rate:** Movements give rise to forces that rise under pressure and need to be taken into account in dimensioning the pipeline. Lateral stiffness rates to move the expansion joint under pressure can be found in the technical appendix; you may also enquire directly with us.

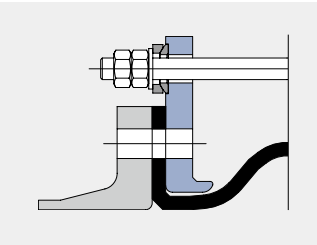
The following tie rod designs are used depending on the requirements:



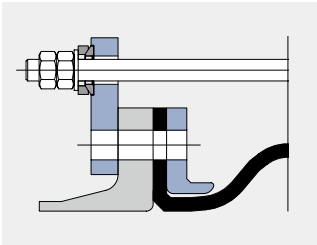
Design: B
Tie rods mounted outside in rubber bushing to accommodate reaction forces in the event of pressure (up to NB 300)



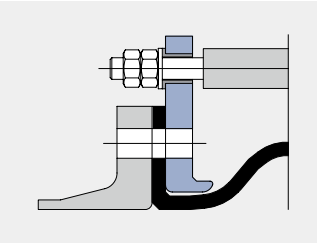
Design: R
Control unit plates: Tie rods mounted outside in the rubber bushing to accommodate reaction forces in the event of pressure (up to NB 300)



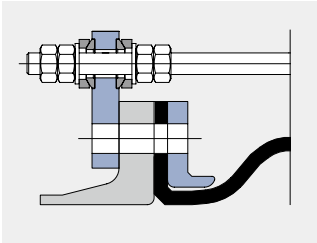
Design: E
Tie rods mounted outside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure



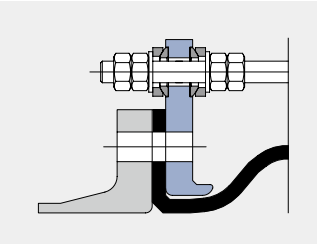
Design: K
Control unit plates: Tie rods mounted outside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure



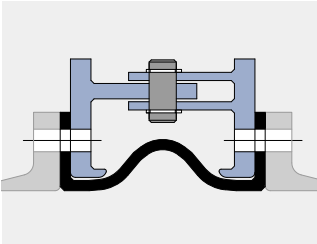
Design: C
Tie rods mounted outside in rubber bushing and inside in the thrust limiter to accommodate stresses in the event of pressure and vacuum (up to NB 300)



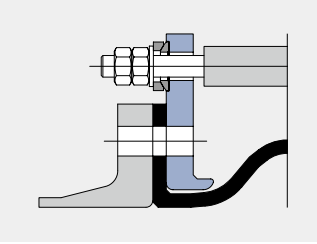
Design: L
Control unit plates: Tie rods mounted outside and inside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure and vacuum



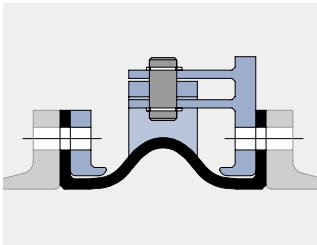
Design: M
Tie rods mounted outside and inside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure and vacuum



Design: F
Hinge tie rod: For angular movements on one level with plates and bolts to accommodate the reaction forces in the event of pressure and vacuum. Axis of rotation in the middle of the installation gap



Design: S
Tie rods mounted outside in spherical bearings and ball disks, as well as internally in thrust limiters to accommodate stresses in the event of pressure and vacuum



Design: G
Cardan joint tie rod: For angular movements on two levels with plates and bolts to accommodate the stresses in the event of pressure and vacuum. Axes of rotation in the middle of the installation gap

- Design:

Dimensioning according to design pressure (test pressure) based on the Pressure Equipment Directive
- Pipeline:

For laterally stayed expansion joints the flange diameter of the pipeline must not be bigger than as defined in the norm, as otherwise the tie rod touches against the side of the flange and the lateral movement is restricted.
- Materials:

Carbon steel in strength class 8.8 or stainless steel
- Coating:

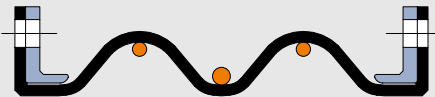
Spherical bearings and ball disks PTFE-coated
Tie rods galvanised, hot-dip galvanised or PTFE-coated

Expansion joint technology >

Vacuum support rings and pressure support rings

Rubber expansion joints can be equipped with internal vacuum support spirals, vacuum support rings and/or external pressure support rings to protect against warping of the expansion joint bellows depending on the operating pressure.

Consider that support rings reduce the movement of the expansion joints. In the event of contact with the medium, the resistance of the support ring material should be checked.

Design		Vacuum support ring	Pressure support ring	Pressure
1 With internal vacuum support ring		Medium contact, inside the arch apex	Without	Depending on the nominal diameter up to 25 bar, for vacuum up to 0.05 bar absolute
2 With embedded vacuum support ring		No medium contact, embedded into the arch apex of the rubber bellows	Without	Depending on the nominal diameter up to 25 bar, for vacuum up to 0.05 bar absolute
3 No vacuum support ring, with pressure support ring in the arch trough		Without	External in the arch trough	Depending on the nominal diameter up to 25 bar, slight vacuum
4 With internal vacuum support ring and external pressure support ring in the arch trough		Medium contact, inside the arch apex	External in the arch trough	Depending on the nominal diameter up to 25 bar, for vacuum up to 0.05 bar absolute
5 With embedded vacuum support ring and external pressure support ring in the arch trough		No medium contact, embedded into the arch apex of the rubber bellows	External in the arch trough	Depending on the nominal diameter up to 25 bar, for vacuum up to 0.05 bar absolute
6 With embedded support rings in the arch foot		No medium contact, embedded into the arch foot of the rubber bellows		Depending on the nominal diameter up to 16 bar, for vacuum up to 0.5 bar absolute

Materials		
Stainless steel:	1.4301 (X5CrNi18-10) 1.4539 (X1NiCrMoCu25-20-5) 1.4571 (X6CrNiMoTi17-12-2)	Other materials on request
Carbon steel:	1.0570 (S355J2G3) rubber coated 1.0570 (S355J2G3) galvanised	

Expansion joint technology > Flow liners

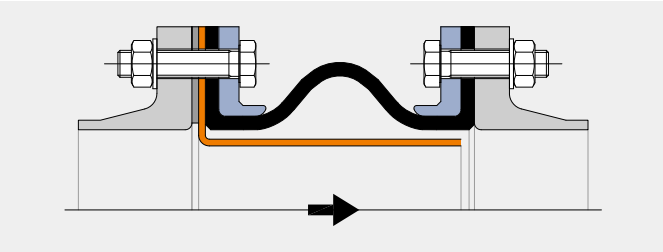
Rubber expansion joints have hydrodynamic arch intersections in order to reduce turbulence and flow losses. As a rule, it is possible to use them without an additional flow liner. This is only needed for abrasive media and for flow speeds of more than 5 m/s.

The expansion joint bellows should then be fully protected by the flow liner. The lateral displacement needs to be taken into account in dimensioning the flow liner and can in some circumstances lead to severe narrowing of the pipeline cross-section. The medium's direction of flow must be taken into account during installation.

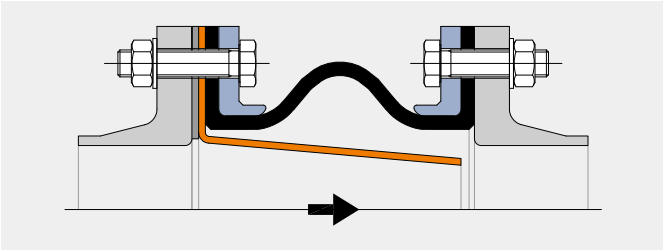
To avoid deposits between the flow liner and the expansion joint, the tube is perforated multiple times around its circumference, so that the intermediate space is flushed out and no deposits are able to form in the dead spots.

The flow liners are installed along with the expansion joint. An additional seal is required between the flow liner flange and the pipeline flange.

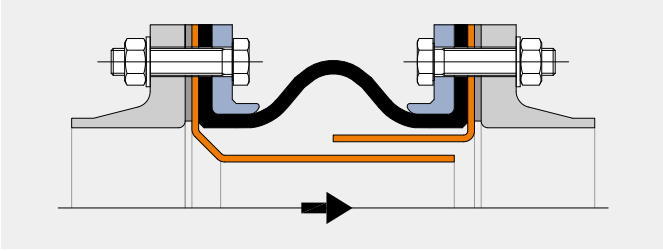
Expansion joints with a full faced rubber flange need a flow liner flange with holes.



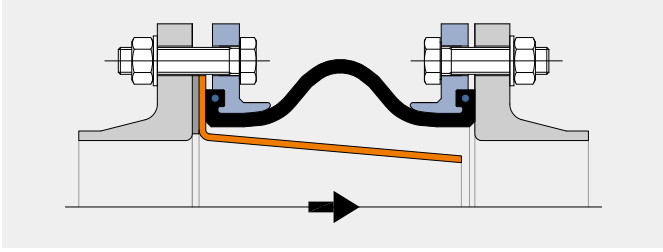
Cylindrical flow liner



Conical flow liner
Hydrodynamic



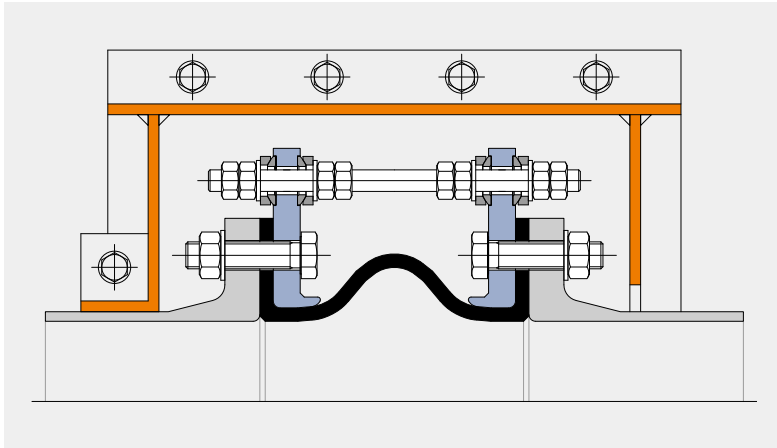
Telescoping flow liner
Complete bellows protection



Flow liners with a centring flange
For expansion joints with a sealing bulge

Expansion joint technology > Expansion joint protective hoods

Extreme external influences require that the expansion joints be protected by special measures. Appropriate protective covers have been developed to this end:

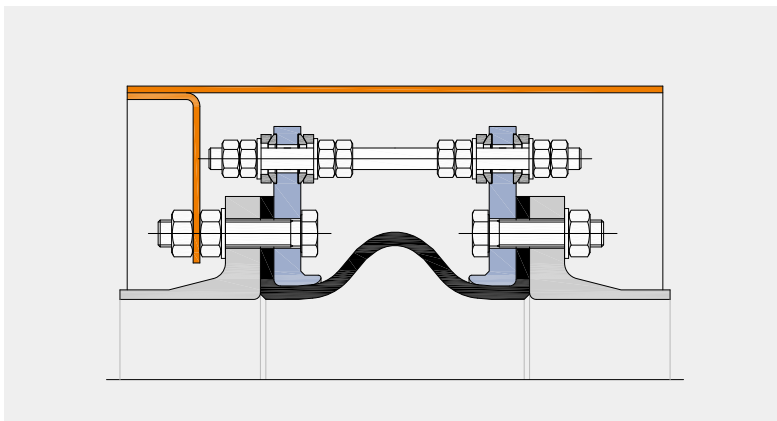


Ground protective cover

Made from galvanised carbon or stainless steel, in two or more parts, affixes to the medium pipe with an integrated clamp.

Protects against damage to bellows, dirt and earth pressure.

Used for underground pipelines.

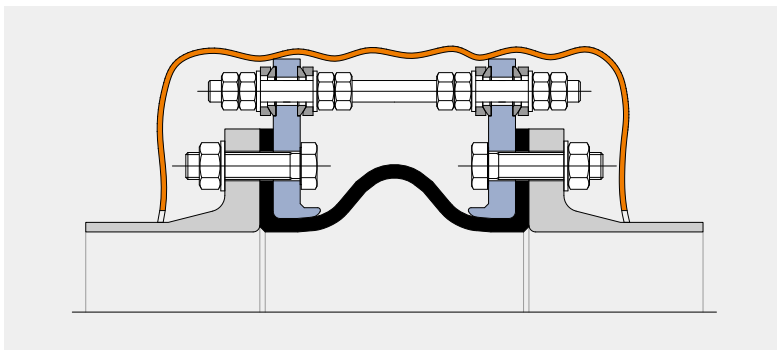


UV protection cover

Made from galvanised sheet metal, with two or more parts, multiple one-sided attachment on the circumference.

Protection against UV radiation and weather effects.

For use in regions with extreme solar radiation.

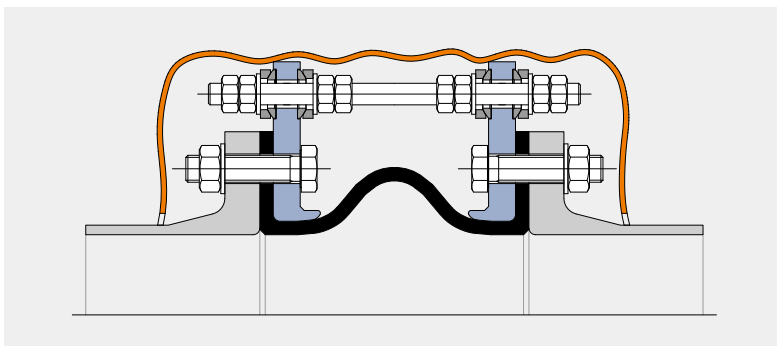


Fire protective cover

Made from coated glass fibre fabric and insulating layers.

Protects against the effects of flame up to 800 °C for a duration of 30 minutes.

Used in ships and for fire water supply lines in plant buildings.



Splash protective cover

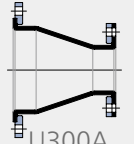
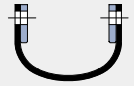
Protection in case of leakages



Type U150A universal expansion joint
Cooling water intake basin
NB 3600



Universal expansion joints with full faced rubber flange

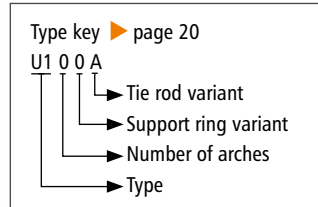
U100A	without arch	▶ 48	 U100A
U110A	with one arch	▶ 52	 U110A
U120A	with two arches	▶ 62	 U120A
U130A	with three or more arches	▶ 72	 U130A
U216A	with an arch and support rings at the arch foot	▶ 80	 U216A
U300A	in a conical-concentric or conical-eccentric design	▶ 84	 U300A
U400A	with one arch facing inward	▶ 90	 U400A
U900A	rectangular without arch	▶ 96	 U900A
U910A	rectangular with one arch	▶ 98	 U910A

U100A

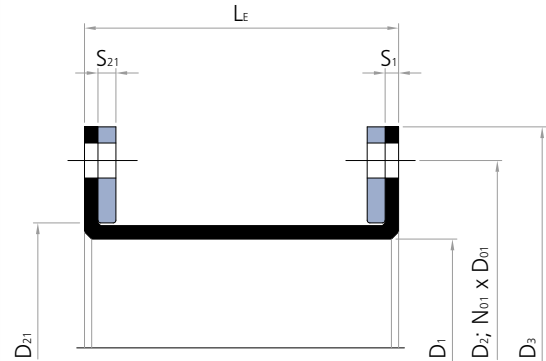
NB 100 – NB 4000



► Type U100A



Planning help U100A



Universal expansion joint without arch

- Design:** Hydrodynamic, cylindrical rubber bellows with full faced rubber flanges and single or multi-part backing flanges
Optionally with embedded pressure or vacuum support rings
- Nominal diameters:** NB 100 to NB 4000, intermediate sizes possible
- Installation length:** Standard $L_E = 150$ to 400 mm (► page 50–51)
Other installation lengths on request
- Pressure:** Depending on the nominal diameter and installation length up to 16 bar
Vacuum stability on request
Design in accordance with Pressure Equipment Directive PED 2014/68/EU
- Movement:** For small axial and lateral movements (► page 50–51)

Application:

Plant construction,
sand/gravel extraction
industry, dredgers,
food processing e. g. as
suction/pressure hoses,
in conveyor lines, on
pumps and vessels



Assembly instruction download
www.ditec-adam.de/en/downloads.html

Rubber bellows

Rubber	Fabric	Marking	Max.	Application
EPDM	Nylon		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDM	Kevlar		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMht	Kevlar		120 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMtw	Nylon		100 °C	Drinking water
EPDMtw	Kevlar		100 °C	Drinking water
EPDMaf	Nylon		100 °C	Abrasive materials, water-sand extraction
EPDMaf	Kevlar		100 °C	Abrasive materials, water-sand extraction
EPDMbeige	Nylon		100 °C	Foodstuffs
EPDMbeige	Kevlar		100 °C	Foodstuffs
IIR	Nylon		100 °C	Hot water, acids, bases, gases
IIR	Kevlar		100 °C	Hot water, acids, bases, gases
CSM	Nylon		100 °C	Strong acids, bases, chemicals
CSM	Kevlar		100 °C	Strong acids, bases, chemicals
NBR	Nylon		100 °C	Oils, petrol, solvents, compressed air
NBR	Kevlar		100 °C	Oils, petrol, solvents, compressed air
NBRbeige	Nylon		100 °C	Oil, fatty foods
NBRbeige	Kevlar		100 °C	Oil, fatty foods
CR	Nylon		90 °C	Cooling water, slightly oily water, seawater
CR	Kevlar		90 °C	Cooling water, slightly oily water, seawater
FPM	Kevlar		180 °C	Corrosive chemicals, petroleum distillates
FPMbeige	Kevlar		180 °C	Oil, fatty foods
NR	Nylon		70 °C	Abrasive materials
Silicon	Kevlar or glass		200 °C	Air, saltwater atmosphere, foodstuffs, medical technology

PTFE-lining: Permanently embedded against chemical attacks on the interior at the rubber bellows, available starting at NB 300. Take the restriction of the listed movement into account (▶ page 50–51)

UNIVERSAL
rubber flange

U100A

Flanges

- Design:

Single-part or multi-part, round backing flanges with clearance holes
- Flange norms:

DIN, EN, ANSI, AWWA, BS, JIS, special measurements (▶ page 256)
- Materials:

Carbon steel:

1.0038 (S235JRG2)
1.0570 (S355J2G3)

Stainless steel:

1.4301 (X5CrNi18-10)
1.4571 (X6CrNiMoTi17-12-2)

Aluminium:

AlMg3

Other materials on request
- Coating:

Primed, hot-dip galvanised, special paint

Optional accessories

- Protective covers:

UV protection cover
Ground protective cover
Fire protection cover
Splash protective cover (▶ page 44)
- Flow liners:

Cylindrical flow liner
Conical flow liner
Telescoping flow liner (▶ page 43)



Installation length (L _E) at design pressure															
	up to 10 bar L _E = 150 mm					up to 10 bar L _E = 200 mm					up to 10 bar L _E = 250 mm				
	higher pressures on request														
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²
100	8	5	10	0	79	10	6	13	0	79	13	8	17	0	79
125	8	5	10	0	123	10	6	13	0	123	13	8	16	0	123
150	8	5	9	0	177	10	6	12	0	177	13	8	15	0	177
175	8	5	9	0	254	10	6	12	0	254	13	8	15	0	254
200	8	5	9	0	314	10	6	12	0	314	13	8	14	0	314
250	8	5	8	0	491	10	6	11	0	491	13	8	14	0	491
300	8	5	8	0	716	10	6	11	0	716	13	8	13	0	716
350	8	5	8	0	990	10	6	10	0	990	13	8	13	0	990
400	8	5	8	0	1,269	10	6	10	0	1,269	13	8	13	0	1,269
450	8	5	7	0	1,612	10	6	10	0	1,612	13	8	12	0	1,612
500	8	5	7	0	1,987	10	6	10	0	1,987	13	8	12	0	1,987
550	8	5	7	0	2,376	10	6	9	0	2,376	13	8	12	0	2,376
600	8	5	7	0	2,856	10	6	9	0	2,856	13	8	12	0	2,856
650	8	5	7	0	3,318	10	6	9	0	3,318	13	8	11	0	3,318
700	8	5	7	0	3,893	10	6	9	0	3,893	13	8	11	0	3,893
750	8	5	7	0	4,418	10	6	9	0	4,418	13	8	11	0	4,418
800	8	5	7	0	5,090	10	6	9	0	5,090	13	8	11	0	5,090
850	8	5	6	0	5,675	10	6	9	0	5,675	13	8	11	0	5,675
900	8	5	6	0	6,433	10	6	9	0	6,433	13	8	11	0	6,433
950	8	5	6	0	7,088	10	6	8	0	7,088	13	8	11	0	7,088
1000	8	5	6	0	7,933	10	6	8	0	7,933	13	8	10	0	7,933
1050	8	5	6	0	8,659	10	6	8	0	8,659	13	8	10	0	8,659
1100	8	5	6	0	9,607	10	6	8	0	9,607	13	8	10	0	9,607
1150	8	5	6	0	10,387	10	6	8	0	10,387	13	8	10	0	10,387
1200	8	5	6	0	11,404	10	6	8	0	11,404	13	8	10	0	11,404
1250	8	5	6	0	12,272	10	6	8	0	12,272	13	8	10	0	12,272
1300	8	5	6	0	13,376	10	6	8	0	13,376	13	8	10	0	13,376
1350	8	5	6	0	14,314	10	6	8	0	14,314	13	8	10	0	14,314
1400	8	5	6	0	15,504	10	6	8	0	15,504	13	8	10	0	15,504
1450	8	5	6	0	16,513	10	6	8	0	16,513	13	8	10	0	16,513
1500	8	5	6	0	17,789	10	6	8	0	17,789	13	8	10	0	17,789
1600	8	5	6	0	20,232	10	6	8	0	20,232	13	8	10	0	20,232
1650	8	5	6	0	21,382	10	6	8	0	21,382	13	8	9	0	21,382
1700	8	5	6	0	22,832	10	6	8	0	22,832	13	8	9	0	22,832
1800	8	5	6	0	25,617	10	6	7	0	25,617	13	8	9	0	25,617
1900	8	5	6	0	28,502	10	6	7	0	28,502	13	8	9	0	28,502
1950	8	5	5	0	29,865	10	6	7	0	29,865	13	8	9	0	29,865
2000	8	5	5	0	31,573	10	6	7	0	31,573	13	8	9	0	31,573
2100	8	5	5	0	34,801	10	6	7	0	34,801	13	8	9	0	34,801
2200	8	5	5	0	38,186	10	6	7	0	38,186	13	8	9	0	38,186
2250	8	5	5	0	39,761	10	6	7	0	39,761	13	8	9	0	39,761
2300	8	5	5	0	41,728	10	6	7	0	41,728	13	8	9	0	41,728
2400	8	5	5	0	45,428	10	6	7	0	45,428	13	8	9	0	45,428
2500	8	5	5	0	49,284	10	6	7	0	49,284	13	8	9	0	49,284
2550	8	5	5	0	51,071	10	6	7	0	51,071	13	8	9	0	51,071
2600	8	5	5	0	53,297	10	6	7	0	53,297	13	8	9	0	53,297
2700	8	5	5	0	57,468	10	6	7	0	57,468	13	8	9	0	57,468
2800	8	5	5	0	61,795	10	6	7	0	61,795	13	8	9	0	61,795
2850	8	5	5	0	63,794	10	6	7	0	63,794	13	8	8	0	63,794
2900	8	5	5	0	66,280	10	6	7	0	66,280	13	8	8	0	66,280
3000	8	5	5	0	70,922	10	6	7	0	70,922	13	8	8	0	70,922
3100	8	5	5	0	75,720	10	6	7	0	75,720	13	8	8	0	75,720
3150	8	5	5	0	77,931	10	6	7	0	77,931	13	8	8	0	77,931
3200	8	5	5	0	80,676	10	6	7	0	80,676	13	8	8	0	80,676
3300	8	5	5	0	85,789	10	6	7	0	85,789	13	8	8	0	85,789
3400	8	5	5	0	91,059	10	6	7	0	91,059	13	8	8	0	91,059
3450	8	5	5	0	93,482	10	6	7	0	93,482	13	8	8	0	93,482
3600	8	5	5	0	102,071	10	6	6	0	102,071	13	8	8	0	102,071
3800	8	5	5	0	113,710	10	6	6	0	113,710	13	8	8	0	113,710
4000	8	5	5	0	125,978	10	6	6	0	125,978	13	8	8	0	125,978

Recommended sizes
 Additional possible sizes

Reduction of movement for expansion joints with PTFE lining:
 axial compression: -33 %; axial extension: -66 %; lateral displacement: -50 %.
 Larger movements see type U110A.



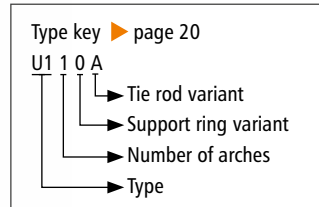
Installation length (L _E) at design pressure															
up to 10 bar L _E = 300 mm					up to 10 bar L _E = 350 mm					up to 10 bar L _E = 400 mm					
higher pressures on request															
Movement				A	Movement				A	Movement				A	NB
mm	mm	±mm	±°	cm²	mm	mm	±mm	±°	cm²	mm	mm	±mm	±°	cm²	
15	9	20	0	79	18	11	23	0	79	20	12	27	0	79	100
15	9	19	0	123	18	11	22	0	123	20	12	25	0	123	125
15	9	18	0	177	18	11	21	0	177	20	12	24	0	177	150
15	9	18	0	254	18	11	21	0	254	20	12	24	0	254	175
15	9	17	0	314	18	11	20	0	314	20	12	23	0	314	200
15	9	17	0	491	18	11	19	0	491	20	12	22	0	491	250
15	9	16	0	716	18	11	19	0	716	20	12	21	0	716	300
15	9	15	0	990	18	11	18	0	990	20	12	21	0	990	350
15	9	15	0	1,269	18	11	18	0	1,269	20	12	20	0	1,269	400
15	9	15	0	1,612	18	11	17	0	1,612	20	12	20	0	1,612	450
15	9	14	0	1,987	18	11	17	0	1,987	20	12	19	0	1,987	500
15	9	14	0	2,376	18	11	17	0	2,376	20	12	19	0	2,376	550
15	9	14	0	2,856	18	11	16	0	2,856	20	12	19	0	2,856	600
15	9	14	0	3,318	18	11	16	0	3,318	20	12	18	0	3,318	650
15	9	13	0	3,893	18	11	16	0	3,893	20	12	18	0	3,893	700
15	9	13	0	4,418	18	11	16	0	4,418	20	12	18	0	4,418	750
15	9	13	0	5,090	18	11	15	0	5,090	20	12	18	0	5,090	800
15	9	13	0	5,675	18	11	15	0	5,675	20	12	17	0	5,675	850
15	9	13	0	6,433	18	11	15	0	6,433	20	12	17	0	6,433	900
15	9	13	0	7,088	18	11	15	0	7,088	20	12	17	0	7,088	950
15	9	13	0	7,933	18	11	15	0	7,933	20	12	17	0	7,933	1000
15	9	12	0	8,659	18	11	15	0	8,659	20	12	17	0	8,659	1050
15	9	12	0	9,607	18	11	14	0	9,607	20	12	16	0	9,607	1100
15	9	12	0	10,387	18	11	14	0	10,387	20	12	16	0	10,387	1150
15	9	12	0	11,404	18	11	14	0	11,404	20	12	16	0	11,404	1200
15	9	12	0	12,272	18	11	14	0	12,272	20	12	16	0	12,272	1250
15	9	12	0	13,376	18	11	14	0	13,376	20	12	16	0	13,376	1300
15	9	12	0	14,314	18	11	14	0	14,314	20	12	16	0	14,314	1350
15	9	12	0	15,504	18	11	14	0	15,504	20	12	16	0	15,504	1400
15	9	12	0	16,513	18	11	14	0	16,513	20	12	16	0	16,513	1450
15	9	12	0	17,789	18	11	14	0	17,789	20	12	15	0	17,789	1500
15	9	11	0	20,232	18	11	13	0	20,232	20	12	15	0	20,232	1600
15	9	11	0	21,382	18	11	13	0	21,382	20	12	15	0	21,382	1650
15	9	11	0	22,832	18	11	13	0	22,832	20	12	15	0	22,832	1700
15	9	11	0	25,617	18	11	13	0	25,617	20	12	15	0	25,617	1800
15	9	11	0	28,502	18	11	13	0	28,502	20	12	15	0	28,502	1900
15	9	11	0	29,865	18	11	13	0	29,865	20	12	15	0	29,865	1950
15	9	11	0	31,573	18	11	13	0	31,573	20	12	15	0	31,573	2000
15	9	11	0	34,801	18	11	13	0	34,801	20	12	14	0	34,801	2100
15	9	11	0	38,186	18	11	13	0	38,186	20	12	14	0	38,186	2200
15	9	11	0	39,761	18	11	12	0	39,761	20	12	14	0	39,761	2250
15	9	11	0	41,728	18	11	12	0	41,728	20	12	14	0	41,728	2300
15	9	11	0	45,428	18	11	12	0	45,428	20	12	14	0	45,428	2400
15	9	10	0	49,284	18	11	12	0	49,284	20	12	14	0	49,284	2500
15	9	10	0	51,071	18	11	12	0	51,071	20	12	14	0	51,071	2550
15	9	10	0	53,297	18	11	12	0	53,297	20	12	14	0	53,297	2600
15	9	10	0	57,468	18	11	12	0	57,468	20	12	14	0	57,468	2700
15	9	10	0	61,795	18	11	12	0	61,795	20	12	14	0	61,795	2800
15	9	10	0	63,794	18	11	12	0	63,794	20	12	14	0	63,794	2850
15	9	10	0	66,280	18	11	12	0	66,280	20	12	14	0	66,280	2900
15	9	10	0	70,922	18	11	12	0	70,922	20	12	13	0	70,922	3000
15	9	10	0	75,720	18	11	12	0	75,720	20	12	13	0	75,720	3100
15	9	10	0	77,931	18	11	12	0	77,931	20	12	13	0	77,931	3150
15	9	10	0	80,676	18	11	12	0	80,676	20	12	13	0	80,676	3200
15	9	10	0	85,789	18	11	12	0	85,789	20	12	13	0	85,789	3300
15	9	10	0	91,059	18	11	11	0	91,059	20	12	13	0	91,059	3400
15	9	10	0	93,482	18	11	11	0	93,482	20	12	13	0	93,482	3450
15	9	10	0	102,071	18	11	11	0	102,071	20	12	13	0	102,071	3600
15	9	10	0	113,710	18	11	11	0	113,710	20	12	13	0	113,710	3800
15	9	10	0	125,978	18	11	11	0	125,978	20	12	13	0	125,978	4000

U110A

NB 100 – NB 4000



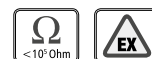
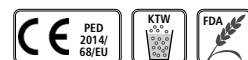
- **Type U110A**
without vacuum support ring
- **Type U111A**
with internal vacuum support ring
- **Type U112A**
with embedded vacuum support ring



Universal expansion joint with one arch

- Design:** Highly elastic, hydrodynamic, single-arch rubber bellows with full faced rubber flanges and backing flanges with support collar
Optionally with vacuum support ring
- Nominal diameters:** NB 100 to NB 4000, intermediate sizes possible
- Installation length:** Standard $L_E = 150$ to 400 mm (► page 56–61)
Other installation lengths on request
- Pressure:** Depending on the nominal diameter up to 40 bar
Vacuum stability on request, with vacuum support ring up to 0.05 bar absolute.
Design in accordance with Pressure Equipment Directive PED 2014/68/EU
- Movement:** For large axial, lateral and angular movements (► page 56–61)
- Stiffness rate:** Axial and lateral stiffness rates (► page 56–61)

Application:
Cooling water systems,
desalination plants,
drinking water supply,
plant constructions e.g.
in pipelines, on pumps,
as dismantling joints, on
condensers and vessels



Assembly instruction download
www.ditec-adam.de/en/downloads.html

Rubber bellows

Rubber	Fabric	Marking	Max.	Application
EPDM	Nylon		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDM	Kevlar		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMht	Kevlar		120 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMtw	Nylon		100 °C	Drinking water
EPDMtw	Kevlar		100 °C	Drinking water
EPDMaf	Nylon		100 °C	Abrasive materials, water-sand extraction
EPDMaf	Kevlar		100 °C	Abrasive materials, water-sand extraction
EPDMbeige	Nylon		100 °C	Foodstuffs
EPDMbeige	Kevlar		100 °C	Foodstuffs
IIR	Nylon		100 °C	Hot water, acids, bases, gases
IIR	Kevlar		100 °C	Hot water, acids, bases, gases
CSM	Nylon		100 °C	Strong acids, bases, chemicals
CSM	Kevlar		100 °C	Strong acids, bases, chemicals
NBR	Nylon		100 °C	Oils, petrol, solvents, compressed air
NBR	Kevlar		100 °C	Oils, petrol, solvents, compressed air
NBRbeige	Nylon		100 °C	Oil, fatty foods
NBRbeige	Kevlar		100 °C	Oil, fatty foods
CR	Nylon		90 °C	Cooling water, slightly oily water, seawater
CR	Kevlar		90 °C	Cooling water, slightly oily water, seawater
FPM	Kevlar		180 °C	Corrosive chemicals, petroleum distillates
FPMbeige	Kevlar		180 °C	Oil, fatty foods
NR	Nylon		70 °C	Abrasive materials
Silicon	Kevlar or glass		200 °C	Air, saltwater atmosphere, foodstuffs, medical technology

PTFE-lining: Permanently embedded against chemical attacks on the interior at the rubber bellows, available starting at NB 300. Take the restriction of the listed movement into account (▶ page 56–61)

UNIVERSAL
rubber flange

U110A

Flanges

- Design:

Single-part or multi-part, round backing flanges with support collar and clearance holes
- Flange norms:

DIN, ANSI, EN, AWWA, BS, JIS, special measurements (▶ page 256)
- Materials:

Carbon steel:

1.0038 (S235JRG2)
1.0570 (S355J2G3)

Stainless steel:

1.4301 (X5CrNi18-10)
1.4571 (X6CrNiMoTi17-12-2)

Aluminium:

AlMg3

Other materials on request
- Coating:

Primed, hot-dip galvanised, special paint

Optional accessories

- Protective covers:

UV protection cover

Ground protective cover

Fire protection cover

Splash protective cover (▶ page 44)
- Flow liners:

Cylindrical flow liner

Conical flow liner

Telescoping flow liner (▶ page 43)

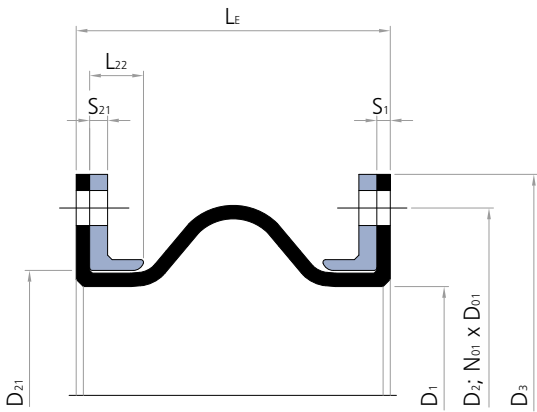
Support rings

TYPE		Vacuum support ring	Pressure	Movement
U110A		Without	Depending on the nominal diameter up to 40 bar, vacuum stability on request	▶ page 56
U111A		Medium contact, inside the arch apex	Depending on the nominal diameter up to 40 bar, for vacuum up to 0.05 bar absolute	▶ page 58
U112A		No medium contact, embedded into the arch apex of the rubber bellows	Depending on the nominal diameter up to 25 bar, for vacuum up to 0.05 bar absolute	▶ page 60

Materials

Stainless steel:	1.4301 (X5CrNi18-10) 1.4539 (X1NiCrMoCu25-20-5) 1.4571 (X6CrNiMoTi17-12-2)	Other materials on request
Carbon steel:	1.0570 (S355J2G3) rubber coated	

Planning help U110A



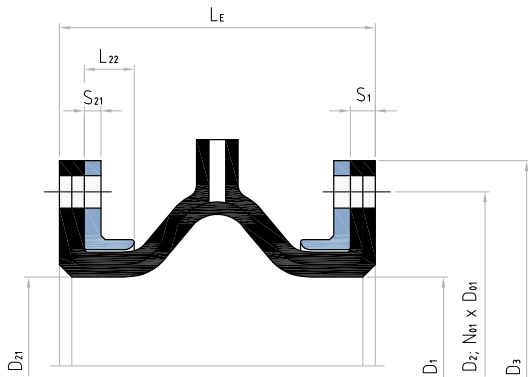
Example: Type U111A

U110A special design - 2-ply safety rubber expansion joint



- A moulded connection port
- B pressure gauge
- C bellows outer ply
- D bellows inner ply

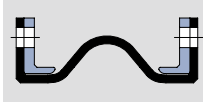
Planning help U110A special design



Design:

The expansion joint bellows reliability is critical as they generally stay on line for long periods of time between shutdowns. For this reason, bellows design incorporates a redundant pressure retaining ply combined with a leak detection hardware.

Typically the bellows is composed of two plies of a material that is capable of handling the full operating pressure alone. Both plies are vulcanized together in the flange connection area. The expansion joint is also able to withstand low pressures with a vacuum ring. The inner ply retains the pressure under normal circumstances. If the inner ply develops a leak, the outer ply then retains the pressure. If this happens the pressure between the plies is ported to a gauge that will then indicate a reading. This alerts personnel to take precautions to replace a failing bellows as soon as possible.



U110A

► without vacuum support ring

Installation length (L _E) at design pressure															
	up to 10 bar L _E = 150 mm					up to 10 bar L _E = 200 mm					up to 10 bar L _E = 250 mm				
	higher pressures on request														
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²
100	31	10	19	11.3	177	40	20	28	21.8	254	44	20	30	21.8	260
125	31	10	19	9.1	241	40	20	28	17.7	330	44	20	30	17.7	337
150	31	10	18	7.6	314	40	20	27	14.9	415	44	20	29	14.9	423
175	31	10	18	6.5	415	40	20	27	12.9	531	44	20	29	12.9	539
200	31	10	18	5.7	491	40	20	26	11.3	616	44	20	29	11.3	625
250	31	10	18	4.6	707	40	20	26	9.1	855	44	20	28	9.1	866
300	31	10	17	3.8	973	40	20	26	7.6	1,146	44	20	27	7.6	1,158
350	31	10	17	3.3	1,288	40	20	25	6.5	1,486	44	20	27	6.5	1,500
400	31	10	17	2.9	1,605	40	20	25	5.7	1,825	44	20	27	5.7	1,840
450	31	10	17	2.5	1,987	40	20	25	5.1	2,231	44	20	26	5.1	2,248
500	31	10	17	2.3	2,402	40	20	24	4.6	2,669	44	20	26	4.6	2,688
550	31	10	16	2.1	2,827	40	20	24	4.2	3,117	44	20	26	4.2	3,137
600	31	10	16	1.9	3,349	40	20	24	3.8	3,664	44	20	26	3.8	3,685
650	31	10	16	1.8	3,848	40	20	24	3.5	4,185	44	20	26	3.5	4,208
700	31	10	16	1.6	4,465	40	20	24	3.3	4,827	44	20	25	3.3	4,852
750	31	10	16	1.5	5,027	40	20	23	3.1	5,411	44	20	25	3.1	5,437
800	31	10	16	1.4	5,741	40	20	23	2.9	6,151	44	20	25	2.9	6,179
850	31	10	16	1.3	6,362	40	20	23	2.7	6,793	44	20	25	2.7	6,822
900	31	10	16	1.3	7,163	40	20	23	2.5	7,620	44	20	25	2.5	7,651
950	31	10	16	1.2	7,854	40	20	23	2.4	8,332	44	20	25	2.4	8,365
1000	31	10	16	1.1	8,742	40	20	23	2.3	9,246	44	20	25	2.3	9,280
1050	31	10	15	1.1	9,503	40	20	23	2.2	10,029	44	20	25	2.2	10,064
1100	31	10	15	1.0	10,496	40	20	23	2.1	11,047	44	20	24	2.1	11,085
1150	31	10	15	1.0	11,310	40	20	23	2.0	11,882	44	20	24	2.0	11,921
1200	31	10	15	1.0	12,370	40	20	22	1.9	12,969	44	20	24	1.9	13,009
1250	31	10	15	0.9	13,273	40	20	22	1.8	13,893	44	20	24	1.8	13,935
1300	31	10	15	0.9	14,420	40	20	22	1.8	15,066	44	20	24	1.8	15,109
1350	31	10	15	0.8	15,394	40	20	22	1.7	16,061	44	20	24	1.7	16,106
1400	31	10	15	0.8	16,627	40	20	22	1.6	17,320	44	20	24	1.6	17,366
1450	31	10	15	0.8	17,671	40	20	22	1.6	18,385	44	20	24	1.6	18,433
1500	31	10	15	0.8	18,991	40	20	22	1.5	19,731	44	20	24	1.5	19,781
1600	31	10	15	0.7	21,512	40	20	22	1.4	22,299	44	20	24	1.4	22,352
1650	31	10	15	0.7	22,698	40	20	22	1.4	23,506	44	20	24	1.4	23,561
1700	31	10	15	0.7	24,190	40	20	22	1.3	25,025	44	20	23	1.3	25,081
1800	31	10	15	0.6	27,055	40	20	22	1.3	27,937	44	20	23	1.3	27,996
1900	31	10	15	0.6	30,018	40	20	22	1.2	30,946	44	20	23	1.2	31,009
1950	31	10	15	0.6	31,416	40	20	22	1.2	32,365	44	20	23	1.2	32,429
2000	31	10	15	0.6	33,168	40	20	21	1.1	34,143	44	20	23	1.1	34,209
2100	31	10	15	0.5	36,474	40	20	21	1.1	37,497	44	20	23	1.1	37,565
2200	31	10	14	0.5	39,938	40	20	21	1.0	41,007	44	20	23	1.0	41,079
2250	31	10	14	0.5	41,548	40	20	21	1.0	42,638	44	20	23	1.0	42,712
2300	31	10	14	0.5	43,558	40	20	21	1.0	44,675	44	20	23	1.0	44,750
2400	31	10	14	0.5	47,336	40	20	21	1.0	48,500	44	20	23	1.0	48,578
2500	31	10	14	0.5	51,271	40	20	21	0.9	52,482	44	20	23	0.9	52,563
2550	31	10	14	0.4	53,093	40	20	21	0.9	54,325	44	20	23	0.9	54,408
2600	31	10	14	0.4	55,363	40	20	21	0.9	56,621	44	20	23	0.9	56,706
2700	31	10	14	0.4	59,612	40	20	21	0.8	60,917	44	20	23	0.8	61,005
2800	31	10	14	0.4	64,018	40	20	21	0.8	65,370	44	20	22	0.8	65,461
2850	31	10	14	0.4	66,052	40	20	21	0.8	67,426	44	20	22	0.8	67,518
2900	31	10	14	0.4	68,581	40	20	21	0.8	69,981	44	20	22	0.8	70,075
3000	31	10	14	0.4	73,301	40	20	21	0.8	74,748	44	20	22	0.8	74,845
3100	31	10	14	0.4	78,179	40	20	21	0.7	79,673	44	20	22	0.7	79,773
3150	31	10	14	0.4	80,425	40	20	21	0.7	81,940	44	20	22	0.7	82,041
3200	31	10	14	0.4	83,213	40	20	21	0.7	84,754	44	20	22	0.7	84,857
3300	31	10	14	0.3	88,405	40	20	21	0.7	89,993	44	20	22	0.7	90,099
3400	31	10	14	0.3	93,753	40	20	20	0.7	95,388	44	20	22	0.7	95,498
3450	31	10	14	0.3	96,211	40	20	20	0.7	97,868	44	20	22	0.7	97,979
3600	31	10	14	0.3	104,922	40	20	20	0.6	106,651	44	20	22	0.6	106,767
3800	31	10	14	0.3	116,718	40	20	20	0.6	118,542	44	20	22	0.6	118,664
4000	31	10	14	0.3	129,143	40	20	20	0.6	131,061	44	20	22	0.6	131,190

Recommended sizes

Additional possible sizes

Reduction of movement for expansion joints with PTFE lining:

axial compression: -33 %; axial extension: -66 %; lateral displacement: -50 %; angular movement: -66 %.

When the axial compression and extension is changed to the mean value, it is possible to increase the angular movement (for values see type U110F).

In the event of axial extension and simultaneous lateral displacement the above movements are reduced (► page 22).

For larger movements see type U120A or U123A.



Installation length (L _E) at design pressure															
up to 10 bar L _E = 300 mm					up to 10 bar L _E = 350 mm					up to 10 bar L _E = 400 mm					
higher pressures on request															
Movement				A	Movement				A	Movement				A	NB
mm	mm	±mm	±°	cm²	mm	mm	±mm	±°	cm²	mm	mm	±mm	±°	cm²	
53	31	39	31.8	353	69	43	53	40.7	491	78	53	62	46.7	616	100
53	31	39	26.4	441	69	43	51	34.5	594	78	53	60	40.3	731	125
53	31	38	22.5	539	69	43	51	29.8	707	78	53	59	35.2	855	150
53	31	37	19.5	670	69	43	50	26.2	855	78	53	58	31.2	1,018	175
53	31	37	17.2	765	69	43	49	23.3	962	78	53	58	27.9	1,134	200
53	31	36	13.9	1,029	69	43	48	19.0	1,257	78	53	57	23.0	1,452	250
53	31	36	11.7	1,346	69	43	48	16.0	1,605	78	53	56	19.5	1,825	300
53	31	35	10.0	1,713	69	43	47	13.8	2,003	78	53	55	16.8	2,248	350
53	31	35	8.8	2,075	69	43	46	12.1	2,393	78	53	54	14.8	2,660	400
53	31	34	7.8	2,507	69	43	46	10.8	2,856	78	53	54	13.3	3,147	450
53	31	34	7.1	2,971	69	43	45	9.8	3,349	78	53	53	12.0	3,664	500
53	31	34	6.4	3,442	69	43	45	8.9	3,848	78	53	53	10.9	4,185	550
53	31	33	5.9	4,015	69	43	45	8.2	4,453	78	53	52	10.0	4,815	600
53	31	33	5.4	4,560	69	43	44	7.5	5,027	78	53	52	9.3	5,411	650
53	31	33	5.1	5,230	69	43	44	7.0	5,728	78	53	52	8.6	6,138	700
53	31	33	4.7	5,836	69	43	44	6.5	6,362	78	53	51	8.0	6,793	750
53	31	33	4.4	6,604	69	43	43	6.1	7,163	78	53	51	7.5	7,620	800
53	31	32	4.2	7,268	69	43	43	5.8	7,854	78	53	51	7.1	8,332	850
53	31	32	3.9	8,123	69	43	43	5.5	8,742	78	53	50	6.7	9,246	900
53	31	32	3.7	8,858	69	43	43	5.2	9,503	78	53	50	6.4	10,029	950
53	31	32	3.5	9,799	69	43	43	4.9	10,477	78	53	50	6.1	11,029	1000
53	31	32	3.4	10,605	69	43	42	4.7	11,310	78	53	50	5.8	11,882	1050
53	31	32	3.2	11,652	69	43	42	4.5	12,390	78	53	49	5.5	12,989	1100
53	31	32	3.1	12,509	69	43	42	4.3	13,273	78	53	49	5.3	13,893	1150
53	31	31	3.0	13,623	69	43	42	4.1	14,420	78	53	49	5.0	15,066	1200
53	31	31	2.8	14,569	69	43	42	3.9	15,394	78	53	49	4.8	16,061	1250
53	31	31	2.7	15,770	69	43	42	3.8	16,627	78	53	49	4.7	17,320	1300
53	31	31	2.6	16,787	69	43	41	3.6	17,671	78	53	49	4.5	18,385	1350
53	31	31	2.5	18,074	69	43	41	3.5	18,991	78	53	48	4.3	19,731	1400
53	31	31	2.4	19,162	69	43	41	3.4	20,106	78	53	48	4.2	20,867	1450
53	31	31	2.4	20,536	69	43	41	3.3	21,512	78	53	48	4.0	22,299	1500
53	31	31	2.2	23,154	69	43	41	3.1	24,190	78	53	48	3.8	25,025	1600
53	31	31	2.2	24,384	69	43	41	3.0	25,447	78	53	48	3.7	26,302	1650
53	31	30	2.1	25,930	69	43	41	2.9	27,026	78	53	48	3.6	27,907	1700
53	31	30	2.0	28,893	69	43	40	2.7	30,049	78	53	47	3.4	30,978	1800
53	31	30	1.9	31,952	69	43	40	2.6	33,168	78	53	47	3.2	34,143	1900
53	31	30	1.8	33,394	69	43	40	2.5	34,636	78	53	47	3.1	35,633	1950
53	31	30	1.8	35,199	69	43	40	2.5	36,474	78	53	47	3.0	37,497	2000
53	31	30	1.7	38,603	69	43	40	2.3	39,938	78	53	47	2.9	41,007	2100
53	31	30	1.6	42,164	69	43	40	2.2	43,558	78	53	46	2.8	44,675	2200
53	31	30	1.6	43,818	69	43	40	2.2	45,239	78	53	46	2.7	46,377	2250
53	31	30	1.5	45,882	69	43	40	2.1	47,336	78	53	46	2.6	48,500	2300
53	31	29	1.5	49,757	69	43	39	2.1	51,271	78	53	46	2.5	52,482	2400
53	31	29	1.4	53,789	69	43	39	2.0	55,363	78	53	46	2.4	56,621	2500
53	31	29	1.4	55,655	69	43	39	1.9	57,256	78	53	46	2.4	58,535	2550
53	31	29	1.4	57,979	69	43	39	1.9	59,612	78	53	46	2.3	60,917	2600
53	31	29	1.3	62,325	69	43	39	1.8	64,018	78	53	46	2.2	65,370	2700
53	31	29	1.3	66,829	69	43	39	1.8	68,581	78	53	45	2.2	69,981	2800
53	31	29	1.2	68,906	69	43	39	1.7	70,686	78	53	45	2.1	72,107	2850
53	31	29	1.2	71,489	69	43	39	1.7	73,301	78	53	45	2.1	74,748	2900
53	31	29	1.2	76,307	69	43	39	1.6	78,179	78	53	45	2.0	79,673	3000
53	31	29	1.1	81,282	69	43	38	1.6	83,213	78	53	45	2.0	84,754	3100
53	31	29	1.1	83,571	69	43	38	1.6	85,530	78	53	45	1.9	87,092	3150
53	31	29	1.1	86,413	69	43	38	1.5	88,405	78	53	45	1.9	89,993	3200
53	31	29	1.1	91,702	69	43	38	1.5	93,753	78	53	45	1.8	95,388	3300
53	31	29	1.0	97,148	69	43	38	1.4	99,259	78	53	45	1.8	100,941	3400
53	31	29	1.0	99,650	69	43	38	1.4	101,788	78	53	45	1.8	103,491	3450
53	31	28	1.0	108,511	69	43	38	1.4	110,741	78	53	44	1.7	112,518	3600
53	31	28	0.9	120,503	69	43	38	1.3	122,852	78	53	44	1.6	124,723	3800
53	31	28	0.9	133,123	69	43	38	1.2	135,591	78	53	44	1.5	137,556	4000

Individual fabrication possible



U111A

► with internal vacuum support ring

Installation length (L _E) at design pressure															
	up to 10 bar L _E = 150 mm					up to 10 bar L _E = 200 mm					up to 10 bar L _E = 250 mm				
	higher pressures on request														
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	±mm	±°	cm²	mm	mm	±mm	±°	cm²	mm	mm	±mm	±°	cm²
100	31	3	19	11.3	177	40	7	28	21.8	254	44	7	30	21.8	260
125	31	3	19	9.1	241	40	7	28	17.7	330	44	7	30	17.7	337
150	31	3	18	7.6	314	40	7	27	14.9	415	44	7	29	14.9	423
175	31	3	18	6.5	415	40	7	27	12.9	531	44	7	29	12.9	539
200	31	3	18	5.7	491	40	7	26	11.3	616	44	7	29	11.3	625
250	31	3	18	4.6	707	40	7	26	9.1	855	44	7	28	9.1	866
300	31	3	17	3.8	973	40	7	26	7.6	1,146	44	7	27	7.6	1,158
350	31	3	17	3.3	1,288	40	7	25	6.5	1,486	44	7	27	6.5	1,500
400	31	3	17	2.9	1,605	40	7	25	5.7	1,825	44	7	27	5.7	1,840
450	31	3	17	2.5	1,987	40	7	25	5.1	2,231	44	7	26	5.1	2,248
500	31	3	17	2.3	2,402	40	7	24	4.6	2,669	44	7	26	4.6	2,688
550	31	3	16	2.1	2,827	40	7	24	4.2	3,117	44	7	26	4.2	3,137
600	31	3	16	1.9	3,349	40	7	24	3.8	3,664	44	7	26	3.8	3,685
650	31	3	16	1.8	3,848	40	7	24	3.5	4,185	44	7	26	3.5	4,208
700	31	3	16	1.6	4,465	40	7	24	3.3	4,827	44	7	25	3.3	4,852
750	31	3	16	1.5	5,027	40	7	23	3.1	5,411	44	7	25	3.1	5,437
800	31	3	16	1.4	5,741	40	7	23	2.9	6,151	44	7	25	2.9	6,179
850	31	3	16	1.3	6,362	40	7	23	2.7	6,793	44	7	25	2.7	6,822
900	31	3	16	1.3	7,163	40	7	23	2.5	7,620	44	7	25	2.5	7,651
950	31	3	16	1.2	7,854	40	7	23	2.4	8,332	44	7	25	2.4	8,365
1000	31	3	16	1.1	8,742	40	7	23	2.3	9,246	44	7	25	2.3	9,280
1050	31	3	15	1.1	9,503	40	7	23	2.2	10,029	44	7	25	2.2	10,064
1100	31	3	15	1.0	10,496	40	7	23	2.1	11,047	44	7	24	2.1	11,085
1150	31	3	15	1.0	11,310	40	7	23	2.0	11,882	44	7	24	2	11,921
1200	31	3	15	1.0	12,370	40	7	22	1.9	12,969	44	7	24	1.9	13,009
1250	31	3	15	0.9	13,273	40	7	22	1.8	13,893	44	7	24	1.8	13,935
1300	31	3	15	0.9	14,420	40	7	22	1.8	15,066	44	7	24	1.8	15,109
1350	31	3	15	0.8	15,394	40	7	22	1.7	16,061	44	7	24	1.7	16,106
1400	31	3	15	0.8	16,627	40	7	22	1.6	17,320	44	7	24	1.6	17,366
1450	31	3	15	0.8	17,671	40	7	22	1.6	18,385	44	7	24	1.6	18,433
1500	31	3	15	0.8	18,991	40	7	22	1.5	19,731	44	7	24	1.5	19,781
1600	31	3	15	0.7	21,512	40	7	22	1.4	22,299	44	7	24	1.4	22,352
1650	31	3	15	0.7	22,698	40	7	22	1.4	23,506	44	7	24	1.4	23,561
1700	31	3	15	0.7	24,190	40	7	22	1.3	25,025	44	7	23	1.3	25,081
1800	31	3	15	0.6	27,055	40	7	22	1.3	27,937	44	7	23	1.3	27,996
1900	31	3	15	0.6	30,018	40	7	22	1.2	30,946	44	7	23	1.2	31,009
1950	31	3	15	0.6	31,416	40	7	22	1.2	32,365	44	7	23	1.2	32,429
2000	31	3	15	0.6	33,168	40	7	21	1.1	34,143	44	7	23	1.1	34,209
2100	31	3	15	0.5	36,474	40	7	21	1.1	37,497	44	7	23	1.1	37,565
2200	31	3	14	0.5	39,938	40	7	21	1.0	41,007	44	7	23	1	41,079
2250	31	3	14	0.5	41,548	40	7	21	1.0	42,638	44	7	23	1	42,712
2300	31	3	14	0.5	43,558	40	7	21	1.0	44,675	44	7	23	1	44,750
2400	31	3	14	0.5	47,336	40	7	21	1.0	48,500	44	7	23	1	48,578
2500	31	3	14	0.5	51,271	40	7	21	0.9	52,482	44	7	23	0.9	52,563
2550	31	3	14	0.4	53,093	40	7	21	0.9	54,325	44	7	23	0.9	54,408
2600	31	3	14	0.4	55,363	40	7	21	0.9	56,621	44	7	23	0.9	56,706
2700	31	3	14	0.4	59,612	40	7	21	0.8	60,917	44	7	23	0.8	61,005
2800	31	3	14	0.4	64,018	40	7	21	0.8	65,370	44	7	22	0.8	65,461
2850	31	3	14	0.4	66,052	40	7	21	0.8	67,426	44	7	22	0.8	67,518
2900	31	3	14	0.4	68,581	40	7	21	0.8	69,981	44	7	22	0.8	70,075
3000	31	3	14	0.4	73,301	40	7	21	0.8	74,748	44	7	22	0.8	74,845
3100	31	3	14	0.4	78,179	40	7	21	0.7	79,673	44	7	22	0.7	79,773
3150	31	3	14	0.4	80,425	40	7	21	0.7	81,940	44	7	22	0.7	82,041
3200	31	3	14	0.4	83,213	40	7	21	0.7	84,754	44	7	22	0.7	84,857
3300	31	3	14	0.3	88,405	40	7	21	0.7	89,993	44	7	22	0.7	90,099
3400	31	3	14	0.3	93,753	40	7	20	0.7	95,388	44	7	22	0.7	95,498
3450	31	3	14	0.3	96,211	40	7	20	0.7	97,868	44	7	22	0.7	97,979
3600	31	3	14	0.3	104,922	40	7	20	0.6	106,651	44	7	22	0.6	106,767
3800	31	3	14	0.3	116,718	40	7	20	0.6	118,542	44	7	22	0.6	118,664
4000	31	3	14	0.3	129,143	40	7	20	0.6	131,061	44	7	22	0.6	131,190

Recommended sizes

Additional possible sizes

Reduction of movement for expansion joints with PTFE lining:

axial compression: -33 %; axial extension: -0 %; lateral displacement: -50 %; angular movement: -0 %.

When axial compression and extension are changed to the mean value, it is possible to increase the angular movement (for values see type U111F).

In the event of axial extension and simultaneous lateral displacement the above movements are reduced ► page 22).

For larger movements see type U121A or U124A.



Installation length (L _E) at design pressure															
up to 10 bar L _E = 300 mm					up to 10 bar L _E = 350 mm					up to 10 bar L _E = 400 mm					
higher pressures on request															
Movement				A	Movement				A	Movement				A	NB
															
mm	mm	± mm	± °	cm²	mm	mm	± mm	± °	cm²	mm	mm	± mm	± °	cm²	
53	10	39	31.8	353	69	14	53	40.7	491	78	17	62	46.7	616	100
53	10	39	26.4	441	69	14	51	34.5	594	78	17	60	40.3	731	125
53	10	38	22.5	539	69	14	51	29.8	707	78	17	59	35.2	855	150
53	10	37	19.5	670	69	14	50	26.2	855	78	17	58	31.2	1,018	175
53	10	37	17.2	765	69	14	49	23.3	962	78	17	58	27.9	1,134	200
53	10	36	13.9	1,029	69	14	48	19	1,257	78	17	57	23	1,452	250
53	10	36	11.7	1,346	69	14	48	16	1,605	78	17	56	19.5	1,825	300
53	10	35	10	1,713	69	14	47	13.8	2,003	78	17	55	16.8	2,248	350
53	10	35	8.8	2,075	69	14	46	12.1	2,393	78	17	54	14.8	2,660	400
53	10	34	7.8	2,507	69	14	46	10.8	2,856	78	17	54	13.3	3,147	450
53	10	34	7.1	2,971	69	14	45	9.8	3,349	78	17	53	12	3,664	500
53	10	34	6.4	3,442	69	14	45	8.9	3,848	78	17	53	10.9	4,185	550
53	10	33	5.9	4,015	69	14	45	8.2	4,453	78	17	52	10	4,815	600
53	10	33	5.4	4,560	69	14	44	7.5	5,027	78	17	52	9.3	5,411	650
53	10	33	5.1	5,230	69	14	44	7	5,728	78	17	52	8.6	6,138	700
53	10	33	4.7	5,836	69	14	44	6.5	6,362	78	17	51	8	6,793	750
53	10	33	4.4	6,604	69	14	43	6.1	7,163	78	17	51	7.5	7,620	800
53	10	32	4.2	7,268	69	14	43	5.8	7,854	78	17	51	7.1	8,332	850
53	10	32	3.9	8,123	69	14	43	5.5	8,742	78	17	50	6.7	9,246	900
53	10	32	3.7	8,858	69	14	43	5.2	9,503	78	17	50	6.4	10,029	950
53	10	32	3.5	9,799	69	14	43	4.9	10,477	78	17	50	6.1	11,029	1000
53	10	32	3.4	10,605	69	14	42	4.7	11,310	78	17	50	5.8	11,882	1050
53	10	32	3.2	11,652	69	14	42	4.5	12,390	78	17	49	5.5	12,989	1100
53	10	32	3.1	12,509	69	14	42	4.3	13,273	78	17	49	5.3	13,893	1150
53	10	31	3	13,623	69	14	42	4.1	14,420	78	17	49	5	15,066	1200
53	10	31	2.8	14,569	69	14	42	3.9	15,394	78	17	49	4.8	16,061	1250
53	10	31	2.7	15,770	69	14	42	3.8	16,627	78	17	49	4.7	17,320	1300
53	10	31	2.6	16,787	69	14	41	3.6	17,671	78	17	49	4.5	18,385	1350
53	10	31	2.5	18,074	69	14	41	3.5	18,991	78	17	48	4.3	19,731	1400
53	10	31	2.4	19,162	69	14	41	3.4	20,106	78	17	48	4.2	20,867	1450
53	10	31	2.4	20,536	69	14	41	3.3	21,512	78	17	48	4	22,299	1500
53	10	31	2.2	23,154	69	14	41	3.1	24,190	78	17	48	3.8	25,025	1600
53	10	31	2.2	24,384	69	14	41	3	25,447	78	17	48	3.7	26,302	1650
53	10	30	2.1	25,930	69	14	41	2.9	27,026	78	17	48	3.6	27,907	1700
53	10	30	2	28,893	69	14	40	2.7	30,049	78	17	47	3.4	30,978	1800
53	10	30	1.9	31,952	69	14	40	2.6	33,168	78	17	47	3.2	34,143	1900
53	10	30	1.8	33,394	69	14	40	2.5	34,636	78	17	47	3.1	35,633	1950
53	10	30	1.8	35,199	69	14	40	2.5	36,474	78	17	47	3	37,497	2000
53	10	30	1.7	38,603	69	14	40	2.3	39,938	78	17	47	2.9	41,007	2100
53	10	30	1.6	42,164	69	14	40	2.2	43,558	78	17	46	2.8	44,675	2200
53	10	30	1.6	43,818	69	14	40	2.2	45,239	78	17	46	2.7	46,377	2250
53	10	30	1.5	45,882	69	14	40	2.1	47,336	78	17	46	2.6	48,500	2300
53	10	29	1.5	49,757	69	14	39	2.1	51,271	78	17	46	2.5	52,482	2400
53	10	29	1.4	53,789	69	14	39	2	55,363	78	17	46	2.4	56,621	2500
53	10	29	1.4	55,655	69	14	39	1.9	57,256	78	17	46	2.4	58,535	2550
53	10	29	1.4	57,979	69	14	39	1.9	59,612	78	17	46	2.3	60,917	2600
53	10	29	1.3	62,325	69	14	39	1.8	64,018	78	17	46	2.2	65,370	2700
53	10	29	1.3	66,829	69	14	39	1.8	68,581	78	17	45	2.2	69,981	2800
53	10	29	1.2	68,906	69	14	39	1.7	70,686	78	17	45	2.1	72,107	2850
53	10	29	1.2	71,489	69	14	39	1.7	73,301	78	17	45	2.1	74,748	2900
53	10	29	1.2	76,307	69	14	39	1.6	78,179	78	17	45	2	79,673	3000
53	10	29	1.1	81,282	69	14	38	1.6	83,213	78	17	45	2	84,754	3100
53	10	29	1.1	83,571	69	14	38	1.6	85,530	78	17	45	1.9	87,092	3150
53	10	29	1.1	86,413	69	14	38	1.5	88,405	78	17	45	1.9	89,993	3200
53	10	29	1.1	91,702	69	14	38	1.5	93,753	78	17	45	1.8	95,388	3300
53	10	29	1	97,148	69	14	38	1.4	99,259	78	17	45	1.8	100,941	3400
53	10	29	1	99,650	69	14	38	1.4	101,788	78	17	45	1.8	103,491	3450
53	10	28	1	108,511	69	14	38	1.4	110,741	78	17	44	1.7	112,518	3600
53	10	28	0.9	120,503	69	14	38	1.3	122,852	78	17	44	1.6	124,723	3800
53	10	28	0.9	133,123	69	14	38	1.2	135,591	78	17	44	1.5	137,556	4000

Individual fabrication possible



U112A

► with embedded vacuum support ring

Installation length (L _E) at design pressure															
	up to 10 bar L _E = 150 mm					up to 10 bar L _E = 200 mm					up to 10 bar L _E = 250 mm				
	higher pressures on request														
NB	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
															
	mm	mm	±mm	±°		mm	mm	±mm	±°		mm	mm	±mm	±°	
100	20	2	18	8.0	150	26	6	27	19.8	222	29	6	29	19.8	232
125	20	2	18	6.4	209	26	6	26	16.1	293	29	6	29	16.1	305
150	20	2	17	5.3	278	26	6	26	13.5	373	29	6	28	13.5	387
175	20	2	17	4.6	373	26	6	26	11.6	483	29	6	28	11.6	499
200	20	2	17	4.0	445	26	6	25	10.2	564	29	6	28	10.2	581
250	20	2	16	3.2	651	26	6	25	8.2	794	29	6	27	8.2	814
300	20	2	16	2.7	908	26	6	24	6.8	1,075	29	6	27	6.8	1,099
350	20	2	16	2.3	1,213	26	6	24	5.9	1,405	29	6	26	5.9	1,432
400	20	2	16	2.0	1,521	26	6	24	5.1	1,735	29	6	26	5.1	1,765
450	20	2	16	1.8	1,893	26	6	23	4.6	2,132	29	6	26	4.6	2,165
500	20	2	15	1.6	2,299	26	6	23	4.1	2,561	29	6	25	4.1	2,597
550	20	2	15	1.5	2,715	26	6	23	3.7	3,000	29	6	25	3.7	3,039
600	20	2	15	1.3	3,227	26	6	23	3.4	3,536	29	6	25	3.4	3,578
650	20	2	15	1.2	3,718	26	6	23	3.2	4,049	29	6	25	3.2	4,094
700	20	2	15	1.1	4,324	26	6	23	2.9	4,681	29	6	25	2.9	4,729
750	20	2	15	1.1	4,877	26	6	22	2.7	5,255	29	6	24	2.7	5,307
800	20	2	15	1.0	5,581	26	6	22	2.6	5,986	29	6	24	2.6	6,041
850	20	2	15	0.9	6,193	26	6	22	2.4	6,619	29	6	24	2.4	6,677
900	20	2	15	0.9	6,984	26	6	22	2.3	7,436	29	6	24	2.3	7,497
950	20	2	15	0.8	7,667	26	6	22	2.2	8,139	29	6	24	2.2	8,203
1000	20	2	15	0.8	8,544	26	6	22	2.1	9,043	29	6	24	2.1	9,110
1050	20	2	14	0.8	9,297	26	6	22	2.0	9,817	29	6	24	2	9,887
1100	20	2	14	0.7	10,279	26	6	22	1.9	10,825	29	6	24	1.9	10,899
1150	20	2	14	0.7	11,085	26	6	22	1.8	11,652	29	6	24	1.8	11,728
1200	20	2	14	0.7	12,135	26	6	21	1.7	12,728	29	6	23	1.7	12,808
1250	20	2	14	0.6	13,029	26	6	21	1.6	13,643	29	6	23	1.6	13,726
1300	20	2	14	0.6	14,166	26	6	21	1.6	14,806	29	6	23	1.6	14,892
1350	20	2	14	0.6	15,131	26	6	21	1.5	15,792	29	6	23	1.5	15,881
1400	20	2	14	0.6	16,354	26	6	21	1.5	17,041	29	6	23	1.5	17,134
1450	20	2	14	0.6	17,390	26	6	21	1.4	18,098	29	6	23	1.4	18,194
1500	20	2	14	0.5	18,699	26	6	21	1.4	19,433	29	6	23	1.4	19,532
1600	20	2	14	0.5	21,201	26	6	21	1.3	21,983	29	6	23	1.3	22,088
1650	20	2	14	0.5	22,379	26	6	21	1.2	23,181	29	6	23	1.2	23,289
1700	20	2	14	0.5	23,861	26	6	21	1.2	24,689	29	6	23	1.2	24,801
1800	20	2	14	0.4	26,706	26	6	21	1.1	27,582	29	6	23	1.1	27,700
1900	20	2	14	0.4	29,651	26	6	21	1.1	30,573	29	6	22	1.1	30,698
1950	20	2	14	0.4	31,040	26	6	21	1.1	31,984	29	6	22	1.1	32,111
2000	20	2	14	0.4	32,781	26	6	21	1.0	33,751	29	6	22	1	33,882
2100	20	2	14	0.4	36,069	26	6	20	1.0	37,086	29	6	22	1	37,223
2200	20	2	14	0.4	39,514	26	6	20	0.9	40,578	29	6	22	0.9	40,721
2250	20	2	14	0.4	41,115	26	6	20	0.9	42,200	29	6	22	0.9	42,346
2300	20	2	13	0.3	43,116	26	6	20	0.9	44,227	29	6	22	0.9	44,376
2400	20	2	13	0.3	46,875	26	6	20	0.9	48,033	29	6	22	0.9	48,188
2500	20	2	13	0.3	50,791	26	6	20	0.8	51,996	29	6	22	0.8	52,158
2550	20	2	13	0.3	52,604	26	6	20	0.8	53,831	29	6	22	0.8	53,995
2600	20	2	13	0.3	54,864	26	6	20	0.8	56,116	29	6	22	0.8	56,284
2700	20	2	13	0.3	59,094	26	6	20	0.8	60,393	29	6	22	0.8	60,568
2800	20	2	13	0.3	63,481	26	6	20	0.7	64,828	29	6	22	0.7	65,008
2850	20	2	13	0.3	65,506	26	6	20	0.7	66,874	29	6	22	0.7	67,058
2900	20	2	13	0.3	68,025	26	6	20	0.7	69,419	29	6	22	0.7	69,606
3000	20	2	13	0.3	72,727	26	6	20	0.7	74,168	29	6	22	0.7	74,361
3100	20	2	13	0.3	77,585	26	6	20	0.7	79,073	29	6	21	0.7	79,273
3150	20	2	13	0.3	79,823	26	6	20	0.7	81,332	29	6	21	0.7	81,534
3200	20	2	13	0.3	82,601	26	6	20	0.6	84,136	29	6	21	0.6	84,342
3300	20	2	13	0.2	87,773	26	6	20	0.6	89,356	29	6	21	0.6	89,568
3400	20	2	13	0.2	93,103	26	6	20	0.6	94,733	29	6	21	0.6	94,951
3450	20	2	13	0.2	95,553	26	6	20	0.6	97,203	29	6	21	0.6	97,425
3600	20	2	13	0.2	104,234	26	6	19	0.6	105,958	29	6	21	0.6	106,188
3800	20	2	13	0.2	115,993	26	6	19	0.5	117,811	29	6	21	0.5	118,054
4000	20	2	13	0.2	128,380	26	6	19	0.5	130,292	29	6	21	0.5	130,548

Recommended sizes

Additional possible sizes

Reduction of movement for expansion joints with PTFE lining:

axial compression: -0 %; axial extension: -0 %; lateral displacement: -0 %; angular movement: -0 %.

When the axial compression and extension is changed to the mean value, it is possible to increase the angular movement (for values see type U112F).

In the event of axial extension and simultaneous lateral displacement the above movements are reduced (► page 22).

For larger movements see type U122A or U125A.



Installation length (L _E) at design pressure															
up to 10 bar L _E = 300 mm					up to 10 bar L _E = 350 mm					up to 10 bar L _E = 400 mm					
higher pressures on request															
Movement				A	Movement				A	Movement				A	NB
mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	
35	9	38	30.1	320	46	13	51	38	423	51	16	60	44.4	539	100
35	9	38	24.9	405	46	13	50	32	519	51	16	59	38.1	647	125
35	9	37	21.1	499	46	13	49	27.5	625	51	16	58	33.2	765	150
35	9	36	18.3	625	46	13	48	24	765	51	16	57	29.2	919	175
35	9	36	16.2	716	46	13	48	21.3	866	51	16	56	26.1	1,029	200
35	9	35	13.1	973	46	13	47	17.3	1,146	51	16	55	21.4	1,333	250
35	9	35	10.9	1,282	46	13	46	14.6	1,479	51	16	54	18.1	1,691	300
35	9	34	9.4	1,640	46	13	45	12.6	1,863	51	16	53	15.6	2,099	350
35	9	34	8.3	1,995	46	13	45	11	2,240	51	16	53	13.8	2,498	400
35	9	33	7.3	2,419	46	13	44	9.8	2,688	51	16	52	12.3	2,971	450
35	9	33	6.6	2,875	46	13	44	8.9	3,167	51	16	52	11.1	3,473	500
35	9	33	6	3,339	46	13	44	8.1	3,653	51	16	51	10.1	3,982	550
35	9	33	5.5	3,904	46	13	43	7.4	4,243	51	16	51	9.3	4,596	600
35	9	32	5.1	4,441	46	13	43	6.8	4,803	51	16	50	8.6	5,178	650
35	9	32	4.7	5,102	46	13	43	6.4	5,489	51	16	50	8	5,890	700
35	9	32	4.4	5,701	46	13	42	5.9	6,110	51	16	50	7.4	6,533	750
35	9	32	4.1	6,461	46	13	42	5.6	6,896	51	16	50	7	7,344	800
35	9	32	3.9	7,118	46	13	42	5.2	7,574	51	16	49	6.6	8,044	850
35	9	31	3.7	7,964	46	13	42	5	8,446	51	16	49	6.2	8,942	900
35	9	31	3.5	8,692	46	13	41	4.7	9,195	51	16	49	5.9	9,712	950
35	9	31	3.3	9,625	46	13	41	4.5	10,153	51	16	49	5.6	10,696	1000
35	9	31	3.2	10,423	46	13	41	4.2	10,973	51	16	48	5.3	11,537	1050
35	9	31	3	11,461	46	13	41	4.1	12,037	51	16	48	5.1	12,628	1100
35	9	31	2.9	12,311	46	13	41	3.9	12,908	51	16	48	4.9	13,519	1150
35	9	31	2.8	13,417	46	13	41	3.7	14,040	51	16	48	4.7	14,677	1200
35	9	31	2.7	14,356	46	13	40	3.6	15,001	51	16	48	4.5	15,659	1250
35	9	30	2.6	15,548	46	13	40	3.4	16,218	51	16	47	4.3	16,902	1300
35	9	30	2.5	16,559	46	13	40	3.3	17,250	51	16	47	4.2	17,955	1350
35	9	30	2.4	17,837	46	13	40	3.2	18,554	51	16	47	4	19,285	1400
35	9	30	2.3	18,918	46	13	40	3.1	19,656	51	16	47	3.9	20,409	1450
35	9	30	2.2	20,283	46	13	40	3	21,047	51	16	47	3.7	21,825	1500
35	9	30	2.1	22,885	46	13	40	2.8	23,697	51	16	47	3.5	24,522	1600
35	9	30	2	24,108	46	13	39	2.7	24,941	51	16	46	3.4	25,787	1650
35	9	30	2	25,645	46	13	39	2.6	26,504	51	16	46	3.3	27,377	1700
35	9	30	1.8	28,592	46	13	39	2.5	29,498	51	16	46	3.1	30,419	1800
35	9	29	1.7	31,636	46	13	39	2.4	32,589	51	16	46	3	33,556	1900
35	9	29	1.7	33,071	46	13	39	2.3	34,045	51	16	46	2.9	35,033	1950
35	9	29	1.7	34,867	46	13	39	2.2	35,867	51	16	46	2.8	36,881	2000
35	9	29	1.6	38,256	46	13	39	2.1	39,303	51	16	45	2.7	40,364	2100
35	9	29	1.5	41,801	46	13	38	2	42,895	51	16	45	2.6	44,003	2200
35	9	29	1.5	43,447	46	13	38	2	44,563	51	16	45	2.5	45,692	2250
35	9	29	1.4	45,503	46	13	38	1.9	46,645	51	16	45	2.4	47,800	2300
35	9	29	1.4	49,363	46	13	38	1.9	50,551	51	16	45	2.3	51,754	2400
35	9	29	1.3	53,379	46	13	38	1.8	54,615	51	16	45	2.2	55,864	2500
35	9	29	1.3	55,238	46	13	38	1.8	56,495	51	16	45	2.2	57,766	2550
35	9	29	1.3	57,553	46	13	38	1.7	58,836	51	16	44	2.2	60,132	2600
35	9	28	1.2	61,883	46	13	38	1.7	63,213	51	16	44	2.1	64,557	2700
35	9	28	1.2	66,371	46	13	38	1.6	67,748	51	16	44	2	69,139	2800
35	9	28	1.2	68,442	46	13	37	1.6	69,840	51	16	44	2	71,252	2850
35	9	28	1.1	71,016	46	13	37	1.5	72,440	51	16	44	1.9	73,878	2900
35	9	28	1.1	75,818	46	13	37	1.5	77,289	51	16	44	1.9	78,775	3000
35	9	28	1.1	80,777	46	13	37	1.4	82,295	51	16	44	1.8	83,828	3100
35	9	28	1.1	83,060	46	13	37	1.4	84,599	51	16	44	1.8	86,153	3150
35	9	28	1	85,893	46	13	37	1.4	87,459	51	16	44	1.8	89,038	3200
35	9	28	1	91,166	46	13	37	1.4	92,779	51	16	44	1.7	94,406	3300
35	9	28	1	96,597	46	13	37	1.3	98,256	51	16	43	1.7	99,930	3400
35	9	28	1	99,091	46	13	37	1.3	100,772	51	16	43	1.6	102,467	3450
35	9	28	0.9	107,928	46	13	37	1.2	109,682	51	16	43	1.6	111,450	3600
35	9	28	0.9	119,888	46	13	37	1.2	121,736	51	16	43	1.5	123,599	3800
35	9	27	0.8	132,477	46	13	36	1.1	134,419	51	16	43	1.4	136,376	4000

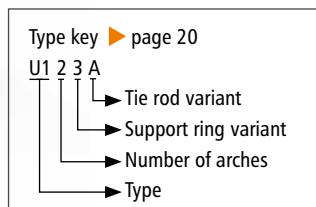
Individual fabrication possible

U120A

NB 100 – NB 4000



- ▶ **Type U120A**
without vacuum support rings
- ▶ **Type U121A**
with internal vacuum support rings
- ▶ **Type U122A**
with embedded vacuum support rings
- ▶ **Type U123A**
without vacuum support rings,
with pressure support ring in the arch trough
- ▶ **Type U124A**
with internal vacuum support rings,
with pressure support ring in the arch trough
- ▶ **Type U125A**
with embedded vacuum support rings,
with pressure support ring in the arch trough

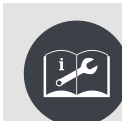
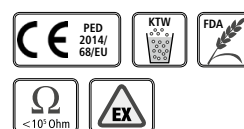


Universal expansion joint with two arches

- Design:** Highly elastic, hydrodynamic, double-arch rubber bellows with full faced rubber flanges and backing flanges with support collar
Optionally with vacuum support rings and/or external pressure support ring in the arch trough
- Nominal diameters:** NB 100 to NB 4000, intermediate sizes possible
- Installation length:** Standard $L_E = 350$ to 600 mm (▶ page 66–71)
Other installation lengths on request
- Pressure:** Depending on the nominal diameter up to 40 bar
Vacuum not allowed without vacuum support rings,
with vacuum support rings up to 0.05 bar absolute
Design in accordance with Pressure Equipment Directive PED 2014/68/EU
- Movement:** For large axial, lateral and angular movements (▶ page 66–71)

Application:

Cooling water systems, desalination plants, drinking water supply, plant constructions e.g. in pipelines, on pumps, as dismantling joints, on condensers and vessels



Assembly instruction download
www.ditec-adam.de/en/downloads.html

Rubber bellows

Rubber	Fabric	Marking	Max.	Application
EPDM	Nylon		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDM	Kevlar		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMht	Kevlar		120 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMtw	Nylon		100 °C	Drinking water
EPDMtw	Kevlar		100 °C	Drinking water
EPDMaf	Nylon		100 °C	Abrasive materials, water-sand extraction
EPDMaf	Kevlar		100 °C	Abrasive materials, water-sand extraction
EPDMbeige	Nylon		100 °C	Foodstuffs
EPDMbeige	Kevlar		100 °C	Foodstuffs
IIR	Nylon		100 °C	Hot water, acids, bases, gases
IIR	Kevlar		100 °C	Hot water, acids, bases, gases
CSM	Nylon		100 °C	Strong acids, bases, chemicals
CSM	Kevlar		100 °C	Strong acids, bases, chemicals
NBR	Nylon		100 °C	Oils, petrol, solvents, compressed air
NBR	Kevlar		100 °C	Oils, petrol, solvents, compressed air
NBRbeige	Nylon		100 °C	Oil, fatty foods
NBRbeige	Kevlar		100 °C	Oil, fatty foods
CR	Nylon		90 °C	Cooling water, slightly oily water, seawater
CR	Kevlar		90 °C	Cooling water, slightly oily water, seawater
FPM	Kevlar		180 °C	Corrosive chemicals, petroleum distillates
FPMbeige	Kevlar		180 °C	Oil, fatty foods
NR	Nylon		70 °C	Abrasive materials
Silicon	Kevlar or glass		200 °C	Air, saltwater atmosphere, foodstuffs, medical technology

PTFE-lining: Permanently embedded against chemical attacks on the interior at the rubber bellows, available starting at NB 300. Take the restriction of the listed movement into account (▶ page 66–71)

UNIVERSAL
rubber flange

U120A

Flanges

- Design:

Single-part or multi-part, round backing flanges with support collars and clearance holes
- Flange norms:

DIN, EN, ANSI, AWWA, BS, JIS, special measurements (▶ page 256)
- Materials:

Carbon steel:

1.0038 (S235JRG2)
1.0570 (S355J2G3)

Stainless steel:

1.4301 (X5CrNi18-10)
1.4571 (X6CrNiMoTi17-12-2)

Aluminium:

AlMg3

Other materials on request
- Coating:

Primed, hot-dip galvanised, special paint

Optional accessories

- Protective hood:

UV protection cover
Ground protective cover
Fire protection cover
Splash protective cover (▶ page 44)
- Flow liners:

Cylindrical flow liner
Conical flow liner
Telescoping flow liner (▶ page 43)

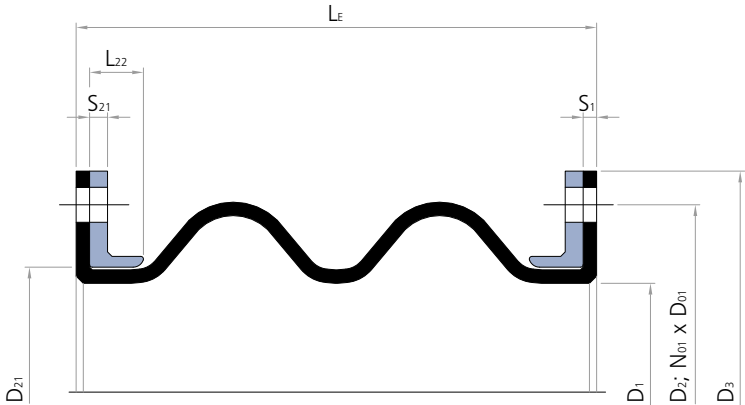
Support rings

TYPE		Vacuum support ring	Pressure support ring	Pressure	Movement
U120A		Without	Without	Slight pressure, vacuum stability on request	► page 66–67
U121A		Medium contact, inside the arch apex	Without	Slight pressure, for vacuum up to 0.05 bar absolute	► page 68–69
U122A		No medium contact, embedded into the arch apex of the rubber bellows	Without	Slight pressure, for vacuum up to 0.05 bar absolute	► page 70–71
U123A		Without	External in the arch trough	Depending on the nominal diameter up to 40 bar, slight vacuum	► page 66–67
U124A		Medium contact, inside the arch apex	External in the arch trough	Depending on the nominal diameter up to 40 bar, for vacuum up to 0.05 bar absolute	► page 68–69
U125A		No medium contact, embedded into the arch apex of the rubber bellows	External in the arch trough	Depending on the nominal diameter up to 25 bar, for vacuum up to 0.05 bar absolute	► page 70–71

Materials

Stainless steel:	1.4301 (X5CrNi18-10) 1.4539 (X1NiCrMoCu25-20-5) 1.4571 (X6CrNiMoTi17-12-2)	Other materials on request
Carbon steel:	1.0570 (S355J2G3) rubber coated 1.0570 (S355J2G3) galvanised	

Planning help U120A





UNIVERSAL
rubber flange

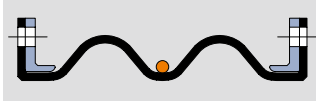
U120A

Lateral expansion joints type U121E
for a marine supply line
NB 2000, +2 / -1 bar



U120A

► without vacuum support rings



U123A

► without vacuum support rings, with pressure support ring in the arch trough

Installation length (L _E) at design pressure															
	up to 10 bar L _E = 350 mm					up to 10 bar L _E = 400 mm					up to 10 bar L _E = 450 mm				
	higher pressures on request														
NB	Movement				A mm ²	Movement				A mm ²	Movement				A mm ²
	 mm	 mm	 ± mm	 ± °		 mm	 mm	 ± mm	 ± °		 mm	 mm	 ± mm	 ± °	
100	62	20	38	21.8	177	80	40	56	38.7	254	88	41	61	39.4	260
125	62	20	38	17.7	241	80	40	55	32.6	330	88	41	60	33.3	337
150	62	20	37	14.9	314	80	40	54	28.1	415	88	41	59	28.7	423
175	62	20	36	12.9	415	80	40	54	24.6	531	88	41	58	25.1	539
200	62	20	36	11.3	491	80	40	53	21.8	616	88	41	57	22.3	625
250	62	20	35	9.1	707	80	40	52	17.7	855	88	41	56	18.2	866
300	62	20	35	7.6	973	80	40	51	14.9	1,146	88	41	55	15.3	1,158
350	62	20	34	6.5	1,288	80	40	50	12.9	1,486	88	41	54	13.2	1,500
400	62	20	34	5.7	1,605	80	40	50	11.3	1,825	88	41	54	11.6	1,840
450	62	20	33	5.1	1,987	80	40	49	10.1	2,231	88	41	53	10.3	2,248
500	62	20	33	4.6	2,402	80	40	49	9.1	2,669	88	41	52	9.3	2,688
550	62	20	33	4.2	2,827	80	40	48	8.3	3,117	88	41	52	8.5	3,137
600	62	20	33	3.8	3,349	80	40	48	7.6	3,664	88	41	52	7.8	3,685
650	62	20	32	3.5	3,848	80	40	48	7.0	4,185	88	41	51	7.2	4,208
700	62	20	32	3.3	4,465	80	40	47	6.5	4,827	88	41	51	6.7	4,852
750	62	20	32	3.1	5,027	80	40	47	6.1	5,411	88	41	51	6.2	5,437
800	62	20	32	2.9	5,741	80	40	47	5.7	6,151	88	41	50	5.9	6,179
850	62	20	32	2.7	6,362	80	40	46	5.4	6,793	88	41	50	5.5	6,822
900	62	20	31	2.5	7,163	80	40	46	5.1	7,620	88	41	50	5.2	7,651
950	62	20	31	2.4	7,854	80	40	46	4.8	8,332	88	41	49	4.9	8,365
1000	62	20	31	2.3	8,742	80	40	46	4.6	9,246	88	41	49	4.7	9,280
1050	62	20	31	2.2	9,503	80	40	46	4.4	10,029	88	41	49	4.5	10,064
1100	62	20	31	2.1	10,496	80	40	45	4.2	11,047	88	41	49	4.3	11,085
1150	62	20	31	2.0	11,310	80	40	45	4.0	11,882	88	41	49	4.1	11,921
1200	62	20	31	1.9	12,370	80	40	45	3.8	12,969	88	41	48	3.9	13,009
1250	62	20	30	1.8	13,273	80	40	45	3.7	13,893	88	41	48	3.8	13,935
1300	62	20	30	1.8	14,420	80	40	45	3.5	15,066	88	41	48	3.6	15,109
1350	62	20	30	1.7	15,394	80	40	45	3.4	16,061	88	41	48	3.5	16,106
1400	62	20	30	1.6	16,627	80	40	44	3.3	17,320	88	41	48	3.4	17,366
1450	62	20	30	1.6	17,671	80	40	44	3.2	18,385	88	41	48	3.2	18,433
1500	62	20	30	1.5	18,991	80	40	44	3.1	19,731	88	41	47	3.1	19,781
1600	62	20	30	1.4	21,512	80	40	44	2.9	22,299	88	41	47	2.9	22,352
1650	62	20	30	1.4	22,698	80	40	44	2.8	23,506	88	41	47	2.8	23,561
1700	62	20	30	1.3	24,190	80	40	44	2.7	25,025	88	41	47	2.8	25,081
1800	62	20	29	1.3	27,055	80	40	43	2.5	27,937	88	41	47	2.6	27,996
1900	62	20	29	1.2	30,018	80	40	43	2.4	30,946	88	41	46	2.5	31,009
1950	62	20	29	1.2	31,416	80	40	43	2.3	32,365	88	41	46	2.4	32,429
2000	62	20	29	1.1	33,168	80	40	43	2.3	34,143	88	41	46	2.3	34,209
2100	62	20	29	1.1	36,474	80	40	43	2.2	37,497	88	41	46	2.2	37,565
2200	62	20	29	1.0	39,938	80	40	43	2.1	41,007	88	41	46	2.1	41,079
2250	62	20	29	1.0	41,548	80	40	42	2.0	42,638	88	41	46	2.1	42,712
2300	62	20	29	1.0	43,558	80	40	42	2.0	44,675	88	41	46	2.0	44,750
2400	62	20	29	1.0	47,336	80	40	42	1.9	48,500	88	41	45	2.0	48,578
2500	62	20	29	0.9	51,271	80	40	42	1.8	52,482	88	41	45	1.9	52,563
2550	62	20	29	0.9	53,093	80	40	42	1.8	54,325	88	41	45	1.8	54,408
2600	62	20	29	0.9	55,363	80	40	42	1.8	56,621	88	41	45	1.8	56,706
2700	62	20	28	0.8	59,612	80	40	42	1.7	60,917	88	41	45	1.7	61,005
2800	62	20	28	0.8	64,018	80	40	42	1.6	65,370	88	41	45	1.7	65,461
2850	62	20	28	0.8	66,052	80	40	42	1.6	67,426	88	41	45	1.6	67,518
2900	62	20	28	0.8	68,581	80	40	42	1.6	69,981	88	41	45	1.6	70,075
3000	62	20	28	0.8	73,301	80	40	41	1.5	74,748	88	41	45	1.6	74,845
3100	62	20	28	0.7	78,179	80	40	41	1.5	79,673	88	41	44	1.5	79,773
3150	62	20	28	0.7	80,425	80	40	41	1.5	81,940	88	41	44	1.5	82,041
3200	62	20	28	0.7	83,213	80	40	41	1.4	84,754	88	41	44	1.5	84,857
3300	62	20	28	0.7	88,405	80	40	41	1.4	89,993	88	41	44	1.4	90,099
3400	62	20	28	0.7	93,753	80	40	41	1.3	95,388	88	41	44	1.4	95,498
3450	62	20	28	0.7	96,211	80	40	41	1.3	97,868	88	41	44	1.4	97,979
3600	62	20	28	0.6	104,922	80	40	41	1.3	106,651	88	41	44	1.3	106,767
3800	62	20	28	0.6	116,718	80	40	41	1.2	118,542	88	41	44	1.2	118,664
4000	62	20	27	0.6	129,143	80	40	40	1.1	131,061	88	41	43	1.2	131,190

Recommended sizes

Additional possible sizes

Reduction of movement for expansion joints with PTFE lining:

axial compression: -33 %; axial extension: -66 %; lateral displacement: -50 %; angular movement: -66 %.

Angular movement only possible with guided pressure support ring.

In the event of axial extension and simultaneous lateral displacement the above movements are reduced (► page 22).

For large movements see type U130A or U133A.

U120A

► without vacuum support rings



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U123A

► without vacuum support rings, with pressure support ring in the arch trough



Installation length (L _E) at design pressure															
up to 10 bar L _E = 500 mm					up to 10 bar L _E = 550 mm					up to 10 bar L _E = 600 mm					
higher pressures on request															
Movement				A	Movement				A	Movement				A	NB
															
mm	mm	±mm	±°	cm²	mm	mm	±mm	±°	cm²	mm	mm	±mm	±°	cm²	
106	61	79	50.7	353	124	82	97	58.6	460	138	85	105	59.5	491	100
106	61	77	44.3	441	124	82	95	52.7	560	138	85	103	53.7	594	125
106	61	76	39.1	539	124	82	93	47.6	670	138	85	101	48.6	707	150
106	61	75	34.9	670	124	82	92	43.1	814	138	85	100	44.2	855	175
106	61	74	31.4	765	124	82	91	39.4	919	138	85	99	40.4	962	200
106	61	72	26.0	1,029	124	82	89	33.3	1,207	138	85	97	34.2	1,257	250
106	61	71	22.1	1,346	124	82	88	28.7	1,548	138	85	95	29.5	1,605	300
106	61	70	19.2	1,713	124	82	86	25.1	1,940	138	85	94	25.9	2,003	350
106	61	69	17.0	2,075	124	82	85	22.3	2,324	138	85	93	23.0	2,393	400
106	61	69	15.2	2,507	124	82	84	20.0	2,781	138	85	92	20.7	2,856	450
106	61	68	13.7	2,971	124	82	84	18.2	3,267	138	85	91	18.8	3,349	500
106	61	67	12.5	3,442	124	82	83	16.6	3,761	138	85	90	17.2	3,848	550
106	61	67	11.5	4,015	124	82	82	15.3	4,359	138	85	89	15.8	4,453	600
106	61	66	10.6	4,560	124	82	82	14.2	4,927	138	85	89	14.7	5,027	650
106	61	66	9.9	5,230	124	82	81	13.2	5,621	138	85	88	13.7	5,728	700
106	61	66	9.2	5,836	124	82	81	12.3	6,249	138	85	87	12.8	6,362	750
106	61	65	8.7	6,604	124	82	80	11.6	7,044	138	85	87	12.0	7,163	800
106	61	65	8.2	7,268	124	82	80	10.9	7,729	138	85	86	11.3	7,854	850
106	61	64	7.7	8,123	124	82	79	10.3	8,610	138	85	86	10.7	8,742	900
106	61	64	7.3	8,858	124	82	79	9.8	9,366	138	85	86	10.1	9,503	950
106	61	64	7.0	9,799	124	82	79	9.3	10,333	138	85	85	9.6	10,477	1000
106	61	64	6.6	10,605	124	82	78	8.9	11,159	138	85	85	9.2	11,310	1050
106	61	63	6.3	11,652	124	82	78	8.5	12,233	138	85	84	8.8	12,390	1100
106	61	63	6.1	12,509	124	82	78	8.1	13,110	138	85	84	8.4	13,273	1150
106	61	63	5.8	13,623	124	82	77	7.8	14,250	138	85	84	8.1	14,420	1200
106	61	63	5.6	14,569	124	82	77	7.5	15,218	138	85	84	7.7	15,394	1250
106	61	62	5.4	15,770	124	82	77	7.2	16,445	138	85	83	7.5	16,627	1300
106	61	62	5.2	16,787	124	82	76	6.9	17,483	138	85	83	7.2	17,671	1350
106	61	62	5.0	18,074	124	82	76	6.7	18,796	138	85	83	6.9	18,991	1400
106	61	62	4.8	19,162	124	82	76	6.5	19,906	138	85	82	6.7	20,106	1450
106	61	62	4.6	20,536	124	82	76	6.2	21,305	138	85	82	6.5	21,512	1500
106	61	61	4.4	23,154	124	82	75	5.9	23,970	138	85	82	6.1	24,190	1600
106	61	61	4.2	24,384	124	82	75	5.7	25,221	138	85	81	5.9	25,447	1650
106	61	61	4.1	25,930	124	82	75	5.5	26,793	138	85	81	5.7	27,026	1700
106	61	61	3.9	28,893	124	82	74	5.2	29,804	138	85	81	5.4	30,049	1800
106	61	60	3.7	31,952	124	82	74	4.9	32,910	138	85	80	5.1	33,168	1900
106	61	60	3.6	33,394	124	82	74	4.8	34,373	138	85	80	5.0	34,636	1950
106	61	60	3.5	35,199	124	82	74	4.7	36,204	138	85	80	4.9	36,474	2000
106	61	60	3.3	38,603	124	82	73	4.5	39,655	138	85	80	4.6	39,938	2100
106	61	59	3.2	42,164	124	82	73	4.3	43,263	138	85	79	4.4	43,558	2200
106	61	59	3.1	43,818	124	82	73	4.2	44,938	138	85	79	4.3	45,239	2250
106	61	59	3.0	45,882	124	82	73	4.1	47,028	138	85	79	4.2	47,336	2300
106	61	59	2.9	49,757	124	82	72	3.9	50,950	138	85	79	4.1	51,271	2400
106	61	59	2.8	53,789	124	82	72	3.8	55,030	138	85	78	3.9	55,363	2500
106	61	59	2.7	55,655	124	82	72	3.7	56,917	138	85	78	3.8	57,256	2550
106	61	59	2.7	57,979	124	82	72	3.6	59,266	138	85	78	3.7	59,612	2600
106	61	58	2.6	62,325	124	82	72	3.5	63,660	138	85	78	3.6	64,018	2700
106	61	58	2.5	66,829	124	82	71	3.4	68,210	138	85	78	3.5	68,581	2800
106	61	58	2.5	68,906	124	82	71	3.3	70,309	138	85	77	3.4	70,686	2850
106	61	58	2.4	71,489	124	82	71	3.2	72,918	138	85	77	3.4	73,301	2900
106	61	58	2.3	76,307	124	82	71	3.1	77,783	138	85	77	3.2	78,179	3000
106	61	58	2.3	81,282	124	82	71	3.0	82,805	138	85	77	3.1	83,213	3100
106	61	58	2.2	83,571	124	82	71	3.0	85,116	138	85	77	3.1	85,530	3150
106	61	57	2.2	86,413	124	82	71	2.9	87,984	138	85	77	3.0	88,405	3200
106	61	57	2.1	91,702	124	82	70	2.8	93,320	138	85	76	2.9	93,753	3300
106	61	57	2.1	97,148	124	82	70	2.8	98,813	138	85	76	2.9	99,259	3400
106	61	57	2.0	99,650	124	82	70	2.7	101,336	138	85	76	2.8	101,788	3450
106	61	57	1.9	108,511	124	82	70	2.6	110,270	138	85	76	2.7	110,741	3600
106	61	57	1.8	120,503	124	82	70	2.5	122,356	138	85	75	2.6	122,852	3800
106	61	56	1.7	133,123	124	82	69	2.3	135,070	138	85	75	2.4	135,591	4000

UNIVERSAL
rubber flange

U120A

Individual fabrication possible

**U121A**

► with internal vacuum support rings

**U124A**

► with internal vacuum support rings, with pressure support ring in the arch trough

Installation length (L _E) at design pressure															
	up to 10 bar L _E = 350 mm					up to 10 bar L _E = 400 mm					up to 10 bar L _E = 450 mm				
	higher pressures on request														
NB	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
	 mm	 mm	 ±mm	 ±°		 mm	 mm	 ±mm	 ±°		 mm	 mm	 ±mm	 ±°	
100	62	7	38	21.8	177	80	13	56	38.7	254	88	13	61	39.4	260
125	62	7	38	17.7	241	80	13	55	32.6	330	88	13	60	33.3	337
150	62	7	37	14.9	314	80	13	54	28.1	415	88	13	59	28.7	423
175	62	7	36	12.9	415	80	13	54	24.6	531	88	13	58	25.1	539
200	62	7	36	11.3	491	80	13	53	21.8	616	88	13	57	22.3	625
250	62	7	35	9.1	707	80	13	52	17.7	855	88	13	56	18.2	866
300	62	7	35	7.6	973	80	13	51	14.9	1,146	88	13	55	15.3	1,158
350	62	7	34	6.5	1,288	80	13	50	12.9	1,486	88	13	54	13.2	1,500
400	62	7	34	5.7	1,605	80	13	50	11.3	1,825	88	13	54	11.6	1,840
450	62	7	33	5.1	1,987	80	13	49	10.1	2,231	88	13	53	10.3	2,248
500	62	7	33	4.6	2,402	80	13	49	9.1	2,669	88	13	52	9.3	2,688
550	62	7	33	4.2	2,827	80	13	48	8.3	3,117	88	13	52	8.5	3,137
600	62	7	33	3.8	3,349	80	13	48	7.6	3,664	88	13	52	7.8	3,685
650	62	7	32	3.5	3,848	80	13	48	7.0	4,185	88	13	51	7.2	4,208
700	62	7	32	3.3	4,465	80	13	47	6.5	4,827	88	13	51	6.7	4,852
750	62	7	32	3.1	5,027	80	13	47	6.1	5,411	88	13	51	6.2	5,437
800	62	7	32	2.9	5,741	80	13	47	5.7	6,151	88	13	50	5.9	6,179
850	62	7	32	2.7	6,362	80	13	46	5.4	6,793	88	13	50	5.5	6,822
900	62	7	31	2.5	7,163	80	13	46	5.1	7,620	88	13	50	5.2	7,651
950	62	7	31	2.4	7,854	80	13	46	4.8	8,332	88	13	49	4.9	8,365
1000	62	7	31	2.3	8,742	80	13	46	4.6	9,246	88	13	49	4.7	9,280
1050	62	7	31	2.2	9,503	80	13	46	4.4	10,029	88	13	49	4.5	10,064
1100	62	7	31	2.1	10,496	80	13	45	4.2	11,047	88	13	49	4.3	11,085
1150	62	7	31	2.0	11,310	80	13	45	4.0	11,882	88	13	49	4.1	11,921
1200	62	7	31	1.9	12,370	80	13	45	3.8	12,969	88	13	48	3.9	13,009
1250	62	7	30	1.8	13,273	80	13	45	3.7	13,893	88	13	48	3.8	13,935
1300	62	7	30	1.8	14,420	80	13	45	3.5	15,066	88	13	48	3.6	15,109
1350	62	7	30	1.7	15,394	80	13	45	3.4	16,061	88	13	48	3.5	16,106
1400	62	7	30	1.6	16,627	80	13	44	3.3	17,320	88	13	48	3.4	17,366
1450	62	7	30	1.6	17,671	80	13	44	3.2	18,385	88	13	48	3.2	18,433
1500	62	7	30	1.5	18,991	80	13	44	3.1	19,731	88	13	47	3.1	19,781
1600	62	7	30	1.4	21,512	80	13	44	2.9	22,299	88	13	47	2.9	22,352
1650	62	7	30	1.4	22,698	80	13	44	2.8	23,506	88	13	47	2.8	23,561
1700	62	7	30	1.3	24,190	80	13	44	2.7	25,025	88	13	47	2.8	25,081
1800	62	7	29	1.3	27,055	80	13	43	2.5	27,937	88	13	47	2.6	27,996
1900	62	7	29	1.2	30,018	80	13	43	2.4	30,946	88	13	46	2.5	31,009
1950	62	7	29	1.2	31,416	80	13	43	2.3	32,365	88	13	46	2.4	32,429
2000	62	7	29	1.1	33,168	80	13	43	2.3	34,143	88	13	46	2.3	34,209
2100	62	7	29	1.1	36,474	80	13	43	2.2	37,497	88	13	46	2.2	37,565
2200	62	7	29	1.0	39,938	80	13	43	2.1	41,007	88	13	46	2.1	41,079
2250	62	7	29	1.0	41,548	80	13	42	2.0	42,638	88	13	46	2.1	42,712
2300	62	7	29	1.0	43,558	80	13	42	2.0	44,675	88	13	46	2	44,750
2400	62	7	29	1.0	47,336	80	13	42	1.9	48,500	88	13	45	2	48,578
2500	62	7	29	0.9	51,271	80	13	42	1.8	52,482	88	13	45	1.9	52,563
2550	62	7	29	0.9	53,093	80	13	42	1.8	54,325	88	13	45	1.8	54,408
2600	62	7	29	0.9	55,363	80	13	42	1.8	56,621	88	13	45	1.8	56,706
2700	62	7	28	0.8	59,612	80	13	42	1.7	60,917	88	13	45	1.7	61,005
2800	62	7	28	0.8	64,018	80	13	42	1.6	65,370	88	13	45	1.7	65,461
2850	62	7	28	0.8	66,052	80	13	42	1.6	67,426	88	13	45	1.6	67,518
2900	62	7	28	0.8	68,581	80	13	42	1.6	69,981	88	13	45	1.6	70,075
3000	62	7	28	0.8	73,301	80	13	41	1.5	74,748	88	13	45	1.6	74,845
3100	62	7	28	0.7	78,179	80	13	41	1.5	79,673	88	13	44	1.5	79,773
3150	62	7	28	0.7	80,425	80	13	41	1.5	81,940	88	13	44	1.5	82,041
3200	62	7	28	0.7	83,213	80	13	41	1.4	84,754	88	13	44	1.5	84,857
3300	62	7	28	0.7	88,405	80	13	41	1.4	89,993	88	13	44	1.4	90,099
3400	62	7	28	0.7	93,753	80	13	41	1.3	95,388	88	13	44	1.4	95,498
3450	62	7	28	0.7	96,211	80	13	41	1.3	97,868	88	13	44	1.4	97,979
3600	62	7	28	0.6	104,922	80	13	41	1.3	106,651	88	13	44	1.3	106,767
3800	62	7	28	0.6	116,718	80	13	41	1.2	118,542	88	13	44	1.2	118,664
4000	62	7	27	0.6	129,143	80	13	40	1.1	131,061	88	13	43	1.2	131,190

Recommended sizes

Additional possible sizes

Reduction of movement for expansion joints with PTFE lining:

axial compression: -33 %; axial extension: -0 %; lateral displacement: -50 %; angular movement: -0 %.

Angular movement only possible with guided pressure support ring.

In the event of axial extension and simultaneous lateral displacement the above movements are reduced (► page 22).

For large movements see type U131A or U134A.

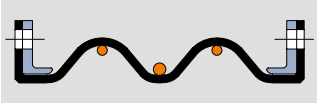
U121A

► with internal vacuum support rings



U124A

► with internal vacuum support rings, with pressure support ring in the arch trough



Installation length (L _E) at design pressure															
up to 10 bar L _E = 500 mm					up to 10 bar L _E = 550 mm					up to 10 bar L _E = 600 mm					
					higher pressures on request										
Movement				A	Movement				A	Movement				A	NB
															
mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²	
106	20	79	50.7	353	124	27	97	58.6	460	138	28	105	59.5	491	100
106	20	77	44.3	441	124	27	95	52.7	560	138	28	103	53.7	594	125
106	20	76	39.1	539	124	27	93	47.6	670	138	28	101	48.6	707	150
106	20	75	34.9	670	124	27	92	43.1	814	138	28	100	44.2	855	175
106	20	74	31.4	765	124	27	91	39.4	919	138	28	99	40.4	962	200
106	20	72	26	1,029	124	27	89	33.3	1,207	138	28	97	34.2	1,257	250
106	20	71	22.1	1,346	124	27	88	28.7	1,548	138	28	95	29.5	1,605	300
106	20	70	19.2	1,713	124	27	86	25.1	1,940	138	28	94	25.9	2,003	350
106	20	69	17	2,075	124	27	85	22.3	2,324	138	28	93	23	2,393	400
106	20	69	15.2	2,507	124	27	84	20	2,781	138	28	92	20.7	2,856	450
106	20	68	13.7	2,971	124	27	84	18.2	3,267	138	28	91	18.8	3,349	500
106	20	67	12.5	3,442	124	27	83	16.6	3,761	138	28	90	17.2	3,848	550
106	20	67	11.5	4,015	124	27	82	15.3	4,359	138	28	89	15.8	4,453	600
106	20	66	10.6	4,560	124	27	82	14.2	4,927	138	28	89	14.7	5,027	650
106	20	66	9.9	5,230	124	27	81	13.2	5,621	138	28	88	13.7	5,728	700
106	20	66	9.2	5,836	124	27	81	12.3	6,249	138	28	87	12.8	6,362	750
106	20	65	8.7	6,604	124	27	80	11.6	7,044	138	28	87	12	7,163	800
106	20	65	8.2	7,268	124	27	80	10.9	7,729	138	28	86	11.3	7,854	850
106	20	64	7.7	8,123	124	27	79	10.3	8,610	138	28	86	10.7	8,742	900
106	20	64	7.3	8,858	124	27	79	9.8	9,366	138	28	86	10.1	9,503	950
106	20	64	7	9,799	124	27	79	9.3	10,333	138	28	85	9.6	10,477	1000
106	20	64	6.6	10,605	124	27	78	8.9	11,159	138	28	85	9.2	11,310	1050
106	20	63	6.3	11,652	124	27	78	8.5	12,233	138	28	84	8.8	12,390	1100
106	20	63	6.1	12,509	124	27	78	8.1	13,110	138	28	84	8.4	13,273	1150
106	20	63	5.8	13,623	124	27	77	7.8	14,250	138	28	84	8.1	14,420	1200
106	20	63	5.6	14,569	124	27	77	7.5	15,218	138	28	84	7.7	15,394	1250
106	20	62	5.4	15,770	124	27	77	7.2	16,445	138	28	83	7.5	16,627	1300
106	20	62	5.2	16,787	124	27	76	6.9	17,483	138	28	83	7.2	17,671	1350
106	20	62	5	18,074	124	27	76	6.7	18,796	138	28	83	6.9	18,991	1400
106	20	62	4.8	19,162	124	27	76	6.5	19,906	138	28	82	6.7	20,106	1450
106	20	62	4.6	20,536	124	27	76	6.2	21,305	138	28	82	6.5	21,512	1500
106	20	61	4.4	23,154	124	27	75	5.9	23,970	138	28	82	6.1	24,190	1600
106	20	61	4.2	24,384	124	27	75	5.7	25,221	138	28	81	5.9	25,447	1650
106	20	61	4.1	25,930	124	27	75	5.5	26,793	138	28	81	5.7	27,026	1700
106	20	61	3.9	28,893	124	27	74	5.2	29,804	138	28	81	5.4	30,049	1800
106	20	60	3.7	31,952	124	27	74	4.9	32,910	138	28	80	5.1	33,168	1900
106	20	60	3.6	33,394	124	27	74	4.8	34,373	138	28	80	5	34,636	1950
106	20	60	3.5	35,199	124	27	74	4.7	36,204	138	28	80	4.9	36,474	2000
106	20	60	3.3	38,603	124	27	73	4.5	39,655	138	28	80	4.6	39,938	2100
106	20	59	3.2	42,164	124	27	73	4.3	43,263	138	28	79	4.4	43,558	2200
106	20	59	3.1	43,818	124	27	73	4.2	44,938	138	28	79	4.3	45,239	2250
106	20	59	3	45,882	124	27	73	4.1	47,028	138	28	79	4.2	47,336	2300
106	20	59	2.9	49,757	124	27	72	3.9	50,950	138	28	79	4.1	51,271	2400
106	20	59	2.8	53,789	124	27	72	3.8	55,030	138	28	78	3.9	55,363	2500
106	20	59	2.7	55,655	124	27	72	3.7	56,917	138	28	78	3.8	57,256	2550
106	20	59	2.7	57,979	124	27	72	3.6	59,266	138	28	78	3.7	59,612	2600
106	20	58	2.6	62,325	124	27	72	3.5	63,660	138	28	78	3.6	64,018	2700
106	20	58	2.5	66,829	124	27	71	3.4	68,210	138	28	78	3.5	68,581	2800
106	20	58	2.5	68,906	124	27	71	3.3	70,309	138	28	77	3.4	70,686	2850
106	20	58	2.4	71,489	124	27	71	3.2	72,918	138	28	77	3.4	73,301	2900
106	20	58	2.3	76,307	124	27	71	3.1	77,783	138	28	77	3.2	78,179	3000
106	20	58	2.3	81,282	124	27	71	3	82,805	138	28	77	3.1	83,213	3100
106	20	58	2.2	83,571	124	27	71	3	85,116	138	28	77	3.1	85,530	3150
106	20	57	2.2	86,413	124	27	71	2.9	87,984	138	28	77	3	88,405	3200
106	20	57	2.1	91,702	124	27	70	2.8	93,320	138	28	76	2.9	93,753	3300
106	20	57	2.1	97,148	124	27	70	2.8	98,813	138	28	76	2.9	99,259	3400
106	20	57	2	99,650	124	27	70	2.7	101,336	138	28	76	2.8	101,788	3450
106	20	57	1.9	108,511	124	27	70	2.6	110,270	138	28	76	2.7	110,741	3600
106	20	57	1.8	120,503	124	27	70	2.5	122,356	138	28	75	2.6	122,852	3800
106	20	56	1.7	133,123	124	27	69	2.3	135,070	138	28	75	2.4	135,591	4000

UNIVERSAL
rubber flange

U120A

Individual fabrication possible



U122A

► with embedded vacuum support rings



U125A

► with embedded vacuum support rings, with pressure support ring in the arch trough

Installation length (L _E) at design pressure															
	up to 10 bar L _E = 350 mm					up to 10 bar L _E = 400 mm					up to 10 bar L _E = 450 mm				
	higher pressures on request														
NB	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
															
	mm	mm	±mm	±°		mm	mm	±mm	±°		mm	mm	±mm	±°	
100	41	5	36	15.6	150	52	12	54	35.0	222	58	12	59	36.5	232
125	41	5	35	12.6	209	52	12	53	29.2	293	58	12	58	30.6	305
150	41	5	35	10.6	278	52	12	52	25.0	373	58	12	57	26.3	387
175	41	5	34	9.1	373	52	12	51	21.8	483	58	12	56	22.9	499
200	41	5	34	8.0	445	52	12	51	19.3	564	58	12	55	20.3	581
250	41	5	33	6.4	651	52	12	50	15.6	794	58	12	54	16.5	814
300	41	5	32	5.3	908	52	12	49	13.1	1,075	58	12	53	13.9	1,099
350	41	5	32	4.6	1,213	52	12	48	11.3	1,405	58	12	52	11.9	1,432
400	41	5	32	4.0	1,521	52	12	48	9.9	1,735	58	12	52	10.5	1,765
450	41	5	31	3.6	1,893	52	12	47	8.8	2,132	58	12	51	9.3	2,165
500	41	5	31	3.2	2,299	52	12	47	8.0	2,561	58	12	51	8.4	2,597
550	41	5	31	2.9	2,715	52	12	46	7.3	3,000	58	12	50	7.7	3,039
600	41	5	30	2.7	3,227	52	12	46	6.7	3,536	58	12	50	7	3,578
650	41	5	30	2.5	3,718	52	12	45	6.1	4,049	58	12	50	6.5	4,094
700	41	5	30	2.3	4,324	52	12	45	5.7	4,681	58	12	49	6	4,729
750	41	5	30	2.1	4,877	52	12	45	5.3	5,255	58	12	49	5.6	5,307
800	41	5	30	2.0	5,581	52	12	45	5.0	5,986	58	12	49	5.3	6,041
850	41	5	30	1.9	6,193	52	12	44	4.7	6,619	58	12	48	5	6,677
900	41	5	29	1.8	6,984	52	12	44	4.4	7,436	58	12	48	4.7	7,497
950	41	5	29	1.7	7,667	52	12	44	4.2	8,139	58	12	48	4.5	8,203
1000	41	5	29	1.6	8,544	52	12	44	4.0	9,043	58	12	48	4.2	9,110
1050	41	5	29	1.5	9,297	52	12	44	3.8	9,817	58	12	47	4	9,887
1100	41	5	29	1.5	10,279	52	12	43	3.6	10,825	58	12	47	3.8	10,899
1150	41	5	29	1.4	11,085	52	12	43	3.5	11,652	58	12	47	3.7	11,728
1200	41	5	29	1.3	12,135	52	12	43	3.3	12,728	58	12	47	3.5	12,808
1250	41	5	29	1.3	13,029	52	12	43	3.2	13,643	58	12	47	3.4	13,726
1300	41	5	28	1.2	14,166	52	12	43	3.1	14,806	58	12	47	3.3	14,892
1350	41	5	28	1.2	15,131	52	12	43	3.0	15,792	58	12	46	3.1	15,881
1400	41	5	28	1.1	16,354	52	12	42	2.9	17,041	58	12	46	3	17,134
1450	41	5	28	1.1	17,390	52	12	42	2.8	18,098	58	12	46	2.9	18,194
1500	41	5	28	1.1	18,699	52	12	42	2.7	19,433	58	12	46	2.8	19,532
1600	41	5	28	1.0	21,201	52	12	42	2.5	21,983	58	12	46	2.6	22,088
1650	41	5	28	1.0	22,379	52	12	42	2.4	23,181	58	12	46	2.6	23,289
1700	41	5	28	0.9	23,861	52	12	42	2.4	24,689	58	12	45	2.5	24,801
1800	41	5	28	0.9	26,706	52	12	41	2.2	27,582	58	12	45	2.4	27,700
1900	41	5	27	0.8	29,651	52	12	41	2.1	30,573	58	12	45	2.2	30,698
1950	41	5	27	0.8	31,040	52	12	41	2.1	31,984	58	12	45	2.2	32,111
2000	41	5	27	0.8	32,781	52	12	41	2.0	33,751	58	12	45	2.1	33,882
2100	41	5	27	0.8	36,069	52	12	41	1.9	37,086	58	12	45	2	37,223
2200	41	5	27	0.7	39,514	52	12	41	1.8	40,578	58	12	44	1.9	40,721
2250	41	5	27	0.7	41,115	52	12	41	1.8	42,200	58	12	44	1.9	42,346
2300	41	5	27	0.7	43,116	52	12	41	1.7	44,227	58	12	44	1.8	44,376
2400	41	5	27	0.7	46,875	52	12	40	1.7	48,033	58	12	44	1.8	48,188
2500	41	5	27	0.6	50,791	52	12	40	1.6	51,996	58	12	44	1.7	52,158
2550	41	5	27	0.6	52,604	52	12	40	1.6	53,831	58	12	44	1.7	53,995
2600	41	5	27	0.6	54,864	52	12	40	1.5	56,116	58	12	44	1.6	56,284
2700	41	5	27	0.6	59,094	52	12	40	1.5	60,393	58	12	44	1.6	60,568
2800	41	5	26	0.6	63,481	52	12	40	1.4	64,828	58	12	43	1.5	65,008
2850	41	5	26	0.6	65,506	52	12	40	1.4	66,874	58	12	43	1.5	67,058
2900	41	5	26	0.6	68,025	52	12	40	1.4	69,419	58	12	43	1.5	69,606
3000	41	5	26	0.5	72,727	52	12	40	1.3	74,168	58	12	43	1.4	74,361
3100	41	5	26	0.5	77,585	52	12	39	1.3	79,073	58	12	43	1.4	79,273
3150	41	5	26	0.5	79,823	52	12	39	1.3	81,332	58	12	43	1.3	81,534
3200	41	5	26	0.5	82,601	52	12	39	1.3	84,136	58	12	43	1.3	84,342
3300	41	5	26	0.5	87,773	52	12	39	1.2	89,356	58	12	43	1.3	89,568
3400	41	5	26	0.5	93,103	52	12	39	1.2	94,733	58	12	43	1.2	94,951
3450	41	5	26	0.5	95,553	52	12	39	1.2	97,203	58	12	43	1.2	97,425
3600	41	5	26	0.4	104,234	52	12	39	1.1	105,958	58	12	42	1.2	106,188
3800	41	5	26	0.4	115,993	52	12	39	1.1	117,811	58	12	42	1.1	118,054
4000	41	5	26	0.4	128,380	52	12	39	1.0	130,292	58	12	42	1.1	130,548

Recommended sizes

Additional possible sizes

Reduction of movement for expansion joints with PTFE lining:

axial compression: -0 %; axial extension: -0 %; lateral displacement: -0 %; angular movement: -0 %.

Angular movement only possible with guided pressure support ring.

In the event of axial extension and simultaneous lateral displacement the above movements are reduced (► page 22).

For large movements see type U132A or U135A.

U122A

► with embedded vacuum support rings



U125A

► with embedded vacuum support rings, with pressure support ring in the arch trough



Installation length (L _E) at design pressure																
up to 10 bar L _E = 500 mm					up to 10 bar L _E = 550 mm					up to 10 bar L _E = 600 mm						
higher pressures on request																
Movement					Movement					A	Movement				A	NB
				A					A					A		
mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²		
70	19	77	48.7	320	82	26	95	57.3	423	91	26	102	57.3	423	100	
70	19	75	42.4	405	82	26	93	51.3	519	91	26	100	51.3	519	125	
70	19	74	37.2	499	82	26	91	46.1	625	91	26	98	46.1	625	150	
70	19	73	33.1	625	82	26	90	41.7	765	91	26	97	41.7	765	175	
70	19	72	29.7	716	82	26	89	38	866	91	26	95	38	866	200	
70	19	71	24.5	973	82	26	87	32	1,146	91	26	94	32	1,146	250	
70	19	69	20.8	1,282	82	26	86	27.5	1,479	91	26	92	27.5	1,479	300	
70	19	69	18	1,640	82	26	85	24	1,863	91	26	91	24	1,863	350	
70	19	68	15.9	1,995	82	26	84	21.3	2,240	91	26	90	21.3	2,240	400	
70	19	67	14.2	2,419	82	26	83	19.1	2,688	91	26	89	19.1	2,688	450	
70	19	66	12.8	2,875	82	26	82	17.3	3,167	91	26	88	17.3	3,167	500	
70	19	66	11.7	3,339	82	26	81	15.8	3,653	91	26	87	15.8	3,653	550	
70	19	65	10.8	3,904	82	26	81	14.6	4,243	91	26	86	14.6	4,243	600	
70	19	65	9.9	4,441	82	26	80	13.5	4,803	91	26	86	13.5	4,803	650	
70	19	64	9.2	5,102	82	26	79	12.6	5,489	91	26	85	12.6	5,489	700	
70	19	64	8.6	5,701	82	26	79	11.7	6,110	91	26	85	11.7	6,110	750	
70	19	64	8.1	6,461	82	26	78	11	6,896	91	26	84	11	6,896	800	
70	19	63	7.6	7,118	82	26	78	10.4	7,574	91	26	84	10.4	7,574	850	
70	19	63	7.2	7,964	82	26	78	9.8	8,446	91	26	83	9.8	8,446	900	
70	19	63	6.8	8,692	82	26	77	9.3	9,195	91	26	83	9.3	9,195	950	
70	19	62	6.5	9,625	82	26	77	8.9	10,153	91	26	82	8.9	10,153	1000	
70	19	62	6.2	10,423	82	26	77	8.5	10,973	91	26	82	8.5	10,973	1050	
70	19	62	5.9	11,461	82	26	76	8.1	12,037	91	26	82	8.1	12,037	1100	
70	19	61	5.7	12,311	82	26	76	7.7	12,908	91	26	81	7.7	12,908	1150	
70	19	61	5.4	13,417	82	26	76	7.4	14,040	91	26	81	7.4	14,040	1200	
70	19	61	5.2	14,356	82	26	75	7.1	15,001	91	26	81	7.1	15,001	1250	
70	19	61	5	15,548	82	26	75	6.8	16,218	91	26	81	6.8	16,218	1300	
70	19	61	4.8	16,559	82	26	75	6.6	17,250	91	26	80	6.6	17,250	1350	
70	19	60	4.7	17,837	82	26	75	6.4	18,554	91	26	80	6.4	18,554	1400	
70	19	60	4.5	18,918	82	26	74	6.1	19,656	91	26	80	6.1	19,656	1450	
70	19	60	4.3	20,283	82	26	74	5.9	21,047	91	26	79	5.9	21,047	1500	
70	19	60	4.1	22,885	82	26	74	5.6	23,697	91	26	79	5.6	23,697	1600	
70	19	60	4	24,108	82	26	73	5.4	24,941	91	26	79	5.4	24,941	1650	
70	19	59	3.8	25,645	82	26	73	5.2	26,504	91	26	79	5.2	26,504	1700	
70	19	59	3.6	28,592	82	26	73	5	29,498	91	26	78	5	29,498	1800	
70	19	59	3.4	31,636	82	26	73	4.7	32,589	91	26	78	4.7	32,589	1900	
70	19	59	3.3	33,071	82	26	72	4.6	34,045	91	26	78	4.6	34,045	1950	
70	19	58	3.3	34,867	82	26	72	4.5	35,867	91	26	77	4.5	35,867	2000	
70	19	58	3.1	38,256	82	26	72	4.2	39,303	91	26	77	4.2	39,303	2100	
70	19	58	3	41,801	82	26	72	4.1	42,895	91	26	77	4.1	42,895	2200	
70	19	58	2.9	43,447	82	26	71	4	44,563	91	26	77	4	44,563	2250	
70	19	58	2.8	45,503	82	26	71	3.9	46,645	91	26	76	3.9	46,645	2300	
70	19	58	2.7	49,363	82	26	71	3.7	50,551	91	26	76	3.7	50,551	2400	
70	19	57	2.6	53,379	82	26	71	3.6	54,615	91	26	76	3.6	54,615	2500	
70	19	57	2.6	55,238	82	26	71	3.5	56,495	91	26	76	3.5	56,495	2550	
70	19	57	2.5	57,553	82	26	71	3.4	58,836	91	26	76	3.4	58,836	2600	
70	19	57	2.4	61,883	82	26	70	3.3	63,213	91	26	75	3.3	63,213	2700	
70	19	57	2.3	66,371	82	26	70	3.2	67,748	91	26	75	3.2	67,748	2800	
70	19	57	2.3	68,442	82	26	70	3.1	69,840	91	26	75	3.1	69,840	2850	
70	19	57	2.3	71,016	82	26	70	3.1	72,440	91	26	75	3.1	72,440	2900	
70	19	56	2.2	75,818	82	26	70	3	77,289	91	26	75	3	77,289	3000	
70	19	56	2.1	80,777	82	26	69	2.9	82,295	91	26	74	2.9	82,295	3100	
70	19	56	2.1	83,060	82	26	69	2.8	84,599	91	26	74	2.8	84,599	3150	
70	19	56	2	85,893	82	26	69	2.8	87,459	91	26	74	2.8	87,459	3200	
70	19	56	2	91,166	82	26	69	2.7	92,779	91	26	74	2.7	92,779	3300	
70	19	56	1.9	96,597	82	26	69	2.6	98,256	91	26	74	2.6	98,256	3400	
70	19	56	1.9	99,091	82	26	69	2.6	100,772	91	26	74	2.6	100,772	3450	
70	19	55	1.8	107,928	82	26	68	2.5	109,682	91	26	73	2.5	109,682	3600	
70	19	55	1.7	119,888	82	26	68	2.4	121,736	91	26	73	2.4	121,736	3800	
70	19	55	1.6	132,477	82	26	68	2.2	134,419	91	26	73	2.2	134,419	4000	

Individual fabrication possible

U130A U140A U150A

NB 100 – NB 4000



- ▶ **Type U130A U140A U150A**
without vacuum support rings
- ▶ **Type U131A U141A U151A**
with internal vacuum support rings
- ▶ **Type U132A U142A U152A**
with embedded vacuum support rings
- ▶ **Type U133A U143A U153A**
without vacuum support rings,
with pressure support rings in the arch
trough
- ▶ **Type U134A U144A U154A**
with inner vacuum support rings,
with pressure support rings in the arch
trough
- ▶ **Type U135A U145A U155A**
with embedded vacuum support rings,
with pressure support rings in the arch
trough

Type key ▶ page 20
U1 3 3 A
├── Tie rod variant
├── Support ring variant
├── Number of arches
└── Type

Universal expansion joint with three or more arches

- Design:** Highly elastic, hydrodynamic, triple or more arched rubber bellows with full faced rubber flanges and backing flanges with support collar
Optionally with vacuum support rings and/or pressure support rings in the arch trough
- Nominal diameters:** NB 100 to NB 4000, intermediate sizes possible
- Installation length/Arches:** Standard $L_E = 650$ with 3 arches, type U130A (▶ p. 76–78)
Standard $L_E = 850$ with 4 arches, type U140A (▶ p. 76–78)
Standard $L_E = 1050$ with 5 arches, type U150A (▶ p. 76–78)
Other installation lengths on request
- Pressure:** Depending on the nominal diameter up to 10 bar
Vacuum not allowed without vacuum support rings, with vacuum support rings up to 0.05 bar absolute. Design in accordance with Pressure Equipment Directive PED 2014/68/EU
- Movement:** For extremely large axial, lateral and angular movements (▶ page 76–78)

Application:
Cooling water systems, desalination plants, drinking water supply, plant constructions e.g. in pipelines, on pumps, as dismantling joints, on condensers and vessels



Assembly instruction download
www.ditec-adam.de/en/downloads.html

Rubber bellows

Rubber	Fabric	Marking	Max.	Application
EPDM	Nylon		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDM	Kevlar		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMht	Kevlar		120 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMtw	Nylon		100 °C	Drinking water
EPDMtw	Kevlar		100 °C	Drinking water
EPDMaf	Nylon		100 °C	Abrasive materials, water-sand extraction
EPDMaf	Kevlar		100 °C	Abrasive materials, water-sand extraction
EPDMbeige	Nylon		100 °C	Foodstuffs
EPDMbeige	Kevlar		100 °C	Foodstuffs
IIR	Nylon		100 °C	Hot water, acids, bases, gases
IIR	Kevlar		100 °C	Hot water, acids, bases, gases
CSM	Nylon		100 °C	Strong acids, bases, chemicals
CSM	Kevlar		100 °C	Strong acids, bases, chemicals
NBR	Nylon		100 °C	Oils, petrol, solvents, compressed air
NBR	Kevlar		100 °C	Oils, petrol, solvents, compressed air
NBRbeige	Nylon		100 °C	Oil, fatty foods
NBRbeige	Kevlar		100 °C	Oil, fatty foods
CR	Nylon		90 °C	Cooling water, slightly oily water, seawater
CR	Kevlar		90 °C	Cooling water, slightly oily water, seawater
FPM	Kevlar		180 °C	Corrosive chemicals, petroleum distillates
FPMbeige	Kevlar		180 °C	Oil, fatty foods
NR	Nylon		70 °C	Abrasive materials
Silicon	Kevlar or glass		200 °C	Air, saltwater atmosphere, foodstuffs, medical technology

PTFE-lining: Permanently embedded against chemical attacks on the interior at the rubber bellows, available starting at NB 300. Take the restriction of the listed movement into account (▶ page 76–78)

Flanges

- Design:

Single-part or multi-part, round backing flanges with support collars and clearance holes
- Flange norms:

DIN, EN, ANSI, AWWA, BS, JIS, special measurements (▶ page 256)
- Materials:

Carbon steel:

1.0038 (S235JRG2)
1.0570 (S355J2G3)

Stainless steel:

1.4301 (X5CrNi18-10)
1.4571 (X6CrNiMoTi17-12-2)

Aluminium:

AlMg3

Other materials on request
- Coating:

Primed, hot-dip galvanised, special paint

Optional accessories

- Protective hood:

UV protection cover
Ground protective cover
Fire protection cover
Splash water protection (▶ page 44)
- Flow liners:

Cylindrical flow liner
Conical flow liner
Telescoping flow liner (▶ page 43)

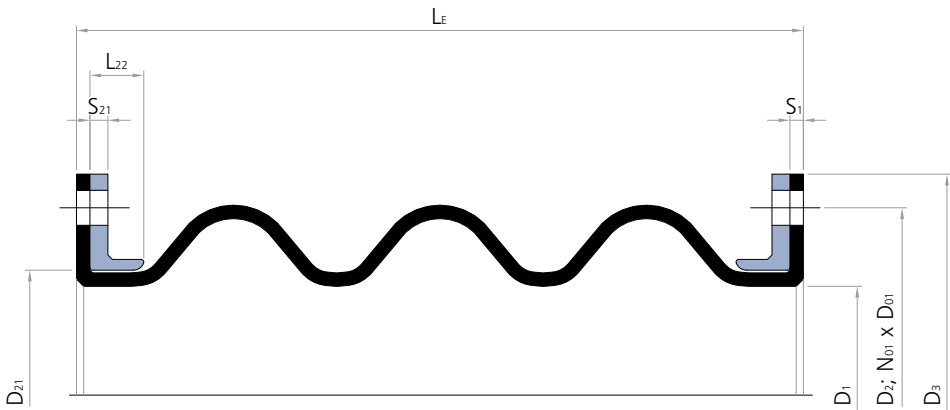
Support rings

TYPE		Vacuum support ring	Pressure support ring	Pressure	Movement
U130A U140A U150A		Without	Without	Slight pressure, vacuum stability on request	► page 76
U131A U141A U151A		Medium contact, inside the arch apex	Without	Slight pressure, for vacuum up to 0.05 bar absolute	► page 77
U132A U142A U152A		No medium contact, embedded into the arch apex of the rubber bellows	Without	Slight pressure, for vacuum up to 0.05 bar absolute	► page 78
U133A U143A U153A		Without	External in the arch trough	Depending on the nominal diameter up to 10 bar, slight vacuum	► page 76
U134A U144A U154A		Medium contact, inside the arch apex	External in the arch trough	Depending on the nominal diameter up to 10 bar, for vacuum up to 0.05 bar absolute	► page 77
U135A U145A U155A		No medium contact, embedded into the arch apex of the rubber bellows	External in the arch trough	Depending on the nominal diameter up to 10 bar, for vacuum up to 0.05 bar absolute	► page 78

Materials

Stainless steel:	1.4301 (X5CrNi18-10) 1.4539 (X1NiCrMoCu25-20-5) 1.4571 (X6CrNiMoTi17-12-2)	Other materials on request
Carbon steel:	1.0570 (S355J2G3) rubber coated 1.0570 (S355J2G3) galvanised	

Planning help U130A





Universal expansion joint U110A
in a cooling tower
NB 3100, 4 bar, axial / lateral ± 40 mm



U130A U140A U150A

► without vacuum support rings



U133A U143A U153A

► without vacuum support rings, with pressure support rings in the arch trough

Installation length (L _E) at design pressure															
	up to 6 bar L _E = 650 mm – U130A U133A					up to 6 bar L _E = 850 mm – U140A U143A					up to 6 bar L _E = 1,050 mm – U150A U153A				
	higher pressures on request														
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²
100	159	92	118	61.5	353	212	123	158	67.9	353	265	154	197	72.0	353
125	159	92	116	55.8	441	212	123	154	63.1	441	265	154	193	67.9	441
150	159	92	114	50.8	539	212	123	152	58.6	539	265	154	190	64.0	539
175	159	92	112	46.4	670	212	123	150	54.6	670	265	154	187	60.4	670
200	159	92	111	42.6	765	212	123	148	50.9	765	265	154	185	57.0	765
250	159	92	109	36.4	1,029	212	123	145	44.5	1,029	265	154	181	50.9	1,029
300	159	92	107	31.5	1,346	212	123	143	39.4	1,346	265	154	178	45.8	1,346
350	159	92	105	27.7	1,713	212	123	141	35.1	1,713	265	154	176	41.3	1,713
400	159	92	104	24.7	2,075	212	123	139	31.6	2,075	265	154	174	37.6	2,075
450	159	92	103	22.2	2,507	212	123	137	28.7	2,507	265	154	172	34.4	2,507
500	159	92	102	20.2	2,971	212	123	136	26.2	2,971	265	154	170	31.6	2,971
550	159	92	101	18.5	3,442	212	123	135	24.1	3,442	265	154	169	29.2	3,442
600	159	92	100	17.0	4,015	212	123	134	22.3	4,015	265	154	167	27.2	4,015
650	159	92	100	15.8	4,560	212	123	133	20.7	4,560	265	154	166	25.4	4,560
700	159	92	99	14.7	5,230	212	123	132	19.4	5,230	265	154	165	23.7	5,230
750	159	92	98	13.8	5,836	212	123	131	18.2	5,836	265	154	164	22.3	5,836
800	159	92	98	13.0	6,604	212	123	130	17.1	6,604	265	154	163	21.1	6,604
850	159	92	97	12.2	7,268	212	123	130	16.1	7,268	265	154	162	19.9	7,268
900	159	92	97	11.6	8,123	212	123	129	15.3	8,123	265	154	161	18.9	8,123
950	159	92	96	11.0	8,858	212	123	128	14.5	8,858	265	154	160	18.0	8,858
1000	159	92	96	10.4	9,799	212	123	128	13.8	9,799	265	154	160	17.1	9,799
1050	159	92	95	9.9	10,605	212	123	127	13.2	10,605	265	154	159	16.3	10,605
1100	159	92	95	9.5	11,652	212	123	127	12.6	11,652	265	154	158	15.6	11,652
1150	159	92	95	9.1	12,509	212	123	126	12.1	12,509	265	154	158	15.0	12,509
1200	159	92	94	8.7	13,623	212	123	126	11.6	13,623	265	154	157	14.4	13,623
1250	159	92	94	8.4	14,569	212	123	125	11.1	14,569	265	154	156	13.8	14,569
1300	159	92	94	8.1	15,770	212	123	125	10.7	15,770	265	154	156	13.3	15,770
1350	159	92	93	7.8	16,787	212	123	124	10.3	16,787	265	154	155	12.9	16,787
1400	159	92	93	7.5	18,074	212	123	124	10.0	18,074	265	154	155	12.4	18,074
1450	159	92	93	7.2	19,162	212	123	124	9.6	19,162	265	154	154	12.0	19,162
1500	159	92	92	7.0	20,536	212	123	123	9.3	20,536	265	154	154	11.6	20,536
1600	159	92	92	6.6	23,154	212	123	122	8.7	23,154	265	154	153	10.9	23,154
1650	159	92	92	6.4	24,384	212	123	122	8.5	24,384	265	154	153	10.6	24,384
1700	159	92	91	6.2	25,930	212	123	122	8.2	25,930	265	154	152	10.3	25,930
1800	159	92	91	5.8	28,893	212	123	121	7.8	28,893	265	154	151	9.7	28,893
1900	159	92	90	5.5	31,952	212	123	121	7.4	31,952	265	154	151	9.2	31,952
1950	159	92	90	5.4	33,394	212	123	120	7.2	33,394	265	154	150	9.0	33,394
2000	159	92	90	5.3	35,199	212	123	120	7.0	35,199	265	154	150	8.8	35,199
2100	159	92	90	5.0	38,603	212	123	119	6.7	38,603	265	154	149	8.3	38,603
2200	159	92	89	4.8	42,164	212	123	119	6.4	42,164	265	154	149	8.0	42,164
2250	159	92	89	4.7	43,818	212	123	119	6.2	43,818	265	154	148	7.8	43,818
2300	159	92	89	4.6	45,882	212	123	118	6.1	45,882	265	154	148	7.6	45,882
2400	159	92	88	4.4	49,757	212	123	118	5.9	49,757	265	154	147	7.3	49,757
2500	159	92	88	4.2	53,789	212	123	118	5.6	53,789	265	154	147	7.0	53,789
2550	159	92	88	4.1	55,655	212	123	117	5.5	55,655	265	154	147	6.9	55,655
2600	159	92	88	4.0	57,979	212	123	117	5.4	57,979	265	154	146	6.8	57,979
2700	159	92	88	3.9	62,325	212	123	117	5.2	62,325	265	154	146	6.5	62,325
2800	159	92	87	3.8	66,829	212	123	116	5.0	66,829	265	154	145	6.3	66,829
2850	159	92	87	3.7	68,906	212	123	116	4.9	68,906	265	154	145	6.2	68,906
2900	159	92	87	3.6	71,489	212	123	116	4.8	71,489	265	154	145	6.1	71,489
3000	159	92	87	3.5	76,307	212	123	116	4.7	76,307	265	154	145	5.9	76,307
3100	159	92	86	3.4	81,282	212	123	115	4.5	81,282	265	154	144	5.7	81,282
3150	159	92	86	3.3	83,571	212	123	115	4.5	83,571	265	154	144	5.6	83,571
3200	159	92	86	3.3	86,413	212	123	115	4.4	86,413	265	154	144	5.5	86,413
3300	159	92	86	3.2	91,702	212	123	115	4.3	91,702	265	154	143	5.3	91,702
3400	159	92	86	3.1	97,148	212	123	114	4.1	97,148	265	154	143	5.2	97,148
3450	159	92	86	3.1	99,650	212	123	114	4.1	99,650	265	154	143	5.1	99,650
3600	159	92	85	2.9	108,511	212	123	114	3.9	108,511	265	154	142	4.9	108,511
3800	159	92	85	2.8	120,503	212	123	113	3.7	120,503	265	154	141	4.6	120,503
4000	159	92	84	2.6	133,123	212	123	113	3.5	133,123	265	154	141	4.4	133,123

Reduction of movement for expansion joints with PTFE lining: axial compression: -33 %; axial extension: -66 %; lateral displacement: -50 %; angular movement: -66 %. Angular movement only possible with guided pressure support ring.

In the event of axial extension and simultaneous lateral displacement the above movements are reduced (► page 22). Larger movements on request.

Individual fabrication possible

U131A U141A U151A
► with internal vacuum support rings



U134A U144A U154A

► with internal vacuum support rings, with pressure support rings in the arch trough



Installation length (L _E) at design pressure															
up to 6 bar L _E = 650 mm – U131A U134A					up to 6 bar L _E = 850 mm – U141A U144A					up to 6 bar L _E = 1,050 mm – U151A U154A					
higher pressures on request															
Movement				A	Movement				A	Movement				A	NB
															
mm	mm	±mm	±°	cm²	mm	mm	±mm	±°	cm²	mm	mm	±mm	±°	cm²	
159	30	118	61.5	353	212	41	158	67.9	353	265	51	197	72.0	353	100
159	30	116	55.8	441	212	41	154	63.1	441	265	51	193	67.9	441	125
159	30	114	50.8	539	212	41	152	58.6	539	265	51	190	64.0	539	150
159	30	112	46.4	670	212	41	150	54.6	670	265	51	187	60.4	670	175
159	30	111	42.6	765	212	41	148	50.9	765	265	51	185	57.0	765	200
159	30	109	36.4	1,029	212	41	145	44.5	1,029	265	51	181	50.9	1,029	250
159	30	107	31.5	1,346	212	41	143	39.4	1,346	265	51	178	45.8	1,346	300
159	30	105	27.7	1,713	212	41	141	35.1	1,713	265	51	176	41.3	1,713	350
159	30	104	24.7	2,075	212	41	139	31.6	2,075	265	51	174	37.6	2,075	400
159	30	103	22.2	2,507	212	41	137	28.7	2,507	265	51	172	34.4	2,507	450
159	30	102	20.2	2,971	212	41	136	26.2	2,971	265	51	170	31.6	2,971	500
159	30	101	18.5	3,442	212	41	135	24.1	3,442	265	51	169	29.2	3,442	550
159	30	100	17.0	4,015	212	41	134	22.3	4,015	265	51	167	27.2	4,015	600
159	30	100	15.8	4,560	212	41	133	20.7	4,560	265	51	166	25.4	4,560	650
159	30	99	14.7	5,230	212	41	132	19.4	5,230	265	51	165	23.7	5,230	700
159	30	98	13.8	5,836	212	41	131	18.2	5,836	265	51	164	22.3	5,836	750
159	30	98	13.0	6,604	212	41	130	17.1	6,604	265	51	163	21.1	6,604	800
159	30	97	12.2	7,268	212	41	130	16.1	7,268	265	51	162	19.9	7,268	850
159	30	97	11.6	8,123	212	41	129	15.3	8,123	265	51	161	18.9	8,123	900
159	30	96	11.0	8,858	212	41	128	14.5	8,858	265	51	160	18.0	8,858	950
159	30	96	10.4	9,799	212	41	128	13.8	9,799	265	51	160	17.1	9,799	1000
159	30	95	9.9	10,605	212	41	127	13.2	10,605	265	51	159	16.3	10,605	1050
159	30	95	9.5	11,652	212	41	127	12.6	11,652	265	51	158	15.6	11,652	1100
159	30	95	9.1	12,509	212	41	126	12.1	12,509	265	51	158	15.0	12,509	1150
159	30	94	8.7	13,623	212	41	126	11.6	13,623	265	51	157	14.4	13,623	1200
159	30	94	8.4	14,569	212	41	125	11.1	14,569	265	51	156	13.8	14,569	1250
159	30	94	8.1	15,770	212	41	125	10.7	15,770	265	51	156	13.3	15,770	1300
159	30	93	7.8	16,787	212	41	124	10.3	16,787	265	51	155	12.9	16,787	1350
159	30	93	7.5	18,074	212	41	124	10.0	18,074	265	51	155	12.4	18,074	1400
159	30	93	7.2	19,162	212	41	124	9.6	19,162	265	51	154	12.0	19,162	1450
159	30	92	7.0	20,536	212	41	123	9.3	20,536	265	51	154	11.6	20,536	1500
159	30	92	6.6	23,154	212	41	122	8.7	23,154	265	51	153	10.9	23,154	1600
159	30	92	6.4	24,384	212	41	122	8.5	24,384	265	51	153	10.6	24,384	1650
159	30	91	6.2	25,930	212	41	122	8.2	25,930	265	51	152	10.3	25,930	1700
159	30	91	5.8	28,893	212	41	121	7.8	28,893	265	51	151	9.7	28,893	1800
159	30	90	5.5	31,952	212	41	121	7.4	31,952	265	51	151	9.2	31,952	1900
159	30	90	5.4	33,394	212	41	120	7.2	33,394	265	51	150	9.0	33,394	1950
159	30	90	5.3	35,199	212	41	120	7.0	35,199	265	51	150	8.8	35,199	2000
159	30	90	5.0	38,603	212	41	119	6.7	38,603	265	51	149	8.3	38,603	2100
159	30	89	4.8	42,164	212	41	119	6.4	42,164	265	51	149	8.0	42,164	2200
159	30	89	4.7	43,818	212	41	119	6.2	43,818	265	51	148	7.8	43,818	2250
159	30	89	4.6	45,882	212	41	118	6.1	45,882	265	51	148	7.6	45,882	2300
159	30	88	4.4	49,757	212	41	118	5.9	49,757	265	51	147	7.3	49,757	2400
159	30	88	4.2	53,789	212	41	118	5.6	53,789	265	51	147	7.0	53,789	2500
159	30	88	4.1	55,655	212	41	117	5.5	55,655	265	51	147	6.9	55,655	2550
159	30	88	4.0	57,979	212	41	117	5.4	57,979	265	51	146	6.8	57,979	2600
159	30	88	3.9	62,325	212	41	117	5.2	62,325	265	51	146	6.5	62,325	2700
159	30	87	3.8	66,829	212	41	116	5.0	66,829	265	51	145	6.3	66,829	2800
159	30	87	3.7	68,906	212	41	116	4.9	68,906	265	51	145	6.2	68,906	2850
159	30	87	3.6	71,489	212	41	116	4.8	71,489	265	51	145	6.1	71,489	2900
159	30	87	3.5	76,307	212	41	116	4.7	76,307	265	51	145	5.9	76,307	3000
159	30	86	3.4	81,282	212	41	115	4.5	81,282	265	51	144	5.7	81,282	3100
159	30	86	3.3	83,571	212	41	115	4.5	83,571	265	51	144	5.6	83,571	3150
159	30	86	3.3	86,413	212	41	115	4.4	86,413	265	51	144	5.5	86,413	3200
159	30	86	3.2	91,702	212	41	115	4.3	91,702	265	51	143	5.3	91,702	3300
159	30	86	3.1	97,148	212	41	114	4.1	97,148	265	51	143	5.2	97,148	3400
159	30	86	3.1	99,650	212	41	114	4.1	99,650	265	51	143	5.1	99,650	3450
159	30	85	2.9	108,511	212	41	114	3.9	108,511	265	51	142	4.9	108,511	3600
159	30	85	2.8	120,503	212	41	113	3.7	120,503	265	51	141	4.6	120,503	3800
159	30	84	2.6	133,123	212	41	113	3.5	133,123	265	51	141	4.4	133,123	4000

Reduction of movement for expansion joints with PTFE lining: axial compression: -33 %; axial extension: -0 %; lateral displacement: -50 %; angular movement: -0 %.
Angular movement only possible with guided pressure support ring.
In the event of axial extension and simultaneous lateral displacement the above movements are reduced (► page 22). Larger movements on request.

Individual fabrication possible



U132A U142A U152A

► with embedded vacuum support rings



U135A U145A U155A

► with embedded vacuum support rings, with pressure support rings in the arch trough

Installation length (L _E) at design pressure															
	up to 6 bar L _E = 650 mm – U132A U135A					up to 6 bar L _E = 850 mm – U142A U145A					up to 6 bar L _E = 1,050 mm – U152A U155A				
	higher pressures on request														
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²
100	105	28	115	59.8	320	140	38	154	66.5	320	175	47	192	70.7	320
125	105	28	113	54.0	405	140	38	150	61.5	405	175	47	188	66.4	405
150	105	28	111	48.9	499	140	38	148	56.9	499	175	47	185	62.3	499
175	105	28	109	44.5	625	140	38	146	52.7	625	175	47	182	58.5	625
200	105	28	108	40.7	716	140	38	144	49.0	716	175	47	180	55.0	716
250	105	28	106	34.5	973	140	38	141	42.6	973	175	47	177	48.8	973
300	105	28	104	29.8	1,282	140	38	139	37.5	1,282	175	47	174	43.6	1,282
350	105	28	103	26.2	1,640	140	38	137	33.3	1,640	175	47	171	39.3	1,640
400	105	28	102	23.3	1,995	140	38	135	29.9	1,995	175	47	169	35.6	1,995
450	105	28	100	20.9	2,419	140	38	134	27.1	2,419	175	47	167	32.4	2,419
500	105	28	99	19.0	2,875	140	38	133	24.7	2,875	175	47	166	29.8	2,875
550	105	28	99	17.4	3,339	140	38	132	22.7	3,339	175	47	164	27.5	3,339
600	105	28	98	16.0	3,904	140	38	130	21.0	3,904	175	47	163	25.5	3,904
650	105	28	97	14.8	4,441	140	38	130	19.5	4,441	175	47	162	23.7	4,441
700	105	28	96	13.8	5,102	140	38	129	18.2	5,102	175	47	161	22.2	5,102
750	105	28	96	12.9	5,701	140	38	128	17.0	5,701	175	47	160	20.9	5,701
800	105	28	95	12.1	6,461	140	38	127	16.0	6,461	175	47	159	19.7	6,461
850	105	28	95	11.4	7,118	140	38	126	15.1	7,118	175	47	158	18.6	7,118
900	105	28	94	10.8	7,964	140	38	126	14.3	7,964	175	47	157	17.6	7,964
950	105	28	94	10.3	8,692	140	38	125	13.6	8,692	175	47	156	16.8	8,692
1000	105	28	93	9.8	9,625	140	38	125	13.0	9,625	175	47	156	16.0	9,625
1050	105	28	93	9.3	10,423	140	38	124	12.4	10,423	175	47	155	15.2	10,423
1100	105	28	93	8.9	11,461	140	38	123	11.8	11,461	175	47	154	14.6	11,461
1150	105	28	92	8.5	12,311	140	38	123	11.3	12,311	175	47	154	14.0	12,311
1200	105	28	92	8.2	13,417	140	38	123	10.9	13,417	175	47	153	13.4	13,417
1250	105	28	92	7.8	14,356	140	38	122	10.4	14,356	175	47	153	12.9	14,356
1300	105	28	91	7.5	15,548	140	38	122	10.0	15,548	175	47	152	12.4	15,548
1350	105	28	91	7.3	16,559	140	38	121	9.7	16,559	175	47	152	12.0	16,559
1400	105	28	91	7.0	17,837	140	38	121	9.3	17,837	175	47	151	11.5	17,837
1450	105	28	90	6.8	18,918	140	38	120	9.0	18,918	175	47	151	11.2	18,918
1500	105	28	90	6.5	20,283	140	38	120	8.7	20,283	175	47	150	10.8	20,283
1600	105	28	90	6.1	22,885	140	38	119	8.2	22,885	175	47	149	10.1	22,885
1650	105	28	89	6.0	24,108	140	38	119	7.9	24,108	175	47	149	9.8	24,108
1700	105	28	89	5.8	25,645	140	38	119	7.7	25,645	175	47	148	9.5	25,645
1800	105	28	89	5.5	28,592	140	38	118	7.3	28,592	175	47	148	9.0	28,592
1900	105	28	88	5.2	31,636	140	38	117	6.9	31,636	175	47	147	8.6	31,636
1950	105	28	88	5.0	33,071	140	38	117	6.7	33,071	175	47	147	8.3	33,071
2000	105	28	88	4.9	34,867	140	38	117	6.6	34,867	175	47	146	8.1	34,867
2100	105	28	87	4.7	38,256	140	38	116	6.3	38,256	175	47	146	7.8	38,256
2200	105	28	87	4.5	41,801	140	38	116	6.0	41,801	175	47	145	7.4	41,801
2250	105	28	87	4.4	43,447	140	38	116	5.8	43,447	175	47	145	7.2	43,447
2300	105	28	87	4.3	45,503	140	38	115	5.7	45,503	175	47	144	7.1	45,503
2400	105	28	86	4.1	49,363	140	38	115	5.5	49,363	175	47	144	6.8	49,363
2500	105	28	86	3.9	53,379	140	38	115	5.3	53,379	175	47	143	6.5	53,379
2550	105	28	86	3.9	55,238	140	38	114	5.2	55,238	175	47	143	6.4	55,238
2600	105	28	86	3.8	57,553	140	38	114	5.1	57,553	175	47	143	6.3	57,553
2700	105	28	85	3.6	61,883	140	38	114	4.9	61,883	175	47	142	6.0	61,883
2800	105	28	85	3.5	66,371	140	38	113	4.7	66,371	175	47	142	5.8	66,371
2850	105	28	85	3.5	68,442	140	38	113	4.6	68,442	175	47	142	5.7	68,442
2900	105	28	85	3.4	71,016	140	38	113	4.5	71,016	175	47	141	5.6	71,016
3000	105	28	85	3.3	75,818	140	38	113	4.4	75,818	175	47	141	5.4	75,818
3100	105	28	84	3.2	80,777	140	38	112	4.2	80,777	175	47	140	5.3	80,777
3150	105	28	84	3.1	83,060	140	38	112	4.2	83,060	175	47	140	5.2	83,060
3200	105	28	84	3.1	85,893	140	38	112	4.1	85,893	175	47	140	5.1	85,893
3300	105	28	84	3.0	91,166	140	38	112	4.0	91,166	175	47	140	5.0	91,166
3400	105	28	84	2.9	96,597	140	38	111	3.9	96,597	175	47	139	4.8	96,597
3450	105	28	83	2.9	99,091	140	38	111	3.8	99,091	175	47	139	4.7	99,091
3600	105	28	83	2.7	107,928	140	38	111	3.7	107,928	175	47	139	4.5	107,928
3800	105	28	83	2.6	119,888	140	38	110	3.5	119,888	175	47	138	4.3	119,888
4000	105	28	82	2.5	132,477	140	38	110	3.3	132,477	175	47	137	4.1	132,477

Reduction of movement for expansion joints with PTFE lining: axial compression: -0 %; axial extension: -0 %; lateral displacement: -0 %; angular movement: -0 %.
Angular movement only possible with guided pressure support ring.

In the event of axial extension and simultaneous lateral displacement the above movements are reduced (► page 22). Larger movements on request.

Individual fabrication possible



Universal expansion joint, type U152A
with PTFE lining in a GRP pipe in a copper mill
NB 2000, -0.17 bar, earthquake movements all sides ± 150 mm



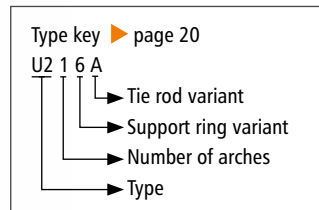
Universal expansion joint, type U142A
with PTFE lining for a sulphuric acid reclamation plant
NB 2800, -0.15 bar, 80°C

U216A

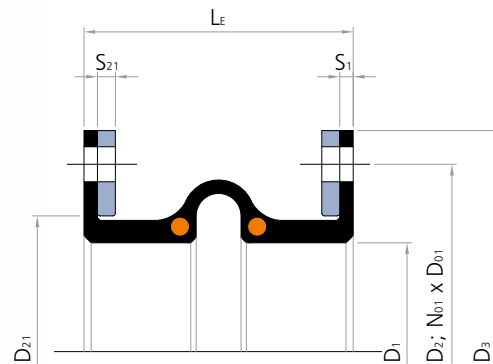
NB 100 – NB 4000



► Type U216A



Planning help U216A



Universal expansion joint with one arch

Design: Thick-walled, single-arch rubber bellows with full faced rubber flanges, split backing flanges and embedded support rings at the arch foot

Nominal diameters: NB 100 to NB 4000, intermediate sizes possible

Installation length: Standard $L_E = 250$ to 350 mm (► page 82)
Other installation lengths on request

Pressure: Depending on the nominal diameter up to 25 bar
Vacuum-proof. Design in accordance with Pressure Equipment Directive PED 2014/68/EU

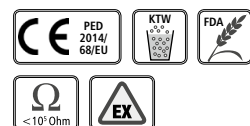
Movement: For axial, lateral and angular movements
(► page 82)

Stiffness rate: The embedded support rings and reinforcements generate large stiffness rates

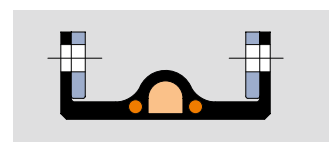
Arch: Optionally filled with foam rubber, to avoid turbulence and accumulation of solid matter
(► page 33)
Observe the restriction on specified movement
(► page 82)

Application:

Cooling water systems,
desalination plants,
drinking water supply,
plant constructions e.g.
in pipelines, on pumps,
as dismantling joints, on
condensers and vessels



Assembly instruction download
www.ditec-adam.de/en/downloads.html



Rubber bellows

Rubber	Fabric	Marking	Max.	Application
EPDM	Nylon		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDM	Kevlar		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMht	Kevlar		120 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMtw	Nylon		100 °C	Drinking water
EPDMtw	Kevlar		100 °C	Drinking water
EPDMaf	Nylon		100 °C	Abrasive materials, water-sand extraction
EPDMaf	Kevlar		100 °C	Abrasive materials, water-sand extraction
EPDMbeige	Nylon		100 °C	Foodstuffs
EPDMbeige	Kevlar		100 °C	Foodstuffs
IIR	Nylon		100 °C	Hot water, acids, bases, gases
IIR	Kevlar		100 °C	Hot water, acids, bases, gases
CSM	Nylon		100 °C	Strong acids, bases, chemicals
CSM	Kevlar		100 °C	Strong acids, bases, chemicals
NBR	Nylon		100 °C	Oils, petrol, solvents, compressed air
NBR	Kevlar		100 °C	Oils, petrol, solvents, compressed air
NBRbeige	Nylon		100 °C	Oil, fatty foods
NBRbeige	Kevlar		100 °C	Oil, fatty foods
CR	Nylon		90 °C	Cooling water, slightly oily water, seawater
CR	Kevlar		90 °C	Cooling water, slightly oily water, seawater
FPM	Kevlar		180 °C	Corrosive chemicals, petroleum distillates
FPMbeige	Kevlar		180 °C	Oil, fatty foods
NR	Nylon		70 °C	Abrasive materials
Silicon	Kevlar or glass		200 °C	Air, saltwater atmosphere, foodstuffs, medical technology

Flanges

- Design:

Multi-part, round backing flanges with clearance holes
- Flange norms:

DIN, EN, ANSI, AWWA, BS, JIS, special measurements (▶ page 256)
- Materials:

Carbon steel:

1.0038 (S235JRG2)
1.0570 (S355J2G3)

Stainless steel:

1.4301 (X5CrNi18-10)
1.4571 (X6CrNiMoTi17-12-2)

Aluminium:

AlMg3

Other materials on request
- Coating:

Primed, hot-dip galvanised, special paint

Optional accessories

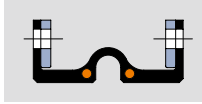
- Protective hood:

UV protection cover
Ground protective cover
Fire protection cover
Splash protective cover (▶ page 44)
- Flow liners:

Cylindrical flow liner
Conical flow liner
Telescoping flow liner (▶ page 43)

UNIVERSAL
rubber flange

U216A



U216A

► with one arch

Installation length (L _E) at design pressure															
	up to 10 bar L _E = 250 mm					up to 10 bar L _E = 300 mm					up to 10 bar L _E = 350 mm				
	higher pressures on request														
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²
100	35	15	27	16.7	346	41	21	35	22.8	460	47	24	40	25.6	573
125	35	15	25	13.5	434	41	21	34	18.6	560	47	24	39	21	683
150	35	15	25	11.3	531	41	21	33	15.6	670	47	24	37	17.7	804
175	35	15	24	9.7	661	41	21	32	13.5	814	47	24	36	15.3	962
200	35	15	23	8.5	755	41	21	31	11.9	919	47	24	35	13.5	1,075
250	35	15	22	6.8	1,018	41	21	30	9.5	1,207	47	24	34	10.9	1,385
300	35	15	22	5.7	1,333	41	21	29	8.0	1,548	47	24	33	9.1	1,750
350	35	15	21	4.9	1,698	41	21	28	6.8	1,940	47	24	32	7.8	2,165
400	35	15	21	4.3	2,059	41	21	27	6.0	2,324	47	24	31	6.8	2,570
450	35	15	20	3.8	2,489	41	21	27	5.3	2,781	47	24	31	6.1	3,048
500	35	15	20	3.4	2,951	41	21	26	4.8	3,267	47	24	30	5.5	3,557
550	35	15	19	3.1	3,421	41	21	26	4.4	3,761	47	24	29	5	4,072
600	35	15	19	2.9	3,993	41	21	25	4.0	4,359	47	24	29	4.6	4,693
650	35	15	19	2.6	4,536	41	21	25	3.7	4,927	47	24	29	4.2	5,281
700	35	15	19	2.5	5,204	41	21	25	3.4	5,621	47	24	28	3.9	5,999
750	35	15	18	2.3	5,809	41	21	24	3.2	6,249	47	24	28	3.7	6,648
800	35	15	18	2.1	6,576	41	21	24	3.0	7,044	47	24	28	3.4	7,466
850	35	15	18	2.0	7,238	41	21	24	2.8	7,729	47	24	27	3.2	8,171
900	35	15	18	1.9	8,091	41	21	24	2.7	8,610	47	24	27	3.1	9,076
950	35	15	18	1.8	8,825	41	21	23	2.5	9,366	47	24	27	2.9	9,852
1000	35	15	17	1.7	9,764	41	21	23	2.4	10,333	47	24	26	2.7	10,843
1050	35	15	17	1.6	10,568	41	21	23	2.3	11,159	47	24	26	2.6	11,690
1100	35	15	17	1.6	11,613	41	21	23	2.2	12,233	47	24	26	2.5	12,788
1150	35	15	17	1.5	12,469	41	21	23	2.1	13,110	47	24	26	2.4	13,685
1200	35	15	17	1.4	13,581	41	21	22	2.0	14,250	47	24	26	2.3	14,849
1250	35	15	17	1.4	14,527	41	21	22	1.9	15,218	47	24	25	2.2	15,837
1300	35	15	17	1.3	15,725	41	21	22	1.9	16,445	47	24	25	2.1	17,087
1350	35	15	17	1.3	16,742	41	21	22	1.8	17,483	47	24	25	2	18,146
1400	35	15	16	1.2	18,027	41	21	22	1.7	18,796	47	24	25	2	19,483
1450	35	15	16	1.2	19,113	41	21	22	1.7	19,906	47	24	25	1.9	20,612
1500	35	15	16	1.1	20,485	41	21	22	1.6	21,305	47	24	25	1.8	22,035
1600	35	15	16	1.1	23,100	41	21	21	1.5	23,970	47	24	24	1.7	24,745
1650	35	15	16	1.0	24,328	41	21	21	1.5	25,221	47	24	24	1.7	26,016
1700	35	15	16	1.0	25,873	41	21	21	1.4	26,793	47	24	24	1.6	27,612
1800	35	15	16	1.0	28,832	41	21	21	1.3	29,804	47	24	24	1.5	30,666
1900	35	15	16	0.9	31,889	41	21	21	1.3	32,910	47	24	24	1.4	33,816
1950	35	15	15	0.9	33,329	41	21	21	1.2	34,373	47	24	23	1.4	35,299
2000	35	15	15	0.9	35,133	41	21	20	1.2	36,204	47	24	23	1.4	37,154
2100	35	15	15	0.8	38,533	41	21	20	1.1	39,655	47	24	23	1.3	40,649
2200	35	15	15	0.8	42,091	41	21	20	1.1	43,263	47	24	23	1.2	44,301
2250	35	15	15	0.8	43,744	41	21	20	1.1	44,938	47	24	23	1.2	45,996
2300	35	15	15	0.7	45,806	41	21	20	1.0	47,028	47	24	23	1.2	48,111
2400	35	15	15	0.7	49,678	41	21	20	1.0	50,950	47	24	23	1.1	52,077
2500	35	15	15	0.7	53,707	41	21	20	1.0	55,030	47	24	22	1.1	56,200
2550	35	15	15	0.7	55,572	41	21	20	0.9	56,917	47	24	22	1.1	58,107
2600	35	15	15	0.7	57,893	41	21	19	0.9	59,266	47	24	22	1.1	60,481
2700	35	15	15	0.6	62,237	41	21	19	0.9	63,660	47	24	22	1	64,918
2800	35	15	14	0.6	66,737	41	21	19	0.9	68,210	47	24	22	1	69,513
2850	35	15	14	0.6	68,813	41	21	19	0.8	70,309	47	24	22	1	71,631
2900	35	15	14	0.6	71,394	41	21	19	0.8	72,918	47	24	22	0.9	74,264
3000	35	15	14	0.6	76,209	41	21	19	0.8	77,783	47	24	22	0.9	79,173
3100	35	15	14	0.6	81,181	41	21	19	0.8	82,805	47	24	22	0.9	84,239
3150	35	15	14	0.5	83,469	41	21	19	0.8	85,116	47	24	21	0.9	86,570
3200	35	15	14	0.5	86,309	41	21	19	0.8	87,984	47	24	21	0.9	89,462
3300	35	15	14	0.5	91,595	41	21	19	0.7	93,320	47	24	21	0.8	94,842
3400	35	15	14	0.5	97,038	41	21	19	0.7	98,813	47	24	21	0.8	100,379
3450	35	15	14	0.5	99,538	41	21	19	0.7	101,336	47	24	21	0.8	102,922
3600	35	15	14	0.5	108,395	41	21	18	0.7	110,270	47	24	21	0.8	111,924
3800	35	15	14	0.5	120,380	41	21	18	0.6	122,356	47	24	21	0.7	124,098
4000	35	15	14	0.4	132,993	41	21	18	0.6	135,070	47	24	21	0.7	136,900

Recommended sizes

Additional possible sizes

Reduction of movement for expansion joints with filled arch:

axial compression: -50 %; axial extension: -75 %; lateral displacement: -50 %; angular movement: -75 %.

In the event of axial extension and simultaneous lateral displacement the above movements are reduced (► page 22).

Individual fabrication possible



Lateral expansion joint, type U110M
in the cooling water system
of a coal-fired power plant
NB 2600, 4 bar

U300A-konz U300A-exz

NB 80 – NB 1600



Type key ► page 20

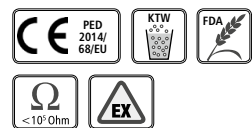
U3 0 0 A
 └─ Tie rod variant
 └─ Support ring variants
 └─ Number of arches
 └─ Type

Conical universal expansion joint

- Design:** Conical-concentric or conical-eccentric rubber bellows with full faced rubber flanges and single or multi-part backing flanges
 In the event of high pressure, large nominal diameters and extreme reductions with self-sealing rubber bulge and single-part swivel backing flange at the large diameter
- Nominal diameters:** NB 80 to NB 1600, intermediate sizes or other nominal diameter combinations possible
- Installation length:** Standard $L_E = 150$ to $2,150$ mm (► page 88–89)
 Other installation lengths on request
- Pressure:** Depending on the nominal diameter and installation length up to 10 bar. Design in accordance with Pressure Equipment Directive PED 2014/68/EU
- Movement:** For small axial and lateral movements (► page 88–89)

Application:

Plant construction,
 desulphurisation plants,
 sand/gravel extraction
 industry, dredgers,
 food processing e.g. in
 gypsum suspension
 conveyance lines, on
 pumps, vessels, as
 vacuum/pressure hoses



Assembly instruction download
www.ditec-adam.de/en/downloads.html

Rubber bellows

Rubber	Fabric	Marking	Max.	Application
EPDM	Nylon		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDM	Kevlar		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMht	Kevlar		120 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMtw	Nylon		100 °C	Drinking water
EPDMtw	Kevlar		100 °C	Drinking water
EPDMaf	Nylon		100 °C	Abrasive materials, water-sand extraction
EPDMaf	Kevlar		100 °C	Abrasive materials, water-sand extraction
EPDMbeige	Nylon		100 °C	Foodstuffs
EPDMbeige	Kevlar		100 °C	Foodstuffs
IIR	Nylon		100 °C	Hot water, acids, bases, gases
IIR	Kevlar		100 °C	Hot water, acids, bases, gases
CSM	Nylon		100 °C	Strong acids, bases, chemicals
CSM	Kevlar		100 °C	Strong acids, bases, chemicals
NBR	Nylon		100 °C	Oils, petrol, solvents, compressed air
NBR	Kevlar		100 °C	Oils, petrol, solvents, compressed air
NBRbeige	Nylon		100 °C	Oil, fatty foods
NBRbeige	Kevlar		100 °C	Oil, fatty foods
CR	Nylon		90 °C	Cooling water, slightly oily water, seawater
CR	Kevlar		90 °C	Cooling water, slightly oily water, seawater
FPM	Kevlar		180 °C	Corrosive chemicals, petroleum distillates
FPMbeige	Kevlar		180 °C	Oil, fatty foods
NR	Nylon		70 °C	Abrasive materials
Silicon	Kevlar or glass		200 °C	Air, saltwater atmosphere, foodstuffs, medical technology

UNIVERSAL
rubber flange

Flanges

Design: Single or multi-part round backing flanges with clearance holes
For high pressure, large nominal diameters and extreme reductions, single-part round steel-backing flange with clearance holes and a groove to accommodate a rubber bulge at the large diameter

Flange norms: DIN, EN, ANSI, AWWA, BS, JIS, special measurements (▶ page 256)

Materials: Carbon steel: 1.0038 (S235JRG2)
1.0570 (S355J2G3)
Stainless steel: 1.4301 (X5CrNi18-10)
1.4571 (X6CrNiMoTi17-12-2)
Aluminium AlMg3
Other materials on request

Coating: Primed, hot-dip galvanised, special paint

Optional accessories

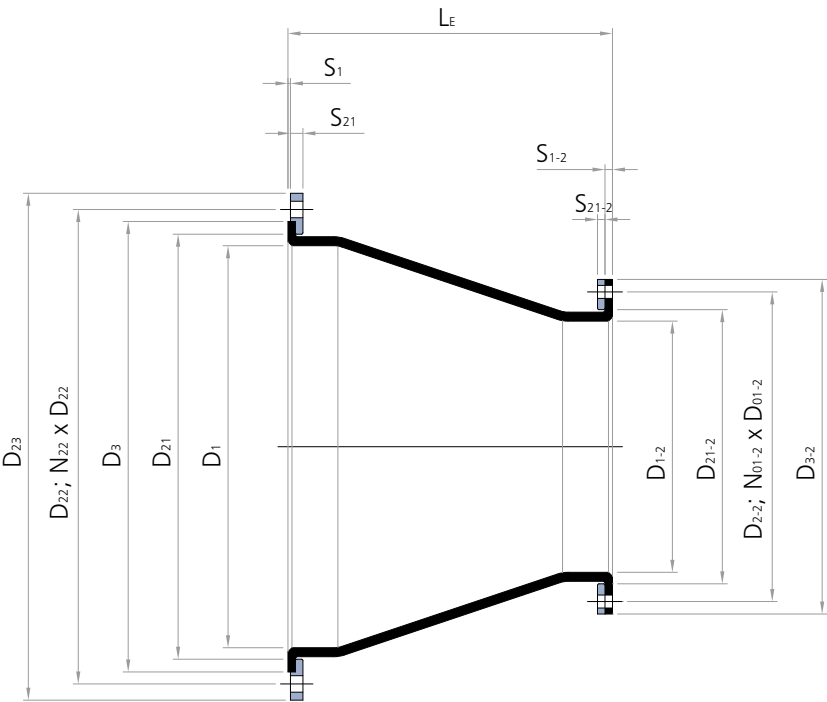
Tie rods: Type U300E: Tie rods mounted outside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure
Type U300M: Tie rods mounted outside and inside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure and vacuum

Protective hoods: UV protection cover, ground protective cover, fire protection cover, splash protective cover (▶ page 44)

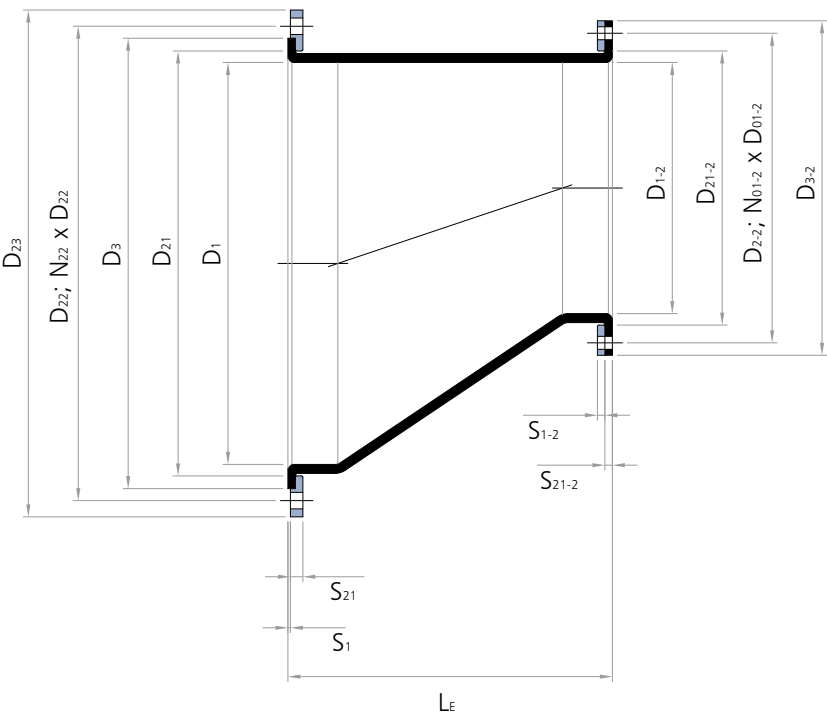
Flow liners: Cylindrical flow liner, conical flow liner, telescoping flow liner (▶ page 43)

U300A

Planning help U300A-konz



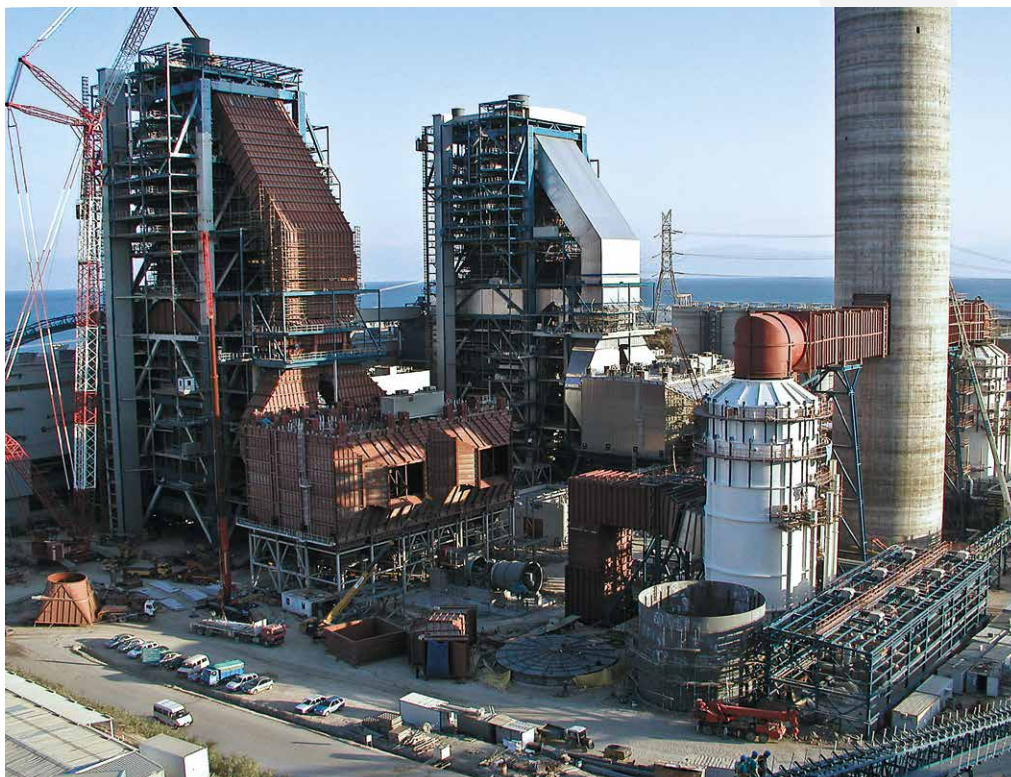
Planning help U300A-exz





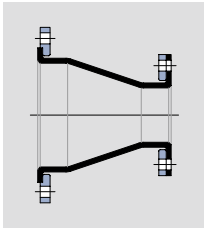
Conical expansion joints, type U300A
on the suction and discharge side of a gypsum slurry pump
in a desulphurization unit of a power plant

4.5 bar



Construction of coal fired power plant in Turkey
ditec supply of rubber and fabric expansion joints

U300A



U300A-konz

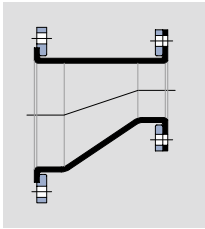
► concentric

Installation length (L _E) at design pressure					
			up to 6 bar		
			higher pressures on request		
Potential combination			Movement		
NB D ₁	NB D ₁₋₂	Installation mm			
100	80	160	2	2	5
	80	235	3	2	7
125	100	175	2	2	5
	80	310	4	3	9
150	100	250	3	3	7
	125	175	2	2	5
200	80	460	7	5	12
	100	400	6	4	11
	125	325	5	3	9
250	150	250	3	3	7
	80	660	10	7	17
	100	600	9	6	15
	125	525	8	5	13
300	150	450	7	5	11
	200	300	4	3	8
	80	810	12	8	19
	100	750	12	8	18
350	125	675	10	7	16
	150	600	9	6	14
	200	450	7	5	11
	250	350	5	4	8
	80	960	15	10	22
	100	900	14	9	21
400	125	825	13	8	19
	150	750	12	8	17
	200	600	10	6	14
	250	500	7	5	12
	300	350	5	4	8
	100	1050	17	11	23
500	125	975	16	10	22
	150	900	15	9	20
	200	750	12	8	17
	250	650	10	7	15
	300	500	8	5	11
	350	350	5	4	8
600	150	1250	21	13	26
	200	1100	19	11	23
	250	1000	17	10	21
	300	850	14	9	18
	350	700	11	7	15
	400	550	9	6	12
700	450	400	6	4	8
	200	1400	25	14	28
	250	1300	23	13	26
	300	1150	21	12	23
	350	1000	18	10	20
	400	850	15	9	17
800	450	700	12	7	14
	500	550	9	6	11
	250	1600	30	16	31
	300	1450	27	15	28
	350	1300	24	13	25
	400	1150	21	12	22
900	450	1000	18	10	19
	500	850	15	9	17
	600	550	9	6	11
	300	1800	35	18	34
	350	1650	32	17	31
	400	1500	29	15	28
1000	450	1350	26	14	25
	500	1200	23	12	23
	600	900	16	9	17
	700	600	10	6	11
	400	2100	43	21	37
	450	1950	40	20	35
1100	500	1800	37	18	32
	600	1500	31	15	27
	700	1200	24	12	21
	800	900	17	9	16
	900	600	10	6	11
	450	2300	49	23	40
1200	500	2150	46	22	37
	600	1850	39	19	32
	700	1550	32	16	27
	800	1250	26	13	22
	900	950	18	10	16
	1000	650	11	7	11
1300	500	2450	53	25	42
	600	2150	47	22	37
	700	1850	40	19	31
	800	1550	33	16	26
	900	1250	26	13	21
	1000	950	19	10	16
1400	1100	650	11	7	11
	600	2450	55	25	41
	700	2150	48	22	36
	800	1850	41	19	31
	900	1550	34	16	26
	1000	1250	27	13	21
1500	1100	950	19	10	16
	1200	650	12	7	11
	700	2500	57	25	41
	800	2200	50	22	36
	900	1900	43	19	31
	1000	1600	36	16	26
1600	1100	1300	28	13	21
	1200	1000	20	10	16
	1300	700	12	7	11
	800	2500	59	25	40
	900	2200	51	22	35
	1000	1900	44	19	31
1700	1100	1600	36	16	26
	1200	1300	29	13	21
	1300	1000	21	10	16
	1400	700	12	7	11
	900	2500	60	25	40
	1000	2200	53	22	35
1800	1100	1900	45	19	30
	1200	1600	37	16	25
	1300	1300	29	13	21
	1400	1000	21	10	16
	1500	700	13	7	11
	900	2500	60	25	40

Installation length (L _E) at design pressure					
			up to 6 bar		
			higher pressures on request		
Potential combination			Movement		
NB D ₁	NB D ₁₋₂	Installation mm			
900	350	1950	39	20	36
	400	1800	36	18	33
	450	1650	33	17	30
	500	1500	30	15	27
	600	1200	24	12	22
	700	900	17	9	16
1000	800	600	10	6	11
	400	2100	43	21	37
	450	1950	40	20	35
	500	1800	37	18	32
	600	1500	31	15	27
	700	1200	24	12	21
1100	800	900	17	9	16
	900	600	10	6	11
	450	2300	49	23	40
	500	2150	46	22	37
	600	1850	39	19	32
	700	1550	32	16	27
1200	800	1250	26	13	22
	900	950	18	10	16
	1000	650	11	7	11
	500	2450	53	25	42
	600	2150	47	22	37
	700	1850	40	19	31
1300	800	1550	33	16	26
	900	1250	26	13	21
	1000	950	19	10	16
	1100	650	11	7	11
	600	2450	55	25	41
	700	2150	48	22	36
1400	800	1850	41	19	31
	900	1550	34	16	26
	1000	1250	27	13	21
	1100	950	19	10	16
	1200	650	12	7	11
	700	2500	57	25	41
1500	800	2200	50	22	36
	900	1900	43	19	31
	1000	1600	36	16	26
	1100	1300	28	13	21
	1200	1000	20	10	16
	1300	700	12	7	11
1600	800	2500	59	25	40
	900	2200	51	22	35
	1000	1900	44	19	31
	1100	1600	36	16	26
	1200	1300	29	13	21
	1300	1000	21	10	16
1700	1400	700	12	7	11
	900	2500	60	25	40
	1000	2200	53	22	35
	1100	1900	45	19	30
	1200	1600	37	16	25
	1300	1300	29	13	21
1800	1400	1000	21	10	16
	1500	700	13	7	11
	900	2500	60	25	40
	1000	2200	53	22	35
	1100	1900	45	19	30
	1200	1600	37	16	25

The specified movements may vary depending on the design pressure.
Also available with length limiters "E" or tie rod design "M"
Intermediate sizes or other nominal diameter combinations as well as other
installation length on request.

Individual fabrication possible



Installation length (L _E) at design pressure					
			up to 6 bar		
			higher pressures on request		
Potential combination			Movement		
NB D ₁	NB D ₁₋₂	Instal- lation- mm			
100	80	160	2	2	5
125	80	235	3	2	7
	100	175	2	2	5
150	80	310	4	3	9
	100	250	3	3	7
	125	175	2	2	5
200	80	460	7	5	12
	100	400	6	4	11
	125	325	5	3	9
250	150	250	3	3	7
	80	660	10	7	17
	100	600	9	6	15
	125	525	8	5	13
300	150	450	7	5	11
	200	300	4	3	8
	80	810	12	8	19
	100	750	12	8	18
350	125	675	10	7	16
	150	600	9	6	14
	200	450	7	5	11
	250	350	5	4	8
400	80	960	15	10	22
	100	900	14	9	21
	125	825	13	8	19
	150	750	12	8	17
	200	600	10	6	14
	250	500	7	5	12
500	300	350	5	4	8
	100	1050	17	11	23
	125	975	16	10	22
	150	900	15	9	20
	200	750	12	8	17
	250	650	10	7	15
600	300	500	8	5	11
	350	350	5	4	8
	150	1250	21	13	26
	200	1100	19	11	23
	250	1000	17	10	21
	300	850	14	9	18
700	350	700	11	7	15
	400	550	9	6	12
	450	400	6	4	8
	200	1400	25	14	28
	250	1300	23	13	26
	300	1150	21	12	23
800	350	1000	18	10	20
	400	850	15	9	17
	450	700	12	7	14
	500	550	9	6	11
	250	1600	30	16	31
	300	1450	27	15	28

Installation length (L _E) at design pressure					
			up to 6 bar		
			higher pressures on request		
Potential combination			Movement		
NB D ₁	NB D ₁₋₂	Instal- lation- mm			
900	350	1950	39	20	36
	400	1800	36	18	33
	450	1650	33	17	30
	500	1500	30	15	27
	600	1200	24	12	22
	700	900	17	9	16
1000	800	600	10	6	11
	400	2100	43	21	37
	450	1950	40	20	35
	500	1800	37	18	32
	600	1500	31	15	27
	700	1200	24	12	21
1100	800	900	17	9	16
	900	600	10	6	11
	450	2300	49	23	40
	500	2150	46	22	37
	600	1850	39	19	32
	700	1550	32	16	27
1200	800	1250	26	13	22
	900	950	18	10	16
	1000	650	11	7	11
	500	2450	53	25	42
	600	2150	47	22	37
	700	1850	40	19	31
1300	800	1550	33	16	26
	900	1250	26	13	21
	1000	950	19	10	16
	1100	650	11	7	11
	600	2450	55	25	41
	700	2150	48	22	36
1400	800	1850	41	19	31
	900	1550	34	16	26
	1000	1250	27	13	21
	1100	950	19	10	16
	1200	650	12	7	11
	700	2500	57	25	41
1500	800	2200	50	22	36
	900	1900	43	19	31
	1000	1600	36	16	26
	1100	1300	28	13	21
	1200	1000	20	10	16
	1300	700	12	7	11
1600	800	2500	59	25	40
	900	2200	51	22	35
	1000	1900	44	19	31
	1100	1600	36	16	26
	1200	1300	29	13	21
	1300	1000	21	10	16

The specified movements may vary depending on the design pressure.

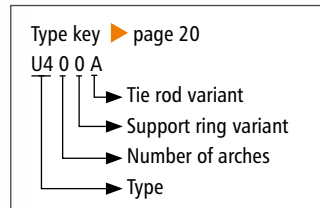
Individual fabrication possible

U400A

NB 300 – NB 4000



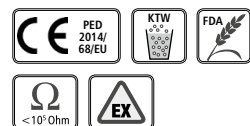
- **Type U400A**
without pressure support ring
- **Type U403A**
with pressure support ring



Universal expansion joint with one arch facing inward

- Design:** Rubber bellows with one arch facing inward along the entire installation length, full faced rubber flanges and single or multi-part backing flanges
Note: The arch reduces the pipe cross-section (please request flange connection measurements)
Optionally for pressure, external pressure support ring in the arch trough
- Nominal diameters:** NB 300 to NB 4000, intermediate sizes possible
- Installation length:** Standard $L_E = 250$ to 350 mm (► page 94–95)
Other installation lengths on request
- Pressure:** Applications with permanent vacuum
Pressure not allowed without external pressure support ring in the arch trough. Design in accordance with Pressure Equipment Directive 2014/68/EU
- Movement:** For axial, lateral and angular movements (► page 94–95)

Application:
Cooling water systems,
plant construction, petro-
chemical and refinery
technology e. g. in vacuum
lines, acid lines and on
vessels



Assembly instruction download
www.ditec-adam.de/en/downloads.html

Rubber bellows

Rubber	Fabric	Marking	Max.	Application
EPDM	Nylon		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDM	Kevlar		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMht	Kevlar		120 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMtw	Nylon		100 °C	Drinking water
EPDMtw	Kevlar		100 °C	Drinking water
EPDMaf	Nylon		100 °C	Abrasive materials, water-sand extraction
EPDMaf	Kevlar		100 °C	Abrasive materials, water-sand extraction
EPDMbeige	Nylon		100 °C	Foodstuffs
EPDMbeige	Kevlar		100 °C	Foodstuffs
IIR	Nylon		100 °C	Hot water, acids, bases, gases
IIR	Kevlar		100 °C	Hot water, acids, bases, gases
CSM	Nylon		100 °C	Strong acids, bases, chemicals
CSM	Kevlar		100 °C	Strong acids, bases, chemicals
NBR	Nylon		100 °C	Oils, petrol, solvents, compressed air
NBR	Kevlar		100 °C	Oils, petrol, solvents, compressed air
NBRbeige	Nylon		100 °C	Oil, fatty foods
NBRbeige	Kevlar		100 °C	Oil, fatty foods
CR	Nylon		90 °C	Cooling water, slightly oily water, seawater
CR	Kevlar		90 °C	Cooling water, slightly oily water, seawater
FPM	Kevlar		180 °C	Corrosive chemicals, petroleum distillates
FPMbeige	Kevlar		180 °C	Oil, fatty foods
NR	Nylon		70 °C	Abrasive materials
Silicon	Kevlar or glass		200 °C	Air, saltwater atmosphere, foodstuffs, medical technology

Flanges

- Design:

Single-part or multi-part, round backing flanges with clearance holes
- Flange norms:

DIN, EN, ANSI, AWWA, BS, JIS, special measurements (▶ page 256)
- Materials:

Carbon steel:

1.0038 (S235JRG2)
1.0570 (S355J2G3)

Stainless steel:

1.4301 (X5CrNi18-10)
1.4571 (X6CrNiMoTi17-12-2)

Aluminium:

AlMg3

Other materials on request
- Coating:

Primed, hot-dip galvanised, special paint

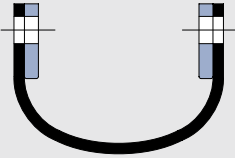
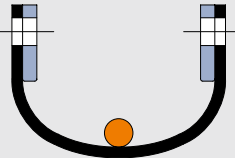
Optional accessories

- Protective hood:

UV protection cover
Ground protective cover
Fire protection cover
Splash protective cover (▶ page 44)
- Flow liners:

Cylindrical flow liner
Conical flow liner
Telescoping flow liner (▶ page 43)

Support rings

TYPE		Pressure support ring	Pressure	Movement
U400A		Without	For vacuum up to 0.05 bar absolute Pressure not allowed	▶ page 94
U403A		External in the arch trough	Depending on the nominal diameter up to 6 bar, for vacuum up to 0.05 bar absolute	▶ page 95

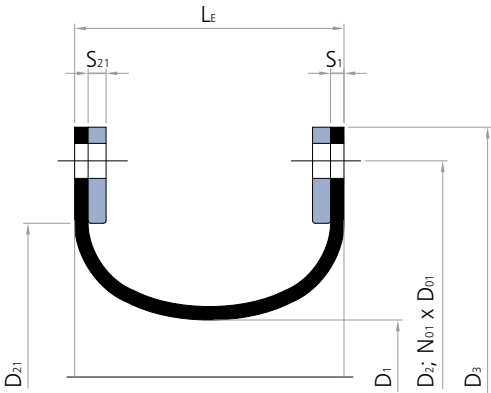
Materials

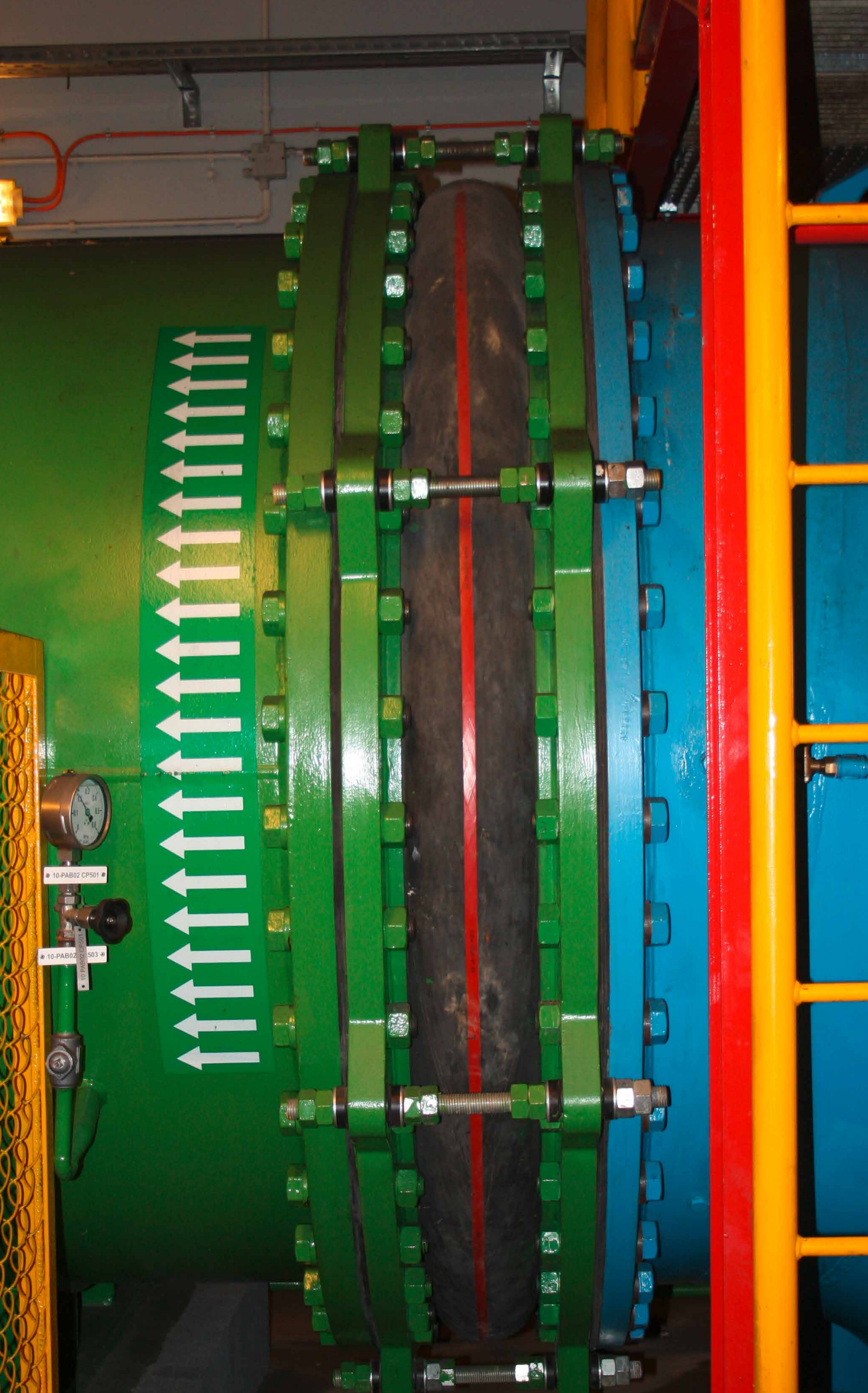
Stainless steel:	1.4301 (X5CrNi18-10) 1.4539 (X1NiCrMoCu25-20-5) 1.4571 (X6CrNiMoTi17-12-2)	Other materials on request
Carbon steel:	1.0570 (S355J2G3) 1.0570 (S355J2G3) galvanised	



Example: Type U403A

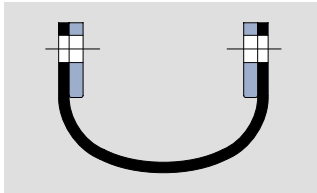
Planning help U400A





U400A

UNIVERSAL
rubber flange



U400A

► without pressure support ring

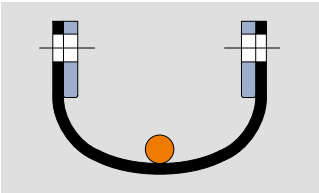
Installation length (L _E)													
	L _E = 250 mm				L _E = 300 mm				L _E = 350 mm				
	higher pressures on request												
NB	Movement			A	Movement			A	Movement			A	
													
	mm	mm	± mm		cm ²	mm	mm		± mm	cm ²	mm		mm
300	30	15	18	707	40	20	25	707	50	25	31	707	
350	30	15	18	962	40	20	24	962	50	25	30	962	
400	30	15	18	1,257	40	20	24	1,257	50	25	30	1,257	
450	30	15	17	1,590	40	20	23	1,590	50	25	29	1,590	
500	30	15	17	1,964	40	20	23	1,964	50	25	29	1,964	
550	30	15	17	2,376	40	20	23	2,376	50	25	28	2,376	
600	30	15	17	2,827	40	20	22	2,827	50	25	28	2,827	
650	30	15	17	3,318	40	20	22	3,318	50	25	28	3,318	
700	30	15	17	3,849	40	20	22	3,849	50	25	28	3,849	
750	30	15	16	4,418	40	20	22	4,418	50	25	27	4,418	
800	30	15	16	5,027	40	20	22	5,027	50	25	27	5,027	
850	30	15	16	5,675	40	20	22	5,675	50	25	27	5,675	
900	30	15	16	6,362	40	20	21	6,362	50	25	27	6,362	
950	30	15	16	7,088	40	20	21	7,088	50	25	27	7,088	
1000	30	15	16	7,854	40	20	21	7,854	50	25	26	7,854	
1050	30	15	16	8,659	40	20	21	8,659	50	25	26	8,659	
1100	30	15	16	9,503	40	20	21	9,503	50	25	26	9,503	
1150	30	15	16	10,387	40	20	21	10,387	50	25	26	10,387	
1200	30	15	15	11,310	40	20	21	11,310	50	25	26	11,310	
1250	30	15	15	12,272	40	20	21	12,272	50	25	26	12,272	
1300	30	15	15	13,273	40	20	20	13,273	50	25	26	13,273	
1350	30	15	15	14,314	40	20	20	14,314	50	25	25	14,314	
1400	30	15	15	15,394	40	20	20	15,394	50	25	25	15,394	
1450	30	15	15	16,513	40	20	20	16,513	50	25	25	16,513	
1500	30	15	15	17,672	40	20	20	17,672	50	25	25	17,672	
1600	30	15	15	20,106	40	20	20	20,106	50	25	25	20,106	
1650	30	15	15	21,383	40	20	20	21,383	50	25	25	21,383	
1700	30	15	15	22,698	40	20	20	22,698	50	25	25	22,698	
1800	30	15	15	25,447	40	20	20	25,447	50	25	24	25,447	
1900	30	15	15	28,353	40	20	19	28,353	50	25	24	28,353	
1950	30	15	15	29,865	40	20	19	29,865	50	25	24	29,865	
2000	30	15	15	31,416	40	20	19	31,416	50	25	24	31,416	
2100	30	15	14	34,636	40	20	19	34,636	50	25	24	34,636	
2200	30	15	14	38,013	40	20	19	38,013	50	25	24	38,013	
2250	30	15	14	39,761	40	20	19	39,761	50	25	24	39,761	
2300	30	15	14	41,548	40	20	19	41,548	50	25	24	41,548	
2400	30	15	14	45,239	40	20	19	45,239	50	25	24	45,239	
2500	30	15	14	49,087	40	20	19	49,087	50	25	24	49,087	
2550	30	15	14	51,071	40	20	19	51,071	50	25	23	51,071	
2600	30	15	14	53,093	40	20	19	53,093	50	25	23	53,093	
2700	30	15	14	57,256	40	20	19	57,256	50	25	23	57,256	
2800	30	15	14	61,575	40	20	19	61,575	50	25	23	61,575	
2850	30	15	14	63,794	40	20	18	63,794	50	25	23	63,794	
2900	30	15	14	66,052	40	20	18	66,052	50	25	23	66,052	
3000	30	15	14	70,686	40	20	18	70,686	50	25	23	70,686	
3100	30	15	14	75,477	40	20	18	75,477	50	25	23	75,477	
3150	30	15	14	77,931	40	20	18	77,931	50	25	23	77,931	
3200	30	15	14	80,425	40	20	18	80,425	50	25	23	80,425	
3300	30	15	14	85,530	40	20	18	85,530	50	25	23	85,530	
3400	30	15	14	90,792	40	20	18	90,792	50	25	23	90,792	
3450	30	15	14	93,482	40	20	18	93,482	50	25	23	93,482	
3600	30	15	13	101,788	40	20	18	101,788	50	25	22	101,788	
3800	30	15	13	113,412	40	20	18	113,412	50	25	22	113,412	
4000	30	15	13	125,664	40	20	18	125,664	50	25	22	125,664	

Recommended sizes
Additional possible sizes

In the event of axial extension and simultaneous lateral displacement the above movements are reduced (► page 22).
Larger movements on request.

Individual fabrication possible

U403A
► with pressure support ring



Installation length (L _E) at design pressure												
	up to 6 bar L _E = 250 mm				up to 6 bar L _E = 300 mm				up to 6 bar L _E = 350 mm			
	higher pressures on request											
NB	Movement			A	Movement			A	Movement			A
												
	mm	mm	±mm	cm ²	mm	mm	±mm	cm ²	mm	mm	±mm	cm ²
300	30	15	18	707	40	20	25	707	50	25	31	707
350	30	15	18	962	40	20	24	962	50	25	30	962
400	30	15	18	1,257	40	20	24	1,257	50	25	30	1,257
450	30	15	17	1,590	40	20	23	1,590	50	25	29	1,590
500	30	15	17	1,964	40	20	23	1,964	50	25	29	1,964
550	30	15	17	2,376	40	20	23	2,376	50	25	28	2,376
600	30	15	17	2,827	40	20	22	2,827	50	25	28	2,827
650	30	15	17	3,318	40	20	22	3,318	50	25	28	3,318
700	30	15	17	3,849	40	20	22	3,849	50	25	28	3,849
750	30	15	16	4,418	40	20	22	4,418	50	25	27	4,418
800	30	15	16	5,027	40	20	22	5,027	50	25	27	5,027
850	30	15	16	5,675	40	20	22	5,675	50	25	27	5,675
900	30	15	16	6,362	40	20	21	6,362	50	25	27	6,362
950	30	15	16	7,088	40	20	21	7,088	50	25	27	7,088
1000	30	15	16	7,854	40	20	21	7,854	50	25	26	7,854
1050	30	15	16	8,659	40	20	21	8,659	50	25	26	8,659
1100	30	15	16	9,503	40	20	21	9,503	50	25	26	9,503
1150	30	15	16	10,387	40	20	21	10,387	50	25	26	10,387
1200	30	15	15	11,310	40	20	21	11,310	50	25	26	11,310
1250	30	15	15	12,272	40	20	21	12,272	50	25	26	12,272
1300	30	15	15	13,273	40	20	20	13,273	50	25	26	13,273
1350	30	15	15	14,314	40	20	20	14,314	50	25	25	14,314
1400	30	15	15	15,394	40	20	20	15,394	50	25	25	15,394
1450	30	15	15	16,513	40	20	20	16,513	50	25	25	16,513
1500	30	15	15	17,672	40	20	20	17,672	50	25	25	17,672
1600	30	15	15	20,106	40	20	20	20,106	50	25	25	20,106
1650	30	15	15	21,383	40	20	20	21,383	50	25	25	21,383
1700	30	15	15	22,698	40	20	20	22,698	50	25	25	22,698
1800	30	15	15	25,447	40	20	20	25,447	50	25	24	25,447
1900	30	15	15	28,353	40	20	19	28,353	50	25	24	28,353
1950	30	15	15	29,865	40	20	19	29,865	50	25	24	29,865
2000	30	15	15	31,416	40	20	19	31,416	50	25	24	31,416
2100	30	15	14	34,636	40	20	19	34,636	50	25	24	34,636
2200	30	15	14	38,013	40	20	19	38,013	50	25	24	38,013
2250	30	15	14	39,761	40	20	19	39,761	50	25	24	39,761
2300	30	15	14	41,548	40	20	19	41,548	50	25	24	41,548
2400	30	15	14	45,239	40	20	19	45,239	50	25	24	45,239
2500	30	15	14	49,087	40	20	19	49,087	50	25	24	49,087
2550	30	15	14	51,071	40	20	19	51,071	50	25	23	51,071
2600	30	15	14	53,093	40	20	19	53,093	50	25	23	53,093
2700	30	15	14	57,256	40	20	19	57,256	50	25	23	57,256
2800	30	15	14	61,575	40	20	19	61,575	50	25	23	61,575
2850	30	15	14	63,794	40	20	18	63,794	50	25	23	63,794
2900	30	15	14	66,052	40	20	18	66,052	50	25	23	66,052
3000	30	15	14	70,686	40	20	18	70,686	50	25	23	70,686
3100	30	15	14	75,477	40	20	18	75,477	50	25	23	75,477
3150	30	15	14	77,931	40	20	18	77,931	50	25	23	77,931
3200	30	15	14	80,425	40	20	18	80,425	50	25	23	80,425
3300	30	15	14	85,530	40	20	18	85,530	50	25	23	85,530
3400	30	15	14	90,792	40	20	18	90,792	50	25	23	90,792
3450	30	15	14	93,482	40	20	18	93,482	50	25	23	93,482
3600	30	15	13	101,788	40	20	18	101,788	50	25	22	101,788
3800	30	15	13	113,412	40	20	18	113,412	50	25	22	113,412
4000	30	15	13	125,664	40	20	18	125,664	50	25	22	125,664

Recommended sizes
Additional possible sizes

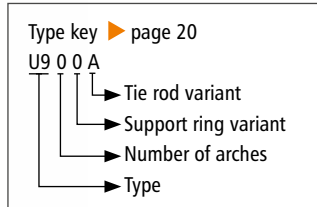
In the event of axial extension and simultaneous lateral displacement the above movements are reduced (► page 22).
Larger movements on request.

Individual fabrication possible

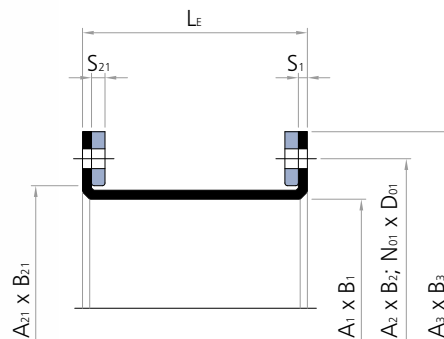
U900A



► Type U900A



Planning help U900A



Rectangular universal expansion joint without arch

Design:	Rectangular rubber bellows with full faced rubber flanges and single- or multi-part backing flanges Oval construction type or rounded corners also possible
Dimensions:	Individual length x width
Installation length:	According to customer specification
Pressure:	Depending on the dimensions and installation length up to 2.5 bar Vacuum stability on request
Movement:	For small axial and lateral movements

Application:

Power plants, plant construction, food processing, wastewater treatment plants, industrial plants, paper industry
e.g. to disconnect apparatus, for compressors



Assembly instruction download
www.ditec-adam.de/en/downloads.html

Rubber bellows

Rubber	Fabric	Marking	Max.	Application
EPDM	Nylon		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDM	Kevlar		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMht	Kevlar		120 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMtw	Nylon		100 °C	Drinking water
EPDMtw	Kevlar		100 °C	Drinking water
EPDMaf	Nylon		100 °C	Abrasive materials, water-sand extraction
EPDMaf	Kevlar		100 °C	Abrasive materials, water-sand extraction
EPDMbeige	Nylon		100 °C	Foodstuffs
EPDMbeige	Kevlar		100 °C	Foodstuffs
IIR	Nylon		100 °C	Hot water, acids, bases, gases
IIR	Kevlar		100 °C	Hot water, acids, bases, gases
CSM	Nylon		100 °C	Strong acids, bases, chemicals
CSM	Kevlar		100 °C	Strong acids, bases, chemicals
NBR	Nylon		100 °C	Oils, petrol, solvents, compressed air
NBR	Kevlar		100 °C	Oils, petrol, solvents, compressed air
NBRbeige	Nylon		100 °C	Oil, fatty foods
NBRbeige	Kevlar		100 °C	Oil, fatty foods
CR	Nylon		90 °C	Cooling water, slightly oily water, seawater
CR	Kevlar		90 °C	Cooling water, slightly oily water, seawater
FPM	Kevlar		180 °C	Corrosive chemicals, petroleum distillates
FPMbeige	Kevlar		180 °C	Oil, fatty foods
NR	Nylon		70 °C	Abrasive materials
Silicon	Kevlar or glass		200 °C	Air, saltwater atmosphere, foodstuffs, medical technology

PTFE-lining: Permanently embedded against chemical attacks on the interior at the rubber bellows.

Flanges

- Design:

Single-part or multi-part backing flanges with clearance holes
- Flange norms:

According to customer specification
- Materials:

Carbon steel:

1.0038 (S235JRG2)
1.0570 (S355J2G3)

Stainless steel:

1.4301 (X5CrNi18-10)
1.4571 (X6CrNiMoTi17-12-2)

Aluminium:

AlMg3

Other materials on request
- Coating:

Primed, hot-dip galvanised, special paint

Optional accessories

- Protective hood:

UV protection cover
Ground protective cover
Fire protection cover
Splash protective cover (▶ page 44)
- Flow liners:

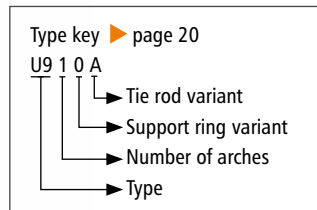
Cylindrical flow liner
Conical flow liner
Telescoping flow liner (▶ page 43)

UNIVERSAL
rubber flange

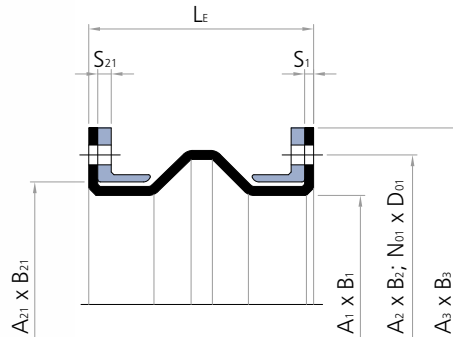
U910A



► Type U910A



Planning help U910A



Rectangular universal expansion joint with one or several arches

- Design:** Rectangular, single or multiple arch rubber bellows with full faced rubber flanges and single or multi-part backing flanges with support collar
Oval construction type or rounded corners also possible
Optional vacuum support rings and/or external pressure support rings in the arch trough
- Dimensions:** Individual length x width up to NG 4000 x 4000
or NG 6000 x 3000
- Installation length:** According to customer specification
- Pressure:** Depending on the dimensions and installation length up to 10 bar
Vacuum stability on request
- Movement:** For large axial and lateral movements

Application:

Power plants, plant construction, food processing, wastewater treatment plants, industrial plants, paper industry
e.g. to disconnect apparatus, for compressors



Assembly instruction download
www.ditec-adam.de/en/downloads.html

Rubber bellows

Rubber	Fabric	Marking	Max.	Application
EPDM	Nylon		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDM	Kevlar		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMht	Kevlar		120 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMtw	Nylon		100 °C	Drinking water
EPDMtw	Kevlar		100 °C	Drinking water
EPDMaf	Nylon		100 °C	Abrasive materials, water-sand extraction
EPDMaf	Kevlar		100 °C	Abrasive materials, water-sand extraction
EPDMbeige	Nylon		100 °C	Foodstuffs
EPDMbeige	Kevlar		100 °C	Foodstuffs
IIR	Nylon		100 °C	Hot water, acids, bases, gases
IIR	Kevlar		100 °C	Hot water, acids, bases, gases
CSM	Nylon		100 °C	Strong acids, bases, chemicals
CSM	Kevlar		100 °C	Strong acids, bases, chemicals
NBR	Nylon		100 °C	Oils, petrol, solvents, compressed air
NBR	Kevlar		100 °C	Oils, petrol, solvents, compressed air
NBRbeige	Nylon		100 °C	Oil, fatty foods
NBRbeige	Kevlar		100 °C	Oil, fatty foods
CR	Nylon		90 °C	Cooling water, slightly oily water, seawater
CR	Kevlar		90 °C	Cooling water, slightly oily water, seawater
FPM	Kevlar		180 °C	Corrosive chemicals, petroleum distillates
FPMbeige	Kevlar		180 °C	Oil, fatty foods
NR	Nylon		70 °C	Abrasive materials
Silicon	Kevlar or glass		200 °C	Air, saltwater atmosphere, foodstuffs, medical technology

PTFE-lining: Permanently embedded against chemical attacks on the interior at the rubber bellows.

UNIVERSAL
rubber flange

Flanges

- Design:

Single-part or multi-part backing flanges with support collar and clearance holes
- Flange norms:

According to customer specification
- Materials:

Carbon steel:

1.0038 (S235JRG2)
1.0570 (S355J2G3)

Stainless steel:

1.4301 (X5CrNi18-10)
1.4571 (X6CrNiMoTi17-12-2)

Aluminium:

AlMg3

Other materials on request
- Coating:

Primed, hot-dip galvanised, special paint

Optional accessories

- Protective hood:

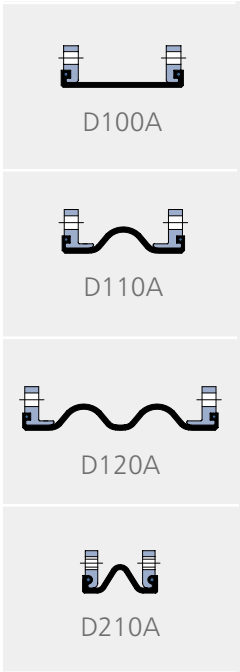
UV protection cover
Ground protective cover
Fire protection cover
Splash protective cover (▶ page 44)
- Flow liners:

Cylindrical flow liner
Conical flow liner
Telescoping flow liner (▶ page 43)



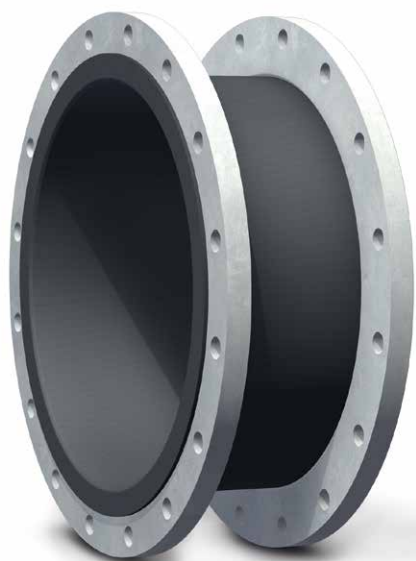
Universal expansion joints with swivel flange

D100A	without arch	▶ 102
D110A	with one arch	▶ 106
D120A	with two arches	▶ 112
D210A	with one arch and flange with threaded holes	▶ 118

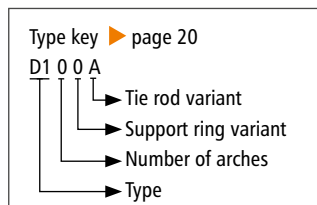


D100A

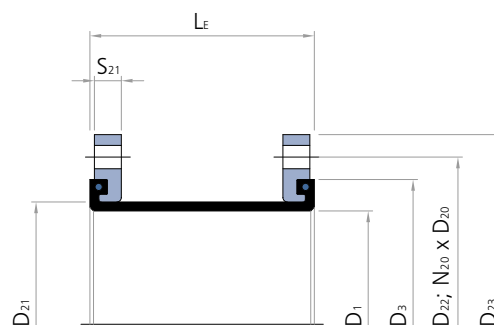
NB 40 – NB 1200



► Type D100A



Planning help D100A



Universal expansion joint without arch

Design: Hydrodynamic, cylindrical rubber bellows with self-sealing rubber bulges and swivel backing flanges
Optionally with embedded pressure or vacuum support rings

Nominal diameters: NB 40 to NB 1200, intermediate sizes possible

Installation length: Standard $L_E = 150$ to 400 mm (► page 104)
Other installation lengths on request

Pressure: Depending on the nominal diameter and installation length up to 10 bar
Vacuum stability on request. Design in accordance with Pressure Equipment Directive PED 2014/68/EU

Movement: For small axial and lateral movements (► page 104)

Application:

Plant construction, sand/gravel extraction industry, dredgers, food processing e.g. as suction/pressure hoses, in conveyor lines, on pumps and vessels



Assembly instruction download
www.ditec-adam.de/en/downloads.html

Rubber bellows

Rubber	Fabric	Marking	Max.	Application
EPDM	Nylon		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDM	Kevlar		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMht	Kevlar		120 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMtw	Nylon		100 °C	Drinking water
EPDMtw	Kevlar		100 °C	Drinking water
EPDMaf	Nylon		100 °C	Abrasive materials, water-sand extraction
EPDMaf	Kevlar		100 °C	Abrasive materials, water-sand extraction
EPDMbeige	Nylon		100 °C	Foodstuffs
EPDMbeige	Kevlar		100 °C	Foodstuffs
IIR	Nylon		100 °C	Hot water, acids, bases, gases
IIR	Kevlar		100 °C	Hot water, acids, bases, gases
CSM	Nylon		100 °C	Strong acids, bases, chemicals
CSM	Kevlar		100 °C	Strong acids, bases, chemicals
NBR	Nylon		100 °C	Oils, petrol, solvents, compressed air
NBR	Kevlar		100 °C	Oils, petrol, solvents, compressed air
NBRbeige	Nylon		100 °C	Oil, fatty foods
NBRbeige	Kevlar		100 °C	Oil, fatty foods
CR	Nylon		90 °C	Cooling water, slightly oily water, seawater
CR	Kevlar		90 °C	Cooling water, slightly oily water, seawater
FPM	Kevlar		180 °C	Corrosive chemicals, petroleum distillates
FPMbeige	Kevlar		180 °C	Oil, fatty foods
NR	Nylon		70 °C	Abrasive materials
Silicon	Kevlar or glass		200 °C	Air, saltwater atmosphere, foodstuffs, medical technology

UNIVERSAL
swivel flange

D100A

Flanges

- Design:** Single-part, swivel, round backing flanges with clearance holes and groove to accommodate the rubber bulges
- Flange norms:** DIN, EN, ANSI, AWWA, BS, JIS, special measurements (▶ page 256)
- Materials:** Carbon steel: 1.0038 (S235JRG2)
1.0570 (S355J2G3)
Stainless steel: 1.4301 (X5CrNi18-10)
1.4571 (X6CrNiMoTi17-12-2)
Aluminium: AlMg3
Other materials on request
- Coating:** Primed, hot-dip galvanised, special paint

Optional accessories

- Protective hood:** UV protection cover
Ground protective cover
Fire protection cover
Splash protective cover (▶ page 44)
- Flow liners:** Cylindrical flow liner
Conical flow liner
Telescoping flow liner (▶ page 43)



D100A

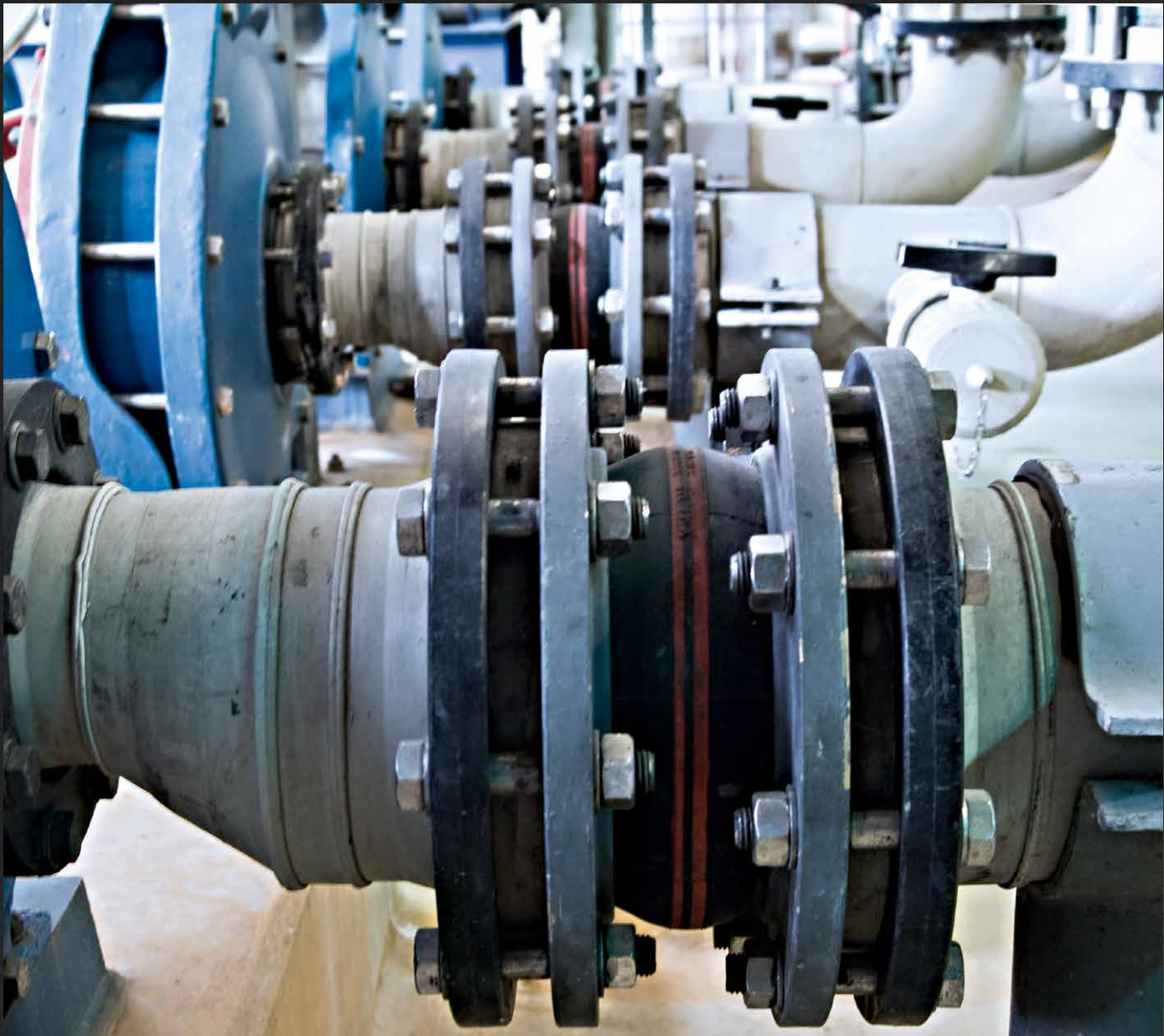
► without arch

Installation length (L _E) at design pressure															
	up to 10 bar L _E = 150 mm					up to 10 bar L _E = 200 mm					up to 10 bar L _E = 250 mm				
	higher pressures on request														
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²
40	8	5	12	0	10	10	6	16	0	10	13	8	20	0	10
50	8	5	11	0	16	10	6	15	0	16	13	8	19	0	16
65	8	5	11	0	28	10	6	14	0	28	13	8	18	0	28
80	8	5	10	0	43	10	6	14	0	43	13	8	17	0	43
100	8	5	10	0	69	10	6	13	0	69	13	8	17	0	69
125	8	5	10	0	115	10	6	13	0	115	13	8	16	0	115
150	8	5	9	0	170	10	6	12	0	170	13	8	15	0	170
200	8	5	9	0	278	10	6	12	0	278	13	8	14	0	278
250	8	5	8	0	449	10	6	11	0	449	13	8	14	0	449
300	8	5	8	0	656	10	6	11	0	656	13	8	13	0	656
350	8	5	8	0	855	10	6	10	0	855	13	8	13	0	855
400	8	5	8	0	1,195	10	6	10	0	1,195	13	8	13	0	1,195
450	8	5	7	0	1,514	10	6	10	0	1,514	13	8	12	0	1,514
500	8	5	7	0	1,886	10	6	10	0	1,886	13	8	12	0	1,886
600	8	5	7	0	2,706	10	6	9	0	2,706	13	8	12	0	2,706
700	8	5	7	0	3,750	10	6	9	0	3,750	13	8	11	0	3,750
800	8	5	7	0	4,914	10	6	9	0	4,914	13	8	11	0	4,914
900	8	5	6	0	6,193	10	6	9	0	6,193	13	8	11	0	6,193
1000	8	5	6	0	7,667	10	6	8	0	7,667	13	8	10	0	7,667
1100	8	5	6	0	9,297	10	6	8	0	9,297	13	8	10	0	9,297
1200	8	5	6	0	11,085	10	6	8	0	11,085	13	8	10	0	11,085

Installation length (L _E) at design pressure															
	up to 10 bar L _E = 300 mm					up to 10 bar L _E = 350 mm					up to 10 bar L _E = 400 mm				
	higher pressures on request														
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²
40	15	9	24	0	10	18	11	28	0	10	20	12	32	0	10
50	15	9	23	0	16	18	11	27	0	16	20	12	30	0	16
65	15	9	22	0	28	18	11	25	0	28	20	12	29	0	28
80	15	9	21	0	43	18	11	24	0	43	20	12	28	0	43
100	15	9	20	0	69	18	11	23	0	69	20	12	27	0	69
125	15	9	19	0	115	18	11	22	0	115	20	12	25	0	115
150	15	9	18	0	170	18	11	21	0	170	20	12	24	0	170
200	15	9	17	0	278	18	11	20	0	278	20	12	23	0	278
250	15	9	17	0	449	18	11	19	0	449	20	12	22	0	449
300	15	9	16	0	656	18	11	19	0	656	20	12	21	0	656
350	15	9	15	0	855	18	11	18	0	855	20	12	21	0	855
400	15	9	15	0	1,195	18	11	18	0	1,195	20	12	20	0	1,195
450	15	9	15	0	1,514	18	11	17	0	1,514	20	12	20	0	1,514
500	15	9	14	0	1,886	18	11	17	0	1,886	20	12	19	0	1,886
600	15	9	14	0	2,706	18	11	16	0	2,706	20	12	19	0	2,706
700	15	9	13	0	3,750	18	11	16	0	3,750	20	12	18	0	3,750
800	15	9	13	0	4,914	18	11	15	0	4,914	20	12	18	0	4,914
900	15	9	13	0	6,193	18	11	15	0	6,193	20	12	17	0	6,193
1000	15	9	13	0	7,667	18	11	15	0	7,667	20	12	17	0	7,667
1100	15	9	12	0	9,297	18	11	14	0	9,297	20	12	16	0	9,297
1200	15	9	12	0	11,085	18	11	14	0	11,085	20	12	16	0	11,085

For larger movements see type D110A.

Individual fabrication possible



Universal expansion joint, type D110A
on the suction side of quenching water pumps in a waste incineration plant
NB 150, 16 bar

D100A

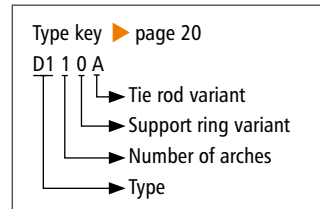
UNIVERSAL
swivel flange

D110A

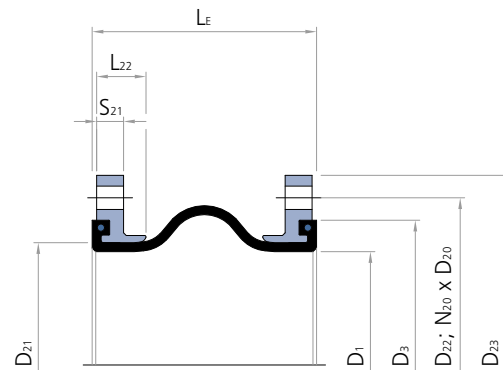
NB 20 – NB 1200



- **Type D110A**
without vacuum support ring
- **Type D111A**
with internal vacuum support ring
- **Type D112A**
with embedded vacuum support ring



Planning help D110A

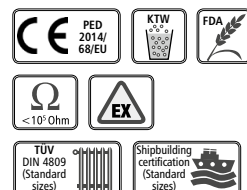


Universal expansion joint with one arch

- Design:** Hydrodynamic, single-arch rubber bellows with self sealing rubber bulges and swivel backing flanges with support collar
Optionally with vacuum support ring
- Nominal diameters:** NB 20 to NB 1200, intermediate sizes possible
- Installation length:** Standard $L_E = 130$ to 350 mm (► page 109–111)
Other installation lengths on request
- Pressure:** Depending on the nominal diameter up to 25 bar
Vacuum stability on request with vacuum support ring up to 0.05 bar absolute
Design in accordance with Pressure Equipment Directive PED 2014/68/EU
- Movement:** For axial, lateral and angular movements (► page 109–111)
- Stiffness rate:** Axial and lateral stiffness rates (► page 254)

Application:

Cooling water systems,
desalination plants,
drinking water supply,
plant construction, e. g.
in pipelines, on pumps,
as dismantling joints, on
condensers and vessels



Assembly instruction download
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Standard rubber bellows

Rubber	Fabric		Max.	Application
EPDM / EPDM	PEEK		130 °C	Heating systems, cooling, hot air
IIR / EPDM	Nylon		100 °C	Drinking water, seawater, weak acids and alkalis, dilute weather resistant
NBR / CR	Nylon		90 °C	Oils, fuels, gases
NBRweiß / CR	Nylon		90 °C	Fat containing food, weather resistant
CSM / CSM	Nylon		100 °C	Chemicals, aggressive chemical wastewater, weather resistant
NBR / CR	Nylon		90 °C	Oils, fuels, gases, LPG, blast furnace gas, lubricants
CR / CR	Nylon		90 °C	Cold- and hot water, seawater, wastewater with oleaginous corrosion protection
NBR / CR	Stahl		90 °C	Oils, fuels, gases, fuel ethanol blends
NBR-LT / CR	Nylon		90 °C	Oils, fuels, gases, LPG, for tanker and filling stations
HNBR / CR	Stahl		100 °C	Oils, fuels, gases, LPG, high Temperature
FPM / ECO	Nylon		100 °C	Flue gas desulphurisation, biodiesel, benzene, xylene
IIR-D / EPDM	PEEK		130 °C	Steam, water
NBR / CR	PEEK		120 °C	Mineral oil, hydraulic oil
CSM / CR	PEEK		120 °C	Acids, alkalis

UNIVERSAL
swivel flange

Non-standard rubber bellows

Rubber	Fabric	Marking	Max.	Application
EPDM	Nylon		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDM	Kevlar		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMht	Kevlar		120 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMtw	Nylon		100 °C	Drinking water
EPDMtw	Kevlar		100 °C	Drinking water
EPDMaf	Nylon		100 °C	Abrasive materials, water-sand extraction
EPDMaf	Kevlar		100 °C	Abrasive materials, water-sand extraction
EPDMbeige	Nylon		100 °C	Foodstuffs
EPDMbeige	Kevlar		100 °C	Foodstuffs
IIR	Nylon		100 °C	Hot water, acids, bases, gases
IIR	Kevlar		100 °C	Hot water, acids, bases, gases
CSM	Nylon		100 °C	Strong acids, bases, chemicals
CSM	Kevlar		100 °C	Strong acids, bases, chemicals
NBR	Nylon		100 °C	Oils, petrol, solvents, compressed air
NBR	Kevlar		100 °C	Oils, petrol, solvents, compressed air
NBRbeige	Nylon		100 °C	Oil, fatty foods
NBRbeige	Kevlar		100 °C	Oil, fatty foods
CR	Nylon		90 °C	Cooling water, slightly oily water, seawater
CR	Kevlar		90 °C	Cooling water, slightly oily water, seawater
FPM	Kevlar		180 °C	Corrosive chemicals, petroleum distillates
FPMbeige	Kevlar		180 °C	Oil, fatty foods
NR	Nylon		70 °C	Abrasive materials
Silicon	Kevlar or glass		200 °C	Air, saltwater atmosphere, foodstuffs, medical technology

D110A

Flanges

- Design:** Single-part, swivel, round backing flanges with support collar, clearance holes and groove to accommodate the rubber bulges
- Flange norms:** DIN, EN, ANSI, AWWA, BS, JIS, special measurements (▶ page 256)
- Materials:** Carbon steel: 1.0038 (S235JRG2)
1.0570 (S355J2G3)
Stainless steel: 1.4301 (X5CrNi18-10)
1.4571 (X6CrNiMoTi17-12-2)
Aluminium: AlMg3
Other materials on request
- Coating:** Primed, hot-dip galvanised, special paint

Optional accessories

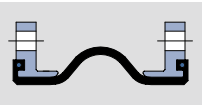
- Protective hood:** UV protection cover
Ground protective cover
Fire protection cover
Splash protective cover (▶ page 44)
- Flow liners:** Cylindrical flow liner
Conical flow liner
Telescoping flow liner (▶ page 43)

Support rings

TYPE		Vacuum support ring	Pressure	Movement
D110A		Without	Depending on the nominal diameter up to 25 bar, vacuum stability on request	▶ page 109
D111A		Vacuum support ring spirals (1.4310) up to NB 300, vacuum support ring starting at NB 350 Medium contact, inside the arch apex	Depending on the nominal diameter up to 25 bar, for vacuum up to 0.05 bar absolute	▶ page 110
D112A		No medium contact, embedded into the arch apex of the rubber bellows	Depending on the nominal diameter up to 16 bar, for vacuum up to 0.05 bar absolute	▶ page 111

Materials

- Stainless steel: 1.4301 (X5CrNi18-10)
1.4539 (X1NiCrMoCu25-20-5)
1.4571 (X6CrNiMoTi17-12-2)
Carbon steel: 1.0570 (S355J2G3) rubber coated
- Other materials on request



Installation length (L _E) at design pressure															
	up to 10 bar L _E = 130 mm					up to 10 bar L _E = 150 mm					up to 10 bar L _E = 175 mm				
	higher pressures on request														
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²
20	30	30	30	30.0	17										
25	30	30	30	30.0	17										
32	30	30	30	30.0	17										
40	30	30	30	35.0	18										
50	30	30	30	30.0	32										
65	30	30	30	30.0	53										
80	30	30	30	30.0	85	30	30	30	30.0	85					
100	30	30	30	20.0	128	30	30	30	20.0	128					
125	30	30	30	20.0	187	30	30	30	20.0	187					
150	30	30	30	20.0	259	30	30	30	20.0	259					
200	30	30	30	12.0	410						30	30	30	12.0	409
250	30	30	30	12.0	596						30	30	30	12.0	599
300	30	30	30	12.0	822						31	10	17	3.8	903
350											31	10	17	3.3	1,134
400											31	10	17	2.9	1,521
450											31	10	17	2.5	1,878
500											31	10	17	2.3	2,290
600											31	10	16	1.9	3,187
700											31	10	16	1.6	4,312
800											31	10	16	1.4	5,555
900											31	10	16	1.3	6,910
1000											31	10	16	1.1	8,462
1100											31	10	15	1.0	10,171
1200											31	10	15	1.0	12,037

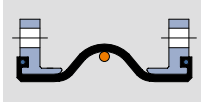
Installation length (L _E) at design pressure															
	up to 10 bar L _E = 200 mm					up to 10 bar L _E = 250 mm					up to 10 bar L _E = 275 mm				
	higher pressures on request														
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²
200	40	20	26	11.3	564	44	20	29	11.3	573	44	20	29	11.3	573
250	40	20	26	9.1	799	44	20	28	9.1	809	44	20	28	9.1	809
300	30	30	30	12.0	822	44	20	27	7.6	1,081	44	20	27	7.6	1,081
350	50	30	30	8.0	907	44	20	27	6.5	1,333	44	20	27	6.5	1,333
400	50	30	30	8.0	1,018	44	20	27	5.7	1,750	44	20	27	5.7	1,750
450	40	20	25	5.1	2,116	40	20	30	6.0	1,801	44	20	26	5.1	2,132
500	50	30	30	8.0	1,692	44	20	26	4.6	2,570	44	20	26	4.6	2,570
600	50	30	30	8.0	3,078	44	20	26	3.8	3,515	44	20	26	3.8	3,515
700	40	20	24	3.3	4,669	50	30	30	8.0	4,019	50	30	30	8.0	4,019
800	40	20	23	2.9	5,958	50	30	30	8.0	5,436	44	20	25	2.9	5,986
900	40	20	23	2.5	7,359	44	20	25	2.5	7,390	44	20	25	2.5	7,390
1000	40	20	23	2.3	8,958	44	20	25	2.3	8,992	44	20	25	2.3	8,992
1100	40	20	23	2.1	10,715	44	20	24	2.1	10,751	44	20	24	2.1	10,751
1200	40	20	22	1.9	12,628	44	20	24	1.9	12,668	44	20	24	1.9	12,668

Installation length (L _E) at design pressure										
	up to 10 bar L _E = 300 mm					up to 10 bar L _E = 350 mm				
	higher pressures on request									
NB	Movement				A	Movement				A
										
	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²
200	53	31	37	17.2	707	69	43	49	23.3	897
250	53	31	36	19.0	968	69	43	48	19.0	1,188
300	53	31	36	16.0	1,263	69	43	48	16.0	1,514
350	53	31	35	13.8	1,534	69	43	47	13.8	1,810
400	53	31	35	12.1	1,979	69	43	46	12.1	2,290
450	53	31	34	10.8	2,384	69	43	46	10.8	2,725
500	53	31	34	9.8	2,846	69	43	45	9.8	3,217
600	53	31	33	8.2	3,837	69	43	45	8.2	4,266
700	53	31	33	7.0	5,064	69	43	44	7.0	5,555
800	53	31	33	6.1	6,404	69	43	43	6.1	6,955
900	50	30	30	5.0	6,706	69	43	43	5.5	8,462
1000	50	30	30	5.0	8,231	69	43	43	4.9	10,171
1100	53	31	32	4.5	11,310	69	43	42	4.5	12,037
1200	53	31	31	4.1	13,273	69	43	42	4.1	14,061

Standard sizes
Non-standard sizes

In the event of axial extension and simultaneous lateral displacement the above movements are reduced (► page 22).
For larger movements see type D120A and D123A.

Individual fabrication possible

**D111A**

► with internal vacuum support ring

Installation length (L _E) at design pressure															
	up to 10 bar L _E = 130 mm					up to 10 bar L _E = 150 mm					up to 10 bar L _E = 175 mm				
	higher pressures on request														
NB	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
															
	mm	mm	± mm	± °		mm	mm	± mm	± °		mm	mm	± mm	± °	
20	30	10	30	30.0	17										
25	30	10	30	30.0	17										
32	30	10	30	30.0	17										
40	30	10	30	35.0	18										
50	30	10	30	30.0	32										
65	30	10	30	30.0	53										
80	30	10	30	30.0	85	30	10	30	30.0	85					
100	30	10	30	20.0	128	30	10	30	20.0	128					
125	30	10	30	20.0	187	30	10	30	20.0	187					
150	30	10	30	20.0	259	30	10	30	20.0	259					
200	30	10	30	12.0	410						30	10	30	12	409
250	30	10	30	12.0	596						30	10	30	12	599
300	30	10	30	12.0	822						31	3	17	3.8	903
350											31	3	17	3.3	1,134
400											31	3	17	2.9	1,521
450											31	3	17	2.5	1,878
500											31	3	17	2.3	2,290
600											31	3	16	1.9	3,187
700											31	3	16	1.6	4,312
800											31	3	16	1.4	5,555
900											31	3	16	1.3	6,910
1000											31	3	16	1.1	8,462
1100											31	3	15	1	10,171
1200											31	3	15	1	12,037

Installation length (L _E) at design pressure															
	up to 10 bar L _E = 200 mm					up to 10 bar L _E = 250 mm					up to 10 bar L _E = 275 mm				
	higher pressures on request														
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²
200	40	7	26	11.3	564	44	7	29	11.3	573	44	7	29	11.3	573
250	40	7	26	9.1	799	44	7	28	9.1	809	44	7	28	9.1	809
300	30	10	30	12	822	44	7	27	7.6	1,081	44	7	27	7.6	1,081
350	50	10	30	8	907	44	7	27	6.5	1,333	44	7	27	6.5	1,333
400	50	10	30	8	1,018	44	7	27	5.7	1,750	44	7	27	5.7	1,750
450	40	7	25	5.1	2,116	40	10	30	6	1,801	44	7	26	5.1	2,132
500	50	10	30	8	1,692	44	7	26	4.6	2,570	44	7	26	4.6	2,570
600	50	10	30	8	3,078	44	7	26	3.8	3,515	44	7	26	3.8	3,515
700	40	7	24	3.3	4,669	50	10	30	8	4,019	50	10	30	8	4,019
800	40	7	23	2.9	5,958	50	10	30	8	5,436	44	7	25	2.9	5,986
900	40	7	23	2.5	7,359	44	7	25	2.5	7,390	44	7	25	2.5	7,390
1000	40	7	23	2.3	8,958	44	7	25	2.3	8,992	44	7	25	2.3	8,992
1100	40	7	23	2.1	10,715	44	7	24	2.1	10,751	44	7	24	2.1	10,751
1200	40	7	22	1.9	12,628	44	7	24	1.9	12,668	44	7	24	1.9	12,668

Installation length (L _E) at design pressure										
	up to 10 bar L _E = 300 mm					up to 10 bar L _E = 350 mm				
	higher pressures on request									
NB	Movement				A	Movement				A
	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²
200	53	10	37	17.2	707	69	14	49	23.3	897
250	53	10	36	13.9	968	69	14	48	19	1,188
300	53	10	36	11.7	1,263	69	14	48	16	1,514
350	53	10	35	10	1,534	69	14	47	13.8	1,810
400	53	10	35	8.8	1,979	69	14	46	12.1	2,290
450	53	10	34	7.8	2,384	69	14	46	10.8	2,725
500	53	10	34	7.1	2,846	69	14	45	9.8	3,217
600	53	10	33	5.9	3,837	69	14	45	8.2	4,266
700	53	10	33	5.1	5,064	69	14	44	7	5,555
800	53	10	33	4.4	6,404	69	14	43	6.1	6,955
900	50	10	30	5	6,706	69	14	43	5.5	8,462
1000	50	10	30	5	8,231	69	14	43	4.9	10,171
1100	53	10	32	3.2	11,310	69	14	42	4.5	12,037
1200	53	10	31	3	13,273	69	14	42	4.1	14,061

Standard sizes
Non-standard sizes

In the event of axial extension and simultaneous lateral displacement the above movements are reduced (► page 22).
For larger movements see type D121A or D124A.

Individual fabrication possible



Installation length (L _E) at design pressure															
	up to 10 bar L _E = 130 mm					up to 10 bar L _E = 150 mm					up to 10 bar L _E = 175 mm				
	higher pressures on request														
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²
20															
25															
32															
40															
50															
65															
80															
100															
125															
150															
200											20	2	17	4	401
250											20	2	16	3.2	603
300											20	2	16	2.7	840
350											20	2	16	2.3	1,064
400											20	2	16	2	1,439
450											20	2	16	1.8	1,787
500											20	2	15	1.6	2,190
600											20	2	15	1.3	3,068
700											20	2	15	1.1	4,174
800											20	2	15	1	5,398
900											20	2	15	0.9	6,735
1000											20	2	15	0.8	8,268
1100											20	2	14	0.7	9,958
1200											20	2	14	0.7	11,805

Installation length (L _E) at design pressure															
	up to 10 bar L _E = 200 mm					up to 10 bar L _E = 250 mm					up to 10 bar L _E = 275 mm				
	higher pressures on request														
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²
200	26	6	25	10.2	515	29	6	28	10.2	531	29	6	28	10.2	531
250	26	6	25	8.2	740	29	6	27	8.2	760	29	6	27	8.2	760
300	26	6	24	6.8	1,001	29	6	27	6.8	1,024	29	6	27	6.8	1,024
350	26	6	24	5.9	1,244	29	6	26	5.9	1,269	29	6	26	5.9	1,269
400	26	6	24	5.1	1,647	29	6	26	5.1	1,676	29	6	26	5.1	1,676
450	26	6	23	4.6	2,019	29	6	26	4.6	2,051	29	6	26	4.6	2,051
500	26	6	23	4.1	2,445	29	6	25	4.1	2,481	29	6	25	4.1	2,481
600	26	6	23	3.4	3,370	29	6	25	3.4	3,411	29	6	25	3.4	3,411
700	26	6	23	2.9	4,525	29	6	25	2.9	4,572	29	6	25	2.9	4,572
800	26	6	22	2.6	5,795	29	6	24	2.6	5,849	29	6	24	2.6	5,849
900	26	6	22	2.3	7,178	29	6	24	2.3	7,238	29	6	24	2.3	7,238
1000	26	6	22	2.1	8,758	29	6	24	2.1	8,825	29	6	24	2.1	8,825
1100	26	6	22	1.9	10,496	29	6	24	1.9	10,568	29	6	24	1.9	10,568
1200	26	6	21	1.7	12,390	29	6	23	1.7	12,469	29	6	23	1.7	12,469

Installation length (L _E) at design pressure										
	up to 10 bar L _E = 300 mm					up to 10 bar L _E = 350 mm				
	higher pressures on request									
NB	Movement				A cm ²	Movement				A cm ²
										
	mm	mm	±mm	±°		mm	mm	±mm	±°	
200	35	9	36	16.2	661	46	13	48	21.3	804
250	35	9	35	13.1	913	46	13	47	17.3	1,081
300	35	9	35	10.9	1,201	46	13	46	14.6	1,392
350	35	9	34	9.4	1,466	46	13	45	12.6	1,676
400	35	9	34	8.3	1,901	46	13	45	11	2,140
450	35	9	33	7.3	2,299	46	13	44	9.8	2,561
500	35	9	33	6.6	2,753	46	13	44	8.9	3,039
600	35	9	33	5.5	3,728	46	13	43	7.4	4,060
700	35	9	32	4.7	4,939	46	13	43	6.4	5,320
800	35	9	32	4.1	6,263	46	13	42	5.6	6,691
900	35	9	31	3.7	7,698	46	13	42	5	8,171
1000	35	9	31	3.3	9,331	46	13	41	4.5	9,852
1100	35	9	31	3	11,122	46	13	41	4.1	11,690
1200	35	9	31	2.8	13,070	46	13	41	3.7	13,685

Standard sizes
Non-standard sizes

In the event of axial extension and simultaneous lateral displacement the above movements are reduced (► page 22).
For larger movements see type D122A or D125A.

Individual fabrication possible

D120A

NB 200 – NB 1200



- **Type D120A**
without vacuum support rings
- **Type D121A**
with internal vacuum support rings
- **Type D122A**
with embedded vacuum support rings
- **Type D123A**
without vacuum support rings, with
pressure support ring in the arch trough
- **Type D124A**
with internal vacuum support rings,
with pressure support ring in the arch
trough
- **Type D125A**
with embedded vacuum support rings,
with external pressure support ring in the
arch trough

Type key ► page 20
D1 2 3 A
└─ Tie rod variant
└─ Support ring variant
└─ Number of arches
└─ Type

Universal expansion joint with two arches

- Design:** Highly elastic, hydrodynamic, double-arch rubber bellows with self-sealing rubber bulges and swivel backing flanges with support collar
Optionally with vacuum support rings and/or external pressure support ring in the arch trough
- Nominal diameters:** NB 200 to NB 1200, intermediate sizes possible
- Installation length:** Standard $L_E = 350$ to 600 mm (► page 115–117)
Other installation lengths on request
- Pressure:** Depending on the nominal diameter up to 10 bar
Vacuum not allowed without vacuum support rings, with vacuum support rings up to 0.05 bar absolute
Design in accordance with Pressure Equipment Directive PED 2014/68/EU
- Movement:** For large axial, lateral and angular movements (► page 115–117)

Application:
Cooling water systems,
desalination plants,
drinking water supply,
plant construction, e. g.
in pipelines, on pumps,
as dismantling joints, on
condensers and vessels



Assembly instruction download
www.ditec-adam.de/en/downloads.html

Rubber bellows

Rubber	Fabric	Marking	Max.	Application
EPDM	Nylon		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDM	Kevlar		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMht	Kevlar		120 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMtw	Nylon		100 °C	Drinking water
EPDMtw	Kevlar		100 °C	Drinking water
EPDMaf	Nylon		100 °C	Abrasive materials, water-sand extraction
EPDMaf	Kevlar		100 °C	Abrasive materials, water-sand extraction
EPDMbeige	Nylon		100 °C	Foodstuffs
EPDMbeige	Kevlar		100 °C	Foodstuffs
IIR	Nylon		100 °C	Hot water, acids, bases, gases
IIR	Kevlar		100 °C	Hot water, acids, bases, gases
CSM	Nylon		100 °C	Strong acids, bases, chemicals
CSM	Kevlar		100 °C	Strong acids, bases, chemicals
NBR	Nylon		100 °C	Oils, petrol, solvents, compressed air
NBR	Kevlar		100 °C	Oils, petrol, solvents, compressed air
NBRbeige	Nylon		100 °C	Oil, fatty foods
NBRbeige	Kevlar		100 °C	Oil, fatty foods
CR	Nylon		90 °C	Cooling water, slightly oily water, seawater
CR	Kevlar		90 °C	Cooling water, slightly oily water, seawater
FPM	Kevlar		180 °C	Corrosive chemicals, petroleum distillates
FPMbeige	Kevlar		180 °C	Oil, fatty foods
NR	Nylon		70 °C	Abrasive materials
Silicon	Kevlar or glass		200 °C	Air, saltwater atmosphere, foodstuffs, medical technology

Flanges

- Design:

Single-part, swivel, round backing flanges with support collar, clearance holes and groove to accommodate the rubber bulges
- Flange norms:

DIN, EN, ANSI, AWWA, BS, JIS, special measurements (▶ page 256)
- Materials:

Carbon steel:

1.0038 (S235JRG2)
1.0570 (S355J2G3)

Stainless steel:

1.4301 (X5CrNi18-10)
1.4571 (X6CrNiMoTi17-12-2)

Aluminium:

AlMg3

Other materials on request
- Coating:

Primed, hot-dip galvanised, special paint

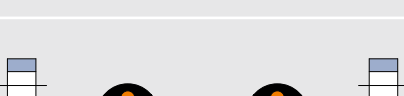
Optional accessories

- Protective hood:

UV protection cover
Ground protective cover
Fire protection cover
Splash protective Cover (▶ page 44)
- Flow liners:

Cylindrical flow liner
Conical flow liner
Telescoping flow liner (▶ page 43)

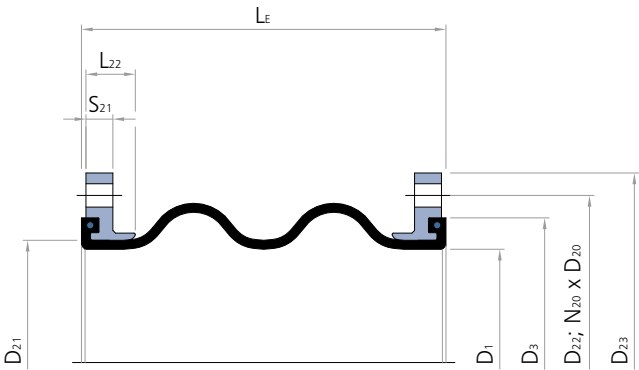
Support rings

TYPE		Vacuum support ring	Pressure support ring	Pressure	Movement
D120A		Without	Without	Slight pressure, vacuum stability on request	► page 115
D121A		Medium contact, inside the arch apex	Without	Slight pressure, for vacuum up to 0.05 bar absolute	► page 116
D122A		No medium contact, embedded into the arch apex of the rubber bellows	Without	Slight pressure, for vacuum up to 0.05 bar absolute	► page 117
D123A		Without	External in the arch trough	Depending on the nominal diameter up to 10 bar, slight vacuum	► page 115
D124A		Medium contact, inside the arch apex	External in the arch trough	Depending on the nominal diameter up to 10 bar, for vacuum up to 0.05 bar absolute	► page 116
D125A		No medium contact, embedded into the arch apex of the rubber bellows	External in the arch trough	Depending on the nominal diameter up to 10 bar, for vacuum up to 0.05 bar absolute	► page 117

Materials

Stainless steel:	1.4301 (X5CrNi18-10) 1.4539 (X1NiCrMoCu25-20-5) 1.4571 (X6CrNiMoTi17-12-2)	Other materials on request
Carbon steel:	1.0570 (S355J2G3) rubber coated 1.0570 (S355J2G3) galvanised	

Planning help D120A



D120A

► without vacuum support rings



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D123A

► without vacuum support rings, with pressure support ring in the arch trough



Installation length (L _E) at design pressure															
	up to 10 bar L _E = 350 mm					up to 10 bar L _E = 400 mm					up to 10 bar L _E = 450 mm				
	higher pressures on request														
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²
200	62	20	36	11.3	445	80	40	53	21.8	564	88	41	57	22.3	573
250	62	20	35	9.1	656	80	40	52	17.7	799	88	41	56	18.2	809
300	62	20	35	7.6	903	80	40	51	14.9	1,069	88	41	55	15.3	1,081
350	62	20	34	6.5	1,134	80	40	50	12.9	1,320	88	41	54	13.2	1,333
400	62	20	34	5.7	1,521	80	40	50	11.3	1,735	88	41	54	11.6	1,750
450	62	20	33	5.1	1,878	80	40	49	10.1	2,116	88	41	53	10.3	2,132
500	62	20	33	4.6	2,290	80	40	49	9.1	2,552	88	41	52	9.3	2,570
600	62	20	33	3.8	3,187	80	40	48	7.6	3,494	88	41	52	7.8	3,515
700	62	20	32	3.3	4,312	80	40	47	6.5	4,669	88	41	51	6.7	4,693
800	62	20	32	2.9	5,555	80	40	47	5.7	5,958	88	41	50	5.9	5,986
900	62	20	31	2.5	6,910	80	40	46	5.1	7,359	88	41	50	5.2	7,390
1000	62	20	31	2.3	8,462	80	40	46	4.6	8,958	88	41	49	4.7	8,992
1100	62	20	31	2.1	10,171	80	40	45	4.2	10,715	88	41	49	4.3	10,751
1200	62	20	31	1.9	12,037	80	40	45	3.8	12,628	88	41	48	3.9	12,668

UNIVERSAL
swivel flange

Installation length (L _E) at design pressure															
	up to 10 bar L _E = 500 mm					up to 10 bar L _E = 550 mm					up to 10 bar L _E = 600 mm				
	higher pressures on request														
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²
200	106	61	74	31.4	707	124	82	91	39.4	855	138	85	99	40.4	897
250	106	61	72	26.0	968	124	82	89	33.3	1,140	138	85	97	34.2	1,188
300	106	61	71	22.1	1,263	124	82	88	28.7	1,459	138	85	95	29.5	1,514
350	106	61	70	19.2	1,534	124	82	86	25.1	1,750	138	85	94	25.9	1,810
400	106	61	69	17.0	1,979	124	82	85	22.3	2,223	138	85	93	23.0	2,290
450	106	61	69	15.2	2,384	124	82	84	20.0	2,651	138	85	92	20.7	2,725
500	106	61	68	13.7	2,846	124	82	84	18.2	3,137	138	85	91	18.8	3,217
600	106	61	67	11.5	3,837	124	82	82	15.3	4,174	138	85	89	15.8	4,266
700	106	61	66	9.9	5,064	124	82	81	13.2	5,450	138	85	88	13.7	5,555
800	106	61	65	8.7	6,404	124	82	80	11.6	6,837	138	85	87	12.0	6,955
900	106	61	64	7.7	7,854	124	82	79	10.3	8,332	138	85	86	10.7	8,462
1000	106	61	64	7.0	9,503	124	82	79	9.3	10,029	138	85	85	9.6	10,171
1100	106	61	63	6.3	11,310	124	82	78	8.5	11,882	138	85	84	8.8	12,037
1200	106	61	63	5.8	13,273	124	82	77	7.8	13,893	138	85	84	8.1	14,061

D120A

Recommended sizes

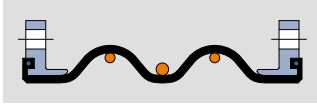
Additional possible sizes

Angular movement only possible with guided pressure support ring.
In the event of axial extension and simultaneous lateral displacement the above movements are reduced (► page 22).
Larger movements on request.

Individual fabrication possible



D121A
▶ with internal vacuum support rings



D124A
▶ with internal vacuum support rings, with pressure support ring in the arch trough

Installation length (L _E) at design pressure															
	up to 10 bar L _E = 350 mm					up to 10 bar L _E = 400 mm					up to 10 bar L _E = 450 mm				
	higher pressures on request														
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²
200	62	7	36	11.3	445	80	13	53	21.8	564	88	13	57	22.3	573
250	62	7	35	9.1	656	80	13	52	17.7	799	88	13	56	18.2	809
300	62	7	35	7.6	903	80	13	51	14.9	1,069	88	13	55	15.3	1,081
350	62	7	34	6.5	1,134	80	13	50	12.9	1,320	88	13	54	13.2	1,333
400	62	7	34	5.7	1,521	80	13	50	11.3	1,735	88	13	54	11.6	1,750
450	62	7	33	5.1	1,878	80	13	49	10.1	2,116	88	13	53	10.3	2,132
500	62	7	33	4.6	2,290	80	13	49	9.1	2,552	88	13	52	9.3	2,570
600	62	7	33	3.8	3,187	80	13	48	7.6	3,494	88	13	52	7.8	3,515
700	62	7	32	3.3	4,312	80	13	47	6.5	4,669	88	13	51	6.7	4,693
800	62	7	32	2.9	5,555	80	13	47	5.7	5,958	88	13	50	5.9	5,986
900	62	7	31	2.5	6,910	80	13	46	5.1	7,359	88	13	50	5.2	7,390
1000	62	7	31	2.3	8,462	80	13	46	4.6	8,958	88	13	49	4.7	8,992
1100	62	7	31	2.1	10,171	80	13	45	4.2	10,715	88	13	49	4.3	10,751
1200	62	7	31	1.9	12,037	80	13	45	3.8	12,628	88	13	48	3.9	12,668

Installation length (L _E) at design pressure															
	up to 10 bar L _E = 500 mm					up to 10 bar L _E = 550 mm					up to 10 bar L _E = 600 mm				
	higher pressures on request														
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²
200	106	20	74	31.4	707	124	27	91	39.4	855	138	28	99	40.4	897
250	106	20	72	26.0	968	124	27	89	33.3	1,140	138	28	97	34.2	1,188
300	106	20	71	22.1	1,263	124	27	88	28.7	1,459	138	28	95	29.5	1,514
350	106	20	70	19.2	1,534	124	27	86	25.1	1,750	138	28	94	25.9	1,810
400	106	20	69	17.0	1,979	124	27	85	22.3	2,223	138	28	93	23.0	2,290
450	106	20	69	15.2	2,384	124	27	84	20.0	2,651	138	28	92	20.7	2,725
500	106	20	68	13.7	2,846	124	27	84	18.2	3,137	138	28	91	18.8	3,217
600	106	20	67	11.5	3,837	124	27	82	15.3	4,174	138	28	89	15.8	4,266
700	106	20	66	9.9	5,064	124	27	81	13.2	5,450	138	28	88	13.7	5,555
800	106	20	65	8.7	6,404	124	27	80	11.6	6,837	138	28	87	12.0	6,955
900	106	20	64	7.7	7,854	124	27	79	10.3	8,332	138	28	86	10.7	8,462
1000	106	20	64	7.0	9,503	124	27	79	9.3	10,029	138	28	85	9.6	10,171
1100	106	20	63	6.3	11,310	124	27	78	8.5	11,882	138	28	84	8.8	12,037
1200	106	20	63	5.8	13,273	124	27	77	7.8	13,893	138	28	84	8.1	14,061

Recommended sizes
Additional possible sizes

Angular movement only possible with guided pressure support ring.
In the event of axial extension and simultaneous lateral displacement the above movements are reduced (▶ page 22).
Larger movements on request.

Individual fabrication possible

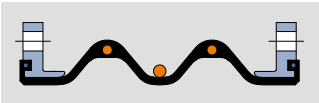
D122A

► with embedded vacuum support rings



D125A

► with embedded vacuum support rings, with pressure support ring in the arch trough



Installation length (L _E) at design pressure															
	up to 10 bar L _E = 350 mm					up to 10 bar L _E = 400 mm					up to 10 bar L _E = 450 mm				
	higher pressures on request														
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²
200	41	5	34	8.0	401	52	12	51	19.3	515	58	12	55	20.3	531
250	41	5	33	6.4	603	52	12	50	15.6	740	58	12	54	16.5	760
300	41	5	32	5.3	840	52	12	49	13.1	1,001	58	12	53	13.9	1,024
350	41	5	32	4.6	1,064	52	12	48	11.3	1,244	58	12	52	11.9	1,269
400	41	5	32	4.0	1,439	52	12	48	9.9	1,647	58	12	52	10.5	1,676
450	41	5	31	3.6	1,787	52	12	47	8.8	2,019	58	12	51	9.3	2,051
500	41	5	31	3.2	2,190	52	12	47	8.0	2,445	58	12	51	8.4	2,481
600	41	5	30	2.7	3,068	52	12	46	6.7	3,370	58	12	50	7.0	3,411
700	41	5	30	2.3	4,174	52	12	45	5.7	4,525	58	12	49	6.0	4,572
800	41	5	30	2.0	5,398	52	12	45	5.0	5,795	58	12	49	5.3	5,849
900	41	5	29	1.8	6,735	52	12	44	4.4	7,178	58	12	48	4.7	7,238
1000	41	5	29	1.6	8,268	52	12	44	4.0	8,758	58	12	48	4.2	8,825
1100	41	5	29	1.5	9,958	52	12	43	3.6	10,496	58	12	47	3.8	10,568
1200	41	5	29	1.3	11,805	52	12	43	3.3	12,390	58	12	47	3.5	12,469

Installation length (L _E) at design pressure															
	up to 10 bar L _E = 500 mm					up to 10 bar L _E = 550 mm					up to 10 bar L _E = 600 mm				
	higher pressures on request														
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²
200	70	19	72	29.7	661	82	26	89	38.0	804	91	26	95	38.0	804
250	70	19	71	24.5	913	82	26	87	32.0	1,081	91	26	94	32.0	1,081
300	70	19	69	20.8	1,201	82	26	86	27.5	1,392	91	26	92	27.5	1,392
350	70	19	69	18.0	1,466	82	26	85	24.0	1,676	91	26	91	24.0	1,676
400	70	19	68	15.9	1,901	82	26	84	21.3	2,140	91	26	90	21.3	2,140
450	70	19	67	14.2	2,299	82	26	83	19.1	2,561	91	26	89	19.1	2,561
500	70	19	66	12.8	2,753	82	26	82	17.3	3,039	91	26	88	17.3	3,039
600	70	19	65	10.8	3,728	82	26	81	14.6	4,060	91	26	86	14.6	4,060
700	70	19	64	9.2	4,939	82	26	79	12.6	5,320	91	26	85	12.6	5,320
800	70	19	64	8.1	6,263	82	26	78	11.0	6,691	91	26	84	11.0	6,691
900	70	19	63	7.2	7,698	82	26	78	9.8	8,171	91	26	83	9.8	8,171
1000	70	19	62	6.5	9,331	82	26	77	8.9	9,852	91	26	82	8.9	9,852
1100	70	19	62	5.9	11,122	82	26	76	8.1	11,690	91	26	82	8.1	11,690
1200	70	19	61	5.4	13,070	82	26	76	7.4	13,685	91	26	81	7.4	13,685

Recommended sizes

Additional possible sizes

Angular movement only possible with guided pressure support ring.

In the event of axial extension and simultaneous lateral displacement the above movements are reduced (► page 22).

Larger movements on request.

Individual fabrication possible

D120A

UNIVERSAL
swivel flange

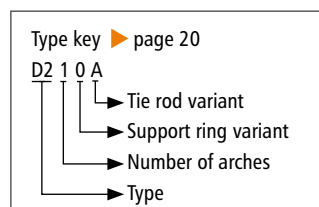
D210A

NB 32 – NB 500

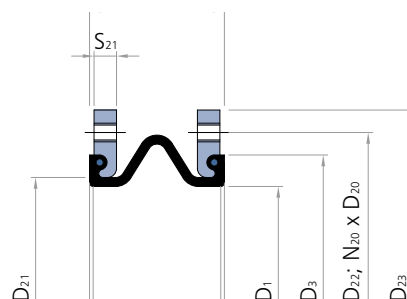


► **Type D210A**
without vacuum support ring

► **Type D211A**
with internal vacuum support ring



Planning help D210A

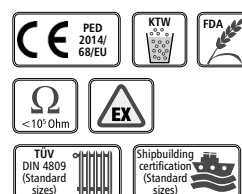


Universal expansion joint with one arch

- Design:** Single-arch rubber bellows with self-sealing rubber bulges and swivel backing flanges with threaded holes
Optionally with vacuum support ring
- Nominal diameters:** NB 32 to NB 500
- Installation length:** $L_E = 100$ or 110 mm (► page 120–121)
- Pressure:** Depending on the nominal diameter up to 25 bar
Vacuum-stability on request, with vacuum support ring up to 0.05 bar absolute
Design in accordance with Pressure Equipment Directive PED 2014/68/EU
- Movement:** For large axial, lateral and angular movements (► page 120–121)

Application:

Cooling water systems,
desalination plants,
drinking water supply,
plant construction, e. g.
in pipelines, on pumps,
as dismantling joints, on
condensers and vessels



Assembly instruction download
www.ditec-adam.de/en/downloads.html

Rubber bellows

Rubber	Fabric	Marking	Max.	Application
EPDM / EPDM	PEEK		120 °C	heating systems, cooling water, hot air
IIR / EPDM	Nylon		100 °C	Drinking water, seawater, acids, dilute chlorine compounds
NBR / CR	Nylon		90 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
NBRweiß / CR	Nylon		90 °C	Drinking water
CSM / CSM	Nylon		100 °C	Drinking water
IIR-D / EPDM	Nylon		100 °C	Abrasive materials, water-sand extraction

Flanges

- Design:

Single-part, swivel, round backing flanges with threaded holes and groove to accommodate the rubber bulges
- Flange norms:

DIN, EN, ANSI, AWWA, BS, JIS, special measurements (▶ page 256)
- Materials:

Carbon steel: 1.0038 (S235JRG2)
Other materials on request
- Coating:

Galvanised, yellow neutralised

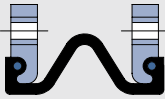
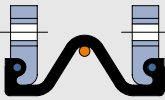
Optional accessories

- Protective hood:

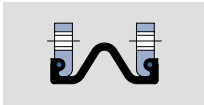
UV protection cover
Ground protective cover
Fire protection cover
Splash protective cover (▶ page 44)
- Flow liners:

Cylindrical flow liner
Conical flow liner
Telescoping flow liner (▶ page 43)

Support rings

TYPE		Vacuum support ring	Pressure	Movement
D210A		Without	Depending on the nominal diameter up to 25 bar, vacuum stability on request	▶ page 120
D211A		Vacuum support ring spiral, medium contact, inside the arch apex	Depending on the nominal diameter up to 25 bar, for vacuum up to 0.05 bar absolute	▶ page 121

Materials		
Stainless steel:	1.4310 (X12CrNi17-7)	Other materials on request



D210A

► without vacuum support ring

Installation length (L _E) at design pressure										
	up to 10 bar L _E = 100 mm					up to 10 bar L _E = 110 mm				
	higher pressures on request									
NB	Movement				A cm ²	Movement				A cm ²
	 mm	 mm	 ± mm	 ± °		 mm	 mm	 ± mm	 ± °	
32	30	20	30	7.0	18					
40	30	20	30	7.0	18					
50	30	20	30	7.0	35					
65	30	20	30	7.0	56					
80	30	20	30	7.0	87					
100	30	20	30	7.0	130					
125	30	20	30	7.0	190					
150	30	20	30	7.0	263					
175	30	20	30	7.0	334					
200	30	20	30	7.0	416					
250	30	20	30	7.0	607					
300	30	20	30	7.0	830					
350	30	20	30	7.0	1,100					
400						30	20	30	7.0	1,385
500						30	20	30	7.0	2,091

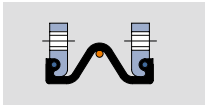
Standard sizes

In the event of axial extension and simultaneous lateral displacement (due to installation gap tolerance) the above movements are reduced (► page 22).

Angular movement only possible for 10 mm reduced installation length (90 / 100).



Universal expansion joint, type D110A
in a plastic pipe of a paper plant
NB 150, design pressure 6 bar



Installation length (L _E) at design pressure										
NB	up to 10 bar L _E = 100 mm					up to 10 bar L _E = 110 mm				
	Movement					Movement				
	mm	mm	± mm	± °	A cm ²	mm	mm	± mm	± °	A cm ²
32	30	5	20	4.0	18					
40	30	5	20	4.0	18					
50	30	5	20	4.0	35					
65	30	5	20	4.0	56					
80	30	5	20	4.0	87					
100	30	5	20	4.0	130					
125	30	5	20	4.0	190					
150	30	5	20	4.0	263					
175	30	5	20	4.0	334					
200	30	5	20	4.0	416					
250	30	5	20	4.0	607					
300	30	5	20	4.0	830					
350	30	5	20	4.0	1,100					
400						30	5	20	4.0	1,385
500						30	5	20	4.0	2,091

Standard sizes

In the event of axial extension and simultaneous lateral displacement (due to installation gap tolerance) the above movements are reduced (► page 22).

Angular movement only possible for 10 mm reduced installation length (90 / 100).



Expansion joints with swivel flanges, type D110A
pumping header installation
NB 300, operating pressure 10 bar

UNIVERSAL
swivel flange

D210A



Universal expansion joints for clamped fixing

B100	without arch	▶ 124
B110	with one arch	▶ 128
B120	with two arches	▶ 134
B130	with three or more arches	▶ 140
B300	in a conical-concentric design	▶ 146

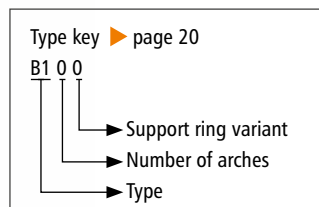


B100

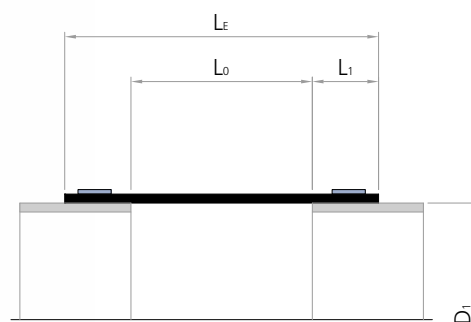
NB 50 – NB 4000



► Type B100



Planning help B100



Universal expansion joint without arch

- Design:** Cylindrical rubber bellows with a sleeve for clamped fixing
- Nominal diameters:** Standard NB 50 to NB 4000, intermediate sizes possible
- Installation length:** = Installation gap + 2 x fixing width
Standard installation gaps L_0 = 125 to 250 mm (► page 126)
Other installation gaps on request
- Fixing width:** Depends on pressure, nominal diameter and clamp design, at least 40 mm
- Pressure:** Depending on the nominal diameter and installation length up to 6 bar
Vacuum stability on request. Design in accordance with Pressure Equipment Directive PED 2014/68/EU
- Movement:** For slight axial compression and lateral movements (► page 126)
For axial extension or vacuums, the expansion joint can be drawn from the pipeline (groove as needed at the pipeline end)

Application:

Power plants, plant construction, food processing, wastewater treatment plants, industrial facilities, e.g. to disconnect pipelines, on oscillating conveyor systems, on sieving machines



Assembly instruction download
www.ditec-adam.de/en/downloads.html

Rubber bellows

Rubber	Fabric	Marking	Max.	Application
EPDM	Nylon		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDM	Kevlar		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMht	Kevlar		120 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMtw	Nylon		100 °C	Drinking water
EPDMtw	Kevlar		100 °C	Drinking water
EPDMaf	Nylon		100 °C	Abrasive materials, water-sand extraction
EPDMaf	Kevlar		100 °C	Abrasive materials, water-sand extraction
EPDMbeige	Nylon		100 °C	Foodstuffs
EPDMbeige	Kevlar		100 °C	Foodstuffs
IIR	Nylon		100 °C	Hot water, acids, bases, gases
IIR	Kevlar		100 °C	Hot water, acids, bases, gases
CSM	Nylon		100 °C	Strong acids, bases, chemicals
CSM	Kevlar		100 °C	Strong acids, bases, chemicals
NBR	Nylon		100 °C	Oils, petrol, solvents, compressed air
NBR	Kevlar		100 °C	Oils, petrol, solvents, compressed air
NBRbeige	Nylon		100 °C	Oil, fatty foods
NBRbeige	Kevlar		100 °C	Oil, fatty foods
CR	Nylon		90 °C	Cooling water, slightly oily water, seawater
CR	Kevlar		90 °C	Cooling water, slightly oily water, seawater
FPM	Kevlar		180 °C	Corrosive chemicals, petroleum distillates
FPMbeige	Kevlar		180 °C	Oil, fatty foods
NR	Nylon		70 °C	Abrasive materials
Silicon	Kevlar or glass		200 °C	Air, saltwater atmosphere, foodstuffs, medical technology

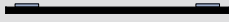
PTFE-lining: Permanently embedded against chemical attacks on the interior at the rubber bellows, available starting at NB 300. Take the restriction of the listed movement into account (► page 126)

UNIVERSAL
clamped fixing

B100

Fastening clamps

Design:	Depending on pressure and the nominal diameter, endless clamp belt, screw thread belt, small clamps or hinge bolt clamps. At higher pressures, 2 adjacent clamps per fastening side	
Width:	Endless clamp belt:	¾"
	Screw thread belt:	½"
	Small clamp:	depending on Ø: 9–12 mm
	Hinge bolt clamp:	depending on Ø: 18–30 mm
Materials:	Endless clamp belt with screw lugs (tongs):	1.7300
	Screw thread belt with threaded screw lugs:	1.4310
	Small clamp, belt and housing:	1.4016 (Screw steel galvanised)
	Hinge bolt clamp, belt and housing:	1.4016 (Screw steel galvanised)



B100

► without arch

Installation gap															
NB	L ₀ = 125 mm					L ₀ = 150 mm					L ₀ = 175 mm				
	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
	mm	mm	± mm	± °		mm	mm	± mm	± °		mm	mm	± mm	± °	
50	6	0	10	0	29	8	0	11	0	29	9	0	13	0	29
65	6	0	9	0	45	8	0	11	0	45	9	0	13	0	45
80	6	0	9	0	62	8	0	10	0	62	9	0	12	0	62
100	6	0	8	0	103	8	0	10	0	103	9	0	12	0	103
125	6	0	8	0	153	8	0	10	0	153	9	0	11	0	153
150	6	0	8	0	222	8	0	9	0	222	9	0	11	0	222
175	6	0	7	0	295	8	0	9	0	295	9	0	10	0	295
200	6	0	7	0	377	8	0	9	0	377	9	0	10	0	377
250	6	0	7	0	585	8	0	8	0	585	9	0	10	0	585
300	6	0	7	0	824	8	0	8	0	824	9	0	9	0	824
350	6	0	6	0	993	8	0	8	0	993	9	0	9	0	993
400	6	0	6	0	1,297	8	0	8	0	1,297	9	0	9	0	1,297
450	6	0	6	0	1,642	8	0	7	0	1,642	9	0	9	0	1,642
500	6	0	6	0	2,027	8	0	7	0	2,027	9	0	8	0	2,027
550	6	0	6	0	2,452	8	0	7	0	2,452	9	0	8	0	2,452
600	6	0	6	0	2,919	8	0	7	0	2,919	9	0	8	0	2,919
650	6	0	6	0	3,425	8	0	7	0	3,425	9	0	8	0	3,425
700	6	0	6	0	3,973	8	0	7	0	3,973	9	0	8	0	3,973
750	6	0	6	0	4,560	8	0	7	0	4,560	9	0	8	0	4,560
800	6	0	5	0	5,189	8	0	7	0	5,189	9	0	8	0	5,189
850	6	0	5	0	5,858	8	0	6	0	5,858	9	0	8	0	5,858
900	6	0	5	0	6,567	8	0	6	0	6,567	9	0	7	0	6,567
1000	6	0	5	0	8,107	8	0	6	0	8,107	9	0	7	0	8,107
1100	6	0	5	0	9,607	8	0	6	0	9,607	9	0	7	0	9,607
1200	6	0	5	0	11,404	8	0	6	0	11,404	9	0	7	0	11,404
1300	6	0	5	0	13,376	8	0	6	0	13,376	9	0	7	0	13,376
1400	6	0	5	0	15,504	8	0	6	0	15,504	9	0	7	0	15,504
1500	6	0	5	0	17,789	8	0	6	0	17,789	9	0	7	0	17,789

Installation gap															
L ₀ = 200 mm					L ₀ = 225 mm					L ₀ = 250 mm					
Movement				A	Movement				A	Movement				A	NB
															
mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	
10	0	15	0	29	11	0	17	0	29	13	0	19	0	29	50
10	0	14	0	45	11	0	16	0	45	13	0	18	0	45	65
10	0	14	0	62	11	0	16	0	62	13	0	17	0	62	80
10	0	13	0	103	11	0	15	0	103	13	0	17	0	103	100
10	0	13	0	153	11	0	14	0	153	13	0	16	0	153	125
10	0	12	0	222	11	0	14	0	222	13	0	15	0	222	150
10	0	12	0	295	11	0	13	0	295	13	0	15	0	295	175
10	0	12	0	377	11	0	13	0	377	13	0	14	0	377	200
10	0	11	0	585	11	0	12	0	585	13	0	14	0	585	250
10	0	11	0	824	11	0	12	0	824	13	0	13	0	824	300
10	0	10	0	993	11	0	12	0	993	13	0	13	0	993	350
10	0	10	0	1,297	11	0	11	0	1,297	13	0	13	0	1,297	400
10	0	10	0	1,642	11	0	11	0	1,642	13	0	12	0	1,642	450
10	0	10	0	2,027	11	0	11	0	2,027	13	0	12	0	2,027	500
10	0	9	0	2,452	11	0	11	0	2,452	13	0	12	0	2,452	550
10	0	9	0	2,919	11	0	10	0	2,919	13	0	12	0	2,919	600
10	0	9	0	3,425	11	0	10	0	3,425	13	0	11	0	3,425	650
10	0	9	0	3,973	11	0	10	0	3,973	13	0	11	0	3,973	700
10	0	9	0	4,560	11	0	10	0	4,560	13	0	11	0	4,560	750
10	0	9	0	5,189	11	0	10	0	5,189	13	0	11	0	5,189	800
10	0	9	0	5,858	11	0	10	0	5,858	13	0	11	0	5,858	850
10	0	9	0	6,567	11	0	10	0	6,567	13	0	11	0	6,567	900
10	0	8	0	8,107	11	0	9	0	8,107	13	0	10	0	8,107	1000
10	0	8	0	9,607	11	0	9	0	9,607	13	0	10	0	9,607	1100
10	0	8	0	11,404	11	0	9	0	11,404	13	0	10	0	11,404	1200
10	0	8	0	13,376	11	0	9	0	13,376	13	0	10	0	13,376	1300
10	0	8	0	15,504	11	0	9	0	15,504	13	0	10	0	15,504	1400
10	0	8	0	17,789	11	0	9	0	17,789	13	0	10	0	17,789	1500

Recommended sizes
Additional possible sizes

Reduction of movement for expansion joints with PTFE lining:
axial compression: -33 %; lateral displacement: -50 %.
Larger movements see type B110.

Individual fabrication possible



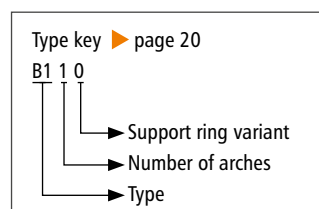
Pipe penetration seal and clamped EPDM rubber expansion joint
penetration seal made from silicone rubber with open seam
for afterwards closing on site

B110

NB 50 – NB 4000



- ▶ **Type B110**
without vacuum support ring
- ▶ **Type B111**
with internal vacuum support ring
- ▶ **Type B112**
with embedded vacuum support ring



Universal expansion joint with one arch

- Design:** Hydrodynamic, single-arch rubber bellows with sleeves for clamped fixing
Optionally with vacuum support ring
- Nominal diameters:** NB 50 to NB 4000, intermediate sizes possible
- Installation length:** = Installation gap + 2 x fixing width
Standard installation gaps L_0 = 125 to 250 mm
(▶ page 131–133)
Other installation gaps on request
- Fixing width:** Depends on pressure, nominal diameter and clamp design, at least 40 mm
- Pressure:** Depending on the nominal diameter and installation length up to 6 bar
Vacuum stability on request, with vacuum support ring up to 0.05 bar absolute
Design in accordance with Pressure Equipment Directive PED 2014/68/EU
- Movement:** For axial, lateral and angular movements
(▶ page 131–133)
For axial extension or vacuums, the expansion joint can be drawn from the pipeline (groove as needed at the pipeline end)

Application:
Power plants, plant construction, food processing, wastewater treatment plants, industrial facilities, e.g.
to disconnect pipelines, on oscillating conveyor systems, on sieving machines



Assembly instruction download
www.ditec-adam.de/en/downloads.html

Rubber bellows

Rubber	Fabric	Marking	Max.	Application
EPDM	Nylon		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDM	Kevlar		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMht	Kevlar		120 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMtw	Nylon		100 °C	Drinking water
EPDMtw	Kevlar		100 °C	Drinking water
EPDMaf	Nylon		100 °C	Abrasive materials, water-sand extraction
EPDMaf	Kevlar		100 °C	Abrasive materials, water-sand extraction
EPDMbeige	Nylon		100 °C	Foodstuffs
EPDMbeige	Kevlar		100 °C	Foodstuffs
IIR	Nylon		100 °C	Hot water, acids, bases, gases
IIR	Kevlar		100 °C	Hot water, acids, bases, gases
CSM	Nylon		100 °C	Strong acids, bases, chemicals
CSM	Kevlar		100 °C	Strong acids, bases, chemicals
NBR	Nylon		100 °C	Oils, petrol, solvents, compressed air
NBR	Kevlar		100 °C	Oils, petrol, solvents, compressed air
NBRbeige	Nylon		100 °C	Oil, fatty foods
NBRbeige	Kevlar		100 °C	Oil, fatty foods
CR	Nylon		90 °C	Cooling water, slightly oily water, seawater
CR	Kevlar		90 °C	Cooling water, slightly oily water, seawater
FPM	Kevlar		180 °C	Corrosive chemicals, petroleum distillates
FPMbeige	Kevlar		180 °C	Oil, fatty foods
NR	Nylon		70 °C	Abrasive materials
Silicon	Kevlar or glass		200 °C	Air, saltwater atmosphere, foodstuffs, medical technology

PTFE-lining: Permanently embedded against chemical attacks on the interior at the rubber bellows, available starting at NB 300. Take the restriction of the listed movement into account (► page 131–133)

Fastening clamps

Design:	Depending on pressure and nominal diameters, endless clamp belt, screw thread belt, small clamps or hinge bolt clamps. At higher pressures, 2 adjacent clamps per fastening side	
Width:	Endless clamp belt:	¾"
	Screw thread belt:	½"
	Small clamp:	depending on Ø: 9–12 mm
	Hinge bolt clamp:	depending on Ø: 18–30 mm
Materials:	Endless clamp belt with screw lugs (tongs):	1.7300
	Screw thread belt with threaded screw lugs:	1.4310
	Small clamp, belt and housing:	1.4016 (Screw steel galvanised)
	Hinge bolt clamp, belt and housing:	1.4016 (Screw steel galvanised)

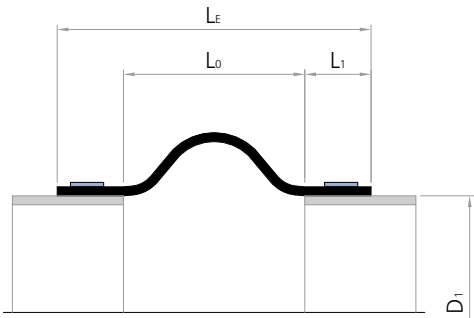
Support rings

TYPE		Vacuum support ring	Pressure	Movement
B110		Without	Depending on the nominal diameter up to 6 bar, vacuum stability on request	► page 131
B111		Medium contact, inside the arch apex	Depending on the nominal diameter up to 6 bar, for vacuum up to 0.05 bar absolute	► page 132
B112		No medium contact, embedded into the arch apex of the rubber bellows	Depending on the nominal diameter up to 6 bar, for vacuum up to 0.05 bar absolute	► page 133

Materials

Stainless steel:	1.4301 (X5CrNi18-10) 1.4539 (X1NiCrMoCu25-20-5) 1.4571 (X6CrNiMoTi17-12-2)	Other materials on request
Carbon steel:	1.0570 (S355J2G3) rubber coated	

Planning help B110



Example: Type B112



Installation gap																
	L ₀ = 125 mm					L ₀ = 150 mm					L ₀ = 175 mm					
NB	Movement				A	Movement				A	Movement				A	
																
	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	
50	31	10	20	21.8	96	40	20	30	38.7	155	44	20	32	38.7	159	
65	31	10	20	17.1	125	40	20	29	31.6	191	44	20	32	31.6	196	
80	31	10	20	14.0	152	40	20	29	26.6	224	44	20	31	26.6	229	
100	31	10	19	11.3	212	40	20	28	21.8	297	44	20	30	21.8	303	
125	31	10	19	9.1	283	40	20	28	17.7	379	44	20	30	17.7	386	
150	31	10	18	7.6	374	40	20	27	14.9	484	44	20	29	14.9	492	
175	31	10	18	6.5	466	40	20	27	12.9	588	44	20	29	12.9	597	
200	31	10	18	5.7	569	40	20	26	11.3	703	44	20	29	11.3	712	
250	31	10	18	4.6	819	40	20	26	9.1	979	44	20	28	9.1	990	
300	31	10	17	3.8	1,098	40	20	26	7.6	1,281	44	20	27	7.6	1,294	
350	31	10	17	3.3	1,292	40	20	25	6.5	1,490	44	20	27	6.5	1,504	
400	31	10	17	2.9	1,636	40	20	25	5.7	1,858	44	20	27	5.7	1,873	
450	31	10	17	2.5	2,020	40	20	25	5.1	2,267	44	20	26	5.1	2,283	
500	31	10	17	2.3	2,445	40	20	24	4.6	2,715	44	20	26	4.6	2,734	
550	31	10	16	2.1	2,911	40	20	24	4.2	3,205	44	20	26	4.2	3,225	
600	31	10	16	1.9	3,417	40	20	24	3.8	3,735	44	20	26	3.8	3,757	
650	31	10	16	1.8	3,964	40	20	24	3.5	4,305	44	20	26	3.5	4,329	
700	31	10	16	1.6	4,551	40	20	24	3.3	4,917	44	20	25	3.3	4,941	
750	31	10	16	1.5	5,178	40	20	23	3.1	5,568	44	20	25	3.1	5,595	
800	31	10	16	1.4	5,847	40	20	23	2.9	6,260	44	20	25	2.9	6,288	
850	31	10	16	1.3	6,555	40	20	23	2.7	6,993	44	20	25	2.7	7,023	
900	31	10	16	1.3	7,305	40	20	23	2.5	7,766	44	20	25	2.5	7,798	
1000	31	10	16	1.1	8,925	40	20	23	2.3	9,434	44	20	25	2.3	9,469	
1100	31	10	15	1.0	10,496	40	20	23	2.1	11,047	44	20	24	2.1	11,085	
1200	31	10	15	1.0	12,370	40	20	22	1.9	12,969	44	20	24	1.9	13,009	
1300	31	10	15	0.9	14,420	40	20	22	1.8	15,066	44	20	24	1.8	15,109	
1400	31	10	15	0.8	16,627	40	20	22	1.6	17,320	44	20	24	1.6	17,366	
1500	31	10	15	0.8	18,991	40	20	22	1.5	19,731	44	20	24	1.5	19,781	

Installation gap															
	L ₀ = 200 mm					L ₀ = 225 mm					L ₀ = 250 mm				
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²
50	53	31	42	51.1	233	60	32	46	52.0	255	69	43	56	59.8	347
65	53	31	41	43.6	278	60	32	45	44.6	302	69	43	55	52.9	402
80	53	31	40	37.8	317	60	32	44	38.7	343	69	43	54	47.1	448
100	53	31	39	31.8	402	60	32	44	32.6	431	69	43	53	40.7	549
125	53	31	39	26.4	498	60	32	43	27.1	530	69	43	51	34.5	659
150	53	31	38	22.5	617	60	32	42	23.1	653	69	43	51	29.8	796
175	53	31	37	19.5	734	60	32	41	20.1	773	69	43	50	26.2	928
200	53	31	37	17.2	861	60	32	41	17.7	903	69	43	49	23.3	1,070
250	53	31	36	13.9	1,164	60	32	40	14.4	1,213	69	43	48	19.0	1,405
300	53	31	36	11.7	1,492	60	32	39	12.0	1,548	69	43	48	16.0	1,764
350	53	31	35	10.0	1,717	60	32	39	10.4	1,777	69	43	47	13.8	2,008
400	53	31	35	8.8	2,111	60	32	38	9.1	2,176	69	43	46	12.1	2,431
450	53	31	34	7.8	2,545	60	32	38	8.1	2,617	69	43	46	10.8	2,896
500	53	31	34	7.1	3,019	60	32	38	7.3	3,097	69	43	45	9.8	3,400
550	53	31	34	6.4	3,534	60	32	37	6.6	3,619	69	43	45	8.9	3,946
600	53	31	33	5.9	4,090	60	32	37	6.1	4,181	69	43	45	8.2	4,532
650	53	31	33	5.4	4,686	60	32	37	5.6	4,783	69	43	44	7.5	5,158
700	53	31	33	5.1	5,322	60	32	36	5.2	5,426	69	43	44	7.0	5,825
750	53	31	33	4.7	5,999	60	32	36	4.9	6,110	69	43	44	6.5	6,533
800	53	31	33	4.4	6,717	60	32	36	4.6	6,834	69	43	43	6.1	7,281
850	53	31	32	4.2	7,475	60	32	36	4.3	7,598	69	43	43	5.8	8,069
900	53	31	32	3.9	8,274	60	32	36	4.1	8,404	69	43	43	5.5	8,898
1000	53	31	32	3.5	9,993	60	32	35	3.7	10,136	69	43	43	4.9	10,678
1100	53	31	32	3.2	11,652	60	32	35	3.3	11,805	69	43	42	4.5	12,390
1200	53	31	31	3.0	13,623	60	32	35	3.1	13,789	69	43	42	4.1	14,420
1300	53	31	31	2.7	15,770	60	32	34	2.8	15,948	69	43	42	3.8	16,627
1400	53	31	31	2.5	18,074	60	32	34	2.6	18,265	69	43	41	3.5	18,991
1500	53	31	31	2.4	20,536	60	32	34	2.4	20,739	69	43	41	3.3	21,512

Recommended sizes
Additional possible sizes

Reduction of movement for expansion joints with PTFE lining:
axial compression: -33 %; axial extension: -66 %; lateral displacement: -50 %; angular movement: -66 %.
In the event of axial extension and simultaneous lateral displacement the above movements are reduced (▶ page 22).
For larger movements see type B120 or B123.

Individual fabrication possible

B110
UNIVERSAL
clamped fixing

**B111**

► with internal vacuum support ring

Installation gap															
L ₀ = 125 mm						L ₀ = 150 mm					L ₀ = 175 mm				
NB	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
	mm	mm	± mm	± °		mm	mm	± mm	± °		mm	mm	± mm	± °	
50	31	3	20	21.8	96	40	7	30	38.7	155	44	7	32	38.7	159
65	31	3	20	17.1	125	40	7	29	31.6	191	44	7	32	31.6	196
80	31	3	20	14.0	152	40	7	29	26.6	224	44	7	31	26.6	229
100	31	3	19	11.3	212	40	7	28	21.8	297	44	7	30	21.8	303
125	31	3	19	9.1	283	40	7	28	17.7	379	44	7	30	17.7	386
150	31	3	18	7.6	374	40	7	27	14.9	484	44	7	29	14.9	492
175	31	3	18	6.5	466	40	7	27	12.9	588	44	7	29	12.9	597
200	31	3	18	5.7	569	40	7	26	11.3	703	44	7	29	11.3	712
250	31	3	18	4.6	819	40	7	26	9.1	979	44	7	28	9.1	990
300	31	3	17	3.8	1,098	40	7	26	7.6	1,281	44	7	27	7.6	1,294
350	31	3	17	3.3	1,292	40	7	25	6.5	1,490	44	7	27	6.5	1,504
400	31	3	17	2.9	1,636	40	7	25	5.7	1,858	44	7	27	5.7	1,873
450	31	3	17	2.5	2,020	40	7	25	5.1	2,267	44	7	26	5.1	2,283
500	31	3	17	2.3	2,445	40	7	24	4.6	2,715	44	7	26	4.6	2,734
550	31	3	16	2.1	2,911	40	7	24	4.2	3,205	44	7	26	4.2	3,225
600	31	3	16	1.9	3,417	40	7	24	3.8	3,735	44	7	26	3.8	3,757
650	31	3	16	1.8	3,964	40	7	24	3.5	4,305	44	7	26	3.5	4,329
700	31	3	16	1.6	4,551	40	7	24	3.3	4,917	44	7	25	3.3	4,941
750	31	3	16	1.5	5,178	40	7	23	3.1	5,568	44	7	25	3.1	5,595
800	31	3	16	1.4	5,847	40	7	23	2.9	6,260	44	7	25	2.9	6,288
850	31	3	16	1.3	6,555	40	7	23	2.7	6,993	44	7	25	2.7	7,023
900	31	3	16	1.3	7,305	40	7	23	2.5	7,766	44	7	25	2.5	7,798
1000	31	3	16	1.1	8,925	40	7	23	2.3	9,434	44	7	25	2.3	9,469
1100	31	3	15	1.0	10,496	40	7	23	2.1	11,047	44	7	24	2.1	11,085
1200	31	3	15	1.0	12,370	40	7	22	1.9	12,969	44	7	24	1.9	13,009
1300	31	3	15	0.9	14,420	40	7	22	1.8	15,066	44	7	24	1.8	15,109
1400	31	3	15	0.8	16,627	40	7	22	1.6	17,320	44	7	24	1.6	17,366
1500	31	3	15	0.8	18,991	40	7	22	1.5	19,731	44	7	24	1.5	19,781

Installation gap															
L ₀ = 200 mm						L ₀ = 225 mm					L ₀ = 250 mm				
NB	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
	mm	mm	± mm	± °		mm	mm	± mm	± °		mm	mm	± mm	± °	
50	53	10	42	51	233	60	11	46	52	255	69	14	56	60	347
65	53	10	41	43.6	278	60	11	45	44.6	302	69	14	55	52.9	402
80	53	10	40	37.8	317	60	11	44	38.7	343	69	14	54	47.1	448
100	53	10	39	31.8	402	60	11	44	32.6	431	69	14	53	40.7	549
125	53	10	39	26.4	498	60	11	43	27.1	530	69	14	51	34.5	659
150	53	10	38	22.5	617	60	11	42	23.1	653	69	14	51	29.8	796
175	53	10	37	19.5	734	60	11	41	20.1	773	69	14	50	26.2	928
200	53	10	37	17.2	861	60	11	41	17.7	903	69	14	49	23.3	1,070
250	53	10	36	13.9	1,164	60	11	40	14.4	1,213	69	14	48	19	1,405
300	53	10	36	11.7	1,492	60	11	39	12	1,548	69	14	48	16	1,764
350	53	10	35	10	1,717	60	11	39	10.4	1,777	69	14	47	13.8	2,008
400	53	10	35	8.8	2,111	60	11	38	9.1	2,176	69	14	46	12.1	2,431
450	53	10	34	7.8	2,545	60	11	38	8.1	2,617	69	14	46	10.8	2,896
500	53	10	34	7.1	3,019	60	11	38	7.3	3,097	69	14	45	9.8	3,400
550	53	10	34	6.4	3,534	60	11	37	6.6	3,619	69	14	45	8.9	3,946
600	53	10	33	5.9	4,090	60	11	37	6.1	4,181	69	14	45	8.2	4,532
650	53	10	33	5.4	4,686	60	11	37	5.6	4,783	69	14	44	7.5	5,158
700	53	10	33	5.1	5,322	60	11	36	5.2	5,426	69	14	44	7	5,825
750	53	10	33	4.7	5,999	60	11	36	4.9	6,110	69	14	44	6.5	6,533
800	53	10	33	4.4	6,717	60	11	36	4.6	6,834	69	14	43	6.1	7,281
850	53	10	32	4.2	7,475	60	11	36	4.3	7,598	69	14	43	5.8	8,069
900	53	10	32	3.9	8,274	60	11	36	4.1	8,404	69	14	43	5.5	8,898
1000	53	10	32	3.5	9,993	60	11	35	3.7	10,136	69	14	43	4.9	10,678
1100	53	10	32	3.2	11,652	60	11	35	3.3	11,805	69	14	42	4.5	12,390
1200	53	10	31	3	13,623	60	11	35	3.1	13,789	69	14	42	4.1	14,420
1300	53	10	31	2.7	15,770	60	11	34	2.8	15,948	69	14	42	3.8	16,627
1400	53	10	31	2.5	18,074	60	11	34	2.6	18,265	69	14	41	3.5	18,991
1500	53	10	31	2.4	20,536	60	11	34	2.4	20,739	69	14	41	3.3	21,512

Recommended sizes

Additional possible sizes

Reduction of movement for expansion joints with PTFE lining:

axial compression: -33 %; axial extension: -0 %; lateral displacement: -50 %; angular movement: -0 %.

In the event of axial extension and simultaneous lateral displacement the above movements are reduced (► page 22).

For larger movements see type B121 or B124.

Individual fabrication possible



Installation gap															
L ₀ = 125 mm						L ₀ = 150 mm					L ₀ = 175 mm				
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²
50	20	2	19	15.6	76	26	6	29	35.8	129	29	6	31	35.8	137
65	20	2	19	12.2	102	26	6	28	29.0	163	29	6	31	29.0	172
80	20	2	18	9.9	126	26	6	27	24.2	193	29	6	30	24.2	203
100	20	2	18	8.0	182	26	6	27	19.8	261	29	6	29	19.8	273
125	20	2	18	6.4	248	26	6	26	16.1	339	29	6	29	16.1	352
150	20	2	17	5.3	334	26	6	26	13.5	439	29	6	28	13.5	454
175	20	2	17	4.6	422	26	6	26	11.6	538	29	6	28	11.6	554
200	20	2	17	4.0	519	26	6	25	10.2	647	29	6	28	10.2	666
250	20	2	16	3.2	760	26	6	25	8.2	913	29	6	27	8.2	935
300	20	2	16	2.7	1,029	26	6	24	6.8	1,206	29	6	27	6.8	1,231
350	20	2	16	2.3	1,217	26	6	24	5.9	1,409	29	6	26	5.9	1,436
400	20	2	16	2.0	1,551	26	6	24	5.1	1,768	29	6	26	5.1	1,798
450	20	2	16	1.8	1,926	26	6	23	4.6	2,166	29	6	26	4.6	2,200
500	20	2	15	1.6	2,341	26	6	23	4.1	2,606	29	6	25	4.1	2,642
550	20	2	15	1.5	2,797	26	6	23	3.7	3,086	29	6	25	3.7	3,125
600	20	2	15	1.3	3,294	26	6	23	3.4	3,606	29	6	25	3.4	3,649
650	20	2	15	1.2	3,831	26	6	23	3.2	4,167	29	6	25	3.2	4,213
700	20	2	15	1.1	4,408	26	6	23	2.9	4,769	29	6	25	2.9	4,818
750	20	2	15	1.1	5,027	26	6	22	2.7	5,411	29	6	24	2.7	5,463
800	20	2	15	1.0	5,685	26	6	22	2.6	6,093	29	6	24	2.6	6,149
850	20	2	15	0.9	6,384	26	6	22	2.4	6,816	29	6	24	2.4	6,875
900	20	2	15	0.9	7,124	26	6	22	2.3	7,580	29	6	24	2.3	7,642
1000	20	2	15	0.8	8,725	26	6	22	2.1	9,229	29	6	24	2.1	9,297
1100	20	2	14	0.7	10,279	26	6	22	1.9	10,825	29	6	24	1.9	10,899
1200	20	2	14	0.7	12,135	26	6	21	1.7	12,728	29	6	23	1.7	12,808
1300	20	2	14	0.6	14,166	26	6	21	1.6	14,806	29	6	23	1.6	14,892
1400	20	2	14	0.6	16,354	26	6	21	1.5	17,041	29	6	23	1.5	17,134
1500	20	2	14	0.5	18,699	26	6	21	1.4	19,433	29	6	23	1.4	19,532

Installation gap															
L ₀ = 200 mm						L ₀ = 225 mm					L ₀ = 250 mm				
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²
50	35	9	41	49	207	40	9	45	49	207	46	13	54	57	290
65	35	9	40	41.7	249	40	9	43	41.7	249	46	13	53	50.2	340
80	35	9	39	35.9	286	40	9	43	35.9	286	46	13	52	44.3	383
100	35	9	38	30.1	367	40	9	42	30.1	367	46	13	51	38	476
125	35	9	38	24.9	459	40	9	41	24.9	459	46	13	50	32	580
150	35	9	37	21.1	574	40	9	40	21.1	574	46	13	49	27.5	708
175	35	9	36	18.3	687	40	9	40	18.3	687	46	13	48	24	833
200	35	9	36	16.2	810	40	9	39	16.2	810	46	13	48	21.3	968
250	35	9	35	13.1	1,104	40	9	38	13.1	1,104	46	13	47	17.3	1,288
300	35	9	35	10.9	1,425	40	9	38	10.9	1,425	46	13	46	14.6	1,632
350	35	9	34	9.4	1,645	40	9	37	9.4	1,645	46	13	45	12.6	1,867
400	35	9	34	8.3	2,030	40	9	37	8.3	2,030	46	13	45	11	2,277
450	35	9	33	7.3	2,456	40	9	36	7.3	2,456	46	13	44	9.8	2,727
500	35	9	33	6.6	2,922	40	9	36	6.6	2,922	46	13	44	8.9	3,217
550	35	9	33	6	3,429	40	9	36	6	3,429	46	13	44	8.1	3,748
600	35	9	33	5.5	3,977	40	9	36	5.5	3,977	46	13	43	7.4	4,319
650	35	9	32	5.1	4,565	40	9	35	5.1	4,565	46	13	43	6.8	4,931
700	35	9	32	4.7	5,194	40	9	35	4.7	5,194	46	13	43	6.4	5,584
750	35	9	32	4.4	5,863	40	9	35	4.4	5,863	46	13	42	5.9	6,277
800	35	9	32	4.1	6,573	40	9	35	4.1	6,573	46	13	42	5.6	7,011
850	35	9	32	3.9	7,323	40	9	34	3.9	7,323	46	13	42	5.2	7,785
900	35	9	31	3.7	8,114	40	9	34	3.7	8,114	46	13	42	5	8,600
1000	35	9	31	3.3	9,817	40	9	34	3.3	9,817	46	13	41	4.5	10,351
1100	35	9	31	3	11,461	40	9	34	3	11,461	46	13	41	4.1	12,037
1200	35	9	31	2.8	13,417	40	9	33	2.8	13,417	46	13	41	3.7	14,040
1300	35	9	30	2.6	15,548	40	9	33	2.6	15,548	46	13	40	3.4	16,218
1400	35	9	30	2.4	17,837	40	9	33	2.4	17,837	46	13	40	3.2	18,554
1500	35	9	30	2.2	20,283	40	9	33	2.2	20,283	46	13	40	3	21,047

Recommended sizes
Additional possible sizes

Reduction of movement for expansion joints with PTFE lining:
axial compression: -0 %; axial extension: -0 %; lateral displacement: -0 %; angular movement: -0 %.
In the event of axial extension and simultaneous lateral displacement the above movements are reduced (► page 22).
For larger movements see type B122 or B125.

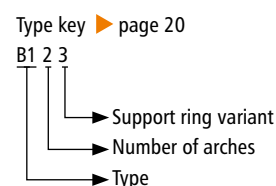
Individual fabrication possible

B120

NB 50 – NB 4000



- **Type B120**
without vacuum support rings
- **Type B121**
with internal vacuum support rings
- **Type B122**
with embedded vacuum support rings
- **Type B123**
without vacuum support rings, with
pressure support ring in the arch trough
- **Type B124**
with internal vacuum support rings, with
pressure support ring in the arch trough
- **Type B125**
with embedded vacuum support rings,
with pressure support ring in the arch
trough



Universal expansion joint with two arches

Design:	Hydrodynamic, double-arched rubber bellows with sleeve for clamped fixing Optionally with vacuum support rings and/or external pressure support ring in the arch trough
Nominal diameters:	NB 50 to NB 4000, intermediate sizes possible
Installation length:	= Installation gap + 2 x fixing width Standard installation gaps L_0 = 250 to 500 mm (► page 137–139) Other installation gaps on request
Fixing width:	Depends on pressure, nominal diameter and clamp design, at least 40 mm
Pressure:	Depending on the nominal diameter and installation length up to 6 bar Vacuum not allowed without vacuum support rings, with vacuum support rings up to 0.05 bar absolute Design in accordance with Pressure Equipment Directive PED 2014/68/EU
Movement:	For axial, lateral and angular movements (► page 137–139) For axial extension or vacuums, the expansion joint can be drawn from the pipeline (groove as needed at the pipeline end)

Application:
Power plants, plant construction, food processing, wastewater treatment plants, industrial facilities, e. g. to disconnect pipelines, on oscillating conveyor systems, on sieving machines



Assembly instruction download
www.ditec-adam.de/en/downloads.html

Rubber bellows

Rubber	Fabric	Marking	Max.	Application
EPDM	Nylon		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDM	Kevlar		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMht	Kevlar		120 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMtw	Nylon		100 °C	Drinking water
EPDMtw	Kevlar		100 °C	Drinking water
EPDMaf	Nylon		100 °C	Abrasive materials, water-sand extraction
EPDMaf	Kevlar		100 °C	Abrasive materials, water-sand extraction
EPDMbeige	Nylon		100 °C	Foodstuffs
EPDMbeige	Kevlar		100 °C	Foodstuffs
IIR	Nylon		100 °C	Hot water, acids, bases, gases
IIR	Kevlar		100 °C	Hot water, acids, bases, gases
CSM	Nylon		100 °C	Strong acids, bases, chemicals
CSM	Kevlar		100 °C	Strong acids, bases, chemicals
NBR	Nylon		100 °C	Oils, petrol, solvents, compressed air
NBR	Kevlar		100 °C	Oils, petrol, solvents, compressed air
NBRbeige	Nylon		100 °C	Oil, fatty foods
NBRbeige	Kevlar		100 °C	Oil, fatty foods
CR	Nylon		90 °C	Cooling water, slightly oily water, seawater
CR	Kevlar		90 °C	Cooling water, slightly oily water, seawater
FPM	Kevlar		180 °C	Corrosive chemicals, petroleum distillates
FPMbeige	Kevlar		180 °C	Oil, fatty foods
NR	Nylon		70 °C	Abrasive materials
Silicon	Kevlar or glass		200 °C	Air, saltwater atmosphere, foodstuffs, medical technology

PTFE-lining: Permanently embedded against chemical attacks on the interior at the rubber bellows, available starting at NB 300. Take the restriction of the listed movement into account (► page 137–139)

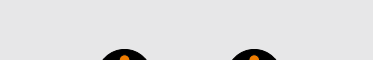
UNIVERSAL
clamped fixing

Fastening clamps

Design:	Depending on pressure and the nominal diameter, endless clamp belt, screw thread belt, small clamps or hinge bolt clamps. At higher pressures, 2 adjacent clamps per fastening side	
Width:	Endless clamp belt:	¾"
	Screw thread belt:	½"
	Small clamp:	depending on Ø: 9–12 mm
	Hinge bolt clamp:	depending on Ø: 18–30 mm
Materials:	Endless clamp belt with screw lugs (tongs):	1.7300
	Screw thread belt with threaded screw lugs:	1.4310
	Small clamp, belt and housing:	1.4016 (Screw steel galvanised)
	Hinge bolt clamp, belt and housing:	1.4016 (Screw steel galvanised)

B120

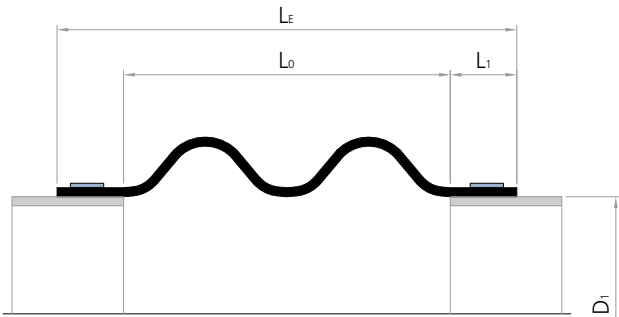
Support rings

TYPE		Vacuum support ring	Pressure support ring	Pressure	Movement
B120		Without	Without	Slight pressure, vacuum stability on request	► page 137
B121		Medium contact, inside the arch apex	Without	Slight pressure, for vacuum up to 0.05 bar absolute	► page 138
B122		No medium contact, embedded into the arch apex of the rubber bellows	Without	Slight pressure, for vacuum up to 0.05 bar absolute	► page 139
B123		Without	External in the arch trough	Depending on the nominal diameter up to 6 bar, slight vacuum	► page 137
B124		Medium contact, inside the arch apex	External in the arch trough	Depending on the nominal diameter up to 6 bar, for vacuum up to 0.05 bar absolute	► page 138
B125		No medium contact, embedded into the arch apex of the rubber bellows	External in the arch trough	Depending on the nominal diameter up to 6 bar, for vacuum up to 0.05 bar absolute	► page 139

Materials

Stainless steel:	1.4301 (X5CrNi18-10)	Other materials on request
	1.4539 (X1NiCrMoCu25-20-5)	
	1.4571 (X6CrNiMoTi17-12-2)	
Carbon steel:	1.0570 (S355J2G3) rubber coated	
	1.0570 (S355J2G3) galvanised	

Planning help B120



B120

► without vacuum support rings



B123

► without vacuum support rings, with pressure support ring in the arch trough



Installation gap

NB	L ₀ = 250 mm					L ₀ = 300 mm					L ₀ = 350 mm				
	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
	mm	mm	±mm	±°		mm	mm	±mm	±°		mm	mm	±mm	±°	
50	62	20	41	38.7	96	80	40	60	58.0	155	88	41	65	58.6	159
65	62	20	40	31.6	125	80	40	59	50.9	191	88	41	63	51.6	196
80	62	20	39	26.6	152	80	40	58	45.0	224	88	41	62	45.7	229
100	62	20	38	21.8	212	80	40	56	38.7	297	88	41	61	39.4	303
125	62	20	38	17.7	283	80	40	55	32.6	379	88	41	60	33.3	386
150	62	20	37	14.9	374	80	40	54	28.1	484	88	41	59	28.7	492
175	62	20	36	12.9	466	80	40	54	24.6	588	88	41	58	25.1	597
200	62	20	36	11.3	569	80	40	53	21.8	703	88	41	57	22.3	712
250	62	20	35	9.1	819	80	40	52	17.7	979	88	41	56	18.2	990
300	62	20	35	7.6	1,098	80	40	51	14.9	1,281	88	41	55	15.3	1,294
350	62	20	34	6.5	1,292	80	40	50	12.9	1,490	88	41	54	13.2	1,504
400	62	20	34	5.7	1,636	80	40	50	11.3	1,858	88	41	54	11.6	1,873
450	62	20	33	5.1	2,020	80	40	49	10.1	2,267	88	41	53	10.3	2,283
500	62	20	33	4.6	2,445	80	40	49	9.1	2,715	88	41	52	9.3	2,734
550	62	20	33	4.2	2,911	80	40	48	8.3	3,205	88	41	52	8.5	3,225
600	62	20	33	3.8	3,417	80	40	48	7.6	3,735	88	41	52	7.8	3,757
650	62	20	32	3.5	3,964	80	40	48	7.0	4,305	88	41	51	7.2	4,329
700	62	20	32	3.3	4,551	80	40	47	6.5	4,917	88	41	51	6.7	4,941
750	62	20	32	3.1	5,178	80	40	47	6.1	5,568	88	41	51	6.2	5,595
800	62	20	32	2.9	5,847	80	40	47	5.7	6,260	88	41	50	5.9	6,288
850	62	20	32	2.7	6,555	80	40	46	5.4	6,993	88	41	50	5.5	7,023
900	62	20	31	2.5	7,305	80	40	46	5.1	7,766	88	41	50	5.2	7,798
1000	62	20	31	2.3	8,925	80	40	46	4.6	9,434	88	41	49	4.7	9,469
1100	62	20	31	2.1	10,496	80	40	45	4.2	11,047	88	41	49	4.3	11,085
1200	62	20	31	1.9	12,370	80	40	45	3.8	12,969	88	41	48	3.9	13,009
1300	62	20	30	1.8	14,420	80	40	45	3.5	15,066	88	41	48	3.6	15,109
1400	62	20	30	1.6	16,627	80	40	44	3.3	17,320	88	41	48	3.4	17,366
1500	62	20	30	1.5	18,991	80	40	44	3.1	19,731	88	41	47	3.1	19,781

UNIVERSAL
clamped fixing

Installation gap

NB	L ₀ = 400 mm					L ₀ = 450 mm					L ₀ = 500 mm				
	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
	mm	mm	±mm	±°		mm	mm	±mm	±°		mm	mm	±mm	±°	
50	106	61	84	67.7	233	121	65	93	69	255	138	85	112	73.6	347
65	106	61	82	62	278	121	65	91	63.4	302	138	85	109	69.1	402
80	106	61	80	56.7	317	121	65	89	58.4	343	138	85	107	64.8	448
100	106	61	79	50.7	402	121	65	87	52.4	431	138	85	105	59.5	549
125	106	61	77	44.3	498	121	65	85	46.1	530	138	85	103	53.7	659
150	106	61	76	39.1	617	121	65	84	40.9	653	138	85	101	48.6	796
175	106	61	75	34.9	734	121	65	83	36.6	773	138	85	100	44.2	928
200	106	61	74	31.4	861	121	65	82	33	903	138	85	99	40.4	1,070
250	106	61	72	26	1,164	121	65	80	27.5	1,213	138	85	97	34.2	1,405
300	106	61	71	22.1	1,492	121	65	79	23.4	1,548	138	85	95	29.5	1,764
350	106	61	70	19.2	1,717	121	65	78	20.4	1,777	138	85	94	25.9	2,008
400	106	61	69	17	2,111	121	65	77	18	2,176	138	85	93	23	2,431
450	106	61	69	15.2	2,545	121	65	76	16.1	2,617	138	85	92	20.7	2,896
500	106	61	68	13.7	3,019	121	65	75	14.6	3,097	138	85	91	18.8	3,400
550	106	61	67	12.5	3,534	121	65	75	13.3	3,619	138	85	90	17.2	3,946
600	106	61	67	11.5	4,090	121	65	74	12.2	4,181	138	85	89	15.8	4,532
650	106	61	66	10.6	4,686	121	65	73	11.3	4,783	138	85	89	14.7	5,158
700	106	61	66	9.9	5,322	121	65	73	10.5	5,426	138	85	88	13.7	5,825
750	106	61	66	9.2	5,999	121	65	72	9.8	6,110	138	85	87	12.8	6,533
800	106	61	65	8.7	6,717	121	65	72	9.2	6,834	138	85	87	12	7,281
850	106	61	65	8.2	7,475	121	65	72	8.7	7,598	138	85	86	11.3	8,069
900	106	61	64	7.7	8,274	121	65	71	8.2	8,404	138	85	86	10.7	8,898
1000	106	61	64	7	9,993	121	65	71	7.4	10,136	138	85	85	9.6	10,678
1100	106	61	63	6.3	11,652	121	65	70	6.7	11,805	138	85	84	8.8	12,390
1200	106	61	63	5.8	13,623	121	65	69	6.2	13,789	138	85	84	8.1	14,420
1300	106	61	62	5.4	15,770	121	65	69	5.7	15,948	138	85	83	7.5	16,627
1400	106	61	62	5	18,074	121	65	68	5.3	18,265	138	85	83	6.9	18,991
1500	106	61	62	4.6	20,536	121	65	68	5	20,739	138	85	82	6.5	21,512

B120

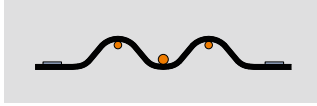
Recommended sizes
Additional possible sizes

Reduction of movement for expansion joints with PTFE lining: axial compression: -33 %; axial extension: -66 %; lateral displacement: -50 %; angular movement: -66 %. In the event of axial extension and simultaneous lateral displacement the above movements are reduced (► page 22). Angular movement only possible with guided pressure support ring. For larger movements see type B130 or B133.

Individual fabrication possible

**B121**

► with internal vacuum support rings

**B124**

► with internal vacuum support rings, with pressure support ring in the arch trough

Installation gap															
NB	L ₀ = 125 mm					L ₀ = 150 mm					L ₀ = 175 mm				
	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
	mm	mm	± mm	± °		mm	mm	± mm	± °		mm	mm	± mm	± °	
50	62	7	41	38.7	96	80	13	60	58.0	155	88	13	65	58.6	159
65	62	7	40	31.6	125	80	13	59	50.9	191	88	13	63	51.6	196
80	62	7	39	26.6	152	80	13	58	45.0	224	88	13	62	45.7	229
100	62	7	38	21.8	212	80	13	56	38.7	297	88	13	61	39.4	303
125	62	7	38	17.7	283	80	13	55	32.6	379	88	13	60	33.3	386
150	62	7	37	14.9	374	80	13	54	28.1	484	88	13	59	28.7	492
175	62	7	36	12.9	466	80	13	54	24.6	588	88	13	58	25.1	597
200	62	7	36	11.3	569	80	13	53	21.8	703	88	13	57	22.3	712
250	62	7	35	9.1	819	80	13	52	17.7	979	88	13	56	18.2	990
300	62	7	35	7.6	1,098	80	13	51	14.9	1,281	88	13	55	15.3	1,294
350	62	7	34	6.5	1,292	80	13	50	12.9	1,490	88	13	54	13.2	1,504
400	62	7	34	5.7	1,636	80	13	50	11.3	1,858	88	13	54	11.6	1,873
450	62	7	33	5.1	2,020	80	13	49	10.1	2,267	88	13	53	10.3	2,283
500	62	7	33	4.6	2,445	80	13	49	9.1	2,715	88	13	52	9.3	2,734
550	62	7	33	4.2	2,911	80	13	48	8.3	3,205	88	13	52	8.5	3,225
600	62	7	33	3.8	3,417	80	13	48	7.6	3,735	88	13	52	7.8	3,757
650	62	7	32	3.5	3,964	80	13	48	7.0	4,305	88	13	51	7.2	4,329
700	62	7	32	3.3	4,551	80	13	47	6.5	4,917	88	13	51	6.7	4,941
750	62	7	32	3.1	5,178	80	13	47	6.1	5,568	88	13	51	6.2	5,595
800	62	7	32	2.9	5,847	80	13	47	5.7	6,260	88	13	50	5.9	6,288
850	62	7	32	2.7	6,555	80	13	46	5.4	6,993	88	13	50	5.5	7,023
900	62	7	31	2.5	7,305	80	13	46	5.1	7,766	88	13	50	5.2	7,798
1000	62	7	31	2.3	8,925	80	13	46	4.6	9,434	88	13	49	4.7	9,469
1100	62	7	31	2.1	10,496	80	13	45	4.2	11,047	88	13	49	4.3	11,085
1200	62	7	31	1.9	12,370	80	13	45	3.8	12,969	88	13	48	3.9	13,009
1300	62	7	30	1.8	14,420	80	13	45	3.5	15,066	88	13	48	3.6	15,109
1400	62	7	30	1.6	16,627	80	13	44	3.3	17,320	88	13	48	3.4	17,366
1500	62	7	30	1.5	18,991	80	13	44	3.1	19,731	88	13	47	3.1	19,781

Installation gap															
NB	L ₀ = 200 mm					L ₀ = 225 mm					L ₀ = 250 mm				
	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
	mm	mm	± mm	± °		mm	mm	± mm	± °		mm	mm	± mm	± °	
50	106	20	84	68	233	121	21	93	69	255	138	28	112	74	347
65	106	20	82	62	278	121	21	91	63.4	302	138	28	109	69.1	402
80	106	20	80	56.7	317	121	21	89	58.4	343	138	28	107	64.8	448
100	106	20	79	50.7	402	121	21	87	52.4	431	138	28	105	59.5	549
125	106	20	77	44.3	498	121	21	85	46.1	530	138	28	103	53.7	659
150	106	20	76	39.1	617	121	21	84	40.9	653	138	28	101	48.6	796
175	106	20	75	34.9	734	121	21	83	36.6	773	138	28	100	44.2	928
200	106	20	74	31.4	861	121	21	82	33	903	138	28	99	40.4	1,070
250	106	20	72	26	1,164	121	21	80	27.5	1,213	138	28	97	34.2	1,405
300	106	20	71	22.1	1,492	121	21	79	23.4	1,548	138	28	95	29.5	1,764
350	106	20	70	19.2	1,717	121	21	78	20.4	1,777	138	28	94	25.9	2,008
400	106	20	69	17	2,111	121	21	77	18	2,176	138	28	93	23	2,431
450	106	20	69	15.2	2,545	121	21	76	16.1	2,617	138	28	92	20.7	2,896
500	106	20	68	13.7	3,019	121	21	75	14.6	3,097	138	28	91	18.8	3,400
550	106	20	67	12.5	3,534	121	21	75	13.3	3,619	138	28	90	17.2	3,946
600	106	20	67	11.5	4,090	121	21	74	12.2	4,181	138	28	89	15.8	4,532
650	106	20	66	10.6	4,686	121	21	73	11.3	4,783	138	28	89	14.7	5,158
700	106	20	66	9.9	5,322	121	21	73	10.5	5,426	138	28	88	13.7	5,825
750	106	20	66	9.2	5,999	121	21	72	9.8	6,110	138	28	87	12.8	6,533
800	106	20	65	8.7	6,717	121	21	72	9.2	6,834	138	28	87	12	7,281
850	106	20	65	8.2	7,475	121	21	72	8.7	7,598	138	28	86	11.3	8,069
900	106	20	64	7.7	8,274	121	21	71	8.2	8,404	138	28	86	10.7	8,898
1000	106	20	64	7	9,993	121	21	71	7.4	10,136	138	28	85	9.6	10,678
1100	106	20	63	6.3	11,652	121	21	70	6.7	11,805	138	28	84	8.8	12,390
1200	106	20	63	5.8	13,623	121	21	69	6.2	13,789	138	28	84	8.1	14,420
1300	106	20	62	5.4	15,770	121	21	69	5.7	15,948	138	28	83	7.5	16,627
1400	106	20	62	5	18,074	121	21	68	5.3	18,265	138	28	83	6.9	18,991
1500	106	20	62	4.6	20,536	121	21	68	5	20,739	138	28	82	6.5	21,512

Recommended sizes
Additional possible sizes

Reduction of movement for expansion joints with PTFE lining: axial compression: -33 %; axial extension: -0 %; lateral displacement: -50 %; angular movement: -0 %. In the event of axial extension and simultaneous lateral displacement the above movements are reduced (► page 22). Angular movement only possible with guided pressure support ring. For larger movements see type B131 or B134.

Individual fabrication possible

B122

► with embedded vacuum support rings



139

B125

► with embedded vacuum support rings, with pressure support ring in the arch trough



Installation gap															
	L ₀ = 125 mm					L ₀ = 150 mm					L ₀ = 175 mm				
	Movement				A	Movement				A	Movement				A
NB															
	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²
50	41	5	38	29.2	76	52	12	57	54.5	129	58	12	63	56.0	137
65	41	5	37	23.3	102	52	12	56	47.1	163	58	12	61	48.7	172
80	41	5	37	19.3	126	52	12	55	41.2	193	58	12	60	42.8	203
100	41	5	36	15.6	182	52	12	54	35.0	261	58	12	59	36.5	273
125	41	5	35	12.6	248	52	12	53	29.2	339	58	12	58	30.6	352
150	41	5	35	10.6	334	52	12	52	25.0	439	58	12	57	26.3	454
175	41	5	34	9.1	422	52	12	51	21.8	538	58	12	56	22.9	554
200	41	5	34	8.0	519	52	12	51	19.3	647	58	12	55	20.3	666
250	41	5	33	6.4	760	52	12	50	15.6	913	58	12	54	16.5	935
300	41	5	32	5.3	1,029	52	12	49	13.1	1,206	58	12	53	13.9	1,231
350	41	5	32	4.6	1,217	52	12	48	11.3	1,409	58	12	52	11.9	1,436
400	41	5	32	4.0	1,551	52	12	48	9.9	1,768	58	12	52	10.5	1,798
450	41	5	31	3.6	1,926	52	12	47	8.8	2,166	58	12	51	9.3	2,200
500	41	5	31	3.2	2,341	52	12	47	8.0	2,606	58	12	51	8.4	2,642
550	41	5	31	2.9	2,797	52	12	46	7.3	3,086	58	12	50	7.7	3,125
600	41	5	30	2.7	3,294	52	12	46	6.7	3,606	58	12	50	7.0	3,649
650	41	5	30	2.5	3,831	52	12	45	6.1	4,167	58	12	50	6.5	4,213
700	41	5	30	2.3	4,408	52	12	45	5.7	4,769	58	12	49	6.0	4,818
750	41	5	30	2.1	5,027	52	12	45	5.3	5,411	58	12	49	5.6	5,463
800	41	5	30	2.0	5,685	52	12	45	5.0	6,093	58	12	49	5.3	6,149
850	41	5	30	1.9	6,384	52	12	44	4.7	6,816	58	12	48	5.0	6,875
900	41	5	29	1.8	7,124	52	12	44	4.4	7,580	58	12	48	4.7	7,642
1000	41	5	29	1.6	8,725	52	12	44	4.0	9,229	58	12	48	4.2	9,297
1100	41	5	29	1.5	10,279	52	12	43	3.6	10,825	58	12	47	3.8	10,899
1200	41	5	29	1.3	12,135	52	12	43	3.3	12,728	58	12	47	3.5	12,808
1300	41	5	28	1.2	14,166	52	12	43	3.1	14,806	58	12	47	3.3	14,892
1400	41	5	28	1.1	16,354	52	12	42	2.9	17,041	58	12	46	3.0	17,134
1500	41	5	28	1.1	18,699	52	12	42	2.7	19,433	58	12	46	2.8	19,532

UNIVERSAL
clamped fixing

Installation gap															
	L ₀ = 200 mm					L ₀ = 225 mm					L ₀ = 250 mm				
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²
50	70	19	82	66	207	80	19	89	66	207	91	26	108	72	290
65	70	19	80	60.3	249	80	19	87	60.3	249	91	26	106	67.4	340
80	70	19	78	54.9	286	80	19	85	54.9	286	91	26	104	62.9	383
100	70	19	77	48.7	367	80	19	84	48.7	367	91	26	102	57.3	476
125	70	19	75	42.4	459	80	19	82	42.4	459	91	26	100	51.3	580
150	70	19	74	37.2	574	80	19	81	37.2	574	91	26	98	46.1	708
175	70	19	73	33.1	687	80	19	79	33.1	687	91	26	97	41.7	833
200	70	19	72	29.7	810	80	19	79	29.7	810	91	26	95	38	968
250	70	19	71	24.5	1,104	80	19	77	24.5	1,104	91	26	94	32	1,288
300	70	19	69	20.8	1,425	80	19	76	20.8	1,425	91	26	92	27.5	1,632
350	70	19	69	18	1,645	80	19	75	18	1,645	91	26	91	24	1,867
400	70	19	68	15.9	2,030	80	19	74	15.9	2,030	91	26	90	21.3	2,277
450	70	19	67	14.2	2,456	80	19	73	14.2	2,456	91	26	89	19.1	2,727
500	70	19	66	12.8	2,922	80	19	72	12.8	2,922	91	26	88	17.3	3,217
550	70	19	66	11.7	3,429	80	19	72	11.7	3,429	91	26	87	15.8	3,748
600	70	19	65	10.8	3,977	80	19	71	10.8	3,977	91	26	86	14.6	4,319
650	70	19	65	9.9	4,565	80	19	71	9.9	4,565	91	26	86	13.5	4,931
700	70	19	64	9.2	5,194	80	19	70	9.2	5,194	91	26	85	12.6	5,584
750	70	19	64	8.6	5,863	80	19	70	8.6	5,863	91	26	85	11.7	6,277
800	70	19	64	8.1	6,573	80	19	69	8.1	6,573	91	26	84	11	7,011
850	70	19	63	7.6	7,323	80	19	69	7.6	7,323	91	26	84	10.4	7,785
900	70	19	63	7.2	8,114	80	19	68	7.2	8,114	91	26	83	9.8	8,600
1000	70	19	62	6.5	9,817	80	19	68	6.5	9,817	91	26	82	8.9	10,351
1100	70	19	62	5.9	11,461	80	19	67	5.9	11,461	91	26	82	8.1	12,037
1200	70	19	61	5.4	13,417	80	19	67	5.4	13,417	91	26	81	7.4	14,040
1300	70	19	61	5	15,548	80	19	66	5	15,548	91	26	81	6.8	16,218
1400	70	19	60	4.7	17,837	80	19	66	4.7	17,837	91	26	80	6.4	18,554
1500	70	19	60	4.3	20,283	80	19	65	4.3	20,283	91	26	79	5.9	21,047

B120

Recommended sizes
Additional possible sizes

Reduction of movement for expansion joints with PTFE lining: axial compression: -0 %; axial extension: -0 %; lateral displacement: -0 %; angular movement: -0 %. In the event of axial extension and simultaneous lateral displacement the above movements are reduced (► page 22). Angular movement only possible with guided support ring. For larger movements see type B132 or B135.

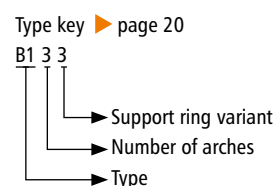
Individual fabrication possible

B130 B140 B150

NB 50 – NB 4000



- ▶ **Type B130 B140 B150**
without vacuum support rings
- ▶ **Type B131 B141 B151**
with internal vacuum support rings
- ▶ **Type B132 B142 B152**
with embedded vacuum support rings
- ▶ **Type B133 B143 B153**
without vacuum support rings, with
pressure support rings in the arch trough
- ▶ **Type B134 B144 B154**
with inner vacuum support rings, with
pressure support rings in the arch trough
- ▶ **Type B135 B145 B155**
with embedded vacuum support rings,
with pressure support rings in the arch
trough



Universal expansion joint with three or more arches

Design:	Hydrodynamic, triple or multiple arch rubber bellows with sleeve for clamped fixing Optionally with vacuum support rings and/or external pressure support rings in the arch trough
Nominal diameters:	NB 50 to NB 4000, intermediate sizes possible
Installation length/arches:	= Installation gap + 2 x fixing width Installation gaps L_0 = 600 with 3 arches, type B130 (▶ page 143–145) Installation gaps L_0 = 800 with 4 arches, type B140 (▶ page 143–145) Installation gaps L_0 = 1000 with 5 arches, type B150 (▶ page 143–145) Other installation gaps on request
Fixing width:	Depends on pressure, nominal diameter and clamp design, at least 40 mm
Pressure:	Depending on the nominal diameter and installation length up to 6 bar. Vacuum not allowed without vacuum support rings, with vacuum support rings up to 0.05 bar absolute Design in accordance with Pressure Equipment Directive 2014/68/EU
Movement:	For axial, lateral and angular movements (▶ page 143–145) For axial extension or vacuums, the expansion joint can be drawn from the pipeline (groove as needed at the pipeline end)

Application:
Power plants, plant construction, food processing, wastewater treatment plants, industrial facilities, e.g. to disconnect pipelines, on oscillating conveyor systems, on sieving machines



Assembly instruction download
www.ditec-adam.de/en/downloads.html

Rubber bellows

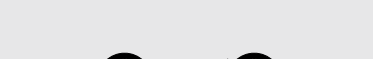
Rubber	Fabric	Marking	Max.	Application
EPDM	Nylon		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDM	Kevlar		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMht	Kevlar		120 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMtw	Nylon		100 °C	Drinking water
EPDMtw	Kevlar		100 °C	Drinking water
EPDMaf	Nylon		100 °C	Abrasive materials, water-sand extraction
EPDMaf	Kevlar		100 °C	Abrasive materials, water-sand extraction
EPDMbeige	Nylon		100 °C	Foodstuffs
EPDMbeige	Kevlar		100 °C	Foodstuffs
IIR	Nylon		100 °C	Hot water, acids, bases, gases
IIR	Kevlar		100 °C	Hot water, acids, bases, gases
CSM	Nylon		100 °C	Strong acids, bases, chemicals
CSM	Kevlar		100 °C	Strong acids, bases, chemicals
NBR	Nylon		100 °C	Oils, petrol, solvents, compressed air
NBR	Kevlar		100 °C	Oils, petrol, solvents, compressed air
NBRbeige	Nylon		100 °C	Oil, fatty foods
NBRbeige	Kevlar		100 °C	Oil, fatty foods
CR	Nylon		90 °C	Cooling water, slightly oily water, seawater
CR	Kevlar		90 °C	Cooling water, slightly oily water, seawater
FPM	Kevlar		180 °C	Corrosive chemicals, petroleum distillates
FPMbeige	Kevlar		180 °C	Oil, fatty foods
NR	Nylon		70 °C	Abrasive materials
Silicon	Kevlar or glass		200 °C	Air, saltwater atmosphere, foodstuffs, medical technology

PTFE-lining: Permanently embedded against chemical attacks on the interior at the rubber bellows, available starting at NB 300. Take the restriction of the listed movement into account (► page 143–145)

Fastening clamps

Design:	Depending on pressure and the nominal diameter, endless clamp belt, screw thread belt, small clamps or hinge bolt clamps. At higher pressures, 2 adjacent clamps per fastening side	
Width:	Endless clamp belt:	¾"
	Screw thread belt:	½"
	Small clamp:	depending on Ø: 9–12 mm
	Hinge bolt clamp:	depending on Ø: 18–30 mm
Materials:	Endless clamp belt with screw lugs (tongs):	1.7300
	Screw thread belt with threaded screw lugs:	1.4310
	Small clamp, belt and housing:	1.4016 (Screw steel galvanised)
	Hinge bolt clamp, belt and housing:	1.4016 (Screw steel galvanised)

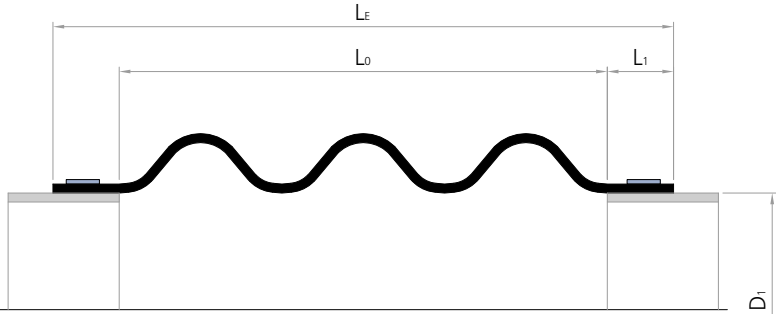
Support rings

TYPE		Vacuum support ring	Pressure support ring	Pressure	Movement
B130 B140 B150		Without	Without	Slight pressure, vacuum stability on request	► page 143
B131 B141 B151		Medium contact, inside the arch apex	Without	Slight pressure, for vacuum up to 0.05 bar absolute	► page 144
B132 B142 B152		No medium contact, embedded into the arch apex of the rubber bellows	Without	Slight pressure, for vacuum up to 0.05 bar absolute	► page 145
B133 B143 B153		Without	External in the arch trough	Depending on the nominal diameter up to 6 bar, slight vacuum	► page 143
B134 B144 B154		Medium contact, inside the arch apex	External in the arch trough	Depending on the nominal diameter up to 6 bar, for vacuum up to 0.05 bar absolute	► page 144
B135 B145 B155		No medium contact, embedded into the arch apex of the rubber bellows	External in the arch trough	Depending on the nominal diameter up to 6 bar, for vacuum up to 0.05 bar absolute	► page 145

Materials

Stainless steel:	1.4301 (X5CrNi18-10) 1.4539 (X1NiCrMoCu25-20-5) 1.4571 (X6CrNiMoTi17-12-2)	Other materials on request
Carbon steel:	1.0570 (S355J2G3) rubber coated	

Planning help B130



B130 B140 B150
▶ without vacuum support rings



143

B133 B143 B153
▶ without vacuum support rings, with pressure support rings in the arch trough

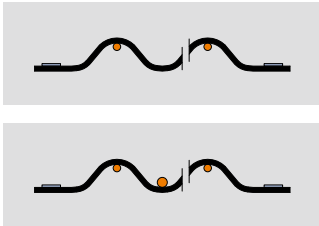


Installation gap															
L ₀ = 600 mm – B130 B133						L ₀ = 800 mm – B140 B143					L ₀ = 1000 mm – B150 B153				
NB	Movement				A	Movement				A	Movement				A
	 mm	 mm	 ± mm	 ± °	 cm ²	 mm	 mm	 ± mm	 ± °	 cm ²	 mm	 mm	 ± mm	 ± °	 cm ²
50	159	92	126	74.8	233	212	123	168	78.5	233	265	154	210	80.8	233
65	159	92	123	70.5	278	212	123	164	75.2	278	265	154	205	78.1	278
80	159	92	121	66.5	317	212	123	161	72.0	317	265	154	201	75.4	317
100	159	92	118	61.5	402	212	123	158	67.9	402	265	154	197	72.0	402
125	159	92	116	55.8	498	212	123	154	63.1	498	265	154	193	67.9	498
150	159	92	114	50.8	617	212	123	152	58.6	617	265	154	190	64.0	617
175	159	92	112	46.4	734	212	123	150	54.6	734	265	154	187	60.4	734
200	159	92	111	42.6	861	212	123	148	50.9	861	265	154	185	57.0	861
250	159	92	109	36.4	1,164	212	123	145	44.5	1,164	265	154	181	50.9	1,164
300	159	92	107	31.5	1,492	212	123	143	39.4	1,492	265	154	178	45.8	1,492
350	159	92	105	27.7	1,717	212	123	141	35.1	1,717	265	154	176	41.3	1,717
400	159	92	104	24.7	2,111	212	123	139	31.6	2,111	265	154	174	37.6	2,111
450	159	92	103	22.2	2,545	212	123	137	28.7	2,545	265	154	172	34.4	2,545
500	159	92	102	20.2	3,019	212	123	136	26.2	3,019	265	154	170	31.6	3,019
550	159	92	101	18.5	3,534	212	123	135	24.1	3,534	265	154	169	29.2	3,534
600	159	92	100	17.0	4,090	212	123	134	22.3	4,090	265	154	167	27.2	4,090
650	159	92	100	15.8	4,686	212	123	133	20.7	4,686	265	154	166	25.4	4,686
700	159	92	99	14.7	5,322	212	123	132	19.4	5,322	265	154	165	23.7	5,322
750	159	92	98	13.8	5,999	212	123	131	18.2	5,999	265	154	164	22.3	5,999
800	159	92	98	13.0	6,717	212	123	130	17.1	6,717	265	154	163	21.1	6,717
850	159	92	97	12.2	7,475	212	123	130	16.1	7,475	265	154	162	19.9	7,475
900	159	92	97	11.6	8,274	212	123	129	15.3	8,274	265	154	161	18.9	8,274
1000	159	92	96	10.4	9,993	212	123	128	13.8	9,993	265	154	160	17.1	9,993
1100	159	92	95	9.5	11,652	212	123	127	12.6	11,652	265	154	158	15.6	11,652
1200	159	92	94	8.7	13,623	212	123	126	11.6	13,623	265	154	157	14.4	13,623
1300	159	92	94	8.1	15,770	212	123	125	10.7	15,770	265	154	156	13.3	15,770
1400	159	92	93	7.5	18,074	212	123	124	10.0	18,074	265	154	155	12.4	18,074
1500	159	92	92	7.0	20,536	212	123	123	9.3	20,536	265	154	154	11.6	20,536

Recommended sizes
Additional possible sizes

Reduction of movement for expansion joints with PTFE lining:
axial compression: -33 %; axial extension: -66 %; lateral displacement: -50 %; angular movement: -66 %.
In the event of axial extension and simultaneous lateral displacement the above movements are reduced (▶ page 22).
Angular movement only possible with guided pressure support ring.
Larger movements on request.

Individual fabrication possible



B131 B141 B151
 ► with internal vacuum support rings

B134 B144 B154
 ► with internal vacuum support rings, with pressure support rings in the arch trough

Installation gap															
L ₀ = 600 mm – B131 B134						L ₀ = 800 mm – B141 B144					L ₀ = 1000 mm – B151 B154				
NB	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
	mm	mm	± mm	± °		mm	mm	± mm	± °		mm	mm	± mm	± °	
50	159	30	126	74.8	233	212	41	168	78.5	233	265	51	210	80.8	233
65	159	30	123	70.5	278	212	41	164	75.2	278	265	51	205	78.1	278
80	159	30	121	66.5	317	212	41	161	72.0	317	265	51	201	75.4	317
100	159	30	118	61.5	402	212	41	158	67.9	402	265	51	197	72.0	402
125	159	30	116	55.8	498	212	41	154	63.1	498	265	51	193	67.9	498
150	159	30	114	50.8	617	212	41	152	58.6	617	265	51	190	64.0	617
175	159	30	112	46.4	734	212	41	150	54.6	734	265	51	187	60.4	734
200	159	30	111	42.6	861	212	41	148	50.9	861	265	51	185	57.0	861
250	159	30	109	36.4	1,164	212	41	145	44.5	1,164	265	51	181	50.9	1,164
300	159	30	107	31.5	1,492	212	41	143	39.4	1,492	265	51	178	45.8	1,492
350	159	30	105	27.7	1,717	212	41	141	35.1	1,717	265	51	176	41.3	1,717
400	159	30	104	24.7	2,111	212	41	139	31.6	2,111	265	51	174	37.6	2,111
450	159	30	103	22.2	2,545	212	41	137	28.7	2,545	265	51	172	34.4	2,545
500	159	30	102	20.2	3,019	212	41	136	26.2	3,019	265	51	170	31.6	3,019
550	159	30	101	18.5	3,534	212	41	135	24.1	3,534	265	51	169	29.2	3,534
600	159	30	100	17.0	4,090	212	41	134	22.3	4,090	265	51	167	27.2	4,090
650	159	30	100	15.8	4,686	212	41	133	20.7	4,686	265	51	166	25.4	4,686
700	159	30	99	14.7	5,322	212	41	132	19.4	5,322	265	51	165	23.7	5,322
750	159	30	98	13.8	5,999	212	41	131	18.2	5,999	265	51	164	22.3	5,999
800	159	30	98	13.0	6,717	212	41	130	17.1	6,717	265	51	163	21.1	6,717
850	159	30	97	12.2	7,475	212	41	130	16.1	7,475	265	51	162	19.9	7,475
900	159	30	97	11.6	8,274	212	41	129	15.3	8,274	265	51	161	18.9	8,274
1000	159	30	96	10.4	9,993	212	41	128	13.8	9,993	265	51	160	17.1	9,993
1100	159	30	95	9.5	11,652	212	41	127	12.6	11,652	265	51	158	15.6	11,652
1200	159	30	94	8.7	13,623	212	41	126	11.6	13,623	265	51	157	14.4	13,623
1300	159	30	94	8.1	15,770	212	41	125	10.7	15,770	265	51	156	13.3	15,770
1400	159	30	93	7.5	18,074	212	41	124	10.0	18,074	265	51	155	12.4	18,074
1500	159	30	92	7.0	20,536	212	41	123	9.3	20,536	265	51	154	11.6	20,536

Recommended sizes
 Additional possible sizes

Reduction of movement for expansion joints with PTFE lining:
 axial compression: -33 %; axial extension: -0 %; lateral displacement: -50 %; angular movement: -0 %.
 In the event of axial extension and simultaneous lateral displacement the above movements are reduced (► page 22).
 Angular movement only possible with guided pressure support ring.
 Larger movements on request.

Individual fabrication possible

B132 B142 B152

► with embedded vacuum support rings



145

B135 B145 B155

► with embedded vacuum support rings, with pressure support rings in the arch trough



Installation gap															
L ₀ = 600 mm – B132 B135						L ₀ = 800 mm – B142 B145					L ₀ = 1000 mm – B152 B155				
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²
50	105	28	123	73.8	207	140	38	164	77.7	207	175	47	204	80.1	207
65	105	28	120	69.3	249	140	38	160	74.2	249	175	47	200	77.2	249
80	105	28	118	65.1	286	140	38	157	70.8	286	175	47	196	74.4	286
100	105	28	115	59.8	367	140	38	154	66.5	367	175	47	192	70.7	367
125	105	28	113	54.0	459	140	38	150	61.5	459	175	47	188	66.4	459
150	105	28	111	48.9	574	140	38	148	56.9	574	175	47	185	62.3	574
175	105	28	109	44.5	687	140	38	146	52.7	687	175	47	182	58.5	687
200	105	28	108	40.7	810	140	38	144	49.0	810	175	47	180	55.0	810
250	105	28	106	34.5	1,104	140	38	141	42.6	1,104	175	47	177	48.8	1,104
300	105	28	104	29.8	1,425	140	38	139	37.5	1,425	175	47	174	43.6	1,425
350	105	28	103	26.2	1,645	140	38	137	33.3	1,645	175	47	171	39.3	1,645
400	105	28	102	23.3	2,030	140	38	135	29.9	2,030	175	47	169	35.6	2,030
450	105	28	100	20.9	2,456	140	38	134	27.1	2,456	175	47	167	32.4	2,456
500	105	28	99	19.0	2,922	140	38	133	24.7	2,922	175	47	166	29.8	2,922
550	105	28	99	17.4	3,429	140	38	132	22.7	3,429	175	47	164	27.5	3,429
600	105	28	98	16.0	3,977	140	38	130	21.0	3,977	175	47	163	25.5	3,977
650	105	28	97	14.8	4,565	140	38	130	19.5	4,565	175	47	162	23.7	4,565
700	105	28	96	13.8	5,194	140	38	129	18.2	5,194	175	47	161	22.2	5,194
750	105	28	96	12.9	5,863	140	38	128	17.0	5,863	175	47	160	20.9	5,863
800	105	28	95	12.1	6,573	140	38	127	16.0	6,573	175	47	159	19.7	6,573
850	105	28	95	11.4	7,323	140	38	126	15.1	7,323	175	47	158	18.6	7,323
900	105	28	94	10.8	8,114	140	38	126	14.3	8,114	175	47	157	17.6	8,114
1000	105	28	93	9.8	9,817	140	38	125	13.0	9,817	175	47	156	16.0	9,817
1100	105	28	93	8.9	11,461	140	38	123	11.8	11,461	175	47	154	14.6	11,461
1200	105	28	92	8.2	13,417	140	38	123	10.9	13,417	175	47	153	13.4	13,417
1300	105	28	91	7.5	15,548	140	38	122	10.0	15,548	175	47	152	12.4	15,548
1400	105	28	91	7.0	17,837	140	38	121	9.3	17,837	175	47	151	11.5	17,837
1500	105	28	90	6.5	20,283	140	38	120	8.7	20,283	175	47	150	10.8	20,283

Recommended sizes

Additional possible sizes

Reduction of movement for expansion joints with PTFE lining:
axial compression: -0 %; axial extension: -0 %; lateral displacement: -0 %; angular movement: -0 %.
In the event of axial extension and simultaneous lateral displacement the above movements are reduced (► page 22).
Angular movement only possible with guided pressure support ring.
Larger movements on request.

Individual fabrication possible

UNIVERSAL
clamped fixing

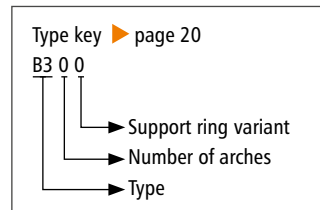
B130

B300

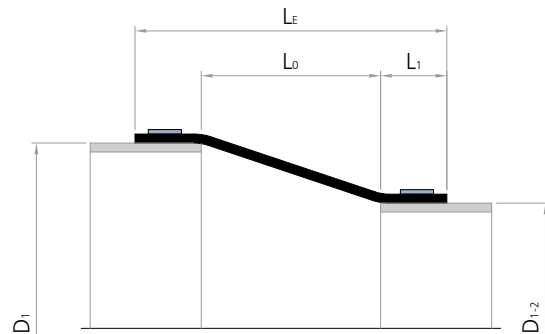
NB 50 – NB 4000



► Type B300



Planning help B300

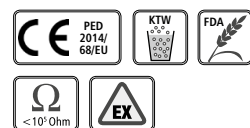


Conical universal expansion joint

- Design:** Conical-concentric rubber bellows with a sleeve for clamped fixing
- Nominal diameters:** Standard NB 80 to NB 4000, intermediate sizes or other nominal diameter combinations possible
- Installation length:** = Installation gap + 2 x fixing width
Standard installation gap L_0 = 75 to 2,100 mm (► page 148)
Other installation gaps on request
- Fixing width:** Depends on pressure, nominal diameter and clamp design, at least 40 mm
- Pressure:** Depending on the nominal diameter and installation length up to 1 bar, vacuum stability on request, Design in accordance with Pressure Equipment Directive PED 2014/68/EU
- Movement:** For slight axial compression and lateral movements (► page 148)
For axial extension or vacuums, the expansion joint can be drawn from the pipeline (groove as needed at the pipeline end)

Application:

Power plants, plant construction, food processing, wastewater treatment plants, industrial facilities, e.g. to disconnect pipelines, on oscillating conveyor systems, on sieving machines



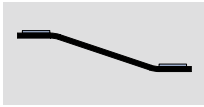
Assembly instruction download
www.ditec-adam.de/en/downloads.html

Rubber bellows

Rubber	Fabric	Marking	Max.	Application
EPDM	Nylon		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDM	Kevlar		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMht	Kevlar		120 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMtw	Nylon		100 °C	Drinking water
EPDMtw	Kevlar		100 °C	Drinking water
EPDMaf	Nylon		100 °C	Abrasive materials, water-sand extraction
EPDMaf	Kevlar		100 °C	Abrasive materials, water-sand extraction
EPDMbeige	Nylon		100 °C	Foodstuffs
EPDMbeige	Kevlar		100 °C	Foodstuffs
IIR	Nylon		100 °C	Hot water, acids, bases, gases
IIR	Kevlar		100 °C	Hot water, acids, bases, gases
CSM	Nylon		100 °C	Strong acids, bases, chemicals
CSM	Kevlar		100 °C	Strong acids, bases, chemicals
NBR	Nylon		100 °C	Oils, petrol, solvents, compressed air
NBR	Kevlar		100 °C	Oils, petrol, solvents, compressed air
NBRbeige	Nylon		100 °C	Oil, fatty foods
NBRbeige	Kevlar		100 °C	Oil, fatty foods
CR	Nylon		90 °C	Cooling water, slightly oily water, seawater
CR	Kevlar		90 °C	Cooling water, slightly oily water, seawater
FPM	Kevlar		180 °C	Corrosive chemicals, petroleum distillates
FPMbeige	Kevlar		180 °C	Oil, fatty foods
NR	Nylon		70 °C	Abrasive materials
Silicon	Kevlar or glass		200 °C	Air, saltwater atmosphere, foodstuffs, medical technology

Fastening clamps

Design:	Depending on pressure and nominal diameters, endless clamp belt, screw thread belt, small clamps or hinge bolt clamps. At higher pressures, 2 adjacent clamps per fastening side	
Width:	Endless clamp belt:	¾"
	Screw thread belt:	½"
	Small clamp:	depending on Ø: 9–12 mm
	Hinge bolt clamp:	depending on Ø: 18–30 mm
Materials:	Endless clamp belt with screw lugs (tongs):	1.7300
	Screw thread belt with threaded screw lugs:	1.4310
	Small clamp, belt and housing:	1.4016 (Screw steel galvanised)
	Hinge bolt clamp, belt and housing:	1.4016 (Screw steel galvanised)



B300

► concentric

Potential combination			Movement		
NB D ₁	NB D ₁₋₂	Gap mm			
100	80	60	1	0	2
125	80	135	2	0	4
	100	75	1	0	2
150	80	210	3	0	6
	100	150	2	0	4
	125	75	1	0	2
200	80	360	6	0	10
	100	300	5	0	8
	125	225	4	0	6
250	150	150	2	0	4
	80	510	8	0	13
	100	450	7	0	11
	125	375	6	0	9
	150	300	5	0	8
300	200	150	3	0	4
	80	660	11	0	16
	100	600	10	0	14
	125	525	9	0	13
	150	450	8	0	11
	200	300	5	0	7
350	250	150	3	0	4
	80	810	14	0	19
	100	750	13	0	17
	125	675	12	0	16
	150	600	10	0	14
	200	450	8	0	10
	250	300	5	0	7
400	300	150	3	0	3
	100	900	16	0	20
	125	825	15	0	18
	150	750	13	0	17
	200	600	11	0	13
	250	450	8	0	10
	300	300	6	0	7
500	350	150	3	0	3
	150	1050	19	0	22
	200	900	17	0	19
	250	750	14	0	16
	300	600	12	0	13
	350	450	9	0	10
	400	300	6	0	6
600	450	150	3	0	3
	200	1200	23	0	24
	250	1050	21	0	21
	300	900	18	0	18
	350	750	15	0	15
	400	600	12	0	12
	450	450	9	0	9
700	500	300	6	0	6
	250	1350	27	0	26
	300	1200	25	0	23
	350	1050	22	0	20
	400	900	19	0	17
	450	750	16	0	15
	500	600	13	0	12
800	600	300	7	0	6
	300	1500	32	0	28
	350	1350	29	0	25
	400	1200	26	0	23
	450	1050	23	0	20
	500	900	20	0	17
	600	600	13	0	11
700	700	300	7	0	6

Potential combination			Movement		
NB D ₁	NB D ₁₋₂	Gap mm			
900	350	1650	36	0	30
	400	1500	33	0	27
	450	1350	30	0	25
	500	1200	27	0	22
	600	900	21	0	16
	700	600	14	0	11
	800	300	7	0	5
1000	400	1800	40	0	32
	450	1650	37	0	29
	500	1500	34	0	27
	600	1200	28	0	21
	700	900	21	0	16
	800	600	14	0	11
	900	300	7	0	5
1100	450	1950	45	0	34
	500	1800	42	0	31
	600	1500	36	0	26
	700	1200	29	0	21
	800	900	22	0	16
	900	600	15	0	10
	1000	300	8	0	5
1200	500	2100	50	0	36
	600	1800	43	0	31
	700	1500	37	0	25
	800	1200	30	0	20
	900	900	23	0	15
	1000	600	15	0	10
	1100	300	8	0	5
1300	600	2100	52	0	35
	700	1800	45	0	30
	800	1500	38	0	25
	900	1200	31	0	20
	1000	900	23	0	15
	1100	600	16	0	10
	1200	300	8	0	5
1400	700	2100	53	0	34
	800	1800	46	0	29
	900	1500	39	0	25
	1000	1200	32	0	20
	1100	900	24	0	15
	1200	600	16	0	10
	1300	300	8	0	5
1500	800	2100	55	0	34
	900	1800	47	0	29
	1000	1500	40	0	24
	1100	1200	32	0	19
	1200	900	25	0	14
	1300	600	17	0	10
	1400	300	8	0	5
1600	900	2100	56	0	33
	1000	1800	49	0	28
	1100	1500	41	0	24
	1200	1200	33	0	19
	1300	900	25	0	14
	1400	600	17	0	9
	1500	300	9	0	5

The specified movements may vary depending on the design pressure.

Individual fabrication possible

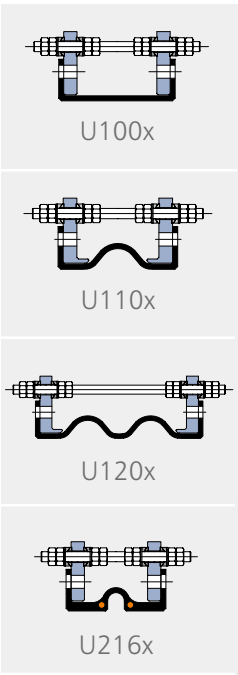


Universal expansion joint, type B310
as a drum connection
NB 900 / NB 650, 0.1 bar



Lateral expansion joints with full faced rubber flange

U100x	without arch	▶ 152
U110x	with one arch	▶ 158
U120x	with two arches	▶ 168
U216x	with an arch and support rings at the arch foot	▶ 178

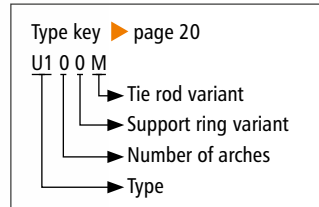


U100x (B/E/C/M/R/K/L)

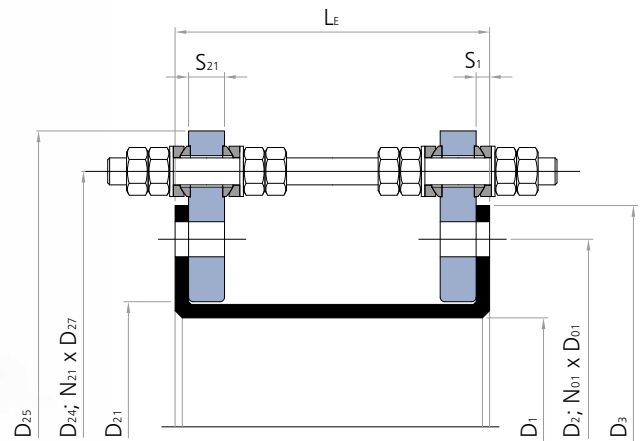
NB 100 – NB 4000



► Type U100x (B/E/C/M/R/K/L)



Planning help U100M



Lateral expansion joint without arch

Design: Hydrodynamic, cylindrical rubber bellows with full faced rubber flanges and single or multi-part backing flanges with tie rods
Optionally with embedded pressure or vacuum support rings

Nominal diameters: NB 100 to NB 4000, intermediate sizes possible

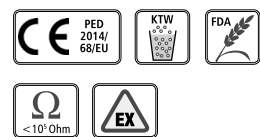
Installation length: Standard $L_E = 150$ to 400 mm (► page 156–157)
Other installation lengths on request

Pressure: Depending on the nominal diameter and installation length up to 16 bar
Vacuum stability on request. Design in accordance with Pressure Equipment Directive PED 2014/68/EU

Movement: For slight axial and lateral movements (► page 156–157)
Installation gap tolerances possible in the context of axial compression and extension

Application:

Plant construction, sand/
gravel extraction
industry, dredgers, food
processing e.g. as suction/
pressure hoses, in conveyor
lines, on pumps and vessels



Assembly instruction download
www.ditec-adam.de/en/downloads.html

Rubber bellows

Rubber	Fabric	Marking	Max.	Application
EPDM	Nylon		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDM	Kevlar		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMht	Kevlar		120 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMtw	Nylon		100 °C	Drinking water
EPDMtw	Kevlar		100 °C	Drinking water
EPDMaf	Nylon		100 °C	Abrasive materials, water-sand extraction
EPDMaf	Kevlar		100 °C	Abrasive materials, water-sand extraction
EPDMbeige	Nylon		100 °C	Foodstuffs
EPDMbeige	Kevlar		100 °C	Foodstuffs
IIR	Nylon		100 °C	Hot water, acids, bases, gases
IIR	Kevlar		100 °C	Hot water, acids, bases, gases
CSM	Nylon		100 °C	Strong acids, bases, chemicals
CSM	Kevlar		100 °C	Strong acids, bases, chemicals
NBR	Nylon		100 °C	Oils, petrol, solvents, compressed air
NBR	Kevlar		100 °C	Oils, petrol, solvents, compressed air
NBRbeige	Nylon		100 °C	Oil, fatty foods
NBRbeige	Kevlar		100 °C	Oil, fatty foods
CR	Nylon		90 °C	Cooling water, slightly oily water, seawater
CR	Kevlar		90 °C	Cooling water, slightly oily water, seawater
FPM	Kevlar		180 °C	Corrosive chemicals, petroleum distillates
FPMbeige	Kevlar		180 °C	Oil, fatty foods
NR	Nylon		70 °C	Abrasive materials
Silicon	Kevlar or glass		200 °C	Air, saltwater atmosphere, foodstuffs, medical technology

PTFE-lining: Permanently embedded against chemical attacks on the interior at the rubber bellows, available starting at NB 300. Take the restriction of the listed movement into account (▶ page 156–157)

Flanges

- Design:

Single-part or multi-part backing flanges with clearance holes and holder for tie rods (control unit type B, E, C, M)

Single-part or multi-part round backing flanges with clearance holes and control unit plates (control unit type R, K, L)
- Flange norms:

DIN, EN, ANSI, AWWA, BS, JIS, special measurements (▶ page 256)
- Materials:

Carbon steel: 1.0038 (S235JRG2)
1.0570 (S355J2G3)

Stainless steel: 1.4301 (X5CrNi18-10)
1.4571 (X6CrNiMoTi17-12-2)

Aluminium: AlMg3

Other materials on request
- Coating:

Primed, hot-dip galvanised, special paint

Optional accessories

- Protective hood:

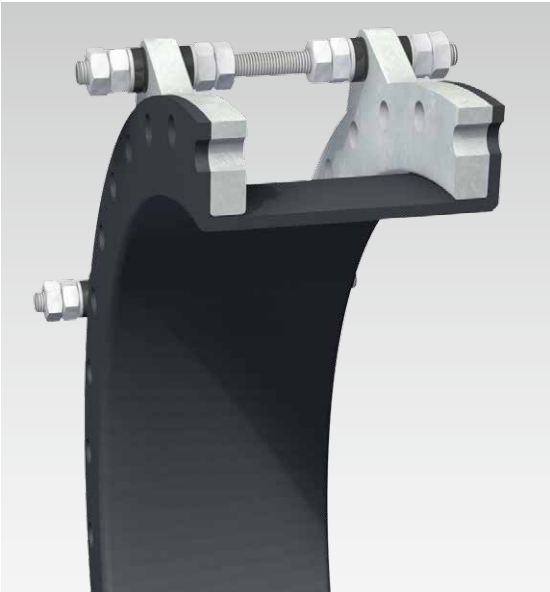
UV protection cover, ground protective cover, fire protection cover, splash protective cover (▶ page 44)
- Flow liners:

Cylindrical flow liner, conical flow liner, telescoping flow liner (▶ page 43)

LATERAL
rubber flange

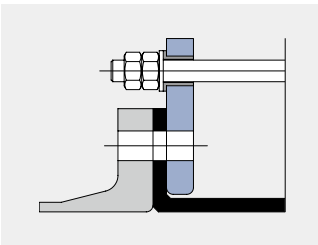
U100x

Tie rods

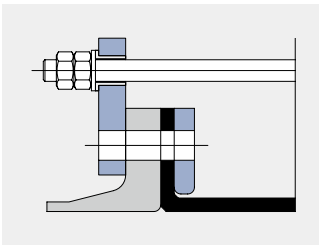


Example: Type U100M

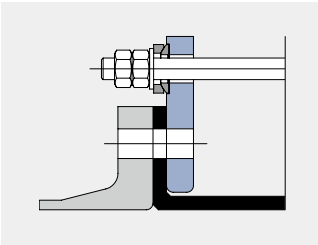
- Design:** Dimensioning according to design pressure (test pressure) based on the Pressure Equipment Directive
- Materials:** Carbon steel in strength class 8.8 or stainless steel
- Coating:** Spherical bearings and ball disks PTFE-coated
Tie rods galvanised, hot-dip galvanised or PTFE-coated



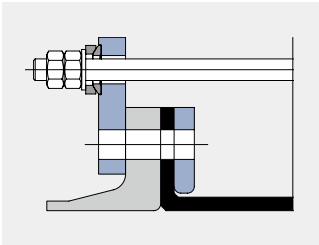
Type U100B
Tie rods mounted outside in rubber bushing to accommodate reaction forces in the event of pressure (up to NB 300)



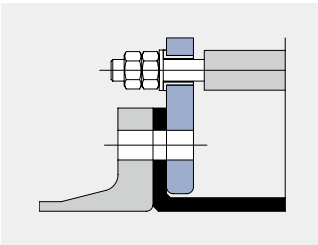
Type U100R
Control unit plates: Tie rods mounted outside in rubber bushing to accommodate reaction forces in the event of pressure (up to NB 300)



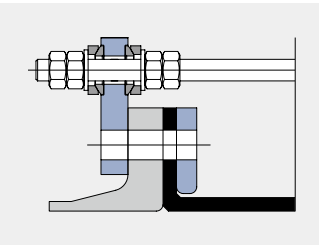
Type U100E
Tie rods mounted outside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure



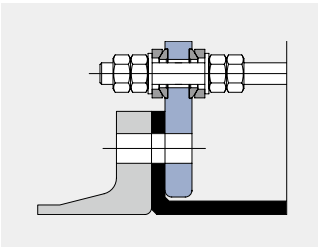
Type U100K
Control unit plates: Tie rods mounted outside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure



Type U100C
Tie rods mounted outside in rubber bushing and inside in the thrust limiter to accommodate stresses in the event of pressure and vacuum (up to NB 300)



Type U100L
Control unit plates: Tie rods mounted outside and inside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure and vacuum



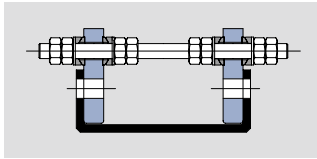
Type U100M
Tie rods mounted outside and inside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure and vacuum



Large bore lateral rubber expansion joint, type U110M
GRP pipe DN 3600 of a utility plant
work-shop hydraulic test at 13 bar

U100x

LATERAL
rubber flange



U100x (B/E/C/M/R/K/L)

► without arch

Installation length (L _E) at design pressure															
	up to 10 bar L _E = 150 mm					up to 10 bar L _E = 200 mm					up to 10 bar L _E = 250 mm				
	higher pressures on request														
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²
100	8	5	10	0	79	10	6	13	0	79	13	8	17	0	79
125	8	5	10	0	123	10	6	13	0	123	13	8	16	0	123
150	8	5	9	0	177	10	6	12	0	177	13	8	15	0	177
175	8	5	9	0	254	10	6	12	0	254	13	8	15	0	254
200	8	5	9	0	314	10	6	12	0	314	13	8	14	0	314
250	8	5	8	0	491	10	6	11	0	491	13	8	14	0	491
300	8	5	8	0	716	10	6	11	0	716	13	8	13	0	716
350	8	5	8	0	990	10	6	10	0	990	13	8	13	0	990
400	8	5	8	0	1,269	10	6	10	0	1,269	13	8	13	0	1,269
450	8	5	7	0	1,612	10	6	10	0	1,612	13	8	12	0	1,612
500	8	5	7	0	1,987	10	6	10	0	1,987	13	8	12	0	1,987
550	8	5	7	0	2,376	10	6	9	0	2,376	13	8	12	0	2,376
600	8	5	7	0	2,856	10	6	9	0	2,856	13	8	12	0	2,856
650	8	5	7	0	3,318	10	6	9	0	3,318	13	8	11	0	3,318
700	8	5	7	0	3,893	10	6	9	0	3,893	13	8	11	0	3,893
750	8	5	7	0	4,418	10	6	9	0	4,418	13	8	11	0	4,418
800	8	5	7	0	5,090	10	6	9	0	5,090	13	8	11	0	5,090
850	8	5	6	0	5,675	10	6	9	0	5,675	13	8	11	0	5,675
900	8	5	6	0	6,433	10	6	9	0	6,433	13	8	11	0	6,433
950	8	5	6	0	7,088	10	6	8	0	7,088	13	8	11	0	7,088
1000	8	5	6	0	7,933	10	6	8	0	7,933	13	8	10	0	7,933
1050	8	5	6	0	8,659	10	6	8	0	8,659	13	8	10	0	8,659
1100	8	5	6	0	9,607	10	6	8	0	9,607	13	8	10	0	9,607
1150	8	5	6	0	10,387	10	6	8	0	10,387	13	8	10	0	10,387
1200	8	5	6	0	11,404	10	6	8	0	11,404	13	8	10	0	11,404
1250	8	5	6	0	12,272	10	6	8	0	12,272	13	8	10	0	12,272
1300	8	5	6	0	13,376	10	6	8	0	13,376	13	8	10	0	13,376
1350	8	5	6	0	14,314	10	6	8	0	14,314	13	8	10	0	14,314
1400	8	5	6	0	15,504	10	6	8	0	15,504	13	8	10	0	15,504
1450	8	5	6	0	16,513	10	6	8	0	16,513	13	8	10	0	16,513
1500	8	5	6	0	17,789	10	6	8	0	17,789	13	8	10	0	17,789
1600	8	5	6	0	20,232	10	6	8	0	20,232	13	8	10	0	20,232
1650	8	5	6	0	21,382	10	6	8	0	21,382	13	8	9	0	21,382
1700	8	5	6	0	22,832	10	6	8	0	22,832	13	8	9	0	22,832
1800	8	5	6	0	25,617	10	6	7	0	25,617	13	8	9	0	25,617
1900	8	5	6	0	28,502	10	6	7	0	28,502	13	8	9	0	28,502
1950	8	5	5	0	29,865	10	6	7	0	29,865	13	8	9	0	29,865
2000	8	5	5	0	31,573	10	6	7	0	31,573	13	8	9	0	31,573
2100	8	5	5	0	34,801	10	6	7	0	34,801	13	8	9	0	34,801
2200	8	5	5	0	38,186	10	6	7	0	38,186	13	8	9	0	38,186
2250	8	5	5	0	39,761	10	6	7	0	39,761	13	8	9	0	39,761
2300	8	5	5	0	41,728	10	6	7	0	41,728	13	8	9	0	41,728
2400	8	5	5	0	45,428	10	6	7	0	45,428	13	8	9	0	45,428
2500	8	5	5	0	49,284	10	6	7	0	49,284	13	8	9	0	49,284
2550	8	5	5	0	51,071	10	6	7	0	51,071	13	8	9	0	51,071
2600	8	5	5	0	53,297	10	6	7	0	53,297	13	8	9	0	53,297
2700	8	5	5	0	57,468	10	6	7	0	57,468	13	8	9	0	57,468
2800	8	5	5	0	61,795	10	6	7	0	61,795	13	8	9	0	61,795
2850	8	5	5	0	63,794	10	6	7	0	63,794	13	8	8	0	63,794
2900	8	5	5	0	66,280	10	6	7	0	66,280	13	8	8	0	66,280
3000	8	5	5	0	70,922	10	6	7	0	70,922	13	8	8	0	70,922
3100	8	5	5	0	75,720	10	6	7	0	75,720	13	8	8	0	75,720
3150	8	5	5	0	77,931	10	6	7	0	77,931	13	8	8	0	77,931
3200	8	5	5	0	80,676	10	6	7	0	80,676	13	8	8	0	80,676
3300	8	5	5	0	85,789	10	6	7	0	85,789	13	8	8	0	85,789
3400	8	5	5	0	91,059	10	6	7	0	91,059	13	8	8	0	91,059
3450	8	5	5	0	93,482	10	6	7	0	93,482	13	8	8	0	93,482
3600	8	5	5	0	102,071	10	6	6	0	102,071	13	8	8	0	102,071
3800	8	5	5	0	113,710	10	6	6	0	113,710	13	8	8	0	113,710
4000	8	5	5	0	125,978	10	6	6	0	125,978	13	8	8	0	125,978

Recommended sizes

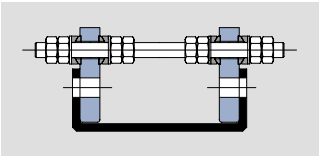
Additional possible sizes

Reduction of movement for expansion joints with PTFE lining:

axial compression: -33 %; axial extension: -66 %; lateral displacement: -50 %.

Larger movements see type U110x.

U100x (B/E/C/M/R/K/L)
► without arch



Installation length (L _E) at design pressure															
up to 10 bar L _E = 300 mm					up to 10 bar L _E = 350 mm					up to 10 bar L _E = 400 mm					
					higher pressures on request										
Movement				A	Movement				A	Movement				A	NB
mm	mm	±mm	±°	cm²	mm	mm	±mm	±°	cm²	mm	mm	±mm	±°	cm²	
15	9	20	0	79	18	11	23	0	79	20	12	27	0	79	100
15	9	19	0	123	18	11	22	0	123	20	12	25	0	123	125
15	9	18	0	177	18	11	21	0	177	20	12	24	0	177	150
15	9	18	0	254	18	11	21	0	254	20	12	24	0	254	175
15	9	17	0	314	18	11	20	0	314	20	12	23	0	314	200
15	9	17	0	491	18	11	19	0	491	20	12	22	0	491	250
15	9	16	0	716	18	11	19	0	716	20	12	21	0	716	300
15	9	15	0	990	18	11	18	0	990	20	12	21	0	990	350
15	9	15	0	1,269	18	11	18	0	1,269	20	12	20	0	1,269	400
15	9	15	0	1,612	18	11	17	0	1,612	20	12	20	0	1,612	450
15	9	14	0	1,987	18	11	17	0	1,987	20	12	19	0	1,987	500
15	9	14	0	2,376	18	11	17	0	2,376	20	12	19	0	2,376	550
15	9	14	0	2,856	18	11	16	0	2,856	20	12	19	0	2,856	600
15	9	14	0	3,318	18	11	16	0	3,318	20	12	18	0	3,318	650
15	9	13	0	3,893	18	11	16	0	3,893	20	12	18	0	3,893	700
15	9	13	0	4,418	18	11	16	0	4,418	20	12	18	0	4,418	750
15	9	13	0	5,090	18	11	15	0	5,090	20	12	18	0	5,090	800
15	9	13	0	5,675	18	11	15	0	5,675	20	12	17	0	5,675	850
15	9	13	0	6,433	18	11	15	0	6,433	20	12	17	0	6,433	900
15	9	13	0	7,088	18	11	15	0	7,088	20	12	17	0	7,088	950
15	9	13	0	7,933	18	11	15	0	7,933	20	12	17	0	7,933	1000
15	9	12	0	8,659	18	11	15	0	8,659	20	12	17	0	8,659	1050
15	9	12	0	9,607	18	11	14	0	9,607	20	12	16	0	9,607	1100
15	9	12	0	10,387	18	11	14	0	10,387	20	12	16	0	10,387	1150
15	9	12	0	11,404	18	11	14	0	11,404	20	12	16	0	11,404	1200
15	9	12	0	12,272	18	11	14	0	12,272	20	12	16	0	12,272	1250
15	9	12	0	13,376	18	11	14	0	13,376	20	12	16	0	13,376	1300
15	9	12	0	14,314	18	11	14	0	14,314	20	12	16	0	14,314	1350
15	9	12	0	15,504	18	11	14	0	15,504	20	12	16	0	15,504	1400
15	9	12	0	16,513	18	11	14	0	16,513	20	12	16	0	16,513	1450
15	9	12	0	17,789	18	11	14	0	17,789	20	12	15	0	17,789	1500
15	9	11	0	20,232	18	11	13	0	20,232	20	12	15	0	20,232	1600
15	9	11	0	21,382	18	11	13	0	21,382	20	12	15	0	21,382	1650
15	9	11	0	22,832	18	11	13	0	22,832	20	12	15	0	22,832	1700
15	9	11	0	25,617	18	11	13	0	25,617	20	12	15	0	25,617	1800
15	9	11	0	28,502	18	11	13	0	28,502	20	12	15	0	28,502	1900
15	9	11	0	29,865	18	11	13	0	29,865	20	12	15	0	29,865	1950
15	9	11	0	31,573	18	11	13	0	31,573	20	12	15	0	31,573	2000
15	9	11	0	34,801	18	11	13	0	34,801	20	12	14	0	34,801	2100
15	9	11	0	38,186	18	11	13	0	38,186	20	12	14	0	38,186	2200
15	9	11	0	39,761	18	11	12	0	39,761	20	12	14	0	39,761	2250
15	9	11	0	41,728	18	11	12	0	41,728	20	12	14	0	41,728	2300
15	9	11	0	45,428	18	11	12	0	45,428	20	12	14	0	45,428	2400
15	9	10	0	49,284	18	11	12	0	49,284	20	12	14	0	49,284	2500
15	9	10	0	51,071	18	11	12	0	51,071	20	12	14	0	51,071	2550
15	9	10	0	53,297	18	11	12	0	53,297	20	12	14	0	53,297	2600
15	9	10	0	57,468	18	11	12	0	57,468	20	12	14	0	57,468	2700
15	9	10	0	61,795	18	11	12	0	61,795	20	12	14	0	61,795	2800
15	9	10	0	63,794	18	11	12	0	63,794	20	12	14	0	63,794	2850
15	9	10	0	66,280	18	11	12	0	66,280	20	12	14	0	66,280	2900
15	9	10	0	70,922	18	11	12	0	70,922	20	12	13	0	70,922	3000
15	9	10	0	75,720	18	11	12	0	75,720	20	12	13	0	75,720	3100
15	9	10	0	77,931	18	11	12	0	77,931	20	12	13	0	77,931	3150
15	9	10	0	80,676	18	11	12	0	80,676	20	12	13	0	80,676	3200
15	9	10	0	85,789	18	11	12	0	85,789	20	12	13	0	85,789	3300
15	9	10	0	91,059	18	11	11	0	91,059	20	12	13	0	91,059	3400
15	9	10	0	93,482	18	11	11	0	93,482	20	12	13	0	93,482	3450
15	9	10	0	102,071	18	11	11	0	102,071	20	12	13	0	102,071	3600
15	9	10	0	113,710	18	11	11	0	113,710	20	12	13	0	113,710	3800
15	9	10	0	125,978	18	11	11	0	125,978	20	12	13	0	125,978	4000

LATERAL
rubber flange

U100x

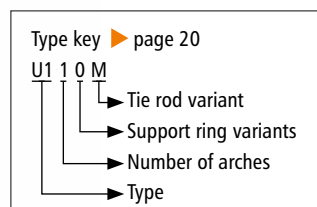
Individual fabrication possible

U110x (B/E/C/M/R/K/L)

NB 100 – NB 4000



- **Type U110x** (B/E/C/M/R/K/L)
without vacuum support ring
- **Type U111x** (B/E/C/M/R/K/L)
with internal vacuum support ring
- **Type U112x** (B/E/C/M/R/K/L)
with embedded vacuum support ring



Lateral expansion joint with one arch

Design: Highly elastic, hydrodynamic, single-arch rubber bellows with full faced rubber flanges and backing flanges with support collar and tie rods
Optionally with vacuum support ring

Nominal diameters: NB 100 to NB 4000, intermediate sizes possible

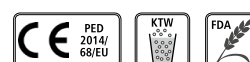
Installation length: Standard $L_E = 200$ to 500 mm (► page 162–167)
Other installation lengths on request

Pressure: Depending on the nominal diameter up to 40 bar
Vacuum stability on request, with vacuum support ring up to 0.05 bar absolute
Design in accordance with Pressure Equipment Directive PED 2014/68/EU

Movement: For lateral movements
Installation gap tolerances possible in the context of axial compression and extension (► page 162–167)

Stiffness rate: Lateral stiffness rates (► page 254)

Application:
Cooling water systems,
desalination plants,
drinking water supply, plant
constructions e. g. in pipelines,
on pumps,
as dismantling joints, on
condensers and vessels



Assembly instruction download
www.ditec-adam.de/en/downloads.html

Rubber bellows

Rubber	Fabric	Marking	Max.	Application
EPDM	Nylon		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDM	Kevlar		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMht	Kevlar		120 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMtw	Nylon		100 °C	Drinking water
EPDMtw	Kevlar		100 °C	Drinking water
EPDMaf	Nylon		100 °C	Abrasive materials, water-sand extraction
EPDMaf	Kevlar		100 °C	Abrasive materials, water-sand extraction
EPDMbeige	Nylon		100 °C	Foodstuffs
EPDMbeige	Kevlar		100 °C	Foodstuffs
IIR	Nylon		100 °C	Hot water, acids, bases, gases
IIR	Kevlar		100 °C	Hot water, acids, bases, gases
CSM	Nylon		100 °C	Strong acids, bases, chemicals
CSM	Kevlar		100 °C	Strong acids, bases, chemicals
NBR	Nylon		100 °C	Oils, petrol, solvents, compressed air
NBR	Kevlar		100 °C	Oils, petrol, solvents, compressed air
NBRbeige	Nylon		100 °C	Oil, fatty foods
NBRbeige	Kevlar		100 °C	Oil, fatty foods
CR	Nylon		90 °C	Cooling water, slightly oily water, seawater
CR	Kevlar		90 °C	Cooling water, slightly oily water, seawater
FPM	Kevlar		180 °C	Corrosive chemicals, petroleum distillates
FPMbeige	Kevlar		180 °C	Oil, fatty foods
NR	Nylon		70 °C	Abrasive materials
Silicon	Kevlar or glass		200 °C	Air, saltwater atmosphere, foodstuffs, medical technology

PTFE-lining: Permanently embedded against chemical attacks on the interior at the rubber bellows, available starting at NB 300. Take the restriction of the listed movement into account (▶ page 162–167)

LATERAL
rubber flange

Flanges

- Design:

Single-part or multi-part backing flanges with support collar, clearance holes and holder for tie rods (control unit type B, E, C, M)

Single-part or multi-part round backing flanges with support collar, clearance holes and control unit plates (control unit type R, K, L)
- Flange norms:

DIN, EN, ANSI, AWWA, BS, JIS, special measurements (▶ page 256)
- Materials:

Carbon steel: 1.0038 (S235JRG2)
1.0570 (S355J2G3)

Stainless steel: 1.4301 (X5CrNi18-10)
1.4571 (X6CrNiMoTi17-12-2)

Aluminium: AlMg3

Other materials on request
- Coating:

Primed, hot-dip galvanised, special paint

U110x

Optional accessories

- Protective hood:

UV protection cover, ground protective cover, fire protection cover, splash protective cover (▶ page 44)
- Flow liners:

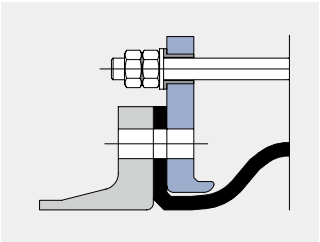
Cylindrical flow liner, conical flow liner, telescoping flow liner (▶ page 43)

Tie rods

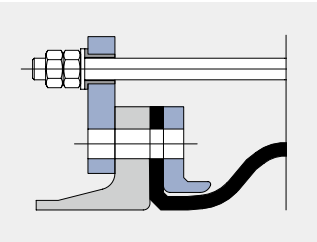


Example: Type U110M

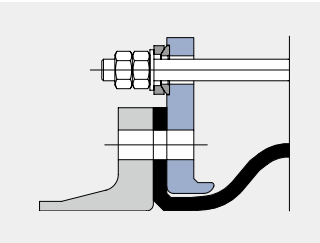
- Design:** Dimensioning according to design pressure (test pressure) based on the Pressure Equipment Directive
- Materials:** Carbon steel in strength class 8.8 or stainless steel
- Coating:** Spherical bearings and ball disks PTFE-coated
Tie rods galvanised, hot-dip galvanised or PTFE-coated



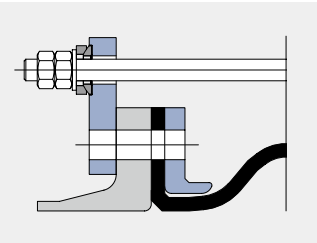
Type U110B
Tie rods mounted outside in rubber bushing to accommodate reaction forces in the event of pressure (up to NB 300)



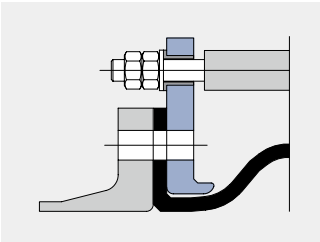
Type U110R
Control unit plates: Tie rods mounted outside in rubber bushing to accommodate reaction forces in the event of pressure (up to NB 300)



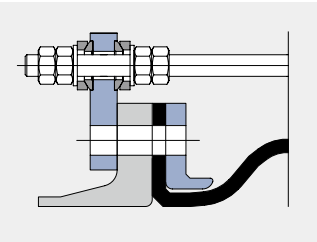
Type U110E
Tie rods mounted outside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure



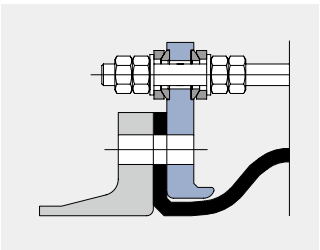
Type U110K
Control unit plates: Tie rods mounted outside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure



Type U110C
Tie rods mounted outside in rubber bushing and inside in the thrust limiter to accommodate stresses in the event of pressure and vacuum (up to NB 300)



Type U110L
Control unit plates: Tie rods mounted outside and inside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure and vacuum



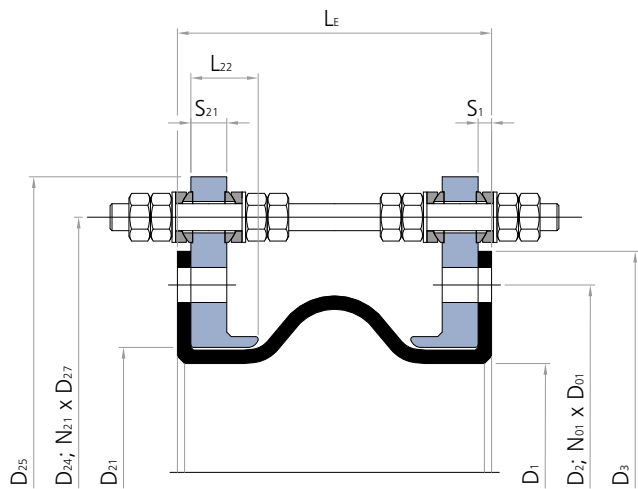
Type U110M
Tie rods mounted outside and inside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure and vacuum

Support rings

TYPE		Vacuum support ring	Pressure	Movement
U110x (B/E/C/M/ R/K/L)		Without	Depending on the nominal diameter up to 40 bar, vacuum stability on request	▶ page 162–163
U111x (B/E/C/M/ R/K/L)		Medium contact, inside the arch apex	Depending on the nominal diameter up to 40 bar, for vacuum up to 0.05 bar absolute	▶ page 164–165
U112x (B/E/C/M/ R/K/L)		No medium contact, embedded into the arch apex of the rubber bellows	Depending on the nominal diameter up to 25 bar, for vacuum up to 0.05 bar absolute	▶ page 166–167

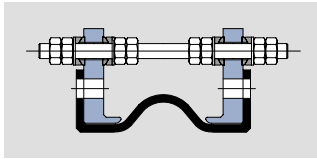
Materials		
Stainless steel:	1.4301 (X5CrNi18-10) 1.4539 (X1NiCrMoCu25-20-5) 1.4571 (X6CrNiMoTi17-12-2)	Other materials on request
Carbon steel:	1.0570 (S355J2G3) rubber coated	

Planning help U110M



U110x

LATERAL
rubber flange



U110x (B/E/C/M/R/K/L)

► without vacuum support ring

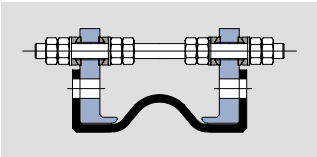
Installation length (L_E) at design pressure

NB	up to 4 bar $L_E = 200$ mm up to 6 bar $L_E = 200$ mm up to 10 bar $L_E = 250$ mm					up to 4 bar $L_E = 200$ mm up to 6 bar $L_E = 250$ mm up to 10 bar $L_E = 300$ mm					up to 4 bar $L_E = 250$ mm up to 6 bar $L_E = 300$ mm up to 10 bar $L_E = 350$ mm				
	higher pressures on request					higher pressures on request					higher pressures on request				
	Movement				A	Movement				A	Movement				A
	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²
100	26	11	18	0	177	31	10	19	0	177	40	20	28	0	254
125	26	11	17	0	241	31	10	19	0	241	40	20	28	0	330
150	26	11	17	0	314	31	10	18	0	314	40	20	27	0	415
175	26	11	17	0	415	31	10	18	0	415	40	20	27	0	531
200	26	11	17	0	491	31	10	18	0	491	40	20	26	0	616
250	26	11	16	0	707	31	10	18	0	707	40	20	26	0	855
300	26	11	16	0	973	31	10	17	0	973	40	20	26	0	1,146
350	26	11	16	0	1,288	31	10	17	0	1,288	40	20	25	0	1,486
400	26	11	16	0	1,605	31	10	17	0	1,605	40	20	25	0	1,825
450	26	11	15	0	1,987	31	10	17	0	1,987	40	20	25	0	2,231
500	26	11	15	0	2,402	31	10	17	0	2,402	40	20	24	0	2,669
550						31	10	16	0	2,827	40	20	24	0	3,117
600						31	10	16	0	3,349	40	20	24	0	3,664
650						31	10	16	0	3,848	40	20	24	0	4,185
700						31	10	16	0	4,465	40	20	24	0	4,827
750						31	10	16	0	5,027	40	20	23	0	5,411
800						31	10	16	0	5,741	40	20	23	0	6,151
850						31	10	16	0	6,362	40	20	23	0	6,793
900						31	10	16	0	7,163	40	20	23	0	7,620
950						31	10	16	0	7,854	40	20	23	0	8,332
1000						31	10	16	0	8,742	40	20	23	0	9,246
1050											40	20	23	0	10,029
1100											40	20	23	0	11,047
1150											40	20	23	0	11,882
1200											40	20	22	0	12,969
1250											40	20	22	0	13,893
1300											40	20	22	0	15,066
1350											40	20	22	0	16,061
1400											40	20	22	0	17,320
1450											40	20	22	0	18,385
1500											40	20	22	0	19,731
1600											40	20	22	0	22,299
1650											40	20	22	0	23,506
1700											40	20	22	0	25,025
1800											40	20	22	0	27,937
1900											40	20	22	0	30,946
1950											40	20	22	0	32,365
2000											40	20	21	0	34,143
2100															
2200															
2250															
2300															
2400															
2500															
2550															
2600															
2700															
2800															
2850															
2900															
3000															
3100															
3150															
3200															
3300															
3400															
3450															
3600															
3800															
4000															

Recommended sizes
Additional possible sizes

Reduction of movement for expansion joints with PTFE lining:
axial compression: -33 %; axial extension: -66 %; lateral displacement: -50 %.
In the event of lateral displacement and simultaneous axial extension (due to installation gap tolerance) the above movements are reduced (► page 22). For larger movements see type U120x.

U110x (B/E/C/M/R/K/L)
► without vacuum support ring

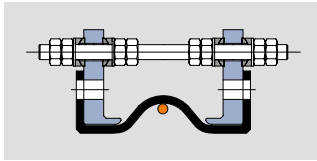


Installation length (L _E) at design pressure																
up to 4 bar L _E = 300 mm up to 6 bar L _E = 350 mm up to 10 bar L _E = 400 mm					up to 4 bar L _E = 350 mm up to 6 bar L _E = 400 mm up to 10 bar L _E = 450 mm					up to 4 bar L _E = 400 mm up to 6 bar L _E = 450 mm up to 10 bar L _E = 500 mm						
higher pressures on request																
Movement				A	Movement				A	Movement				A	NB	
mm	mm	± mm	± °	cm²	mm	mm	± mm	± °	cm²	mm	mm	± mm	± °	cm²		
44	20	30	0	260	53	31	39	0	353	69	43	53	0	491	100	
44	20	30	0	337	53	31	39	0	441	69	43	51	0	594	125	
44	20	29	0	423	53	31	38	0	539	69	43	51	0	707	150	
44	20	29	0	539	53	31	37	0	670	69	43	50	0	855	175	
44	20	29	0	625	53	31	37	0	765	69	43	49	0	962	200	
44	20	28	0	866	53	31	36	0	1,029	69	43	48	0	1,257	250	
44	20	27	0	1,158	53	31	36	0	1,346	69	43	48	0	1,605	300	
44	20	27	0	1,500	53	31	35	0	1,713	69	43	47	0	2,003	350	
44	20	27	0	1,840	53	31	35	0	2,075	69	43	46	0	2,393	400	
44	20	26	0	2,248	53	31	34	0	2,507	69	43	46	0	2,856	450	
44	20	26	0	2,688	53	31	34	0	2,971	69	43	45	0	3,349	500	
44	20	26	0	3,137	53	31	34	0	3,442	69	43	45	0	3,848	550	
44	20	26	0	3,685	53	31	33	0	4,015	69	43	45	0	4,453	600	
44	20	26	0	4,208	53	31	33	0	4,560	69	43	44	0	5,027	650	
44	20	25	0	4,852	53	31	33	0	5,230	69	43	44	0	5,728	700	
44	20	25	0	5,437	53	31	33	0	5,836	69	43	44	0	6,362	750	
44	20	25	0	6,179	53	31	33	0	6,604	69	43	43	0	7,163	800	
44	20	25	0	6,822	53	31	32	0	7,268	69	43	43	0	7,854	850	
44	20	25	0	7,651	53	31	32	0	8,123	69	43	43	0	8,742	900	
44	20	25	0	8,365	53	31	32	0	8,858	69	43	43	0	9,503	950	
44	20	25	0	9,280	53	31	32	0	9,799	69	43	43	0	10,477	1000	
44	20	25	0	10,064	53	31	32	0	10,605	69	43	42	0	11,310	1050	
44	20	24	0	11,085	53	31	32	0	11,652	69	43	42	0	12,390	1100	
44	20	24	0	11,921	53	31	32	0	12,509	69	43	42	0	13,273	1150	
44	20	24	0	13,009	53	31	31	0	13,623	69	43	42	0	14,420	1200	
44	20	24	0	13,935	53	31	31	0	14,569	69	43	42	0	15,394	1250	
44	20	24	0	15,109	53	31	31	0	15,770	69	43	42	0	16,627	1300	
44	20	24	0	16,106	53	31	31	0	16,787	69	43	41	0	17,671	1350	
44	20	24	0	17,366	53	31	31	0	18,074	69	43	41	0	18,991	1400	
44	20	24	0	18,433	53	31	31	0	19,162	69	43	41	0	20,106	1450	
44	20	24	0	19,781	53	31	31	0	20,536	69	43	41	0	21,512	1500	
44	20	24	0	22,352	53	31	31	0	23,154	69	43	41	0	24,190	1600	
44	20	24	0	23,561	53	31	31	0	24,384	69	43	41	0	25,447	1650	
44	20	23	0	25,081	53	31	30	0	25,930	69	43	41	0	27,026	1700	
44	20	23	0	27,996	53	31	30	0	28,893	69	43	40	0	30,049	1800	
44	20	23	0	31,009	53	31	30	0	31,952	69	43	40	0	33,168	1900	
44	20	23	0	32,429	53	31	30	0	33,394	69	43	40	0	34,636	1950	
44	20	23	0	34,209	53	31	30	0	35,199	69	43	40	0	36,474	2000	
44	20	23	0	37,565	53	31	30	0	38,603	69	43	40	0	39,938	2100	
44	20	23	0	41,079	53	31	30	0	42,164	69	43	40	0	43,558	2200	
44	20	23	0	42,712	53	31	30	0	43,818	69	43	40	0	45,239	2250	
44	20	23	0	44,750	53	31	30	0	45,882	69	43	40	0	47,336	2300	
44	20	23	0	48,578	53	31	29	0	49,757	69	43	39	0	51,271	2400	
44	20	23	0	52,563	53	31	29	0	53,789	69	43	39	0	55,363	2500	
44	20	23	0	54,408	53	31	29	0	55,655	69	43	39	0	57,256	2550	
44	20	23	0	56,706	53	31	29	0	57,979	69	43	39	0	59,612	2600	
44	20	23	0	61,005	53	31	29	0	62,325	69	43	39	0	64,018	2700	
44	20	22	0	65,461	53	31	29	0	66,829	69	43	39	0	68,581	2800	
44	20	22	0	67,518	53	31	29	0	68,906	69	43	39	0	70,686	2850	
44	20	22	0	70,075	53	31	29	0	71,489	69	43	39	0	73,301	2900	
44	20	22	0	74,845	53	31	29	0	76,307	69	43	39	0	78,179	3000	
44	20	22	0	79,773	53	31	29	0	81,282	69	43	38	0	83,213	3100	
44	20	22	0	82,041	53	31	29	0	83,571	69	43	38	0	85,530	3150	
44	20	22	0	84,857	53	31	29	0	86,413	69	43	38	0	88,405	3200	
44	20	22	0	90,099	53	31	29	0	91,702	69	43	38	0	93,753	3300	
44	20	22	0	95,498	53	31	29	0	97,148	69	43	38	0	99,259	3400	
44	20	22	0	97,979	53	31	29	0	99,650	69	43	38	0	101,788	3450	
44	20	22	0	106,767	53	31	28	0	108,511	69	43	38	0	110,741	3600	
44	20	22	0	118,664	53	31	28	0	120,503	69	43	38	0	122,852	3800	
44	20	22	0	131,190	53	31	28	0	133,123	69	43	38	0	135,591	4000	

LATERAL
rubber flange

U110x

Individual fabrication possible



U111x (B/E/C/M/R/K/L)

► with internal vacuum support ring

Installation length (L _E) at design pressure															
	up to 4 bar L _E = 200 mm up to 6 bar L _E = 200 mm up to 10 bar L _E = 250 mm					up to 4 bar L _E = 200 mm up to 6 bar L _E = 250 mm up to 10 bar L _E = 300 mm					up to 4 bar L _E = 250 mm up to 6 bar L _E = 300 mm up to 10 bar L _E = 350 mm				
	higher pressures on request														
NB	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
															
	mm	mm	± mm	± °		mm	mm	± mm	± °		mm	mm	± mm	± °	
100	26	4	18	0	177	31	3	19	0	177	40	7	28	0	254
125	26	4	17	0	241	31	3	19	0	241	40	7	28	0	330
150	26	4	17	0	314	31	3	18	0	314	40	7	27	0	415
175	26	4	17	0	415	31	3	18	0	415	40	7	27	0	531
200	26	4	17	0	491	31	3	18	0	491	40	7	26	0	616
250	26	4	16	0	707	31	3	18	0	707	40	7	26	0	855
300	26	4	16	0	973	31	3	17	0	973	40	7	26	0	1,146
350	26	4	16	0	1,288	31	3	17	0	1,288	40	7	25	0	1,486
400	26	4	16	0	1,605	31	3	17	0	1,605	40	7	25	0	1,825
450	26	4	15	0	1,987	31	3	17	0	1,987	40	7	25	0	2,231
500	26	4	15	0	2,402	31	3	17	0	2,402	40	7	24	0	2,669
550						31	3	16	0	2,827	40	7	24	0	3,117
600						31	3	16	0	3,349	40	7	24	0	3,664
650						31	3	16	0	3,848	40	7	24	0	4,185
700						31	3	16	0	4,465	40	7	24	0	4,827
750						31	3	16	0	5,027	40	7	23	0	5,411
800						31	3	16	0	5,741	40	7	23	0	6,151
850						31	3	16	0	6,362	40	7	23	0	6,793
900						31	3	16	0	7,163	40	7	23	0	7,620
950						31	3	16	0	7,854	40	7	23	0	8,332
1000						31	3	16	0	8,742	40	7	23	0	9,246
1050											40	7	23	0	10,029
1100											40	7	23	0	11,047
1150											40	7	23	0	11,882
1200											40	7	22	0	12,969
1250											40	7	22	0	13,893
1300											40	7	22	0	15,066
1350											40	7	22	0	16,061
1400											40	7	22	0	17,320
1450											40	7	22	0	18,385
1500											40	7	22	0	19,731
1600											40	7	22	0	22,299
1650											40	7	22	0	23,506
1700											40	7	22	0	25,025
1800											40	7	22	0	27,937
1900											40	7	22	0	30,946
1950											40	7	22	0	32,365
2000											40	7	21	0	34,143
2100															
2200															
2250															
2300															
2400															
2500															
2550															
2600															
2700															
2800															
2850															
2900															
3000															
3100															
3150															
3200															
3300															
3400															
3450															
3600															
3800															
4000															

Recommended sizes

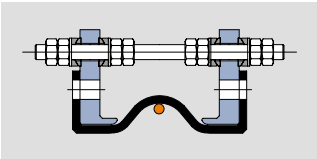
Additional possible sizes

Reduction of movement for expansion joints with PTFE lining:

axial compression: -33 %; axial extension: -0 %; lateral displacement: -50 %.

In the event of lateral displacement and simultaneous axial extension (due to installation gap tolerance) the above movements are reduced (► page 22). For larger movements see type U121x.

U111x (B/E/C/M/R/K/L)
► with internal vacuum support ring

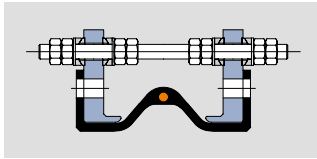


Installation length (L _E) at design pressure																
up to 4 bar L _E = 300 mm up to 6 bar L _E = 350 mm up to 10 bar L _E = 400 mm					up to 4 bar L _E = 350 mm up to 6 bar L _E = 400 mm up to 10 bar L _E = 450 mm					up to 4 bar L _E = 400 mm up to 6 bar L _E = 450 mm up to 10 bar L _E = 500 mm						
higher pressures on request																
Movement				A 	Movement				A 	Movement				A 	NB	
																
mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²		
44	7	30	0	260	53	10	39	0	353	69	14	53	0	491		100
44	7	30	0	337	53	10	39	0	441	69	14	51	0	594	125	
44	7	29	0	423	53	10	38	0	539	69	14	51	0	707	150	
44	7	29	0	539	53	10	37	0	670	69	14	50	0	855	175	
44	7	29	0	625	53	10	37	0	765	69	14	49	0	962	200	
44	7	28	0	866	53	10	36	0	1,029	69	14	48	0	1,257	250	
44	7	27	0	1,158	53	10	36	0	1,346	69	14	48	0	1,605	300	
44	7	27	0	1,500	53	10	35	0	1,713	69	14	47	0	2,003	350	
44	7	27	0	1,840	53	10	35	0	2,075	69	14	46	0	2,393	400	
44	7	26	0	2,248	53	10	34	0	2,507	69	14	46	0	2,856	450	
44	7	26	0	2,688	53	10	34	0	2,971	69	14	45	0	3,349	500	
44	7	26	0	3,137	53	10	34	0	3,442	69	14	45	0	3,848	550	
44	7	26	0	3,685	53	10	33	0	4,015	69	14	45	0	4,453	600	
44	7	26	0	4,208	53	10	33	0	4,560	69	14	44	0	5,027	650	
44	7	25	0	4,852	53	10	33	0	5,230	69	14	44	0	5,728	700	
44	7	25	0	5,437	53	10	33	0	5,836	69	14	44	0	6,362	750	
44	7	25	0	6,179	53	10	33	0	6,604	69	14	43	0	7,163	800	
44	7	25	0	6,822	53	10	32	0	7,268	69	14	43	0	7,854	850	
44	7	25	0	7,651	53	10	32	0	8,123	69	14	43	0	8,742	900	
44	7	25	0	8,365	53	10	32	0	8,858	69	14	43	0	9,503	950	
44	7	25	0	9,280	53	10	32	0	9,799	69	14	43	0	10,477	1000	
44	7	25	0	10,064	53	10	32	0	10,605	69	14	42	0	11,310	1050	
44	7	24	0	11,085	53	10	32	0	11,652	69	14	42	0	12,390	1100	
44	7	24	0	11,921	53	10	32	0	12,509	69	14	42	0	13,273	1150	
44	7	24	0	13,009	53	10	31	0	13,623	69	14	42	0	14,420	1200	
44	7	24	0	13,935	53	10	31	0	14,569	69	14	42	0	15,394	1250	
44	7	24	0	15,109	53	10	31	0	15,770	69	14	42	0	16,627	1300	
44	7	24	0	16,106	53	10	31	0	16,787	69	14	41	0	17,671	1350	
44	7	24	0	17,366	53	10	31	0	18,074	69	14	41	0	18,991	1400	
44	7	24	0	18,433	53	10	31	0	19,162	69	14	41	0	20,106	1450	
44	7	24	0	19,781	53	10	31	0	20,536	69	14	41	0	21,512	1500	
44	7	24	0	22,352	53	10	31	0	23,154	69	14	41	0	24,190	1600	
44	7	24	0	23,561	53	10	31	0	24,384	69	14	41	0	25,447	1650	
44	7	23	0	25,081	53	10	30	0	25,930	69	14	41	0	27,026	1700	
44	7	23	0	27,996	53	10	30	0	28,893	69	14	40	0	30,049	1800	
44	7	23	0	31,009	53	10	30	0	31,952	69	14	40	0	33,168	1900	
44	7	23	0	32,429	53	10	30	0	33,394	69	14	40	0	34,636	1950	
44	7	23	0	34,209	53	10	30	0	35,199	69	14	40	0	36,474	2000	
44	7	23	0	37,565	53	10	30	0	38,603	69	14	40	0	39,938	2100	
44	7	23	0	41,079	53	10	30	0	42,164	69	14	40	0	43,558	2200	
44	7	23	0	42,712	53	10	30	0	43,818	69	14	40	0	45,239	2250	
44	7	23	0	44,750	53	10	30	0	45,882	69	14	40	0	47,336	2300	
44	7	23	0	48,578	53	10	29	0	49,757	69	14	39	0	51,271	2400	
44	7	23	0	52,563	53	10	29	0	53,789	69	14	39	0	55,363	2500	
44	7	23	0	54,408	53	10	29	0	55,655	69	14	39	0	57,256	2550	
44	7	23	0	56,706	53	10	29	0	57,979	69	14	39	0	59,612	2600	
44	7	23	0	61,005	53	10	29	0	62,325	69	14	39	0	64,018	2700	
44	7	22	0	65,461	53	10	29	0	66,829	69	14	39	0	68,581	2800	
44	7	22	0	67,518	53	10	29	0	68,906	69	14	39	0	70,686	2850	
44	7	22	0	70,075	53	10	29	0	71,489	69	14	39	0	73,301	2900	
44	7	22	0	74,845	53	10	29	0	76,307	69	14	39	0	78,179	3000	
44	7	22	0	79,773	53	10	29	0	81,282	69	14	38	0	83,213	3100	
44	7	22	0	82,041	53	10	29	0	83,571	69	14	38	0	85,530	3150	
44	7	22	0	84,857	53	10	29	0	86,413	69	14	38	0	88,405	3200	
44	7	22	0	90,099	53	10	29	0	91,702	69	14	38	0	93,753	3300	
44	7	22	0	95,498	53	10	29	0	97,148	69	14	38	0	99,259	3400	
44	7	22	0	97,979	53	10	29	0	99,650	69	14	38	0	101,788	3450	
44	7	22	0	106,767	53	10	28	0	108,511	69	14	38	0	110,741	3600	
44	7	22	0	118,664	53	10	28	0	120,503	69	14	38	0	122,852	3800	
44	7	22	0	131,190	53	10	28	0	133,123	69	14	38	0	135,591	4000	

Individual fabrication possible

LATERAL
rubber flange

U110x



U112x (B/E/C/M/R/K/L)

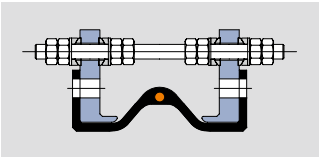
► with embedded vacuum support ring

Installation length (L _E) at design pressure															
	up to 4 bar L _E = 200 mm up to 6 bar L _E = 200 mm up to 10 bar L _E = 250 mm					up to 4 bar L _E = 200 mm up to 6 bar L _E = 250 mm up to 10 bar L _E = 300 mm					up to 4 bar L _E = 250 mm up to 6 bar L _E = 300 mm up to 10 bar L _E = 350 mm				
	higher pressures on request														
NB	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
															
	mm	mm	± mm	± °	mm	mm	± mm	± °	mm	mm	± mm	± °			
100	17	4	18	0	177	20	2	18	0	150	26	6	27	0	222
125	17	4	17	0	241	20	2	18	0	209	26	6	26	0	293
150	17	4	17	0	314	20	2	17	0	278	26	6	26	0	373
175	17	4	17	0	415	20	2	17	0	373	26	6	26	0	483
200	17	4	17	0	491	20	2	17	0	445	26	6	25	0	564
250	17	4	16	0	707	20	2	16	0	651	26	6	25	0	794
300	17	4	16	0	973	20	2	16	0	908	26	6	24	0	1,075
350	17	4	16	0	1,288	20	2	16	0	1,213	26	6	24	0	1,405
400	17	4	16	0	1,605	20	2	16	0	1,521	26	6	24	0	1,735
450	17	4	15	0	1,987	20	2	16	0	1,893	26	6	23	0	2,132
500	17	4	15	0	2,402	20	2	15	0	2,299	26	6	23	0	2,561
550						20	2	15	0	2,715	26	6	23	0	3,000
600						20	2	15	0	3,227	26	6	23	0	3,536
650						20	2	15	0	3,718	26	6	23	0	4,049
700						20	2	15	0	4,324	26	6	23	0	4,681
750						20	2	15	0	4,877	26	6	22	0	5,255
800						20	2	15	0	5,581	26	6	22	0	5,986
850						20	2	15	0	6,193	26	6	22	0	6,619
900						20	2	15	0	6,984	26	6	22	0	7,436
950						20	2	15	0	7,667	26	6	22	0	8,139
1000						20	2	15	0	8,544	26	6	22	0	9,043
1050											26	6	22	0	9,817
1100											26	6	22	0	10,825
1150											26	6	22	0	11,652
1200											26	6	21	0	12,728
1250											26	6	21	0	13,643
1300											26	6	21	0	14,806
1350											26	6	21	0	15,792
1400											26	6	21	0	17,041
1450											26	6	21	0	18,098
1500											26	6	21	0	19,433
1600											26	6	21	0	21,983
1650											26	6	21	0	23,181
1700											26	6	21	0	24,689
1800											26	6	21	0	27,582
1900											26	6	21	0	30,573
1950											26	6	21	0	31,984
2000											26	6	21	0	33,751
2100															
2200															
2250															
2300															
2400															
2500															
2550															
2600															
2700															
2800															
2850															
2900															
3000															
3100															
3150															
3200															
3300															
3400															
3450															
3600															
3800															
4000															

Recommended sizes
Additional possible sizes

Reduction of movement for expansion joints with PTFE lining:
axial compression: -0 %; axial extension: -0 %; lateral displacement: -0 %.
In the event of lateral displacement and simultaneous axial extension (due to installation gap tolerance) the above movements are reduced (► page 22). For larger movements see type U122x.

U112x (B/E/C/M/R/K/L)
► with embedded vacuum support ring



Installation length (L _E) at design pressure																
up to 4 bar L _E = 300 mm up to 6 bar L _E = 350 mm up to 10 bar L _E = 400 mm					up to 4 bar L _E = 350 mm up to 6 bar L _E = 400 mm up to 10 bar L _E = 450 mm					up to 4 bar L _E = 400 mm up to 6 bar L _E = 450 mm up to 10 bar L _E = 500 mm						
higher pressures on request																
Movement				A	Movement				A	Movement				A	NB	
mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²		
29	6	29	0	232	35	9	38	0	320	46	13	51	0	423	100	
29	6	29	0	305	35	9	38	0	405	46	13	50	0	519	125	
29	6	28	0	387	35	9	37	0	499	46	13	49	0	625	150	
29	6	28	0	499	35	9	36	0	625	46	13	48	0	765	175	
29	6	28	0	581	35	9	36	0	716	46	13	48	0	866	200	
29	6	27	0	814	35	9	35	0	973	46	13	47	0	1,146	250	
29	6	27	0	1,099	35	9	35	0	1,282	46	13	46	0	1,479	300	
29	6	26	0	1,432	35	9	34	0	1,640	46	13	45	0	1,863	350	
29	6	26	0	1,765	35	9	34	0	1,995	46	13	45	0	2,240	400	
29	6	26	0	2,165	35	9	33	0	2,419	46	13	44	0	2,688	450	
29	6	25	0	2,597	35	9	33	0	2,875	46	13	44	0	3,167	500	
29	6	25	0	3,039	35	9	33	0	3,339	46	13	44	0	3,653	550	
29	6	25	0	3,578	35	9	33	0	3,904	46	13	43	0	4,243	600	
29	6	25	0	4,094	35	9	32	0	4,441	46	13	43	0	4,803	650	
29	6	25	0	4,729	35	9	32	0	5,102	46	13	43	0	5,489	700	
29	6	24	0	5,307	35	9	32	0	5,701	46	13	42	0	6,110	750	
29	6	24	0	6,041	35	9	32	0	6,461	46	13	42	0	6,896	800	
29	6	24	0	6,677	35	9	32	0	7,118	46	13	42	0	7,574	850	
29	6	24	0	7,497	35	9	31	0	7,964	46	13	42	0	8,446	900	
29	6	24	0	8,203	35	9	31	0	8,692	46	13	41	0	9,195	950	
29	6	24	0	9,110	35	9	31	0	9,625	46	13	41	0	10,153	1000	
29	6	24	0	9,887	35	9	31	0	10,423	46	13	41	0	10,973	1050	
29	6	24	0	10,899	35	9	31	0	11,461	46	13	41	0	12,037	1100	
29	6	24	0	11,728	35	9	31	0	12,311	46	13	41	0	12,908	1150	
29	6	23	0	12,808	35	9	31	0	13,417	46	13	41	0	14,040	1200	
29	6	23	0	13,726	35	9	31	0	14,356	46	13	40	0	15,001	1250	
29	6	23	0	14,892	35	9	30	0	15,548	46	13	40	0	16,218	1300	
29	6	23	0	15,881	35	9	30	0	16,559	46	13	40	0	17,250	1350	
29	6	23	0	17,134	35	9	30	0	17,837	46	13	40	0	18,554	1400	
29	6	23	0	18,194	35	9	30	0	18,918	46	13	40	0	19,656	1450	
29	6	23	0	19,532	35	9	30	0	20,283	46	13	40	0	21,047	1500	
29	6	23	0	22,088	35	9	30	0	22,885	46	13	40	0	23,697	1600	
29	6	23	0	23,289	35	9	30	0	24,108	46	13	39	0	24,941	1650	
29	6	23	0	24,801	35	9	30	0	25,645	46	13	39	0	26,504	1700	
29	6	23	0	27,700	35	9	30	0	28,592	46	13	39	0	29,498	1800	
29	6	22	0	30,698	35	9	29	0	31,636	46	13	39	0	32,589	1900	
29	6	22	0	32,111	35	9	29	0	33,071	46	13	39	0	34,045	1950	
29	6	22	0	33,882	35	9	29	0	34,867	46	13	39	0	35,867	2000	
29	6	22	0	37,223	35	9	29	0	38,256	46	13	39	0	39,303	2100	
29	6	22	0	40,721	35	9	29	0	41,801	46	13	38	0	42,895	2200	
29	6	22	0	42,346	35	9	29	0	43,447	46	13	38	0	44,563	2250	
29	6	22	0	44,376	35	9	29	0	45,503	46	13	38	0	46,645	2300	
29	6	22	0	48,188	35	9	29	0	49,363	46	13	38	0	50,551	2400	
29	6	22	0	52,158	35	9	29	0	53,379	46	13	38	0	54,615	2500	
29	6	22	0	53,995	35	9	29	0	55,238	46	13	38	0	56,495	2550	
29	6	22	0	56,284	35	9	29	0	57,553	46	13	38	0	58,836	2600	
29	6	22	0	60,568	35	9	28	0	61,883	46	13	38	0	63,213	2700	
29	6	22	0	65,008	35	9	28	0	66,371	46	13	38	0	67,748	2800	
29	6	22	0	67,058	35	9	28	0	68,442	46	13	37	0	69,840	2850	
29	6	22	0	69,606	35	9	28	0	71,016	46	13	37	0	72,440	2900	
29	6	22	0	74,361	35	9	28	0	75,818	46	13	37	0	77,289	3000	
29	6	21	0	79,273	35	9	28	0	80,777	46	13	37	0	82,295	3100	
29	6	21	0	81,534	35	9	28	0	83,060	46	13	37	0	84,599	3150	
29	6	21	0	84,342	35	9	28	0	85,893	46	13	37	0	87,459	3200	
29	6	21	0	89,568	35	9	28	0	91,166	46	13	37	0	92,779	3300	
29	6	21	0	94,951	35	9	28	0	96,597	46	13	37	0	98,256	3400	
29	6	21	0	97,425	35	9	28	0	99,091	46	13	37	0	100,772	3450	
29	6	21	0	106,188	35	9	28	0	107,928	46	13	37	0	109,682	3600	
29	6	21	0	118,054	35	9	28	0	119,888	46	13	37	0	121,736	3800	
29	6	21	0	130,548	35	9	27	0	132,477	46	13	36	0	134,419	4000	

Individual fabrication possible

U120x (B/E/C/M/R/K/L)

NB 100 – NB 4000



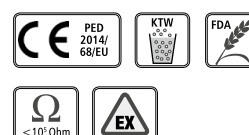
- ▶ **Type U120x** (B/E/C/M/R/K/L)
without vacuum support rings
- ▶ **Type U121x** (B/E/C/M/R/K/L)
with internal vacuum support rings
- ▶ **Type U122x** (B/E/C/M/R/K/L)
with embedded vacuum support rings
- ▶ **Type U123x** (B/E/C/M/R/K/L)
without vacuum support rings,
with pressure support ring in the arch trough
- ▶ **Type U124x** (B/E/C/M/R/K/L)
with internal vacuum support rings,
with pressure support ring outside in the arch trough
- ▶ **Type U125** (B/E/C/M/R/K/L)
with embedded vacuum support rings,
with external pressure support ring in the arch trough

Type key ▶ page 20
 U1 2 3 M
 ↳ Tie rod variant
 ↳ Support ring variant
 ↳ Number of arches
 ↳ Type

Lateral expansion joint with two arches

- Design:** Highly elastic, hydrodynamic, double-arch rubber bellows with full faced rubber flanges and backing flanges with support collar and tie rods
 Optionally with vacuum support rings and/or external pressure support ring in the arch trough
- Nominal diameters:** NB 100 to NB 4000, intermediate sizes possible
- Installation length:** Standard $L_E = 350$ to 650 mm (▶ page 172–177)
 Other installation lengths on request
- Pressure:** Depending on the nominal diameter up to 40 bar
 Vacuum not allowed without vacuum support rings,
 with vacuum support rings up to 0.05 bar absolute
 Design in accordance with Pressure Equipment Directive PED 2014/68/EU
- Movement:** For very large axial, lateral and angular movements (▶ page 172–177)
 Installation gap tolerances possible in the context of axial compression and extension

Application:
 Cooling water systems,
 desalination plants,
 drinking water supply, plant constructions
 e.g. in pipelines, on pumps,
 as dismantling joints, on
 condensers and vessels



Assembly instruction download
www.ditec-adam.de/en/downloads.html

Rubber bellows

Rubber	Fabric	Marking	Max.	Application
EPDM	Nylon		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDM	Kevlar		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMht	Kevlar		120 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMtw	Nylon		100 °C	Drinking water
EPDMtw	Kevlar		100 °C	Drinking water
EPDMaf	Nylon		100 °C	Abrasive materials, water-sand extraction
EPDMaf	Kevlar		100 °C	Abrasive materials, water-sand extraction
EPDMbeige	Nylon		100 °C	Foodstuffs
EPDMbeige	Kevlar		100 °C	Foodstuffs
IIR	Nylon		100 °C	Hot water, acids, bases, gases
IIR	Kevlar		100 °C	Hot water, acids, bases, gases
CSM	Nylon		100 °C	Strong acids, bases, chemicals
CSM	Kevlar		100 °C	Strong acids, bases, chemicals
NBR	Nylon		100 °C	Oils, petrol, solvents, compressed air
NBR	Kevlar		100 °C	Oils, petrol, solvents, compressed air
NBRbeige	Nylon		100 °C	Oil, fatty foods
NBRbeige	Kevlar		100 °C	Oil, fatty foods
CR	Nylon		90 °C	Cooling water, slightly oily water, seawater
CR	Kevlar		90 °C	Cooling water, slightly oily water, seawater
FPM	Kevlar		180 °C	Corrosive chemicals, petroleum distillates
FPMbeige	Kevlar		180 °C	Oil, fatty foods
NR	Nylon		70 °C	Abrasive materials
Silicon	Kevlar or glass		200 °C	Air, saltwater atmosphere, foodstuffs, medical technology

PTFE-lining: Permanently embedded against chemical attacks on the interior at the rubber bellows, available starting at NB 300. Take the restriction of the listed movement into account (▶ page 172–177)

LATERAL
rubber flange

Flanges

- Design:

Single-part or multi-part backing flanges with support collar, clearance holes and holder for tie rods (control unit type B, E, C, M)

Single-part or multi-part round backing flanges with support collar, clearance holes and control unit plates (control unit type R, K, L)
- Flange norms:

DIN, EN, ANSI, AWWA, BS, JIS, special measurements (▶ page 256)
- Materials:

Carbon steel: 1.0038 (S235JRG2)
1.0570 (S355J2G3)

Stainless steel: 1.4301 (X5CrNi18-10)
1.4571 (X6CrNiMoTi17-12-2)

Aluminium: AlMg3

Other materials on request
- Coating:

Primed, hot-dip galvanised, special paint

U120x

Optional accessories

- Protective hood:

UV protection cover, ground protective cover, fire protection cover, splash protective cover (▶ page 44)
- Flow liners:

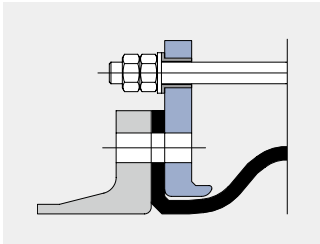
Cylindrical flow liner, conical flow liner, telescoping flow liner (▶ page 43)

Tie rods

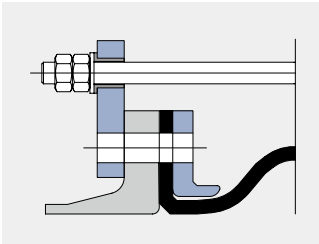


Example: Type U124M

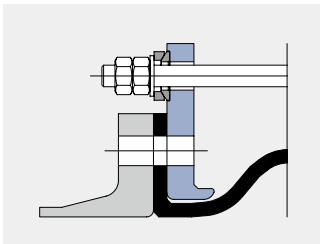
- Design:** Dimensioning according to design pressure (test pressure) based on the Pressure Equipment Directive
- Materials:** Carbon steel in strength class 8.8 or stainless steel
- Coating:** Spherical bearings and ball disks PTFE-coated
Tie rods galvanised, hot-dip galvanised or PTFE-coated



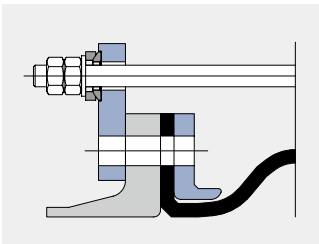
Type U120B
Tie rods mounted outside in rubber bushing to accommodate reaction forces in the event of pressure (up to NB 300)



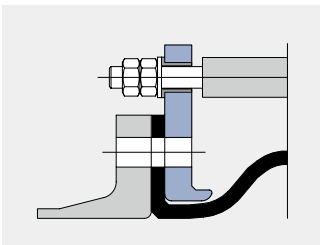
Type U120R
Control unit plate: Tie rods mounted outside in rubber bushing to accommodate reaction forces in the event of pressure (up to NB 300)



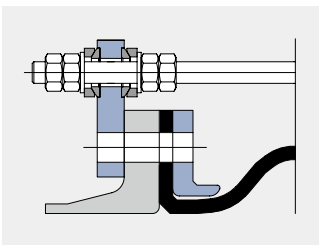
Type U120E
Tie rods mounted outside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure



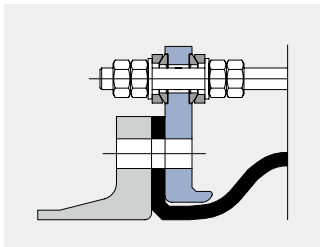
Type U120K
Control unit plate: Tie rods mounted outside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure



Type U120C
Tie rods mounted outside in rubber bushing and inside in the thrust limiter to accommodate stresses in the event of pressure and vacuum (up to NB 300)



Type U120L
Control unit plate: Tie rods mounted outside and inside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure and vacuum



Type U120M
Tie rods mounted outside and inside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure and vacuum

Support rings

TYPE		Vacuum support ring	Pressure support ring	Pressure	Movement
U120x (B/E/C/M/ R/K/L)		Without	Without	Slight pressure, vacuum stability on request	▶ page 172–173
U121x (B/E/C/M/ R/K/L)		Medium contact, inside the arch apex	Without	Slight pressure, for vacuum up to 0.05 bar absolute	▶ page 174–175
U122x (B/E/C/M/ R/K/L)		No medium contact, embedded into the arch apex of the rubber bellows	Without	Slight pressure, for vacuum up to 0.05 bar absolute	▶ page 176–177
U123x (B/E/C/M/ R/K/L)		Without	External in the arch trough	Depending on the nominal diameter up to 40 bar, slight vacuum	▶ page 172–173
U124x (B/E/C/M/ R/K/L)		Medium contact, inside the arch apex	External in the arch trough	Depending on the nominal diameter up to 40 bar, for vacuum up to 0.05 bar absolute	▶ page 174–175
U125x (B/E/C/M/ R/K/L)		No medium contact, embedded into the arch apex of the rubber bellows	External in the arch trough	Depending on the nominal diameter up to 25 bar, for vacuum up to 0.05 bar absolute	▶ page 176–177

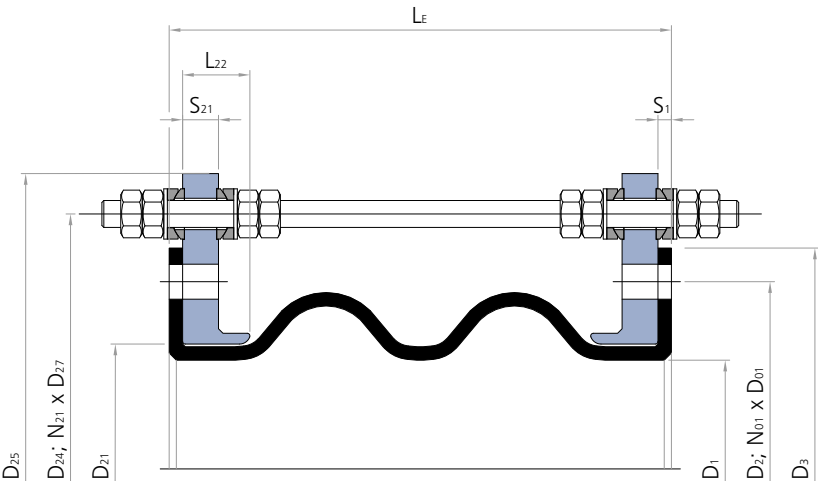
Materials

Stainless steel: 1.4301 (X5CrNi18-10)
1.4539 (X1NiCrMoCu25-20-5)
1.4571 (X6CrNiMoTi17-12-2)

Carbon steel: 1.0570 (S355J2G3) rubber coated
1.0570 (S355J2G3) galvanised

Other materials on request

Planning help U120M



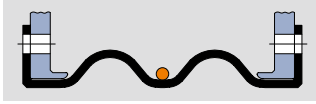
U120x

LATERAL
rubber flange



U120x (B/E/C/M/R/K/L)

► without vacuum support rings



U123x (B/E/C/M/R/K/L)

► without vacuum support rings, with external pressure support ring in the arch trough

Installation length (L_E) at design pressure

NB	up to 4 bar $L_E = 350$ mm up to 6 bar $L_E = 350$ mm up to 10 bar $L_E = 400$ mm					up to 4 bar $L_E = 350$ mm up to 6 bar $L_E = 400$ mm up to 10 bar $L_E = 450$ mm					up to 4 bar $L_E = 400$ mm up to 6 bar $L_E = 450$ mm up to 10 bar $L_E = 500$ mm				
	Movement					Movement					Movement				
	mm	mm	± mm	± °	A cm ²	mm	mm	± mm	± °	A cm ²	mm	mm	± mm	± °	A cm ²
100	53	22	35	0	177	62	20	38	0	177	80	40	56	0	254
125	53	22	34	0	241	62	20	38	0	241	80	40	55	0	330
150	53	22	34	0	314	62	20	37	0	314	80	40	54	0	415
175	53	22	33	0	415	62	20	36	0	415	80	40	54	0	531
200	53	22	33	0	491	62	20	36	0	491	80	40	53	0	616
250	53	22	32	0	707	62	20	35	0	707	80	40	52	0	855
300	53	22	32	0	973	62	20	35	0	973	80	40	51	0	1,146
350	53	22	31	0	1,288	62	20	34	0	1,288	80	40	50	0	1,486
400	53	22	31	0	1,605	62	20	34	0	1,605	80	40	50	0	1,825
450	53	22	31	0	1,987	62	20	33	0	1,987	80	40	49	0	2,231
500	53	22	30	0	2,402	62	20	33	0	2,402	80	40	49	0	2,669
550						62	20	33	0	2,827	80	40	48	0	3,117
600						62	20	33	0	3,349	80	40	48	0	3,664
650						62	20	32	0	3,848	80	40	48	0	4,185
700						62	20	32	0	4,465	80	40	47	0	4,827
750						62	20	32	0	5,027	80	40	47	0	5,411
800						62	20	32	0	5,741	80	40	47	0	6,151
850						62	20	32	0	6,362	80	40	46	0	6,793
900						62	20	31	0	7,163	80	40	46	0	7,620
950						62	20	31	0	7,854	80	40	46	0	8,332
1000						62	20	31	0	8,742	80	40	46	0	9,246
1050											80	40	46	0	10,029
1100											80	40	45	0	11,047
1150											80	40	45	0	11,882
1200											80	40	45	0	12,969
1250											80	40	45	0	13,893
1300											80	40	45	0	15,066
1350											80	40	45	0	16,061
1400											80	40	44	0	17,320
1450											80	40	44	0	18,385
1500											80	40	44	0	19,731
1600											80	40	44	0	22,299
1650											80	40	44	0	23,506
1700											80	40	44	0	25,025
1800											80	40	43	0	27,937
1900											80	40	43	0	30,946
1950											80	40	43	0	32,365
2000											80	40	43	0	34,143
2100															
2200															
2250															
2300															
2400															
2500															
2550															
2600															
2700															
2800															
2850															
2900															
3000															
3100															
3150															
3200															
3300															
3400															
3450															
3600															
3800															
4000															

Recommended sizes

Additional possible sizes

Reduction of movement for expansion joints with PTFE lining:

axial compression: -33 %; axial extension: -66 %; lateral displacement: -50 %.

In the event of lateral displacement and simultaneous axial extension (due to installation gap tolerance) the above movements are reduced (► page 22). Larger movements on request.

U120x (B/E/C/M/R/K/L)
► without vacuum support rings



173

U123x (B/E/C/M/R/K/L)
► without vacuum support rings, with external pressure support ring in the arch trough



Installation length (L _E) at design pressure																
up to 4 bar L _E = 450 mm up to 6 bar L _E = 500 mm up to 10 bar L _E = 550 mm					up to 4 bar L _E = 500 mm up to 6 bar L _E = 550 mm up to 10 bar L _E = 600 mm					up to 4 bar L _E = 550 mm up to 6 bar L _E = 600 mm up to 10 bar L _E = 650 mm						
higher pressures on request																
Movement				A	Movement				A	Movement				A	NB	
mm	mm	± mm	± °	cm²	mm	mm	± mm	± °	cm²	mm	mm	± mm	± °	cm²		
88	41	61	0	260	106	61	79	0	353	124	82	97	0	460	100	
88	41	60	0	337	106	61	77	0	441	124	82	95	0	560	125	
88	41	59	0	423	106	61	76	0	539	124	82	93	0	670	150	
88	41	58	0	539	106	61	75	0	670	124	82	92	0	814	175	
88	41	57	0	625	106	61	74	0	765	124	82	91	0	919	200	
88	41	56	0	866	106	61	72	0	1,029	124	82	89	0	1,207	250	
88	41	55	0	1,158	106	61	71	0	1,346	124	82	88	0	1,548	300	
88	41	54	0	1,500	106	61	70	0	1,713	124	82	86	0	1,940	350	
88	41	54	0	1,840	106	61	69	0	2,075	124	82	85	0	2,324	400	
88	41	53	0	2,248	106	61	69	0	2,507	124	82	84	0	2,781	450	
88	41	52	0	2,688	106	61	68	0	2,971	124	82	84	0	3,267	500	
88	41	52	0	3,137	106	61	67	0	3,442	124	82	83	0	3,761	550	
88	41	52	0	3,685	106	61	67	0	4,015	124	82	82	0	4,359	600	
88	41	51	0	4,208	106	61	66	0	4,560	124	82	82	0	4,927	650	
88	41	51	0	4,852	106	61	66	0	5,230	124	82	81	0	5,621	700	
88	41	51	0	5,437	106	61	66	0	5,836	124	82	81	0	6,249	750	
88	41	50	0	6,179	106	61	65	0	6,604	124	82	80	0	7,044	800	
88	41	50	0	6,822	106	61	65	0	7,268	124	82	80	0	7,729	850	
88	41	50	0	7,651	106	61	64	0	8,123	124	82	79	0	8,610	900	
88	41	49	0	8,365	106	61	64	0	8,858	124	82	79	0	9,366	950	
88	41	49	0	9,280	106	61	64	0	9,799	124	82	79	0	10,333	1000	
88	41	49	0	10,064	106	61	64	0	10,605	124	82	78	0	11,159	1050	
88	41	49	0	11,085	106	61	63	0	11,652	124	82	78	0	12,233	1100	
88	41	49	0	11,921	106	61	63	0	12,509	124	82	78	0	13,110	1150	
88	41	48	0	13,009	106	61	63	0	13,623	124	82	77	0	14,250	1200	
88	41	48	0	13,935	106	61	63	0	14,569	124	82	77	0	15,218	1250	
88	41	48	0	15,109	106	61	62	0	15,770	124	82	77	0	16,445	1300	
88	41	48	0	16,106	106	61	62	0	16,787	124	82	76	0	17,483	1350	
88	41	48	0	17,366	106	61	62	0	18,074	124	82	76	0	18,796	1400	
88	41	48	0	18,433	106	61	62	0	19,162	124	82	76	0	19,906	1450	
88	41	47	0	19,781	106	61	62	0	20,536	124	82	76	0	21,305	1500	
88	41	47	0	22,352	106	61	61	0	23,154	124	82	75	0	23,970	1600	
88	41	47	0	23,561	106	61	61	0	24,384	124	82	75	0	25,221	1650	
88	41	47	0	25,081	106	61	61	0	25,930	124	82	75	0	26,793	1700	
88	41	47	0	27,996	106	61	61	0	28,893	124	82	74	0	29,804	1800	
88	41	46	0	31,009	106	61	60	0	31,952	124	82	74	0	32,910	1900	
88	41	46	0	32,429	106	61	60	0	33,394	124	82	74	0	34,373	1950	
88	41	46	0	34,209	106	61	60	0	35,199	124	82	74	0	36,204	2000	
88	41	46	0	37,565	106	61	60	0	38,603	124	82	73	0	39,655	2100	
88	41	46	0	41,079	106	61	59	0	42,164	124	82	73	0	43,263	2200	
88	41	46	0	42,712	106	61	59	0	43,818	124	82	73	0	44,938	2250	
88	41	46	0	44,750	106	61	59	0	45,882	124	82	73	0	47,028	2300	
88	41	45	0	48,578	106	61	59	0	49,757	124	82	72	0	50,950	2400	
88	41	45	0	52,563	106	61	59	0	53,789	124	82	72	0	55,030	2500	
88	41	45	0	54,408	106	61	59	0	55,655	124	82	72	0	56,917	2550	
88	41	45	0	56,706	106	61	59	0	57,979	124	82	72	0	59,266	2600	
88	41	45	0	61,005	106	61	58	0	62,325	124	82	72	0	63,660	2700	
88	41	45	0	65,461	106	61	58	0	66,829	124	82	71	0	68,210	2800	
88	41	45	0	67,518	106	61	58	0	68,906	124	82	71	0	70,309	2850	
88	41	45	0	70,075	106	61	58	0	71,489	124	82	71	0	72,918	2900	
88	41	45	0	74,845	106	61	58	0	76,307	124	82	71	0	77,783	3000	
88	41	44	0	79,773	106	61	58	0	81,282	124	82	71	0	82,805	3100	
88	41	44	0	82,041	106	61	58	0	83,571	124	82	71	0	85,116	3150	
88	41	44	0	84,857	106	61	57	0	86,413	124	82	71	0	87,984	3200	
88	41	44	0	90,099	106	61	57	0	91,702	124	82	70	0	93,320	3300	
88	41	44	0	95,498	106	61	57	0	97,148	124	82	70	0	98,813	3400	
88	41	44	0	97,979	106	61	57	0	99,650	124	82	70	0	101,336	3450	
88	41	44	0	106,767	106	61	57	0	108,511	124	82	70	0	110,270	3600	
88	41	44	0	118,664	106	61	57	0	120,503	124	82	70	0	122,356	3800	
88	41	43	0	131,190	106	61	56	0	133,123	124	82	69	0	135,070	4000	

LATERAL
rubber flange

U120x

Individual fabrication possible



U121x (B/E/C/M/R/K/L)

► with internal vacuum support rings



U124x (B/E/C/M/R/K/L)

► with internal vacuum support rings, with external pressure support ring in the arch trough

Installation length (L _E) at design pressure															
	up to 4 bar L _E = 350 mm up to 6 bar L _E = 350 mm up to 10 bar L _E = 400 mm					up to 4 bar L _E = 350 mm up to 6 bar L _E = 400 mm up to 10 bar L _E = 450 mm					up to 4 bar L _E = 400 mm up to 6 bar L _E = 450 mm up to 10 bar L _E = 500 mm				
	higher pressures on request														
NB	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
															
	mm	mm	± mm	± °		mm	mm	± mm	± °		mm	mm	± mm	± °	
100	53	7	35	0	177	62	7	38	0	177	80	13	56	0	254
125	53	7	34	0	241	62	7	38	0	241	80	13	55	0	330
150	53	7	34	0	314	62	7	37	0	314	80	13	54	0	415
175	53	7	33	0	415	62	7	36	0	415	80	13	54	0	531
200	53	7	33	0	491	62	7	36	0	491	80	13	53	0	616
250	53	7	32	0	707	62	7	35	0	707	80	13	52	0	855
300	53	7	32	0	973	62	7	35	0	973	80	13	51	0	1,146
350	53	7	31	0	1,288	62	7	34	0	1,288	80	13	50	0	1,486
400	53	7	31	0	1,605	62	7	34	0	1,605	80	13	50	0	1,825
450	53	7	31	0	1,987	62	7	33	0	1,987	80	13	49	0	2,231
500	53	7	30	0	2,402	62	7	33	0	2,402	80	13	49	0	2,669
550						62	7	33	0	2,827	80	13	48	0	3,117
600						62	7	33	0	3,349	80	13	48	0	3,664
650						62	7	32	0	3,848	80	13	48	0	4,185
700						62	7	32	0	4,465	80	13	47	0	4,827
750						62	7	32	0	5,027	80	13	47	0	5,411
800						62	7	32	0	5,741	80	13	47	0	6,151
850						62	7	32	0	6,362	80	13	46	0	6,793
900						62	7	31	0	7,163	80	13	46	0	7,620
950						62	7	31	0	7,854	80	13	46	0	8,332
1000						62	7	31	0	8,742	80	13	46	0	9,246
1050											80	13	46	0	10,029
1100											80	13	45	0	11,047
1150											80	13	45	0	11,882
1200											80	13	45	0	12,969
1250											80	13	45	0	13,893
1300											80	13	45	0	15,066
1350											80	13	45	0	16,061
1400											80	13	44	0	17,320
1450											80	13	44	0	18,385
1500											80	13	44	0	19,731
1600											80	13	44	0	22,299
1650											80	13	44	0	23,506
1700											80	13	44	0	25,025
1800											80	13	43	0	27,937
1900											80	13	43	0	30,946
1950											80	13	43	0	32,365
2000											80	13	43	0	34,143
2100															
2200															
2250															
2300															
2400															
2500															
2550															
2600															
2700															
2800															
2850															
2900															
3000															
3100															
3150															
3200															
3300															
3400															
3450															
3600															
3800															
4000															

Recommended sizes
Additional possible sizes

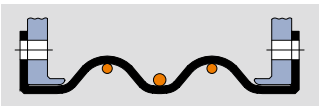
Reduction of movement for expansion joints with PTFE lining:
axial compression: -33 %; axial extension: -0 %; lateral displacement: -50 %.
In the event of lateral displacement and simultaneous axial extension (due to installation gap tolerance) the above movements are reduced (► page 22). Larger movements on request.

U121x (B/E/C/M/R/K/L)
► with internal vacuum support rings



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U124x (B/E/C/M/R/K/L)
► with internal vacuum support rings, with external pressure support ring in the arch trough



Installation length (L _E) at design pressure																
up to 4 bar L _E = 450 mm up to 6 bar L _E = 500 mm up to 10 bar L _E = 550 mm					up to 4 bar L _E = 500 mm up to 6 bar L _E = 550 mm up to 10 bar L _E = 600 mm					up to 4 bar L _E = 550 mm up to 6 bar L _E = 600 mm up to 10 bar L _E = 650 mm						
higher pressures on request																
Movement				A	Movement				A	Movement				A	NB	
																
mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²		
88	13	61	0	260	106	20	79	0	353	124	27	97	0	460	100	
88	13	60	0	337	106	20	77	0	441	124	27	95	0	560	125	
88	13	59	0	423	106	20	76	0	539	124	27	93	0	670	150	
88	13	58	0	539	106	20	75	0	670	124	27	92	0	814	175	
88	13	57	0	625	106	20	74	0	765	124	27	91	0	919	200	
88	13	56	0	866	106	20	72	0	1,029	124	27	89	0	1,207	250	
88	13	55	0	1,158	106	20	71	0	1,346	124	27	88	0	1,548	300	
88	13	54	0	1,500	106	20	70	0	1,713	124	27	86	0	1,940	350	
88	13	54	0	1,840	106	20	69	0	2,075	124	27	85	0	2,324	400	
88	13	53	0	2,248	106	20	69	0	2,507	124	27	84	0	2,781	450	
88	13	52	0	2,688	106	20	68	0	2,971	124	27	84	0	3,267	500	
88	13	52	0	3,137	106	20	67	0	3,442	124	27	83	0	3,761	550	
88	13	52	0	3,685	106	20	67	0	4,015	124	27	82	0	4,359	600	
88	13	51	0	4,208	106	20	66	0	4,560	124	27	82	0	4,927	650	
88	13	51	0	4,852	106	20	66	0	5,230	124	27	81	0	5,621	700	
88	13	51	0	5,437	106	20	66	0	5,836	124	27	81	0	6,249	750	
88	13	50	0	6,179	106	20	65	0	6,604	124	27	80	0	7,044	800	
88	13	50	0	6,822	106	20	65	0	7,268	124	27	80	0	7,729	850	
88	13	50	0	7,651	106	20	64	0	8,123	124	27	79	0	8,610	900	
88	13	49	0	8,365	106	20	64	0	8,858	124	27	79	0	9,366	950	
88	13	49	0	9,280	106	20	64	0	9,799	124	27	79	0	10,333	1000	
88	13	49	0	10,064	106	20	64	0	10,605	124	27	78	0	11,159	1050	
88	13	49	0	11,085	106	20	63	0	11,652	124	27	78	0	12,233	1100	
88	13	49	0	11,921	106	20	63	0	12,509	124	27	78	0	13,110	1150	
88	13	48	0	13,009	106	20	63	0	13,623	124	27	77	0	14,250	1200	
88	13	48	0	13,935	106	20	63	0	14,569	124	27	77	0	15,218	1250	
88	13	48	0	15,109	106	20	62	0	15,770	124	27	77	0	16,445	1300	
88	13	48	0	16,106	106	20	62	0	16,787	124	27	76	0	17,483	1350	
88	13	48	0	17,366	106	20	62	0	18,074	124	27	76	0	18,796	1400	
88	13	48	0	18,433	106	20	62	0	19,162	124	27	76	0	19,906	1450	
88	13	47	0	19,781	106	20	62	0	20,536	124	27	76	0	21,305	1500	
88	13	47	0	22,352	106	20	61	0	23,154	124	27	75	0	23,970	1600	
88	13	47	0	23,561	106	20	61	0	24,384	124	27	75	0	25,221	1650	
88	13	47	0	25,081	106	20	61	0	25,930	124	27	75	0	26,793	1700	
88	13	47	0	27,996	106	20	61	0	28,893	124	27	74	0	29,804	1800	
88	13	46	0	31,009	106	20	60	0	31,952	124	27	74	0	32,910	1900	
88	13	46	0	32,429	106	20	60	0	33,394	124	27	74	0	34,373	1950	
88	13	46	0	34,209	106	20	60	0	35,199	124	27	74	0	36,204	2000	
88	13	46	0	37,565	106	20	60	0	38,603	124	27	73	0	39,655	2100	
88	13	46	0	41,079	106	20	59	0	42,164	124	27	73	0	43,263	2200	
88	13	46	0	42,712	106	20	59	0	43,818	124	27	73	0	44,938	2250	
88	13	46	0	44,750	106	20	59	0	45,882	124	27	73	0	47,028	2300	
88	13	45	0	48,578	106	20	59	0	49,757	124	27	72	0	50,950	2400	
88	13	45	0	52,563	106	20	59	0	53,789	124	27	72	0	55,030	2500	
88	13	45	0	54,408	106	20	59	0	55,655	124	27	72	0	56,917	2550	
88	13	45	0	56,706	106	20	59	0	57,979	124	27	72	0	59,266	2600	
88	13	45	0	61,005	106	20	58	0	62,325	124	27	72	0	63,660	2700	
88	13	45	0	65,461	106	20	58	0	66,829	124	27	71	0	68,210	2800	
88	13	45	0	67,518	106	20	58	0	68,906	124	27	71	0	70,309	2850	
88	13	45	0	70,075	106	20	58	0	71,489	124	27	71	0	72,918	2900	
88	13	45	0	74,845	106	20	58	0	76,307	124	27	71	0	77,783	3000	
88	13	44	0	79,773	106	20	58	0	81,282	124	27	71	0	82,805	3100	
88	13	44	0	82,041	106	20	58	0	83,571	124	27	71	0	85,116	3150	
88	13	44	0	84,857	106	20	57	0	86,413	124	27	71	0	87,984	3200	
88	13	44	0	90,099	106	20	57	0	91,702	124	27	70	0	93,320	3300	
88	13	44	0	95,498	106	20	57	0	97,148	124	27	70	0	98,813	3400	
88	13	44	0	97,979	106	20	57	0	99,650	124	27	70	0	101,336	3450	
88	13	44	0	106,767	106	20	57	0	108,511	124	27	70	0	110,270	3600	
88	13	44	0	118,664	106	20	57	0	120,503	124	27	70	0	122,356	3800	
88	13	43	0	131,190	106	20	56	0	133,123	124	27	69	0	135,070	4000	

LATERAL
rubber flange

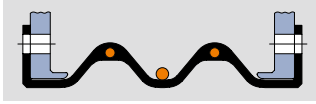
U120x

Individual fabrication possible



U122x (B/E/C/M/R/K/L)

► with embedded vacuum support rings



U125x (B/E/C/M/R/K/L)

► with embedded vacuum support rings, with external pressure support ring in the arch trough

Installation length (L_E) at design pressure

NB	up to 4 bar $L_E = 350$ mm up to 6 bar $L_E = 350$ mm up to 10 bar $L_E = 400$ mm					up to 4 bar $L_E = 350$ mm up to 6 bar $L_E = 400$ mm up to 10 bar $L_E = 450$ mm					up to 4 bar $L_E = 400$ mm up to 6 bar $L_E = 450$ mm up to 10 bar $L_E = 500$ mm				
	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
	mm	mm	± mm	± °		mm	mm	± mm	± °		mm	mm	± mm	± °	
100	35	7	35	0	177	41	5	36	0	150	52	12	54	0	222
125	35	7	34	0	241	41	5	35	0	209	52	12	53	0	293
150	35	7	34	0	314	41	5	35	0	278	52	12	52	0	373
175	35	7	33	0	415	41	5	34	0	373	52	12	51	0	483
200	35	7	33	0	491	41	5	34	0	445	52	12	51	0	564
250	35	7	32	0	707	41	5	33	0	651	52	12	50	0	794
300	35	7	32	0	973	41	5	32	0	908	52	12	49	0	1,075
350	35	7	31	0	1,288	41	5	32	0	1,213	52	12	48	0	1,405
400	35	7	31	0	1,605	41	5	32	0	1,521	52	12	48	0	1,735
450	35	7	31	0	1,987	41	5	31	0	1,893	52	12	47	0	2,132
500	35	7	30	0	2,402	41	5	31	0	2,299	52	12	47	0	2,561
550						41	5	31	0	2,715	52	12	46	0	3,000
600						41	5	30	0	3,227	52	12	46	0	3,536
650						41	5	30	0	3,718	52	12	45	0	4,049
700						41	5	30	0	4,324	52	12	45	0	4,681
750						41	5	30	0	4,877	52	12	45	0	5,255
800						41	5	30	0	5,581	52	12	45	0	5,986
850						41	5	30	0	6,193	52	12	44	0	6,619
900						41	5	29	0	6,984	52	12	44	0	7,436
950						41	5	29	0	7,667	52	12	44	0	8,139
1000						41	5	29	0	8,544	52	12	44	0	9,043
1050											52	12	44	0	9,817
1100											52	12	43	0	10,825
1150											52	12	43	0	11,652
1200											52	12	43	0	12,728
1250											52	12	43	0	13,643
1300											52	12	43	0	14,806
1350											52	12	43	0	15,792
1400											52	12	42	0	17,041
1450											52	12	42	0	18,098
1500											52	12	42	0	19,433
1600											52	12	42	0	21,983
1650											52	12	42	0	23,181
1700											52	12	42	0	24,689
1800											52	12	41	0	27,582
1900											52	12	41	0	30,573
1950											52	12	41	0	31,984
2000											52	12	41	0	33,751
2100															
2200															
2250															
2300															
2400															
2500															
2550															
2600															
2700															
2800															
2850															
2900															
3000															
3100															
3150															
3200															
3300															
3400															
3450															
3600															
3800															
4000															

Recommended sizes

Additional possible sizes

Reduction of movement for expansion joints with PTFE lining:

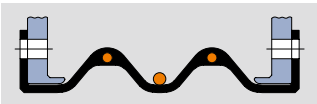
axial compression: -0 %; axial extension: -0 %; lateral displacement: -0 %.

In the event of lateral displacement and simultaneous axial extension (due to installation gap tolerance) the above movements are reduced (► page 22). Larger movements on request.

U122x (B/E/C/M/R/K/L)
► with embedded vacuum support rings



U125x (B/E/C/M/R/K/L)
► with embedded vacuum support rings, with external pressure support ring in the arch trough



Installation length (L _E) at design pressure																
up to 4 bar L _E = 450 mm up to 6 bar L _E = 500 mm up to 10 bar L _E = 550 mm					up to 4 bar L _E = 500 mm up to 6 bar L _E = 550 mm up to 10 bar L _E = 600 mm					up to 4 bar L _E = 550 mm up to 6 bar L _E = 600 mm up to 10 bar L _E = 650 mm						
higher pressures on request																
Movement				A	Movement				A	Movement				A	NB	
																
mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²		
58	12	59	0	232	70	19	77	0	320	82	26	95	0	423	100	
58	12	58	0	305	70	19	75	0	405	82	26	93	0	519	125	
58	12	57	0	387	70	19	74	0	499	82	26	91	0	625	150	
58	12	56	0	499	70	19	73	0	625	82	26	90	0	765	175	
58	12	55	0	581	70	19	72	0	716	82	26	89	0	866	200	
58	12	54	0	814	70	19	71	0	973	82	26	87	0	1,146	250	
58	12	53	0	1,099	70	19	69	0	1,282	82	26	86	0	1,479	300	
58	12	52	0	1,432	70	19	69	0	1,640	82	26	85	0	1,863	350	
58	12	52	0	1,765	70	19	68	0	1,995	82	26	84	0	2,240	400	
58	12	51	0	2,165	70	19	67	0	2,419	82	26	83	0	2,688	450	
58	12	51	0	2,597	70	19	66	0	2,875	82	26	82	0	3,167	500	
58	12	50	0	3,039	70	19	66	0	3,339	82	26	81	0	3,653	550	
58	12	50	0	3,578	70	19	65	0	3,904	82	26	81	0	4,243	600	
58	12	50	0	4,094	70	19	65	0	4,441	82	26	80	0	4,803	650	
58	12	49	0	4,729	70	19	64	0	5,102	82	26	79	0	5,489	700	
58	12	49	0	5,307	70	19	64	0	5,701	82	26	79	0	6,110	750	
58	12	49	0	6,041	70	19	64	0	6,461	82	26	78	0	6,896	800	
58	12	48	0	6,677	70	19	63	0	7,118	82	26	78	0	7,574	850	
58	12	48	0	7,497	70	19	63	0	7,964	82	26	78	0	8,446	900	
58	12	48	0	8,203	70	19	63	0	8,692	82	26	77	0	9,195	950	
58	12	48	0	9,110	70	19	62	0	9,625	82	26	77	0	10,153	1000	
58	12	47	0	9,887	70	19	62	0	10,423	82	26	77	0	10,973	1050	
58	12	47	0	10,899	70	19	62	0	11,461	82	26	76	0	12,037	1100	
58	12	47	0	11,728	70	19	61	0	12,311	82	26	76	0	12,908	1150	
58	12	47	0	12,808	70	19	61	0	13,417	82	26	76	0	14,040	1200	
58	12	47	0	13,726	70	19	61	0	14,356	82	26	75	0	15,001	1250	
58	12	47	0	14,892	70	19	61	0	15,548	82	26	75	0	16,218	1300	
58	12	46	0	15,881	70	19	61	0	16,559	82	26	75	0	17,250	1350	
58	12	46	0	17,134	70	19	60	0	17,837	82	26	75	0	18,554	1400	
58	12	46	0	18,194	70	19	60	0	18,918	82	26	74	0	19,656	1450	
58	12	46	0	19,532	70	19	60	0	20,283	82	26	74	0	21,047	1500	
58	12	46	0	22,088	70	19	60	0	22,885	82	26	74	0	23,697	1600	
58	12	46	0	23,289	70	19	60	0	24,108	82	26	73	0	24,941	1650	
58	12	45	0	24,801	70	19	59	0	25,645	82	26	73	0	26,504	1700	
58	12	45	0	27,700	70	19	59	0	28,592	82	26	73	0	29,498	1800	
58	12	45	0	30,698	70	19	59	0	31,636	82	26	73	0	32,589	1900	
58	12	45	0	32,111	70	19	59	0	33,071	82	26	72	0	34,045	1950	
58	12	45	0	33,882	70	19	58	0	34,867	82	26	72	0	35,867	2000	
58	12	45	0	37,223	70	19	58	0	38,256	82	26	72	0	39,303	2100	
58	12	44	0	40,721	70	19	58	0	41,801	82	26	72	0	42,895	2200	
58	12	44	0	42,346	70	19	58	0	43,447	82	26	71	0	44,563	2250	
58	12	44	0	44,376	70	19	58	0	45,503	82	26	71	0	46,645	2300	
58	12	44	0	48,188	70	19	58	0	49,363	82	26	71	0	50,551	2400	
58	12	44	0	52,158	70	19	57	0	53,379	82	26	71	0	54,615	2500	
58	12	44	0	53,995	70	19	57	0	55,238	82	26	71	0	56,495	2550	
58	12	44	0	56,284	70	19	57	0	57,553	82	26	71	0	58,836	2600	
58	12	44	0	60,568	70	19	57	0	61,883	82	26	70	0	63,213	2700	
58	12	43	0	65,008	70	19	57	0	66,371	82	26	70	0	67,748	2800	
58	12	43	0	67,058	70	19	57	0	68,442	82	26	70	0	69,840	2850	
58	12	43	0	69,606	70	19	57	0	71,016	82	26	70	0	72,440	2900	
58	12	43	0	74,361	70	19	56	0	75,818	82	26	70	0	77,289	3000	
58	12	43	0	79,273	70	19	56	0	80,777	82	26	69	0	82,295	3100	
58	12	43	0	81,534	70	19	56	0	83,060	82	26	69	0	84,599	3150	
58	12	43	0	84,342	70	19	56	0	85,893	82	26	69	0	87,459	3200	
58	12	43	0	89,568	70	19	56	0	91,166	82	26	69	0	92,779	3300	
58	12	43	0	94,951	70	19	56	0	96,597	82	26	69	0	98,256	3400	
58	12	43	0	97,425	70	19	56	0	99,091	82	26	69	0	100,772	3450	
58	12	42	0	106,188	70	19	55	0	107,928	82	26	68	0	109,682	3600	
58	12	42	0	118,054	70	19	55	0	119,888	82	26	68	0	121,736	3800	
58	12	42	0	130,548	70	19	55	0	132,477	82	26	68	0	134,419	4000	

LATERAL
rubber flange

U120x

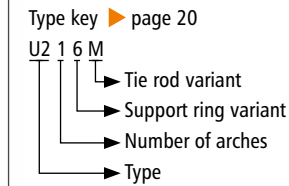
Individual fabrication possible

U216x (B/E/C/M/R/K/L)

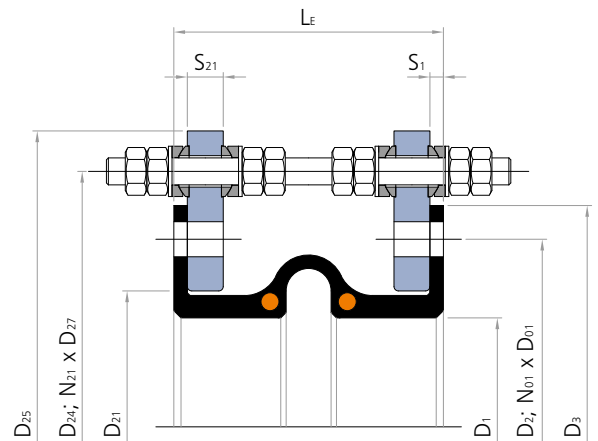
NB 100 – NB 4000



► Type U216x (B/E/C/M/R/K/L)



Planning help U216M



Lateral expansion joint with one arch

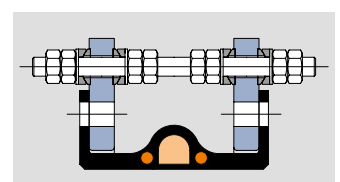
- Design:** Thick-walled, single-arch rubber bellows with full faced rubber flanges, split backing flanges with tie rods and embedded support rings at the arch foot
- Nominal diameters:** NB 100 to NB 4000, intermediate sizes possible
- Installation length:** Standard $L_E = 250$ to 350 mm (► page 181)
Other installation lengths on request
- Pressure:** Depending on the nominal diameter up to 25 bar
Vacuum-proof. Design in accordance with Pressure Equipment Directive PED 2014/68/EU
- Movement:** For lateral movements (► page 181)
Installation gap tolerances possible in the context of axial compression and extension
- Stiffness rate:** The embedded support rings and reinforcements generate large stiffness rates
- Arch:** Optionally filled with foam rubber, to avoid turbulence and accumulation of solid matter (► page 181)
Observe the restriction on specified movement (► page 181)

Application:

Cooling water systems,
desalination plants, drinking
water supply, plant construction,
e.g. in pipelines, on
pumps, as dismantling joints,
on condensers and vessels



Assembly instruction download
www.ditec-adam.de/en/downloads.html



Rubber bellows

Rubber	Fabric	Marking	Max.	Application
EPDM	Nylon		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDM	Kevlar		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMht	Kevlar		120 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMtw	Nylon		100 °C	Drinking water
EPDMtw	Kevlar		100 °C	Drinking water
EPDMaf	Nylon		100 °C	Abrasive materials, water-sand extraction
EPDMaf	Kevlar		100 °C	Abrasive materials, water-sand extraction
EPDMbeige	Nylon		100 °C	Foodstuffs
EPDMbeige	Kevlar		100 °C	Foodstuffs
IIR	Nylon		100 °C	Hot water, acids, bases, gases
IIR	Kevlar		100 °C	Hot water, acids, bases, gases
CSM	Nylon		100 °C	Strong acids, bases, chemicals
CSM	Kevlar		100 °C	Strong acids, bases, chemicals
NBR	Nylon		100 °C	Oils, petrol, solvents, compressed air
NBR	Kevlar		100 °C	Oils, petrol, solvents, compressed air
NBRbeige	Nylon		100 °C	Oil, fatty foods
NBRbeige	Kevlar		100 °C	Oil, fatty foods
CR	Nylon		90 °C	Cooling water, slightly oily water, seawater
CR	Kevlar		90 °C	Cooling water, slightly oily water, seawater
FPM	Kevlar		180 °C	Corrosive chemicals, petroleum distillates
FPMbeige	Kevlar		180 °C	Oil, fatty foods
NR	Nylon		70 °C	Abrasive materials
Silicon	Kevlar or glass		200 °C	Air, saltwater atmosphere, foodstuffs, medical technology

Flanges

- Design:

Single-part or multi-part backing flanges with clearance holes and holder for tie rods (control unit type B, E, C, M)

Single-part or multi-part round backing flanges with clearance holes and control unit plates (control unit type R, K, L)
- Flange norms:

DIN, EN, ANSI, AWWA, BS, JIS, special measurements (▶ page 256)
- Materials:

Carbon steel: 1.0038 (S235JRG2)
1.0570 (S355J2G3)
Stainless steel: 1.4301 (X5CrNi18-10)
1.4571 (X6CrNiMoTi17-12-2)
Aluminium: AlMg3
Other materials on request
- Coating:

Primed, hot-dip galvanised, special paint

Optional accessories

- Protective hood:

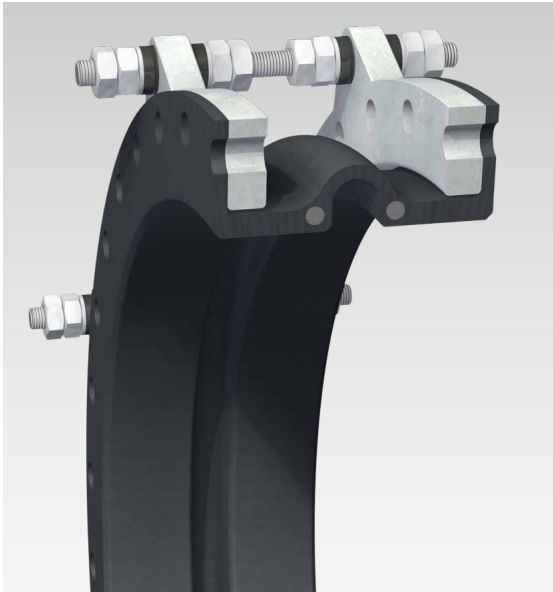
UV protection cover, ground protective cover, fire protection cover, splash protective cover (▶ page 44)
- Flow liners:

Cylindrical flow liner, conical flow liner, telescoping flow liner (▶ page 43)

LATERAL
rubber flange

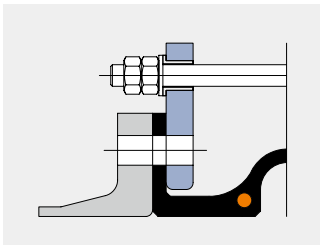
U216x

Tie rods

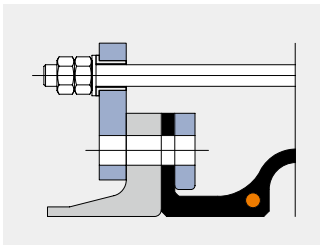


Example: Type U216M

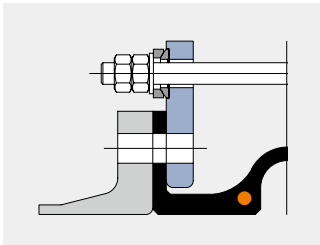
- Design:** Dimensioning according to design pressure (test pressure) based on the Pressure Equipment Directive
- Materials:** Carbon steel in strength class 8.8 or stainless steel
- Coating:** Spherical bearings and ball disks PTFE-coated
Tie rods galvanised, hot-dip galvanised or PTFE-coated



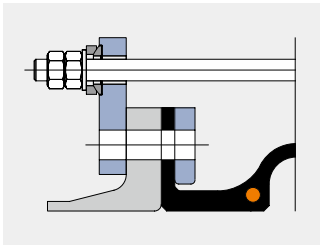
Type U216B
Tie rods mounted outside in rubber bushing to accommodate reaction forces in the event of pressure (up to NB 300)



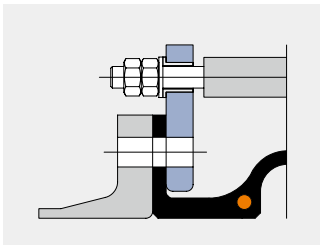
Type U216R
Control unit plate: Tie rods mounted outside in rubber bushing to accommodate reaction forces in the event of pressure (up to NB 300)



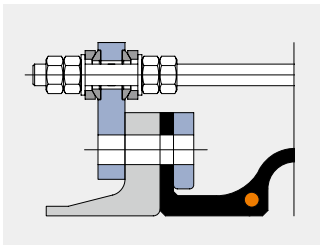
Type U216E
Tie rods mounted outside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure



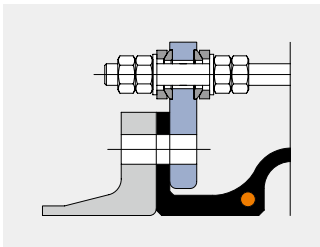
Type U216K
Control unit plate: Tie rods mounted outside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure



Type U216C
Tie rods mounted outside in rubber bushing and inside in the thrust limiter to accommodate stresses in the event of pressure and vacuum (up to NB 300)

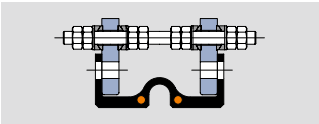


Type U216L
Control unit plate: Tie rods mounted outside and inside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure and vacuum



Type U216M
Tie rods mounted outside and inside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure and vacuum

U216x (B/E/C/M/R/K/L)
► with one arch



Installation length (L _E) at design pressure															
	up to 10 bar L _E = 250 mm					up to 10 bar L _E = 300 mm					up to 10 bar L _E = 350 mm				
	higher pressures on request														
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	±mm	±°	cm²	mm	mm	±mm	±°	cm²	mm	mm	±mm	±°	cm²
100	35	15	27	0	346	41	21	35	0	460	47	24	40	0	573
125	35	15	25	0	434	41	21	34	0	560	47	24	39	0	683
150	35	15	25	0	531	41	21	33	0	670	47	24	37	0	804
175	35	15	24	0	661	41	21	32	0	814	47	24	36	0	962
200	35	15	23	0	755	41	21	31	0	919	47	24	35	0	1,075
250	35	15	22	0	1,018	41	21	30	0	1,207	47	24	34	0	1,385
300	35	15	22	0	1,333	41	21	29	0	1,548	47	24	33	0	1,750
350	35	15	21	0	1,698	41	21	28	0	1,940	47	24	32	0	2,165
400	35	15	21	0	2,059	41	21	27	0	2,324	47	24	31	0	2,570
450	35	15	20	0	2,489	41	21	27	0	2,781	47	24	31	0	3,048
500	35	15	20	0	2,951	41	21	26	0	3,267	47	24	30	0	3,557
550	35	15	19	0	3,421	41	21	26	0	3,761	47	24	29	0	4,072
600	35	15	19	0	3,993	41	21	25	0	4,359	47	24	29	0	4,693
650	35	15	19	0	4,536	41	21	25	0	4,927	47	24	29	0	5,281
700	35	15	19	0	5,204	41	21	25	0	5,621	47	24	28	0	5,999
750	35	15	18	0	5,809	41	21	24	0	6,249	47	24	28	0	6,648
800	35	15	18	0	6,576	41	21	24	0	7,044	47	24	28	0	7,466
850	35	15	18	0	7,238	41	21	24	0	7,729	47	24	27	0	8,171
900	35	15	18	0	8,091	41	21	24	0	8,610	47	24	27	0	9,076
950	35	15	18	0	8,825	41	21	23	0	9,366	47	24	27	0	9,852
1000	35	15	17	0	9,764	41	21	23	0	10,333	47	24	26	0	10,843
1050	35	15	17	0	10,568	41	21	23	0	11,159	47	24	26	0	11,690
1100	35	15	17	0	11,613	41	21	23	0	12,233	47	24	26	0	12,788
1150	35	15	17	0	12,469	41	21	23	0	13,110	47	24	26	0	13,685
1200	35	15	17	0	13,581	41	21	22	0	14,250	47	24	26	0	14,849
1250	35	15	17	0	14,527	41	21	22	0	15,218	47	24	25	0	15,837
1300	35	15	17	0	15,725	41	21	22	0	16,445	47	24	25	0	17,087
1350	35	15	17	0	16,742	41	21	22	0	17,483	47	24	25	0	18,146
1400	35	15	16	0	18,027	41	21	22	0	18,796	47	24	25	0	19,483
1450	35	15	16	0	19,113	41	21	22	0	19,906	47	24	25	0	20,612
1500	35	15	16	0	20,485	41	21	22	0	21,305	47	24	25	0	22,035
1600	35	15	16	0	23,100	41	21	21	0	23,970	47	24	24	0	24,745
1650	35	15	16	0	24,328	41	21	21	0	25,221	47	24	24	0	26,016
1700	35	15	16	0	25,873	41	21	21	0	26,793	47	24	24	0	27,612
1800	35	15	16	0	28,832	41	21	21	0	29,804	47	24	24	0	30,666
1900	35	15	16	0	31,889	41	21	21	0	32,910	47	24	24	0	33,816
1950	35	15	15	0	33,329	41	21	21	0	34,373	47	24	23	0	35,299
2000	35	15	15	0	35,133	41	21	20	0	36,204	47	24	23	0	37,154
2100	35	15	15	0	38,533	41	21	20	0	39,655	47	24	23	0	40,649
2200	35	15	15	0	42,091	41	21	20	0	43,263	47	24	23	0	44,301
2250	35	15	15	0	43,744	41	21	20	0	44,938	47	24	23	0	45,996
2300	35	15	15	0	45,806	41	21	20	0	47,028	47	24	23	0	48,111
2400	35	15	15	0	49,678	41	21	20	0	50,950	47	24	23	0	52,077
2500	35	15	15	0	53,707	41	21	20	0	55,030	47	24	22	0	56,200
2550	35	15	15	0	55,572	41	21	20	0	56,917	47	24	22	0	58,107
2600	35	15	15	0	57,893	41	21	19	0	59,266	47	24	22	0	60,481
2700	35	15	15	0	62,237	41	21	19	0	63,660	47	24	22	0	64,918
2800	35	15	14	0	66,737	41	21	19	0	68,210	47	24	22	0	69,513
2850	35	15	14	0	68,813	41	21	19	0	70,309	47	24	22	0	71,631
2900	35	15	14	0	71,394	41	21	19	0	72,918	47	24	22	0	74,264
3000	35	15	14	0	76,209	41	21	19	0	77,783	47	24	22	0	79,173
3100	35	15	14	0	81,181	41	21	19	0	82,805	47	24	22	0	84,239
3150	35	15	14	0	83,469	41	21	19	0	85,116	47	24	21	0	86,570
3200	35	15	14	0	86,309	41	21	19	0	87,984	47	24	21	0	89,462
3300	35	15	14	0	91,595	41	21	19	0	93,320	47	24	21	0	94,842
3400	35	15	14	0	97,038	41	21	19	0	98,813	47	24	21	0	100,379
3450	35	15	14	0	99,538	41	21	19	0	101,336	47	24	21	0	102,922
3600	35	15	14	0	108,395	41	21	18	0	110,270	47	24	21	0	111,924
3800	35	15	14	0	120,380	41	21	18	0	122,356	47	24	21	0	124,098
4000	35	15	14	0	132,993	41	21	18	0	135,070	47	24	21	0	136,900

Recommended sizes
Additional possible sizes

Reduction of movement for expansion joints with filled arch:
axial compression: -50 %; axial extension: -75 %; lateral displacement: -50 %.
In the event of lateral displacement and simultaneous axial extension the above movements are reduced (► page 22).

Individual fabrication possible

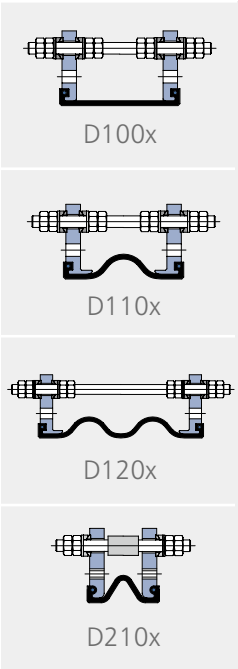
LATERAL
rubber flange

U216x



Lateral expansion joints with swivel flange

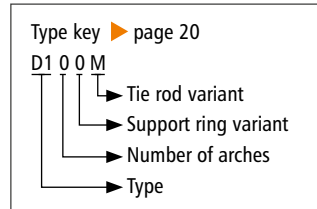
D100x	without arch	▶ 184
D110x	with one arch	▶ 190
D120x	with two arches	▶ 198
D210x	with one arch and flange with threaded holes	▶ 206



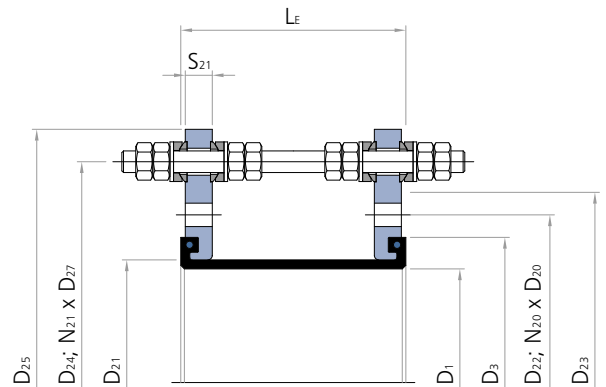
D100x (B/E/C/M/R/K/L)

NB 40 – NB 1200

► Type D100x (B/E/C/M/R/K/L)



Planning help D100M



Lateral expansion joint without arch

- Design:** Hydrodynamic, cylindrical rubber bellows with self-sealing rubber bulges and swivel backing flanges with tie rods
- Nominal diameters:** NB 40 to NB 1200, intermediate sizes possible
- Installation length:** Standard $L_E = 150$ to 400 mm (► page 188)
Other installation lengths on request
- Pressure:** Depending on the nominal diameter and installation length up to 10 bar
Vacuum stability on request
Design in accordance with Pressure Equipment Directive PED 2014/68/EU
- Movement:** For slight lateral movements (► page 188)
Installation gap tolerances possible in the context of axial compression and extension

Application:

Plant construction, sand/
gravel extraction industry,
dredgers, food processing
e.g. as suction/pressure
hoses, in conveyor lines, on
pumps and vessels



Assembly instruction download
www.ditec-adam.de/en/downloads.html

Rubber bellows

Rubber	Fabric	Marking	Max.	Application
EPDM	Nylon		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDM	Kevlar		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMht	Kevlar		120 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMtw	Nylon		100 °C	Drinking water
EPDMtw	Kevlar		100 °C	Drinking water
EPDMaf	Nylon		100 °C	Abrasive materials, water-sand extraction
EPDMaf	Kevlar		100 °C	Abrasive materials, water-sand extraction
EPDMbeige	Nylon		100 °C	Foodstuffs
EPDMbeige	Kevlar		100 °C	Foodstuffs
IIR	Nylon		100 °C	Hot water, acids, bases, gases
IIR	Kevlar		100 °C	Hot water, acids, bases, gases
CSM	Nylon		100 °C	Strong acids, bases, chemicals
CSM	Kevlar		100 °C	Strong acids, bases, chemicals
NBR	Nylon		100 °C	Oils, petrol, solvents, compressed air
NBR	Kevlar		100 °C	Oils, petrol, solvents, compressed air
NBRbeige	Nylon		100 °C	Oil, fatty foods
NBRbeige	Kevlar		100 °C	Oil, fatty foods
CR	Nylon		90 °C	Cooling water, slightly oily water, seawater
CR	Kevlar		90 °C	Cooling water, slightly oily water, seawater
FPM	Kevlar		180 °C	Corrosive chemicals, petroleum distillates
FPMbeige	Kevlar		180 °C	Oil, fatty foods
NR	Nylon		70 °C	Abrasive materials
Silicon	Kevlar or glass		200 °C	Air, saltwater atmosphere, foodstuffs, medical technology

LATERAL
swivel flange

Flanges

Design: Single-part swivel backing flanges with clearance holes, groove to accommodate the rubber bulges and holder for tie rods (control unit type B, E, C, M)

Single-part, round, swivel backing flanges with clearance holes, groove to accommodate the rubber bulges and control unit plates (control unit type R, K, L)

Flange norms: DIN, EN, ANSI, AWWA, BS, JIS, special measurements (▶ page 256)

Materials: Carbon steel: 1.0038 (S235JRG2)
1.0570 (S355J2G3)
Stainless steel: 1.4301 (X5CrNi18-10)
1.4571 (X6CrNiMoTi17-12-2)
Aluminium: AlMg3
Other materials on request

Coating: Primed, hot-dip galvanised, special paint

Optional accessories

Protective hood: UV protection cover, ground protective cover,
fire protection cover, splash protective cover (▶ page 44)

Flow liners: Cylindrical flow liner, conical flow liner,
telescoping flow liner (▶ page 43)

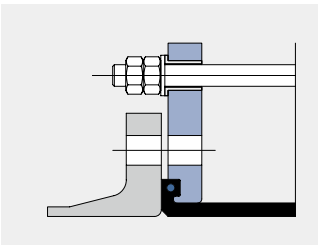
D100x

Tie rods

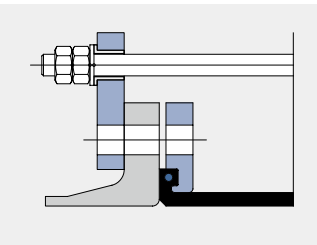


Example: Type D100M

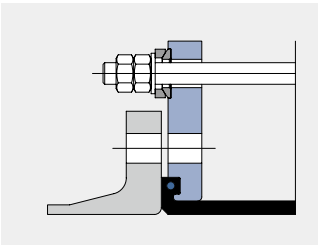
- Design:** Dimensioning according to design pressure (test pressure) based on the Pressure Equipment Directive
- Materials:** Carbon steel in strength class 8.8 or stainless steel
- Coating:** Spherical bearings and ball disks PTFE-coated
Tie rods galvanised, hot-dip galvanised or PTFE-coated



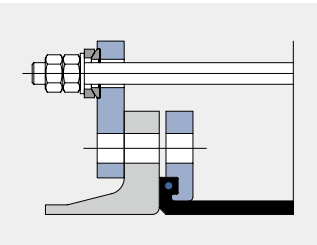
Type D100B
Tie rods mounted outside in rubber bushing to accommodate reaction forces in the event of pressure (up to NB 300)



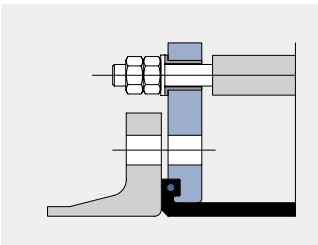
Type D100R
Control unit plates: Tie rods mounted outside in rubber bushing to accommodate reaction forces in the event of pressure (up to NB 300)



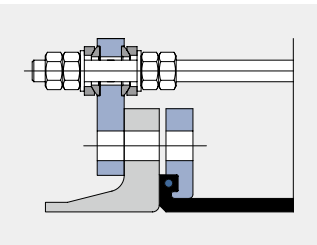
Type D100E
Tie rods mounted outside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure



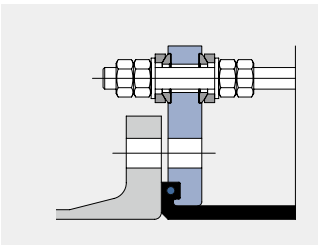
Type D100K
Control unit plates: Tie rods mounted outside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure



Type D100C
Tie rods mounted outside in rubber bushing and inside in the thrust limiter to accommodate stresses in the event of pressure and vacuum (up to NB 300)



Type D100L
Control unit plates: Tie rods mounted outside and inside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure and vacuum



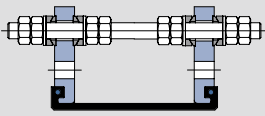
Type D100M
Tie rods mounted outside and inside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure and vacuum



Lateral expansion joint, type U110R
on the pump pressure side in a paper mill
NB 50, 10 bar

LATERAL
swivel flange

D100x



D100x (B/E/C/M/R/K/L)

► without arch

Installation length (L _E) at design pressure															
	up to 10 bar L _E = 150 mm					up to 10 bar L _E = 200 mm					up to 10 bar L _E = 250 mm				
	higher pressures on request														
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²
40	8	5	12	0	10	10	6	16	0	10	13	8	20	0	10
50	8	5	11	0	16	10	6	15	0	16	13	8	19	0	16
65	8	5	11	0	28	10	6	14	0	28	13	8	18	0	28
80	8	5	10	0	43	10	6	14	0	43	13	8	17	0	43
100	8	5	10	0	69	10	6	13	0	69	13	8	17	0	69
125	8	5	10	0	115	10	6	13	0	115	13	8	16	0	115
150	8	5	9	0	170	10	6	12	0	170	13	8	15	0	170
200	8	5	9	0	278	10	6	12	0	278	13	8	14	0	278
250	8	5	8	0	449	10	6	11	0	449	13	8	14	0	449
300	8	5	8	0	656	10	6	11	0	656	13	8	13	0	656
350	8	5	8	0	855	10	6	10	0	855	13	8	13	0	855
400	8	5	8	0	1,195	10	6	10	0	1,195	13	8	13	0	1,195
450	8	5	7	0	1,514	10	6	10	0	1,514	13	8	12	0	1,514
500	8	5	7	0	1,886	10	6	10	0	1,886	13	8	12	0	1,886
600	8	5	7	0	2,706	10	6	9	0	2,706	13	8	12	0	2,706
700	8	5	7	0	3,750	10	6	9	0	3,750	13	8	11	0	3,750
800	8	5	7	0	4,914	10	6	9	0	4,914	13	8	11	0	4,914
900	8	5	6	0	6,193	10	6	9	0	6,193	13	8	11	0	6,193
1000	8	5	6	0	7,667	10	6	8	0	7,667	13	8	10	0	7,667
1100	8	5	6	0	9,297	10	6	8	0	9,297	13	8	10	0	9,297
1200	8	5	6	0	11,085	10	6	8	0	11,085	13	8	10	0	11,085

Installation length (L _E) at design pressure															
up to 10 bar L _E = 300 mm					up to 10 bar L _E = 350 mm					up to 10 bar L _E = 400 mm					
higher pressures on request															
Movement				A	Movement				A	Movement				A	NB
mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	
15	9	24	0	10	18	11	28	0	10	20	12	32	0	10	40
15	9	23	0	16	18	11	27	0	16	20	12	30	0	16	50
15	9	22	0	28	18	11	25	0	28	20	12	29	0	28	65
15	9	21	0	43	18	11	24	0	43	20	12	28	0	43	80
15	9	20	0	69	18	11	23	0	69	20	12	27	0	69	100
15	9	19	0	115	18	11	22	0	115	20	12	25	0	115	125
15	9	18	0	170	18	11	21	0	170	20	12	24	0	170	150
15	9	17	0	278	18	11	20	0	278	20	12	23	0	278	200
15	9	17	0	449	18	11	19	0	449	20	12	22	0	449	250
15	9	16	0	656	18	11	19	0	656	20	12	21	0	656	300
15	9	15	0	855	18	11	18	0	855	20	12	21	0	855	350
15	9	15	0	1,195	18	11	18	0	1,195	20	12	20	0	1,195	400
15	9	15	0	1,514	18	11	17	0	1,514	20	12	20	0	1,514	450
15	9	14	0	1,886	18	11	17	0	1,886	20	12	19	0	1,886	500
15	9	14	0	2,706	18	11	16	0	2,706	20	12	19	0	2,706	600
15	9	13	0	3,750	18	11	16	0	3,750	20	12	18	0	3,750	700
15	9	13	0	4,914	18	11	15	0	4,914	20	12	18	0	4,914	800
15	9	13	0	6,193	18	11	15	0	6,193	20	12	17	0	6,193	900
15	9	13	0	7,667	18	11	15	0	7,667	20	12	17	0	7,667	1000
15	9	12	0	9,297	18	11	14	0	9,297	20	12	16	0	9,297	1100
15	9	12	0	11,085	18	11	14	0	11,085	20	12	16	0	11,085	1200

Larger movements see type D110x.

Individual fabrication possible



Lateral expansion joint, type U110R
on the pump discharge side
Universal expansion joint type U110A
on the pump suction side of a lye pipe
in a paper mill
NB 125, 5 bar

D100x

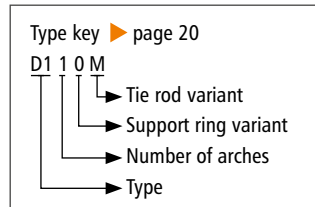
LATERAL
swivel flange

D110x (B/E/C/M/R/K/L)

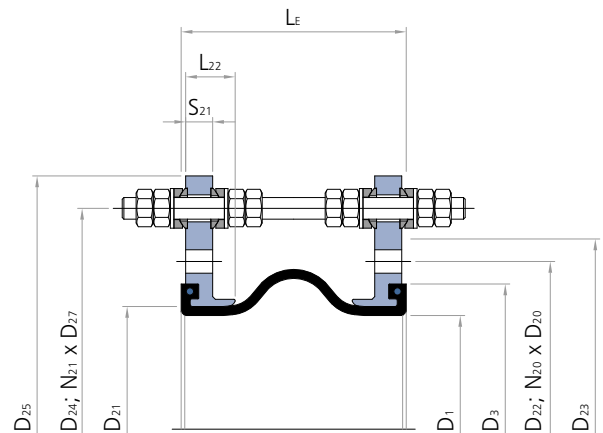
NB 20 – NB 1200



- **Type D110x** (B/E/C/M/R/K/L)
without vacuum support ring
- **Type D111x** (B/E/C/M/R/K/L)
with internal vacuum support ring
- **Type D112x** (B/E/C/M/R/K/L)
with embedded vacuum support ring



Planning help D110M

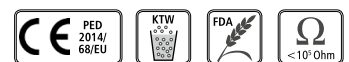


Lateral expansion joint with one arch

- Design:** Hydrodynamic, single-arch rubber bellows with self-sealing rubber bulges and swivel backing flanges with support collar and tie rods
Optionally with vacuum support ring
- Nominal diameters:** NB 20 to NB 1200, intermediate sizes possible
- Installation length:** Standard $L_E = 130$ to 350 mm (► page 194–196)
Other installation lengths on request
- Pressure:** Depending on the nominal diameter up to 25 bar
Vacuum stability on request, with vacuum support ring up to 0.05 bar absolute
Design in accordance with Pressure Equipment Directive PED 2014/68/EU
- Movement:** For lateral movements (► page 194–196)
Installation gap tolerances possible in the context of axial compression and extension
- Stiffness rate:** Lateral stiffness rates (► page 254)

Application:

Cooling water systems,
desalination plants, drinking
water supply, plant construc-
tion, e.g. in pipelines, on
pumps, as dismantling joints,
on condensers and vessels



Assembly instruction download
www.ditec-adam.de/en/downloads.html

Standard rubber bellows

Rubber	Fabric	Marking	Max.	Application
EPDM / EPDM	PEEK		130 °C	Heating systems, cooling, hot air
IIR / EPDM	Nylon		100 °C	Drinking water, seawater, weak acids and alkalis, dilute weather resistant
NBR / CR	Nylon		90 °C	Oils, fuels, gases
NBRweiß / CR	Nylon		90 °C	Fat containing food, weather resistant
CSM / CSM	Nylon		100 °C	Chemicals, aggressive chemical wastewater, weather resistant
NBR / CR	Nylon		90 °C	Oils, fuels, gases, LPG, blast furnace gas, lubricants
CR / CR	Nylon		90 °C	Cold- and hot water, seawater, wastewater with oleaginous corrosion protection
NBR / CR	Stahl		90 °C	Oils, fuels, gases, fuel ethanol blends
NBR-LT / CR	Nylon		90 °C	Oils, fuels, gases, LPG, for tanker and filling stations
HNBR / CR	Stahl		100 °C	Oils, fuels, gases, LPG, high Temperature
FPM / ECO	Nylon		100 °C	Flue gas desulphurisation, biodiesel, benzene, xylene
IIR-D / EPDM	PEEK		130 °C	Steam, water
NBR / CR	PEEK		120 °C	Mineral oil, hydraulic oil
CSM / CR	PEEK		120 °C	Acids, alkalis

Non-standard rubber bellows

Rubber	Fabric	Marking	Max.	Application
EPDM	Nylon		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDM	Kevlar		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMht	Kevlar		120 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMtw	Nylon		100 °C	Drinking water
EPDMtw	Kevlar		100 °C	Drinking water
EPDMaf	Nylon		100 °C	Abrasive materials, water-sand extraction
EPDMaf	Kevlar		100 °C	Abrasive materials, water-sand extraction
EPDMbeige	Nylon		100 °C	Foodstuffs
EPDMbeige	Kevlar		100 °C	Foodstuffs
IIR	Nylon		100 °C	Hot water, acids, bases, gases
IIR	Kevlar		100 °C	Hot water, acids, bases, gases
CSM	Nylon		100 °C	Strong acids, bases, chemicals
CSM	Kevlar		100 °C	Strong acids, bases, chemicals
NBR	Nylon		100 °C	Oils, petrol, solvents, compressed air
NBR	Kevlar		100 °C	Oils, petrol, solvents, compressed air
NBRbeige	Nylon		100 °C	Oil, fatty foods
NBRbeige	Kevlar		100 °C	Oil, fatty foods
CR	Nylon		90 °C	Cooling water, slightly oily water, seawater
CR	Kevlar		90 °C	Cooling water, slightly oily water, seawater
FPM	Kevlar		180 °C	Corrosive chemicals, petroleum distillates
FPMbeige	Kevlar		180 °C	Oil, fatty foods
NR	Nylon		70 °C	Abrasive materials
Silicon	Kevlar or glass		200 °C	Air, saltwater atmosphere, foodstuffs, medical technology

LATERAL
swivel flange

D110x

Flanges

Design: Single-part swivel backing flanges with support collar, clearance holes, groove to accommodate the rubber bulges and holder for tie rods (control unit B, E, C, M)

Single-part round backing swivel flanges with support collar, clearance holes, groove to accommodate the rubber bulges and control unit plates (control unit type R, K, L)

Flange norms: DIN, EN, ANSI, AWWA, BS, JIS, special measurements (▶ page 256)

Materials:

Carbon steel: 1.0038 (S235JRG2)
1.0570 (S355J2G3)

Stainless steel: 1.4301 (X5CrNi18-10)
1.4571 (X6CrNiMoTi17-12-2)

Aluminium: AlMg3

Other materials on request

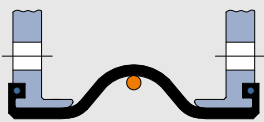
Coating: Primed, hot-dip galvanised, special paint

Optional accessories

Protective hood: UV protection cover
Ground protective cover
Fire protection cover
Splash protective cover
(▶ page 44)

Flow liners: Cylindrical flow liner
Conical flow liner
Telescoping flow liner
(▶ page 43)

Support rings

TYPE		Vacuum support ring	Pressure	Movement
D110x (B/E/C/M/ R/K/L)		Without	Depending on the nominal diameter up to 25 bar, vacuum stability on request	▶ page 194
D111x (B/E/C/M/ R/K/L)		Vacuum support ring spiral (1.4310) up to NB 300, vacuum support ring starting at NB 350 Medium contact, inside the arch apex	Depending on the nominal diameter up to 25 bar, for vacuum up to 0.05 bar absolute	▶ page 195
D112x (B/E/C/M/ R/K/L)		No medium contact, embedded into the arch apex of the rubber bellows starting at NB 200	Depending on the nominal diameter up to 16 bar, for vacuum up to 0.05 bar absolute	▶ page 196

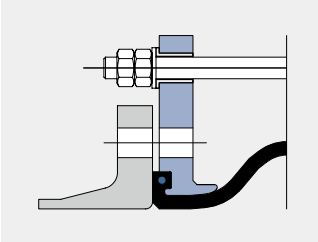
Materials	
Stainless steel:	1.4301 (X5CrNi18-10) 1.4539 (X1NiCrMoCu25-20-5) 1.4571 (X6CrNiMoTi17-12-2) Other materials on request
Carbon steel:	1.0570 (S355J2G3) rubber coated

Tie rods

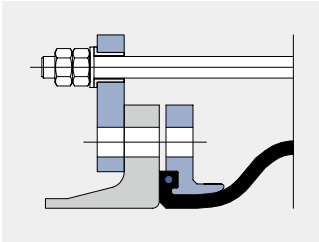


Example: Type D111M

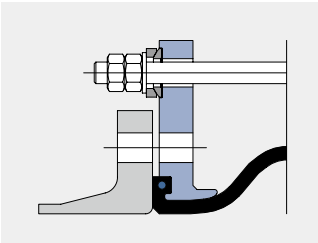
- Design:**
- Dimensioning according to design pressure (test pressure) based on the Pressure Equipment Directive
- Materials:**
- Carbon steel in strength class 8.8 or stainless steel
- Coating:**
- Spherical bearings and ball disks
PTFE-coated
Tie rods galvanised, hot-dip galvanised or PTFE-coated



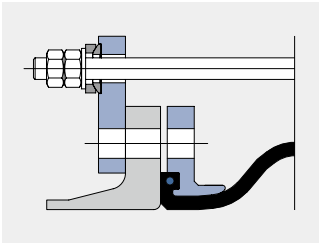
Type D110B
Tie rods mounted outside in rubber bushing to accommodate reaction forces in the event of pressure (up to NB 300)



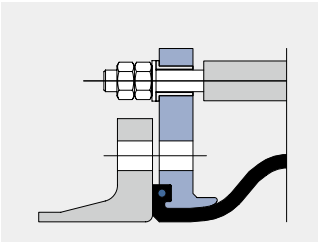
Type D110R
Control unit plates: Tie rods mounted outside in rubber bushing to accommodate reaction forces in the event of pressure (up to NB 300)



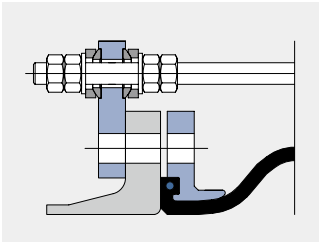
Type D110E
Tie rods mounted outside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure



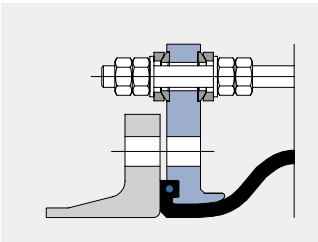
Type D110K
Control unit plates: Tie rods mounted outside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure



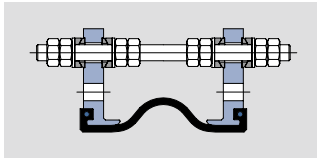
Type D110C
Tie rods mounted outside in rubber bushing and inside in the thrust limiter to accommodate stresses in the event of pressure and vacuum (up to NB 300)



Type D110L
Control unit plates: Tie rods mounted outside and inside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure and vacuum



Type D110M
Tie rods mounted outside and inside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure and vacuum



D110x (B/E/C/M/R/K/L)

► without vacuum support ring

Installation length (L _E) at design pressure															
	up to 10 bar L _E = 130 mm					up to 10 bar L _E = 150 mm					up to 10 bar L _E = 175 mm				
	higher pressures on request														
NB	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
															
	mm	mm	± mm	± °		mm	mm	± mm	± °		mm	mm	± mm	± °	
20	30	30	30	0	17										
25	30	30	30	0	17										
32	30	30	30	0	17										
40	30	30	30	0	18										
50	30	30	30	0	32										
65	30	30	30	0	53										
80	30	30	30	0	85	30	30	30	0	85					
100	30	30	30	0	128	30	30	30	0	128					
125	30	30	30	0	187	30	30	30	0	187					
150	30	30	30	0	259	30	30	30	0	259					
200	30	30	30	0	410						30	30	30	0	409
250	30	30	30	0	596						30	30	30	0	599
300	30	30	30	0	822						31	10	17	0	903
350											31	10	17	0	1,134
400											31	10	17	0	1,521
450											31	10	17	0	1,878
500											31	10	17	0	2,290
600											31	10	16	0	3,187
700											31	10	16	0	4,312
800											31	10	16	0	5,555
900											31	10	16	0	6,910
1000											31	10	16	0	8,462
1100											31	10	15	0	10,171
1200											31	10	15	0	12,037

Installation length (L _E) at design pressure															
	up to 10 bar L _E = 200 mm					up to 10 bar L _E = 250 mm					up to 10 bar L _E = 275 mm				
	higher pressures on request														
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²
200	40	20	26	0	564	44	20	29	0	573	44	20	29	0	573
250	40	20	26	0	799	44	20	28	0	809	44	20	28	0	809
300	30	30	30	0	822	44	20	27	0	1,081	44	20	27	0	1,081
350	50	30	30	0	907	44	20	27	0	1,333	44	20	27	0	1,333
400	50	30	30	0	1,018	44	20	27	0	1,750	44	20	27	0	1,750
450	40	20	25	0	2,116	40	20	30	0	1,801	44	20	26	0	2,132
500	50	30	30	0	1,692	44	20	26	0	2,570	44	20	26	0	2,570
600	50	30	30	0	3,078	44	20	26	0	3,515	44	20	26	0	3,515
700	40	20	24	0	4,669	50	30	30	0	4,019	50	30	30	0	4,019
800	40	20	23	0	5,958	50	30	30	0	5,436	44	20	25	0	5,986
900	40	20	23	0	7,359	44	20	25	0	7,390	44	20	25	0	7,390
1000	40	20	23	0	8,958	44	20	25	0	8,992	44	20	25	0	8,992
1100	40	20	23	0	10,715	44	20	24	0	10,751	44	20	24	0	10,751
1200	40	20	22	0	12,628	44	20	24	0	12,668	44	20	24	0	12,668

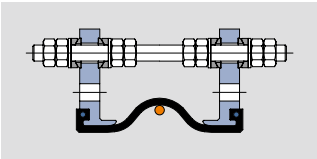
Installation length (L _E) at design pressure															
	up to 10 bar L _E = 300 mm					up to 10 bar L _E = 350 mm									
	higher pressures on request														
NB	Movement				A cm ²	Movement				A cm ²					
															
	mm	mm	± mm	± °		mm	mm	± mm	± °						
200	53	31	37	0	707	69	43	49	0	897					
250	53	31	36	0	968	69	43	48	0	1,188					
300	53	31	36	0	1,263	69	43	48	0	1,514					
350	53	31	35	0	1,534	69	43	47	0	1,810					
400	53	31	35	0	1,979	69	43	46	0	2,290					
450	53	31	34	0	2,384	69	43	46	0	2,725					
500	53	31	34	0	2,846	69	43	45	0	3,217					
600	53	31	33	0	3,837	69	43	45	0	4,266					
700	53	31	33	0	5,064	69	43	44	0	5,555					
800	53	31	33	0	6,404	69	43	43	0	6,955					
900	50	30	30	0	6,706	69	43	43	0	8,462					
1000	50	30	30	0	8,231	69	43	43	0	10,171					
1100	53	31	32	0	11,310	69	43	42	0	12,037					
1200	53	31	31	0	13,273	69	43	42	0	14,061					

Standard sizes
Non-standard sizes

In the event of lateral displacement and simultaneous axial extension (due to installation gap tolerance) the above movements are reduced (► page 26).
For larger movements see type U120x.

Individual fabrication possible

D111x (B/E/C/M/R/K/L)
► with internal vacuum support ring



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Installation length (L _E) at design pressure																					
	up to 10 bar L _E = 130 mm					up to 10 bar L _E = 150 mm					up to 10 bar L _E = 175 mm										
	higher pressures on request																				
NB	Movement				A	Movement				A	Movement				A						
	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²						
20	30	10	30	30	17																
25	30	10	30	30	17																
32	30	10	30	30	17																
40	30	10	30	35	18																
50	30	10	30	30	32																
65	30	10	30	30	53																
80	30	10	30	30	85																
100	30	10	30	20	128	30	10	30	20	128											
125	30	10	30	20	187	30	10	30	20	187											
150	30	10	30	20	259	30	10	30	20	259											
200	30	10	30	12	410						30	10	30	12	409						
250	30	10	30	12	596						30	10	30	12	599						
300	30	10	30	12	822						31	3	17	4	903						
350												31	3	17	3	1,134					
400												31	3	17	3	1,521					
450												31	3	17	3	1,878					
500												31	3	17	2	2,290					
600												31	3	16	2	3,187					
700												31	3	16	2	4,312					
800												31	3	16	1	5,555					
900												31	3	16	1	6,910					
1000												31	3	16	1	8,462					
1100												31	3	15	1	10,171					
1200												31	3	15	1	12,037					

Installation length (L _E) at design pressure															
	up to 10 bar L _E = 200 mm					up to 10 bar L _E = 250 mm					up to 10 bar L _E = 275 mm				
	higher pressures on request														
NB	Movement				A	Movement				A	Movement				A
	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²
200	40	7	26	11	564	44	7	29	11	573	44	7	29	11	573
250	40	7	26	9	799	44	7	28	9	809	44	7	28	9	809
300	30	10	30	12	822	44	7	27	8	1,081	44	7	27	8	1,081
350	50	10	30	8	907	44	7	27	7	1,333	44	7	27	7	1,333
400	50	10	30	8	1,018	44	7	27	6	1,750	44	7	27	6	1,750
450	40	7	25	5	2,116	40	10	30	6	1,801	44	7	26	5	2,132
500	50	10	30	8	1,692	44	7	26	5	2,570	44	7	26	5	2,570
600	50	10	30	8	3,078	44	7	26	4	3,515	44	7	26	4	3,515
700	40	7	24	3	4,669	50	30	30	8	4,019	50	10	30	8	4,019
800	40	7	23	3	5,958	50	30	30	8	5,436	44	7	25	3	5,986
900	40	7	23	3	7,359	44	7	25	3	7,390	44	7	25	3	7,390
1000	40	7	23	2	8,958	44	7	25	2	8,992	44	7	25	2	8,992
1100	40	7	23	2	10,715	44	7	24	2	10,751	44	7	24	2	10,751
1200	40	7	22	2	12,628	44	7	24	2	12,668	44	7	24	2	12,668

Installation length (L _E) at design pressure															
up to 10 bar L _E = 300 mm						up to 10 bar L _E = 350 mm					higher pressures on request				
NB	Movement				A	Movement				A	Movement				A
	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²
200	53	10	37	17	707	69	14	49	23	897					
250	53	10	36	14	968	69	14	48	19	1,188					
300	53	10	36	12	1,263	69	14	48	16	1,514					
350	53	10	35	10	1,534	69	14	47	14	1,810					
400	53	10	35	9	1,979	69	14	46	12	2,290					
450	53	10	34	8	2,384	69	14	46	11	2,725					
500	53	10	34	7	2,846	69	14	45	10	3,217					
600	53	10	33	6	3,837	69	14	45	8	4,266					
700	53	10	33	5	5,064	69	14	44	7	5,555					
800	53	10	33	4	6,404	69	14	43	6	6,955					
900	50	10	30	5	6,706	69	14	43	6	8,462					
1000	50	10	30	5	8,231	69	14	43	5	10,171					
1100	53	10	32	3	11,310	69	14	42	5	12,037					
1200	53	10	31	3	13,273	69	14	42	4	14,061					

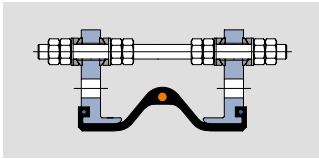
Standard sizes
Non-standard sizes

In the event of lateral displacement and simultaneous axial extension (due to installation gap tolerance) the above movements are reduced (► page 26).
For larger movements see type U121x.

Individual fabrication possible

LATERAL
swivel flange

D110x



D112x (B/E/C/M/R/K/L)

► with embedded vacuum support ring

Installation length (L _E) at design pressure															
	up to 10 bar L _E = 130 mm					up to 10 bar L _E = 150 mm					up to 10 bar L _E = 175 mm				
	higher pressures on request														
NB	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
															
	mm	mm	± mm	± °		mm	mm	± mm	± °		mm	mm	± mm	± °	
20															
25															
32															
40															
50															
65															
80															
100															
125															
150															
200											20	2	17	0	401
250											20	2	16	0	603
300											20	2	16	0	840
350											20	2	16	0	1,064
400											20	2	16	0	1,439
450											20	2	16	0	1,787
500											20	2	15	0	2,190
600											20	2	15	0	3,068
700											20	2	15	0	4,174
800											20	2	15	0	5,398
900											20	2	15	0	6,735
1000											20	2	15	0	8,268
1100											20	2	14	0	9,958
1200											20	2	14	0	11,805

Installation length (L _E) at design pressure															
	up to 10 bar L _E = 200 mm					up to 10 bar L _E = 250 mm					up to 10 bar L _E = 275 mm				
	higher pressures on request														
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²
200	26	6	25	0	515	29	6	28	0	531	29	6	28	0	531
250	26	6	25	0	740	29	6	27	0	760	29	6	27	0	760
300	26	6	24	0	1,001	29	6	27	0	1,024	29	6	27	0	1,024
350	26	6	24	0	1,244	29	6	26	0	1,269	29	6	26	0	1,269
400	26	6	24	0	1,647	29	6	26	0	1,676	29	6	26	0	1,676
450	26	6	23	0	2,019	29	6	26	0	2,051	29	6	26	0	2,051
500	26	6	23	0	2,445	29	6	25	0	2,481	29	6	25	0	2,481
600	26	6	23	0	3,370	29	6	25	0	3,411	29	6	25	0	3,411
700	26	6	23	0	4,525	29	6	25	0	4,572	29	6	25	0	4,572
800	26	6	22	0	5,795	29	6	24	0	5,849	29	6	24	0	5,849
900	26	6	22	0	7,178	29	6	24	0	7,238	29	6	24	0	7,238
1000	26	6	22	0	8,758	29	6	24	0	8,825	29	6	24	0	8,825
1100	26	6	22	0	10,496	29	6	24	0	10,568	29	6	24	0	10,568
1200	26	6	21	0	12,390	29	6	23	0	12,469	29	6	23	0	12,469

Installation length (L _E) at design pressure										
	up to 10 bar L _E = 300 mm					up to 10 bar L _E = 350 mm				
	higher pressures on request									
NB	Movement				A cm ²	Movement				A cm ²
										
	mm	mm	± mm	± °		mm	mm	± mm	± °	
200	35	9	36	0	661	46	13	48	0	804
250	35	9	35	0	913	46	13	47	0	1,081
300	35	9	35	0	1,201	46	13	46	0	1,392
350	35	9	34	0	1,466	46	13	45	0	1,676
400	35	9	34	0	1,901	46	13	45	0	2,140
450	35	9	33	0	2,299	46	13	44	0	2,561
500	35	9	33	0	2,753	46	13	44	0	3,039
600	35	9	33	0	3,728	46	13	43	0	4,060
700	35	9	32	0	4,939	46	13	43	0	5,320
800	35	9	32	0	6,263	46	13	42	0	6,691
900	35	9	31	0	7,698	46	13	42	0	8,171
1000	35	9	31	0	9,331	46	13	41	0	9,852
1100	35	9	31	0	11,122	46	13	41	0	11,690
1200	35	9	31	0	13,070	46	13	41	0	13,685

Standard sizes
Non-standard sizes

In the event of axial extension and simultaneous lateral displacement the above movements are reduced (► page 26).
For larger movements see type D122x or D125x.

Individual fabrication possible



Lateral expansion joints, type U111M
for the power plant of an aluminium oxide mill
NB 1300 to NB 2700, +9/-1 bar

LATERAL
swivel flange

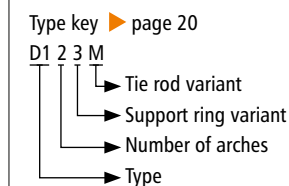
D110x

D120x (B/E/C/M/R/K/L)

NB 20 – NB 1200



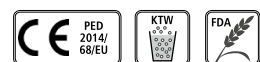
- ▶ **Type D120x** (B/E/C/M/R/K/L)
without vacuum support rings
- ▶ **Type D121x** (B/E/C/M/R/K/L)
with internal vacuum support rings
- ▶ **Type D122x** (B/E/C/M/R/K/L)
with embedded vacuum support rings
- ▶ **Type D123x** (B/E/C/M/R/K/L)
without vacuum support rings,
with pressure support ring in the arch trough
- ▶ **Type D124x** (B/E/C/M/R/K/L)
with internal vacuum support rings,
with external pressure support ring in the
arch trough
- ▶ **Type D125x** (B/E/C/M/R/K/L)
with embedded vacuum support rings,
with external pressure support ring in the
arch trough



Lateral expansion joint with two arches

- Design:** Highly elastic, hydrodynamic, double-arch rubber bellows with self-sealing rubber bulges and swivel backing flanges with support collar and tie rods
Optionally with vacuum support rings and/or pressure support ring in the arch trough
- Nominal diameters:** NB 200 to NB 1200, intermediate sizes possible
- Installation length:** Standard $L_E = 350$ to 650 mm (▶ page 202–204)
Other installation lengths on request
- Pressure:** Depending on the nominal diameter up to 10 bar
Vacuum not allowed without vacuum support rings, with vacuum support rings up to 0.05 bar absolute
Design in accordance with Pressure Equipment Directive PED 2014/68/EU
- Movement:** For very large lateral movements (▶ page 202–204)
Installation gap tolerances possible in the context of axial compression and extension

Application:
Cooling water systems,
desalination plants, drinking
water supply, plant construc-
tion, e.g. in pipelines,
on pumps, as dismantling
joints, on condensers and
vessels



Assembly instruction download
www.ditec-adam.de/en/downloads.html

Rubber bellows

Rubber	Fabric	Marking	Max.	Application
EPDM	Nylon		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDM	Kevlar		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMht	Kevlar		120 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMtw	Nylon		100 °C	Drinking water
EPDMtw	Kevlar		100 °C	Drinking water
EPDMaf	Nylon		100 °C	Abrasive materials, water-sand extraction
EPDMaf	Kevlar		100 °C	Abrasive materials, water-sand extraction
EPDMbeige	Nylon		100 °C	Foodstuffs
EPDMbeige	Kevlar		100 °C	Foodstuffs
IIR	Nylon		100 °C	Hot water, acids, bases, gases
IIR	Kevlar		100 °C	Hot water, acids, bases, gases
CSM	Nylon		100 °C	Strong acids, bases, chemicals
CSM	Kevlar		100 °C	Strong acids, bases, chemicals
NBR	Nylon		100 °C	Oils, petrol, solvents, compressed air
NBR	Kevlar		100 °C	Oils, petrol, solvents, compressed air
NBRbeige	Nylon		100 °C	Oil, fatty foods
NBRbeige	Kevlar		100 °C	Oil, fatty foods
CR	Nylon		90 °C	Cooling water, slightly oily water, seawater
CR	Kevlar		90 °C	Cooling water, slightly oily water, seawater
FPM	Kevlar		180 °C	Corrosive chemicals, petroleum distillates
FPMbeige	Kevlar		180 °C	Oil, fatty foods
NR	Nylon		70 °C	Abrasive materials
Silicon	Kevlar or glass		200 °C	Air, saltwater atmosphere, foodstuffs, medical technology

LATERAL
swivel flange

Flanges

- Design:

Single-part swivel backing flanges with support collar, clearance holes, groove to accommodate the rubber bulges and holder for tie rods (control unit type B, E, C, M)

Single-part, round, swivel backing flanges with support collar, clearance holes, groove to accommodate the rubber bulges and control unit plates (control unit type R, K, L)
- Flange norms:

DIN, EN, ANSI, AWWA, BS, JIS, special measurements (▶ page 256)
- Materials:

Carbon steel: 1.0038 (S235JRG2)
1.0570 (S355J2G3)

Stainless steel: 1.4301 (X5CrNi18-10)
1.4571 (X6CrNiMoTi17-12-2)

Aluminium: AlMg3

Other materials on request
- Coating:

Primed, hot-dip galvanised, special paint

Optional accessories

- Protective hood:

UV protection cover, ground protective cover,
fire protection cover, splash protective cover (▶ page 44)
- Flow liners:

Cylindrical flow liner, conical flow liner,
telescoping flow liner (▶ page 43)

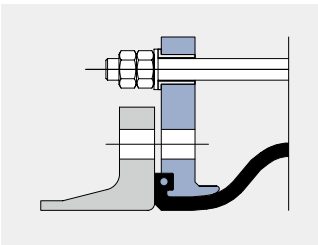
D120x

Tie rods

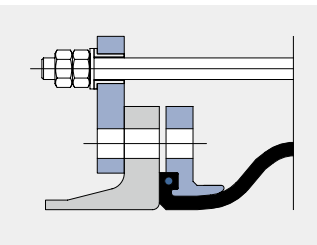


Example: Type D124M

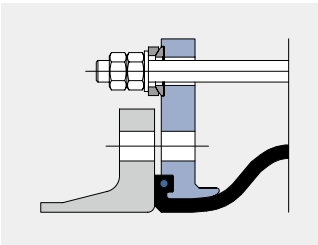
- Design:** Dimensioning according to design pressure (test pressure) based on the Pressure Equipment Directive
- Materials:** Carbon steel in strength class 8.8 or stainless steel
- Coating:** Spherical bearing and ball disks PTFE-coated
Tie rods galvanised, hot-dip galvanised or PTFE-coated



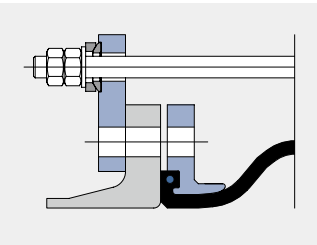
Type D120B
Tie rods mounted outside in rubber bushing to accommodate reaction forces in the event of pressure (up to NB 300)



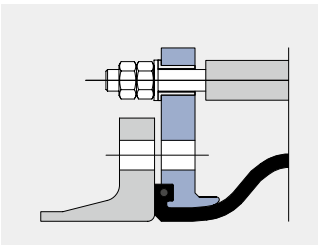
Type D120R
Control unit plates: Tie rods mounted outside in rubber bushing to accommodate reaction forces in the event of pressure (up to NB 300)



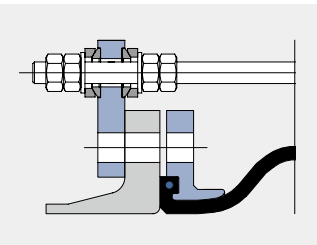
Type D120E
Tie rods mounted outside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure



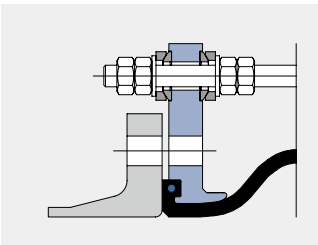
Type D120K
Control unit plates: Tie rods mounted outside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure



Type D120C
Tie rods mounted outside in rubber bushing and in the thrust limiter to accommodate stresses in the event of pressure and vacuum (up to NB 300)



Type D120L
Control unit plates: Tie rods mounted outside and inside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure and vacuum



Type D120M
Tie rods mounted outside and inside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure and vacuum

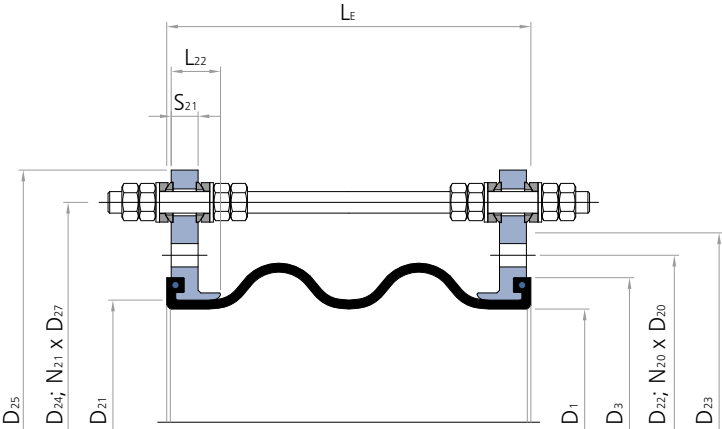
Support rings

TYPE		Vacuum support ring	Pressure support ring	Pressure	Movement
D120x B/E/C/M/ R/K/L)		Without	Without	Slight pressure, vacuum stability on request	▶ page 202
D121x B/E/C/M/ R/K/L)		Medium contact, inside the arch apex	Without	Slight pressure, for vacuum up to 0.05 bar absolute	▶ page 203
D122x B/E/C/M/ R/K/L)		No medium contact, embedded into the arch apex of the rubber bellows	Without	Slight pressure, for vacuum up to 0.05 bar absolute	▶ page 204
D123x B/E/C/M/ R/K/L)		Without	External in the arch trough	Depending on the nominal diameter up to 10 bar, slight vacuum	▶ page 202
D124x B/E/C/M/ R/K/L)		Medium contact, inside the arch apex	External in the arch trough	Depending on the nominal diameter up to 10 bar, for vacuum up to 0.05 bar absolute	▶ page 203
D125x B/E/C/M/ R/K/L)		No medium contact, embedded into the arch apex of the rubber bellows	External in the arch trough	Depending on the nominal diameter up to 10 bar, for vacuum up to 0.05 bar absolute	▶ page 204

Materials

Stainless steel:	1.4301 (X5CrNi18-10) 1.4539 (X1NiCrMoCu25-20-5) 1.4571 (X6CrNiMoTi17-12-2)	Other materials on request
Carbon steel:	1.0570 (S355J2G3) rubber coated 1.0570 (S355J2G3) galvanised	

Planning help D120M



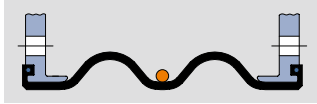
D120x

LATERAL
swivel flange



D120x (B/E/C/M/R/K/L)

► without vacuum support rings



D123x (B/E/C/M/R/K/L)

► without vacuum support rings, with external pressure support ring in the arch trough

Installation length (L _E) at design pressure															
	up to 10 bar L _E = 350 mm					up to 10 bar L _E = 400 mm					up to 10 bar L _E = 450 mm				
	higher pressures on request														
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²
200	53	22	33	0	445	62	20	36	0	445	80	40	53	0	564
250	53	22	32	0	656	62	20	35	0	656	80	40	52	0	799
300	53	22	32	0	903	62	20	35	0	903	80	40	51	0	1,069
350	53	22	31	0	1,134	62	20	34	0	1,134	80	40	50	0	1,320
400	53	22	31	0	1,521	62	20	34	0	1,521	80	40	50	0	1,735
450	53	22	31	0	1,878	62	20	33	0	1,878	80	40	49	0	2,116
500	53	22	30	0	2,290	62	20	33	0	2,290	80	40	49	0	2,552
600	53	22	30	0	3,187	62	20	33	0	3,187	80	40	48	0	3,494
700	53	22	29	0	4,312	62	20	32	0	4,312	80	40	47	0	4,669
800	53	22	29	0	5,555	62	20	32	0	5,555	80	40	47	0	5,958
900	53	22	29	0	6,910	62	20	31	0	6,910	80	40	46	0	7,359
1000	53	22	29	0	8,462	62	20	31	0	8,462	80	40	46	0	8,958
1100	53	22	28	0	10,171	62	20	31	0	10,171	80	40	45	0	10,715
1200	53	22	28	0	12,037	62	20	31	0	12,037	80	40	45	0	12,628

Installation length (L _E) at design pressure															
	up to 10 bar L _E = 500 mm					up to 10 bar L _E = 550 mm					up to 10 bar L _E = 600 mm				
	higher pressures on request														
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²
200	88	41	57	0	573	106	61	74	0	707	124	82	91	0	855
250	88	41	56	0	809	106	61	72	0	968	124	82	89	0	1,140
300	88	41	55	0	1,081	106	61	71	0	1,263	124	82	88	0	1,459
350	88	41	54	0	1,333	106	61	70	0	1,534	124	82	86	0	1,750
400	88	41	54	0	1,750	106	61	69	0	1,979	124	82	85	0	2,223
450	88	41	53	0	2,132	106	61	69	0	2,384	124	82	84	0	2,651
500	88	41	52	0	2,570	106	61	68	0	2,846	124	82	84	0	3,137
600	88	41	52	0	3,515	106	61	67	0	3,837	124	82	82	0	4,174
700	88	41	51	0	4,693	106	61	66	0	5,064	124	82	81	0	5,450
800	88	41	50	0	5,986	106	61	65	0	6,404	124	82	80	0	6,837
900	88	41	50	0	7,390	106	61	64	0	7,854	124	82	79	0	8,332
1000	88	41	49	0	8,992	106	61	64	0	9,503	124	82	79	0	10,029
1100	88	41	49	0	10,751	106	61	63	0	11,310	124	82	78	0	11,882
1200	88	41	48	0	12,668	106	61	63	0	13,273	124	82	77	0	13,893

Recommended sizes
Additional possible sizes

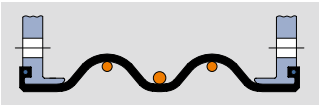
In the event of lateral displacement and simultaneous axial extension the above movements are reduced (► page 22).
Larger movements on request.

Individual fabrication possible

D121x (B/E/C/M/R/K/L)
► with internal vacuum support rings



D124x (B/E/C/M/R/K/L)
► with internal vacuum support rings, with external pressure support ring in the arch trough



Installation length (L _E) at design pressure															
	up to 10 bar L _E = 350 mm					up to 10 bar L _E = 400 mm					up to 10 bar L _E = 450 mm				
	higher pressures on request														
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²
200	53	7	33	0	445	62	7	36	0	445	80	13	53	0	564
250	53	7	32	0	656	62	7	35	0	656	80	13	52	0	799
300	53	7	32	0	903	62	7	35	0	903	80	13	51	0	1,069
350	53	7	31	0	1,134	62	7	34	0	1,134	80	13	50	0	1,320
400	53	7	31	0	1,521	62	7	34	0	1,521	80	13	50	0	1,735
450	53	7	31	0	1,878	62	7	33	0	1,878	80	13	49	0	2,116
500	53	7	30	0	2,290	62	7	33	0	2,290	80	13	49	0	2,552
600	53	7	30	0	3,187	62	7	33	0	3,187	80	13	48	0	3,494
700	53	7	29	0	4,312	62	7	32	0	4,312	80	13	47	0	4,669
800	53	7	29	0	5,555	62	7	32	0	5,555	80	13	47	0	5,958
900	53	7	29	0	6,910	62	7	31	0	6,910	80	13	46	0	7,359
1000	53	7	29	0	8,462	62	7	31	0	8,462	80	13	46	0	8,958
1100	53	7	28	0	10,171	62	7	31	0	10,171	80	13	45	0	10,715
1200	53	7	28	0	12,037	62	7	31	0	12,037	80	13	45	0	12,628

Installation length (L _E) at design pressure															
	up to 10 bar L _E = 500 mm					up to 10 bar L _E = 550 mm					up to 10 bar L _E = 600 mm				
	higher pressures on request														
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²
200	88	13	57	0	573	106	20	74	0	707	124	27	91	0	855
250	88	13	56	0	809	106	20	72	0	968	124	27	89	0	1,140
300	88	13	55	0	1,081	106	20	71	0	1,263	124	27	88	0	1,459
350	88	13	54	0	1,333	106	20	70	0	1,534	124	27	86	0	1,750
400	88	13	54	0	1,750	106	20	69	0	1,979	124	27	85	0	2,223
450	88	13	53	0	2,132	106	20	69	0	2,384	124	27	84	0	2,651
500	88	13	52	0	2,570	106	20	68	0	2,846	124	27	84	0	3,137
600	88	13	52	0	3,515	106	20	67	0	3,837	124	27	82	0	4,174
700	88	13	51	0	4,693	106	20	66	0	5,064	124	27	81	0	5,450
800	88	13	50	0	5,986	106	20	65	0	6,404	124	27	80	0	6,837
900	88	13	50	0	7,390	106	20	64	0	7,854	124	27	79	0	8,332
1000	88	13	49	0	8,992	106	20	64	0	9,503	124	27	79	0	10,029
1100	88	13	49	0	10,751	106	20	63	0	11,310	124	27	78	0	11,882
1200	88	13	48	0	12,668	106	20	63	0	13,273	124	27	77	0	13,893

Recommended sizes
Additional possible sizes

In the event of lateral displacement and simultaneous axial extension the above movements are reduced (► page 22).
Larger movements on request.

Individual fabrication possible

LATERAL
swivel flange

D120x



D122x (B/E/C/M/R/K/L)

► with embedded vacuum support rings



D125x (B/E/C/M/R/K/L)

► with embedded vacuum support rings, with external pressure support ring in the arch trough

Installation length (L _E) at design pressure															
	up to 10 bar L _E = 350 mm					up to 10 bar L _E = 400 mm					up to 10 bar L _E = 450 mm				
	higher pressures on request														
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²
200	35	7	33	0	445	41	5	34	0	401	52	12	51	0	515
250	35	7	32	0	656	41	5	33	0	603	52	12	50	0	740
300	35	7	32	0	903	41	5	32	0	840	52	12	49	0	1,001
350	35	7	31	0	1,134	41	5	32	0	1,064	52	12	48	0	1,244
400	35	7	31	0	1,521	41	5	32	0	1,439	52	12	48	0	1,647
450	35	7	31	0	1,878	41	5	31	0	1,787	52	12	47	0	2,019
500	35	7	30	0	2,290	41	5	31	0	2,190	52	12	47	0	2,445
600	35	7	30	0	3,187	41	5	30	0	3,068	52	12	46	0	3,370
700	35	7	29	0	4,312	41	5	30	0	4,174	52	12	45	0	4,525
800	35	7	29	0	5,555	41	5	30	0	5,398	52	12	45	0	5,795
900	35	7	29	0	6,910	41	5	29	0	6,735	52	12	44	0	7,178
1000	35	7	29	0	8,462	41	5	29	0	8,268	52	12	44	0	8,758
1100	35	7	28	0	10,171	41	5	29	0	9,958	52	12	43	0	10,496
1200	35	7	28	0	12,037	41	5	29	0	11,805	52	12	43	0	12,390

Installation length (L _E) at design pressure															
	up to 10 bar L _E = 500 mm					up to 10 bar L _E = 550 mm					up to 10 bar L _E = 600 mm				
	higher pressures on request														
NB	Movement				A	Movement				A	Movement				A
															
	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²
200	58	12	55	0	531	70	19	72	0	661	82	26	89	0	804
250	58	12	54	0	760	70	19	71	0	913	82	26	87	0	1,081
300	58	12	53	0	1,024	70	19	69	0	1,201	82	26	86	0	1,392
350	58	12	52	0	1,269	70	19	69	0	1,466	82	26	85	0	1,676
400	58	12	52	0	1,676	70	19	68	0	1,901	82	26	84	0	2,140
450	58	12	51	0	2,051	70	19	67	0	2,299	82	26	83	0	2,561
500	58	12	51	0	2,481	70	19	66	0	2,753	82	26	82	0	3,039
600	58	12	50	0	3,411	70	19	65	0	3,728	82	26	81	0	4,060
700	58	12	49	0	4,572	70	19	64	0	4,939	82	26	79	0	5,320
800	58	12	49	0	5,849	70	19	64	0	6,263	82	26	78	0	6,691
900	58	12	48	0	7,238	70	19	63	0	7,698	82	26	78	0	8,171
1000	58	12	48	0	8,825	70	19	62	0	9,331	82	26	77	0	9,852
1100	58	12	47	0	10,568	70	19	62	0	11,122	82	26	76	0	11,690
1200	58	12	47	0	12,469	70	19	61	0	13,070	82	26	76	0	13,685

Recommended sizes
Additional possible sizes

In the event of lateral displacement and simultaneous axial extension (due to installation gap tolerance) the above movements are reduced (► page 22).
Larger movements on request.

Individual fabrication possible



2-ply safety rubber expansion joint, type U110A
NB 2400, 3 bar,
in a jet bow thruster in a cruise liner

D210x (B/E/C/S/R/K/L)

NB 32 – NB 500



► **Type D210x** (B/E/C/S/R/K/L)
without vacuum support ring

► **Type D211x** (B/E/C/S/R/K/L)
with internal vacuum support ring

Type key ► page 20

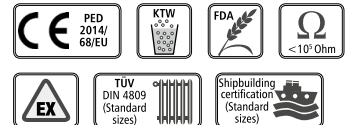
D2 1 0 S
└─ Tie rod variant
└─ Support ring variant
└─ Number of arches
└─ Type

Lateral expansion joint with one arch

- Design:** Single-arch rubber bellows with self-sealing rubber bulges and backing flanges with threaded holes and tie rods
- Nominal diameters:** NB 32 to NB 500
- Installation length:** $L_E = 100$ or 110 mm (► page 210–211)
- Pressure:** Depending on the nominal diameter up to 25 bar
Vacuum stability on request, with vacuum support ring up to 0.05 bar absolute
Design in accordance with Pressure Equipment Directive PED 2014/68/EU
- Movement:** For lateral movements (► page 210–211)

Application:

Cooling water systems,
desalination plants, drinking
water supply, plant construc-
tion, e.g. in pipelines, on
pumps, as dismantling joints,
on condensers and vessels



Assembly instruction download
www.ditec-adam.de/en/downloads.html

Standard Rubber bellows

Rubber	Fabric		Max.	Application
EPDM / EPDM	PEEK		120 °C	heating systems, cooling water, hot air
IIR / EPDM	Nylon		100 °C	Drinking water, seawater, weak acids and alkalis, weather-resistant
NBR / CR	Nylon		90 °C	oils, fuels, gases, LPG, natural gas, blast furnace gas, lubricants
NBR weiß / CR	Nylon		90 °C	fatty foods, weather-resistant
CSM / CSM	Nylon		100 °C	chemicals, aggressive chemical wastewater, weather-resistant
IIR / EPDM	Nylon		100 °C	Hot and cold water, salt water, swimming pool water

Flanges

- Design:

Single-part backing flanges with threaded holes, groove to accommodate the rubber bulges and holder for tie rods (control unit type B, E, C, S)

Single-part, round backing flanges with threaded holes, groove to accommodate the rubber bulges and control unit plates (control unit type R, K, L)
- Flange norms:

DIN, EN, ANSI, AWWA, BS, JIS, special measurements (▶ page 256)
- Materials:

Carbon steel: 1.0038 (S235JRG2)
Other materials on request
- Coating:

Galvanised, yellow-neutralized

Optional accessories

- Protective hood:

UV protection cover
Ground protective cover
Fire protection cover
Splash protective cover
(▶ page 44)
- Flow liners:

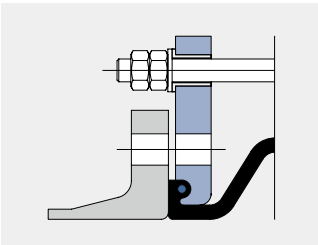
Cylindrical flow liner
Conical flow liner
Telescoping flow liner
(▶ page 43)

Tie rods

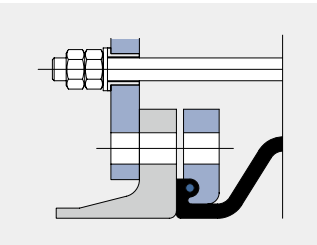


Example: Type D210C

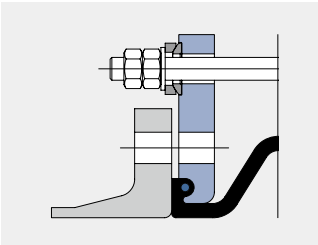
- Design:** Dimensioning according to design pressure (test pressure) based on the Pressure Equipment Directive
- Materials:** Carbon steel in strength class 8.8 or stainless steel
- Coating:** Spherical bearings and ball disks PTFE-coated
Tie rods galvanised, hot-dip galvanised or PTFE-coated



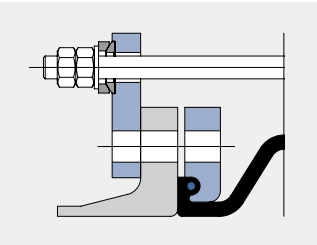
Type D210B
Tie rods mounted outside in rubber bushing to accommodate reaction forces in the event of pressure (up to NB 300)



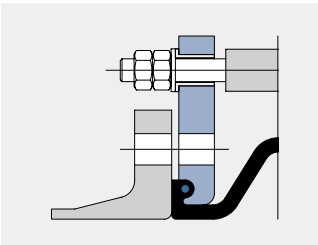
Type D210R
Control unit plates: Tie rods mounted outside in rubber bushing to accommodate reaction forces in the event of pressure (up to NB 300)



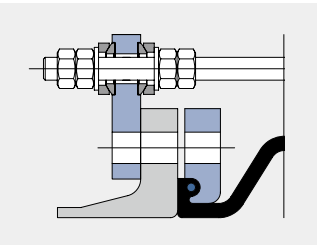
Type D210E
Tie rods mounted outside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure



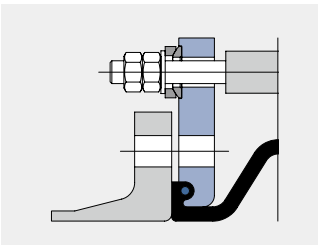
Type D210K
Control unit plates: Tie rods mounted outside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure



Type D210C
Tie rods mounted outside in rubber bushing and inside in the thrust limiter to accommodate stresses in the event of pressure and vacuum (up to NB 300)

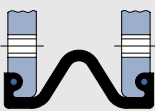
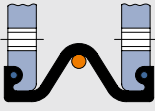


Type D210L
Control unit plates: Tie rods mounted outside and inside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure and vacuum

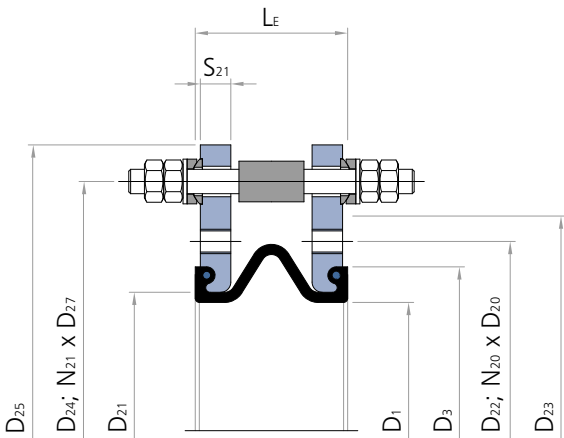


Type D210S
Tie rods mounted outside in spherical bearings and ball disks and inside in thrust limiters to accommodate stresses in the event of pressure and vacuum

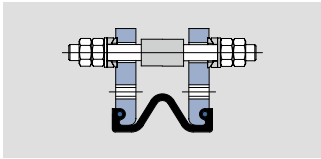
Support rings

TYPE		Vacuum support ring	Pressure	Movement
D210x (B/E/C/S/ R/K/L)		Without	Depending on the nominal diameter up to 25 bar, vacuum stability on request	▶ page 210
D211x (B/E/C/S/ R/K/L)		Vacuum support ring spiral, medium contact, inside the arch apex	Depending on the nominal diameter up to 25 bar, for vacuum up to 0.05 bar absolute	▶ page 211
Materials				
Stainless steel:		1.4310 (X12 CrNi 17 7)	Other materials on request	

Planning help D210S



LATERAL
swivel flange



D210x (B/E/C/M/R/K/L)
▶ without vacuum support ring

Installation length (L _E) at design pressure										
	up to 10 bar L _E = 100 mm					up to 10 bar L _E = 110 mm				
	higher pressures on request									
NB	Movement				A cm ²	Movement				A cm ²
										
	mm	mm	± mm	± °		mm	mm	± mm	± °	
32	30	20	30	0	18					
40	30	20	30	0	18					
50	30	20	30	0	35					
65	30	20	30	0	56					
80	30	20	30	0	87					
100	30	20	30	0	130					
125	30	20	30	0	190					
150	30	20	30	0	263					
175	30	20	30	0	334					
200	30	20	30	0	416					
250	30	20	30	0	607					
300	30	20	30	0	830					
350	30	20	30	0	1,100					
400						30	20	30	0	1,385
500						30	20	30	0	2,091

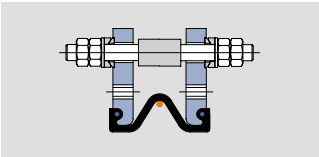
Standard sizes

In the event of lateral displacement and simultaneous axial extension (due to installation gap tolerance) the above movements are reduced (▶ page 22).



Standard rubber expansion joint, D210A

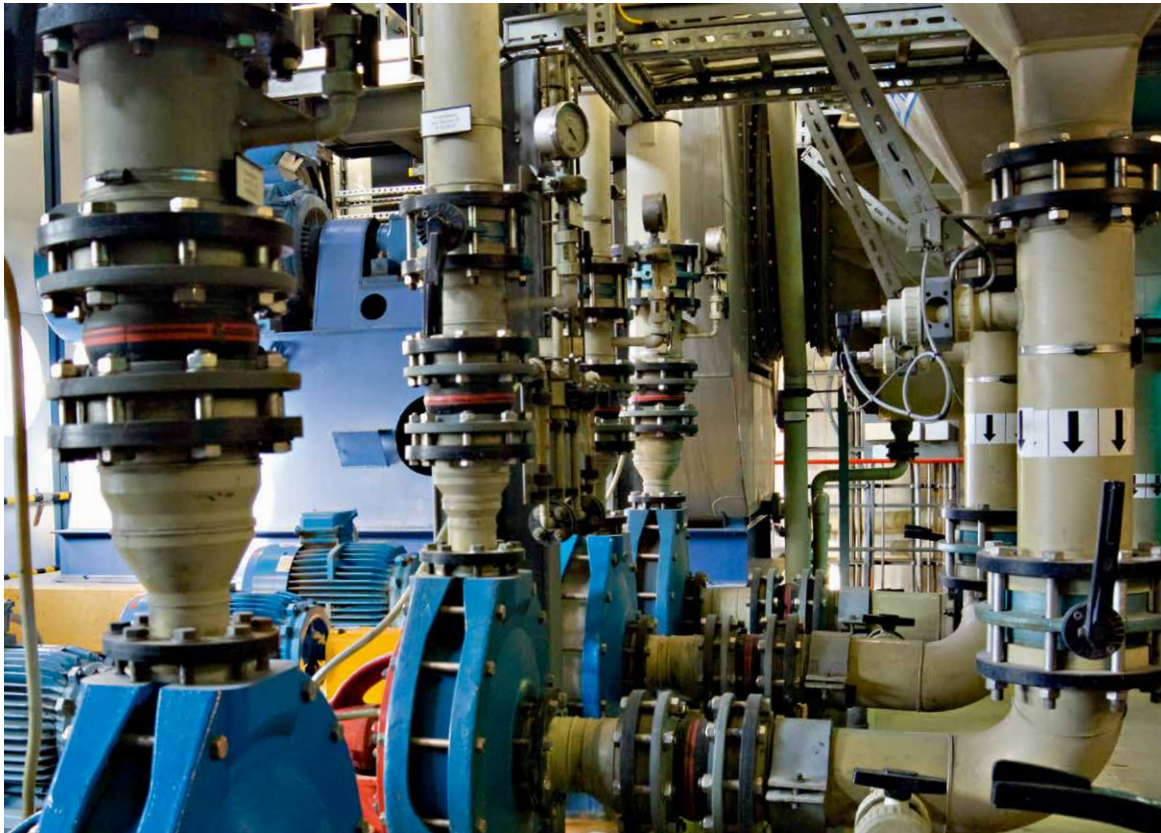
D211x (B/E/C/M/R/K/L)
► with internal vacuum support ring



Installation length (L _E) at design pressure										
NB	up to 10 bar L _E = 100 mm					up to 10 bar L _E = 110 mm				
	higher pressures on request					higher pressures on request				
	Movement				A	Movement				A
	mm	mm	±mm	±°	cm ²	mm	mm	±mm	±°	cm ²
32	30	5	20	0	18					
40	30	5	20	0	18					
50	30	5	20	0	35					
65	30	5	20	0	56					
80	30	5	20	0	87					
100	30	5	20	0	130					
125	30	5	20	0	190					
150	30	5	20	0	263					
175	30	5	20	0	334					
200	30	5	20	0	416					
250	30	5	20	0	607					
300	30	5	20	0	830					
350	30	5	20	0	1,100					
400						30	5	20	0	1,385
500						30	5	20	0	2,091

Standard sizes

In the event of lateral displacement and simultaneous axial extension (due to installation gap tolerance) the above movements are reduced (► page 22).



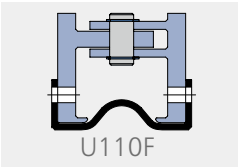
Typical pump station arrangement
with expansion joints to decouple pump vibrations from pipeline

LATERAL
swivel flange



Angular expansion joints with full faced rubber flange

U110F with one arch ▶ 214

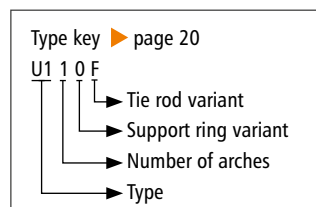


U110F

NB 100 – NB 4000



- **Type U110F**
without vacuum support ring
- **Type U111F**
with internal vacuum support ring
- **Type U112F**
with embedded vacuum support ring



Angular expansion joint with one arch

- Design:** Highly elastic, hydrodynamic, single-arch rubber bellows with full faced rubber flanges and oval backing flanges with support collar and hinge tie rods
Optionally with vacuum support ring
- Nominal diameters:** NB 100 to NB 4000, intermediate sizes possible
- Installation length:** Standard $L_E = 150$ to 400 mm (► page 217–219)
Other installation lengths on request
- Pressure:** Depending on the nominal diameter and installation length up to 25 bar
Vacuum stability on request, with vacuum support ring up to 0.05 bar absolute
- Movement:** For angular movements (► page 217–219)

Application:

Cooling water systems, desalination plants, drinking water supply, plant construction, e.g. in pipelines, on pumps, as dismantling joints, on condensers and vessels



Assembly instruction download
www.ditec-adam.de/en/downloads.html

Rubber bellows

Rubber	Fabric	Marking	Max.	Application
EPDM	Nylon		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDM	Kevlar		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMht	Kevlar		120 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMtw	Nylon		100 °C	Drinking water
EPDMtw	Kevlar		100 °C	Drinking water
EPDMaf	Nylon		100 °C	Abrasive materials, water-sand extraction
EPDMaf	Kevlar		100 °C	Abrasive materials, water-sand extraction
EPDMbeige	Nylon		100 °C	Foodstuffs
EPDMbeige	Kevlar		100 °C	Foodstuffs
IIR	Nylon		100 °C	Hot water, acids, bases, gases
IIR	Kevlar		100 °C	Hot water, acids, bases, gases
CSM	Nylon		100 °C	Strong acids, bases, chemicals
CSM	Kevlar		100 °C	Strong acids, bases, chemicals
NBR	Nylon		100 °C	Oils, petrol, solvents, compressed air
NBR	Kevlar		100 °C	Oils, petrol, solvents, compressed air
NBRbeige	Nylon		100 °C	Oil, fatty foods
NBRbeige	Kevlar		100 °C	Oil, fatty foods
CR	Nylon		90 °C	Cooling water, slightly oily water, seawater
CR	Kevlar		90 °C	Cooling water, slightly oily water, seawater
FPM	Kevlar		180 °C	Corrosive chemicals, petroleum distillates
FPMbeige	Kevlar		180 °C	Oil, fatty foods
NR	Nylon		70 °C	Abrasive materials
Silicon	Kevlar or glass		200 °C	Air, saltwater atmosphere, foodstuffs, medical technology

PTFE-lining: Permanently embedded against chemical attacks on the interior at the rubber bellows, available starting at NB 300. Take the restriction of the listed movement into account (▶ page 217–219)

Flanges

- Design:

Single-part, oval backing flanges with support collar, clearance holes and hinge tie rods (control unit type F)
- Flange norms:

DIN, EN, ANSI, AWWA, BS, JIS, special measurements (▶ page 256)
- Materials:

Carbon steel:

1.0038 (S235JRG2)
1.0570 (S355J2G3)

Stainless steel:

1.4301 (X5CrNi18-10)
1.4571 (X6CrNiMoTi17-12-2)

Other materials on request
- Coating:

Primed, hot-dip galvanised, special paint

Optional accessories

- Protective hood:

UV protection cover, ground protective cover, fire protection cover, splash protective cover (▶ page 44)
- Flow liners:

Cylindrical flow liner, conical flow liner, telescoping flow liner (▶ page 43)

Hinge tie rod

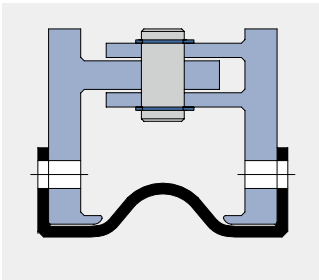
- Design:

Materials:

Coating:
- Dimensions according to design pressure (test pressure)

Carbon steel or stainless steel

Galvanised or hot-dip galvanised



Type U110F
Hinge tie rod for angular movements on one level with plates and bolts to absorb the reaction forces in the event of pressure and vacuum. Axis of rotation in the middle of the installation gap

Support rings

TYPE		Vacuum support ring	Pressure	Movement
U110F		Without	Depending on the nominal diameter up to 25 bar, vacuum stability on request	► page 217
U111F		Medium contact, inside the arch apex	Depending on the nominal diameter up to 25 bar, for vacuum up to 0.05 bar absolute	► page 218
U112F		No medium contact, embedded into the arch apex of the rubber bellows	Depending on the nominal diameter up to 25 bar, for vacuum up to 0.05 bar absolute	► page 219

Materials

- Stainless steel:

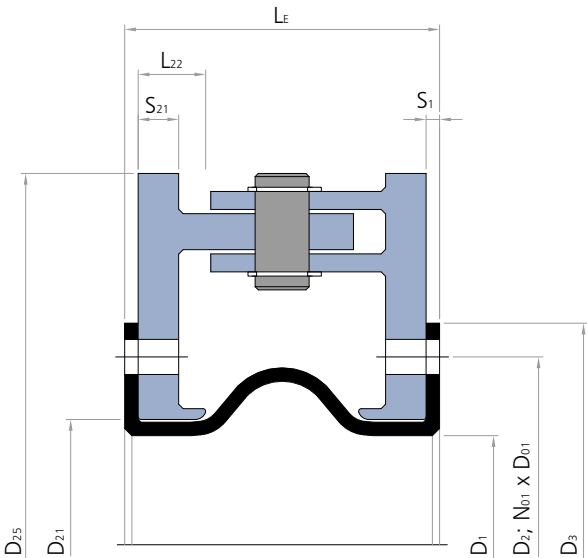
Carbon steel:
- 1.4301 (X5CrNi18-10)

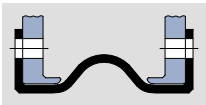
1.4539 (X1NiCrMoCu25-20-5)

1.4571 (X6CrNiMoTi17-12-2)

1.0570 (S355J2G3) rubber coated
- Other materials on request

Planning help U110F





Installation length (L _E) depending on design pressure												
	L _E = 150 mm		L _E = 200 mm		L _E = 250 mm		L _E = 300 mm		L _E = 350 mm		L _E = 400 mm	
	pressures on request											
NB	Movement	A	Movement	A	Movement	A	Movement	A	Movement	A	Movement	A
	 ±°	 cm²	 ±°	 cm²	 ±°	 cm²	 ±°	 cm²	 ±°	 cm²	 ±°	 cm²
100	22.3	177	31.0	254	32.6	260	40	353	48.2	491	52.6	616
125	18.2	241	25.6	330	27.1	337	33.9	441	41.9	594	46.3	731
150	15.3	314	21.8	415	23.1	423	29.2	539	36.7	707	41.1	855
175	13.2	415	18.9	531	20.1	539	25.6	670	32.6	855	36.8	1,018
200	11.6	491	16.7	616	17.7	625	22.8	765	29.2	962	33.2	1,134
250	9.3	707	13.5	855	14.4	866	18.6	1,029	24.1	1,257	27.7	1,452
300	7.8	973	11.3	1,146	12	1,158	15.6	1,346	20.5	1,605	23.6	1,825
350	6.7	1,288	9.7	1,486	10.4	1,500	13.5	1,713	17.7	2,003	20.5	2,248
400	5.9	1,605	8.5	1,825	9.1	1,840	11.9	2,075	15.6	2,393	18.1	2,660
450	5.2	1,987	7.6	2,231	8.1	2,248	10.6	2,507	14	2,856	16.2	3,147
500	4.7	2,402	6.8	2,669	7.3	2,688	9.5	2,971	12.6	3,349	14.7	3,664
550	4.3	2,827	6.2	3,117	6.6	3,137	8.7	3,442	11.5	3,848	13.4	4,185
600	3.9	3,349	5.7	3,664	6.1	3,685	8	4,015	10.6	4,453	12.3	4,815
650	3.6	3,848	5.3	4,185	5.6	4,208	7.4	4,560	9.8	5,027	11.4	5,411
700	3.4	4,465	4.9	4,827	5.2	4,852	6.8	5,230	9.1	5,728	10.6	6,138
750	3.1	5,027	4.6	5,411	4.9	5,437	6.4	5,836	8.5	6,362	9.9	6,793
800	2.9	5,741	4.3	6,151	4.6	6,179	6	6,604	8	7,163	9.3	7,620
850	2.8	6,362	4.0	6,793	4.3	6,822	5.6	7,268	7.5	7,854	8.8	8,332
900	2.6	7,163	3.8	7,620	4.1	7,651	5.3	8,123	7.1	8,742	8.3	9,246
950	2.5	7,854	3.6	8,332	3.9	8,365	5.1	8,858	6.7	9,503	7.9	10,029
1000	2.3	8,742	3.4	9,246	3.7	9,280	4.8	9,799	6.4	10,477	7.5	11,029
1050	2.2	9,503	3.3	10,029	3.5	10,064	4.6	10,605	6.1	11,310	7.1	11,882
1100	2.1	10,496	3.1	11,047	3.3	11,085	4.4	11,652	5.8	12,390	6.8	12,989
1150	2.0	11,310	3.0	11,882	3.2	11,921	4.2	12,509	5.6	13,273	6.5	13,893
1200	2.0	12,370	2.9	12,969	3.1	13,009	4	13,623	5.3	14,420	6.2	15,066
1250	1.9	13,273	2.7	13,893	2.9	13,935	3.8	14,569	5.1	15,394	6	16,061
1300	1.8	14,420	2.6	15,066	2.8	15,109	3.7	15,770	4.9	16,627	5.8	17,320
1350	1.7	15,394	2.5	16,061	2.7	16,106	3.6	16,787	4.7	17,671	5.5	18,385
1400	1.7	16,627	2.5	17,320	2.6	17,366	3.4	18,074	4.6	18,991	5.3	19,731
1450	1.6	17,671	2.4	18,385	2.5	18,433	3.3	19,162	4.4	20,106	5.2	20,867
1500	1.6	18,991	2.3	19,731	2.4	19,781	3.2	20,536	4.3	21,512	5	22,299
1600	1.5	21,512	2.1	22,299	2.3	22,352	3	23,154	4	24,190	4.7	25,025
1650	1.4	22,698	2.1	23,506	2.2	23,561	2.9	24,384	3.9	25,447	4.5	26,302
1700	1.4	24,190	2.0	25,025	2.2	25,081	2.8	25,930	3.8	27,026	4.4	27,907
1800	1.3	27,055	1.9	27,937	2	27,996	2.7	28,893	3.6	30,049	4.2	30,978
1900	1.2	30,018	1.8	30,946	1.9	31,009	2.5	31,952	3.4	33,168	3.9	34,143
1950	1.2	31,416	1.8	32,365	1.9	32,429	2.5	33,394	3.3	34,636	3.8	35,633
2000	1.2	33,168	1.7	34,143	1.8	34,209	2.4	35,199	3.2	36,474	3.7	37,497
2100	1.1	36,474	1.6	37,497	1.7	37,565	2.3	38,603	3.1	39,938	3.6	41,007
2200	1.1	39,938	1.6	41,007	1.7	41,079	2.2	42,164	2.9	43,558	3.4	44,675
2250	1.0	41,548	1.5	42,638	1.6	42,712	2.1	43,818	2.8	45,239	3.3	46,377
2300	1.0	43,558	1.5	44,675	1.6	44,750	2.1	45,882	2.8	47,336	3.3	48,500
2400	1.0	47,336	1.4	48,500	1.5	48,578	2	49,757	2.7	51,271	3.1	52,482
2500	0.9	51,271	1.4	52,482	1.5	52,563	1.9	53,789	2.6	55,363	3	56,621
2550	0.9	53,093	1.3	54,325	1.4	54,408	1.9	55,655	2.5	57,256	2.9	58,535
2600	0.9	55,363	1.3	56,621	1.4	56,706	1.9	57,979	2.5	59,612	2.9	60,917
2700	0.9	59,612	1.3	60,917	1.4	61,005	1.8	62,325	2.4	64,018	2.8	65,370
2800	0.8	64,018	1.2	65,370	1.3	65,461	1.7	66,829	2.3	68,581	2.7	69,981
2850	0.8	66,052	1.2	67,426	1.3	67,518	1.7	68,906	2.3	70,686	2.6	72,107
2900	0.8	68,581	1.2	69,981	1.3	70,075	1.7	71,489	2.2	73,301	2.6	74,748
3000	0.8	73,301	1.1	74,748	1.2	74,845	1.6	76,307	2.1	78,179	2.5	79,673
3100	0.8	78,179	1.1	79,673	1.2	79,773	1.6	81,282	2.1	83,213	2.4	84,754
3150	0.7	80,425	1.1	81,940	1.2	82,041	1.5	83,571	2	85,530	2.4	87,092
3200	0.7	83,213	1.1	84,754	1.1	84,857	1.5	86,413	2	88,405	2.3	89,993
3300	0.7	88,405	1.0	89,993	1.1	90,099	1.5	91,702	1.9	93,753	2.3	95,388
3400	0.7	93,753	1.0	95,388	1.1	95,498	1.4	97,148	1.9	99,259	2.2	100,941
3450	0.7	96,211	1.0	97,868	1.1	97,979	1.4	99,650	1.9	101,788	2.2	103,491
3600	0.7	104,922	1.0	106,651	1	106,767	1.3	108,511	1.8	110,741	2.1	112,518
3800	0.6	116,718	0.9	118,542	1	118,664	1.3	120,503	1.7	122,852	2	124,723
4000	0.6	129,143	0.9	131,061	0.9	131,190	1.2	133,123	1.6	135,591	1.9	137,556

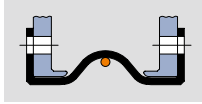
Recommended sizes
Additional possible sizes

Reduction of movement for expansion joints
with PTFE lining: angular movement: -66 %.

Individual fabrication possible

ANGULAR
rubber flange

U110F



U111F

► with internal vacuum support ring

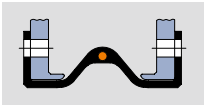
Installation length (L_E) depending on design pressure

	L _E = 150 mm		L _E = 200 mm		L _E = 250 mm		L _E = 300 mm		L _E = 350 mm		L _E = 400 mm	
	pressures on request											
NB	Movement	A	Movement	A	Movement	A	Movement	A	Movement	A	Movement	A
	 ±°	 cm ²	 ±°	 cm ²	 ±°	 cm ²	 ±°	 cm ²	 ±°	 cm ²	 ±°	 cm ²
100	18.8	177	25.2	254	27.0	260	32.2	353	39.7	491	43.5	616
125	15.2	241	20.6	330	22.2	337	26.7	441	33.6	594	37.2	731
150	12.8	314	17.4	415	18.8	423	22.8	539	29.0	707	32.3	855
175	11.0	415	15.0	531	16.2	539	19.8	670	25.4	855	28.5	1,018
200	9.6	491	13.2	616	14.3	625	17.5	765	22.5	962	25.4	1,134
250	7.7	707	10.6	855	11.5	866	14.1	1,029	18.4	1,257	20.8	1,452
300	6.5	973	8.9	1,146	9.6	1,158	11.9	1,346	15.5	1,605	17.6	1,825
350	5.5	1,288	7.6	1,486	8.3	1,500	10.2	1,713	13.3	2,003	15.2	2,248
400	4.9	1,605	6.7	1,825	7.3	1,840	9.0	2,075	11.7	2,393	13.4	2,660
450	4.3	1,987	6.0	2,231	6.5	2,248	8.0	2,507	10.5	2,856	11.9	3,147
500	3.9	2,402	5.4	2,669	5.8	2,688	7.2	2,971	9.4	3,349	10.8	3,664
550	3.5	2,827	4.9	3,117	5.3	3,137	6.5	3,442	8.6	3,848	9.8	4,185
600	3.2	3,349	4.5	3,664	4.9	3,685	6.0	4,015	7.9	4,453	9.0	4,815
650	3.0	3,848	4.1	4,185	4.5	4,208	5.5	4,560	7.3	5,027	8.3	5,411
700	2.8	4,465	3.8	4,827	4.2	4,852	5.1	5,230	6.8	5,728	7.7	6,138
750	2.6	5,027	3.6	5,411	3.9	5,437	4.8	5,836	6.3	6,362	7.2	6,793
800	2.4	5,741	3.4	6,151	3.6	6,179	4.5	6,604	5.9	7,163	6.8	7,620
850	2.3	6,362	3.2	6,793	3.4	6,822	4.2	7,268	5.6	7,854	6.4	8,332
900	2.2	7,163	3.0	7,620	3.2	7,651	4.0	8,123	5.3	8,742	6.0	9,246
950	2.0	7,854	2.8	8,332	3.1	8,365	3.8	8,858	5.0	9,503	5.7	10,029
1000	1.9	8,742	2.7	9,246	2.9	9,280	3.6	9,799	4.7	10,477	5.4	11,029
1050	1.9	9,503	2.6	10,029	2.8	10,064	3.4	10,605	4.5	11,310	5.2	11,882
1100	1.8	10,496	2.4	11,047	2.7	11,085	3.3	11,652	4.3	12,390	4.9	12,989
1150	1.7	11,310	2.3	11,882	2.5	11,921	3.1	12,509	4.1	13,273	4.7	13,893
1200	1.6	12,370	2.2	12,969	2.4	13,009	3.0	13,623	4.0	14,420	4.5	15,066
1250	1.6	13,273	2.2	13,893	2.3	13,935	2.9	14,569	3.8	15,394	4.3	16,061
1300	1.5	14,420	2.1	15,066	2.2	15,109	2.8	15,770	3.7	16,627	4.2	17,320
1350	1.4	15,394	2.0	16,061	2.2	16,106	2.7	16,787	3.5	17,671	4.0	18,385
1400	1.4	16,627	1.9	17,320	2.1	17,366	2.6	18,074	3.4	18,991	3.9	19,731
1450	1.3	17,671	1.9	18,385	2.0	18,433	2.5	19,162	3.3	20,106	3.7	20,867
1500	1.3	18,991	1.8	19,731	1.9	19,781	2.4	20,536	3.2	21,512	3.6	22,299
1600	1.2	21,512	1.7	22,299	1.8	22,352	2.3	23,154	3.0	24,190	3.4	25,025
1650	1.2	22,698	1.6	23,506	1.8	23,561	2.2	24,384	2.9	25,447	3.3	26,302
1700	1.1	24,190	1.6	25,025	1.7	25,081	2.1	25,930	2.8	27,026	3.2	27,907
1800	1.1	27,055	1.5	27,937	1.6	27,996	2.0	28,893	2.6	30,049	3.0	30,978
1900	1.0	30,018	1.4	30,946	1.5	31,009	1.9	31,952	2.5	33,168	2.9	34,143
1950	1.0	31,416	1.4	32,365	1.5	32,429	1.9	33,394	2.4	34,636	2.8	35,633
2000	1.0	33,168	1.3	34,143	1.5	34,209	1.8	35,199	2.4	36,474	2.7	37,497
2100	0.9	36,474	1.3	37,497	1.4	37,565	1.7	38,603	2.3	39,938	2.6	41,007
2200	0.9	39,938	1.2	41,007	1.3	41,079	1.6	42,164	2.2	43,558	2.5	44,675
2250	0.9	41,548	1.2	42,638	1.3	42,712	1.6	43,818	2.1	45,239	2.4	46,377
2300	0.8	43,558	1.2	44,675	1.3	44,750	1.6	45,882	2.1	47,336	2.4	48,500
2400	0.8	47,336	1.1	48,500	1.2	48,578	1.5	49,757	2.0	51,271	2.3	52,482
2500	0.8	51,271	1.1	52,482	1.2	52,563	1.4	53,789	1.9	55,363	2.2	56,621
2550	0.8	53,093	1.1	54,325	1.1	54,408	1.4	55,655	1.9	57,256	2.1	58,535
2600	0.7	55,363	1.0	56,621	1.1	56,706	1.4	57,979	1.8	59,612	2.1	60,917
2700	0.7	59,612	1.0	60,917	1.1	61,005	1.3	62,325	1.8	64,018	2.0	65,370
2800	0.7	64,018	1.0	65,370	1.0	65,461	1.3	66,829	1.7	68,581	1.9	69,981
2850	0.7	66,052	0.9	67,426	1.0	67,518	1.3	68,906	1.7	70,686	1.9	72,107
2900	0.7	68,581	0.9	69,981	1.0	70,075	1.2	71,489	1.6	73,301	1.9	74,748
3000	0.6	73,301	0.9	74,748	1.0	74,845	1.2	76,307	1.6	78,179	1.8	79,673
3100	0.6	78,179	0.9	79,673	0.9	79,773	1.2	81,282	1.5	83,213	1.8	84,754
3150	0.6	80,425	0.9	81,940	0.9	82,041	1.1	83,571	1.5	85,530	1.7	87,092
3200	0.6	83,213	0.8	84,754	0.9	84,857	1.1	86,413	1.5	88,405	1.7	89,993
3300	0.6	88,405	0.8	89,993	0.9	90,099	1.1	91,702	1.4	93,753	1.6	95,388
3400	0.6	93,753	0.8	95,388	0.9	95,498	1.1	97,148	1.4	99,259	1.6	100,941
3450	0.6	96,211	0.8	97,868	0.8	97,979	1.0	99,650	1.4	101,788	1.6	103,491
3600	0.5	104,922	0.7	106,651	0.8	106,767	1.0	108,511	1.3	110,741	1.5	112,518
3800	0.5	116,718	0.7	118,542	0.8	118,664	0.9	120,503	1.3	122,852	1.4	124,723
4000	0.5	129,143	0.7	131,061	0.7	131,190	0.9	133,123	1.2	135,591	1.4	137,556

Recommended sizes
Additional possible sizes

Reduction of movement for expansion joints
with PTFE lining: angular movement: -0 %.

Individual fabrication possible



Installation length (L _E) depending on design pressure												
	L _E = 150 mm		L _E = 200 mm		L _E = 250 mm		L _E = 300 mm		L _E = 350 mm		L _E = 400 mm	
	pressures on request											
NB	Movement	A	Movement	A	Movement	A	Movement	A	Movement	A	Movement	A
	 ±°	 cm²	 ±°	 cm²	 ±°	 cm²	 ±°	 cm²	 ±°	 cm²	 ±°	 cm²
100	12.4	150	17.7	222	19.3	232	23.7	320	30.5	423	33.8	539
125	10.0	209	14.4	293	15.6	305	19.4	405	25.3	519	28.2	647
150	8.3	278	12.0	373	13.1	387	16.3	499	21.5	625	24.1	765
175	7.2	373	10.4	483	11.3	499	14.1	625	18.6	765	20.9	919
200	6.3	445	9.1	564	9.9	581	12.4	716	16.4	866	18.5	1,029
250	5.0	651	7.3	794	8	814	10	973	13.3	1,146	15	1,333
300	4.2	908	6.1	1,075	6.7	1,099	8.3	1,282	11.1	1,479	12.6	1,691
350	3.6	1,213	5.2	1,405	5.7	1,432	7.2	1,640	9.6	1,863	10.8	2,099
400	3.1	1,521	4.6	1,735	5	1,765	6.3	1,995	8.4	2,240	9.5	2,498
450	2.8	1,893	4.1	2,132	4.4	2,165	5.6	2,419	7.5	2,688	8.5	2,971
500	2.5	2,299	3.7	2,561	4	2,597	5	2,875	6.7	3,167	7.6	3,473
550	2.3	2,715	3.3	3,000	3.6	3,039	4.6	3,339	6.1	3,653	6.9	3,982
600	2.1	3,227	3.1	3,536	3.3	3,578	4.2	3,904	5.6	4,243	6.4	4,596
650	1.9	3,718	2.8	4,049	3.1	4,094	3.9	4,441	5.2	4,803	5.9	5,178
700	1.8	4,324	2.6	4,681	2.9	4,729	3.6	5,102	4.8	5,489	5.5	5,890
750	1.7	4,877	2.4	5,255	2.7	5,307	3.4	5,701	4.5	6,110	5.1	6,533
800	1.6	5,581	2.3	5,986	2.5	6,041	3.1	6,461	4.2	6,896	4.8	7,344
850	1.5	6,193	2.2	6,619	2.4	6,677	3	7,118	4	7,574	4.5	8,044
900	1.4	6,984	2.0	7,436	2.2	7,497	2.8	7,964	3.8	8,446	4.3	8,942
950	1.3	7,667	1.9	8,139	2.1	8,203	2.7	8,692	3.6	9,195	4	9,712
1000	1.3	8,544	1.8	9,043	2	9,110	2.5	9,625	3.4	10,153	3.8	10,696
1050	1.2	9,297	1.7	9,817	1.9	9,887	2.4	10,423	3.2	10,973	3.7	11,537
1100	1.1	10,279	1.7	10,825	1.8	10,899	2.3	11,461	3.1	12,037	3.5	12,628
1150	1.1	11,085	1.6	11,652	1.7	11,728	2.2	12,311	2.9	12,908	3.3	13,519
1200	1.1	12,135	1.5	12,728	1.7	12,808	2.1	13,417	2.8	14,040	3.2	14,677
1250	1.0	13,029	1.5	13,643	1.6	13,726	2	14,356	2.7	15,001	3.1	15,659
1300	1.0	14,166	1.4	14,806	1.5	14,892	1.9	15,548	2.6	16,218	3	16,902
1350	0.9	15,131	1.4	15,792	1.5	15,881	1.9	16,559	2.5	17,250	2.8	17,955
1400	0.9	16,354	1.3	17,041	1.4	17,134	1.8	17,837	2.4	18,554	2.7	19,285
1450	0.9	17,390	1.3	18,098	1.4	18,194	1.7	18,918	2.3	19,656	2.6	20,409
1500	0.8	18,699	1.2	19,433	1.3	19,532	1.7	20,283	2.3	21,047	2.6	21,825
1600	0.8	21,201	1.1	21,983	1.3	22,088	1.6	22,885	2.1	23,697	2.4	24,522
1650	0.8	22,379	1.1	23,181	1.2	23,289	1.5	24,108	2	24,941	2.3	25,787
1700	0.7	23,861	1.1	24,689	1.2	24,801	1.5	25,645	2	26,504	2.3	27,377
1800	0.7	26,706	1.0	27,582	1.1	27,700	1.4	28,592	1.9	29,498	2.1	30,419
1900	0.7	29,651	1.0	30,573	1.1	30,698	1.3	31,636	1.8	32,589	2	33,556
1950	0.6	31,040	0.9	31,984	1	32,111	1.3	33,071	1.7	34,045	2	35,033
2000	0.6	32,781	0.9	33,751	1	33,882	1.3	34,867	1.7	35,867	1.9	36,881
2100	0.6	36,069	0.9	37,086	1	37,223	1.2	38,256	1.6	39,303	1.8	40,364
2200	0.6	39,514	0.8	40,578	0.9	40,721	1.1	41,801	1.5	42,895	1.7	44,003
2250	0.6	41,115	0.8	42,200	0.9	42,346	1.1	43,447	1.5	44,563	1.7	45,692
2300	0.5	43,116	0.8	44,227	0.9	44,376	1.1	45,503	1.5	46,645	1.7	47,800
2400	0.5	46,875	0.8	48,033	0.8	48,188	1.1	49,363	1.4	50,551	1.6	51,754
2500	0.5	50,791	0.7	51,996	0.8	52,158	1	53,379	1.4	54,615	1.5	55,864
2550	0.5	52,604	0.7	53,831	0.8	53,995	1	55,238	1.3	56,495	1.5	57,766
2600	0.5	54,864	0.7	56,116	0.8	56,284	1	57,553	1.3	58,836	1.5	60,132
2700	0.5	59,094	0.7	60,393	0.7	60,568	0.9	61,883	1.3	63,213	1.4	64,557
2800	0.5	63,481	0.7	64,828	0.7	65,008	0.9	66,371	1.2	67,748	1.4	69,139
2850	0.4	65,506	0.6	66,874	0.7	67,058	0.9	68,442	1.2	69,840	1.3	71,252
2900	0.4	68,025	0.6	69,419	0.7	69,606	0.9	71,016	1.2	72,440	1.3	73,878
3000	0.4	72,727	0.6	74,168	0.7	74,361	0.8	75,818	1.1	77,289	1.3	78,775
3100	0.4	77,585	0.6	79,073	0.6	79,273	0.8	80,777	1.1	82,295	1.2	83,828
3150	0.4	79,823	0.6	81,332	0.6	81,534	0.8	83,060	1.1	84,599	1.2	86,153
3200	0.4	82,601	0.6	84,136	0.6	84,342	0.8	85,893	1.1	87,459	1.2	89,038
3300	0.4	87,773	0.6	89,356	0.6	89,568	0.8	91,166	1	92,779	1.2	94,406
3400	0.4	93,103	0.5	94,733	0.6	94,951	0.7	96,597	1	98,256	1.1	99,930
3450	0.4	95,553	0.5	97,203	0.6	97,425	0.7	99,091	1	100,772	1.1	102,467
3600	0.4	104,234	0.5	105,958	0.6	106,188	0.7	107,928	0.9	109,682	1.1	111,450
3800	0.3	115,993	0.5	117,811	0.5	118,054	0.7	119,888	0.9	121,736	1	123,599
4000	0.3	128,380	0.5	130,292	0.5	130,548	0.6	132,477	0.8	134,419	1	136,376

Recommended sizes
Additional possible sizes

Reduction of movement for expansion joints
with PTFE lining: angular movement: -0 %.

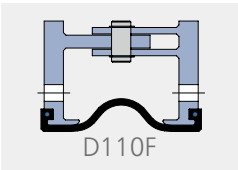
Individual fabrication possible

ANGULAR
rubber flange
U110F



Angular expansion joints with swivel flange

D110F with one arch ► 222

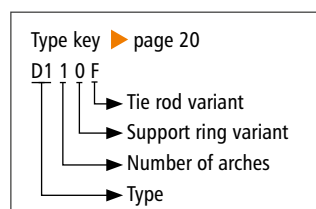


D110F

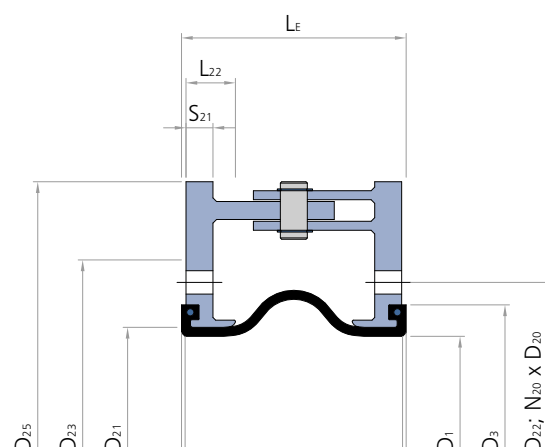
NB 20 – NB 1200



- **Type D110F**
without vacuum support ring
- **Type D111F**
with internal vacuum support ring
- **Type D112F**
with embedded vacuum support ring



Planning help D110F

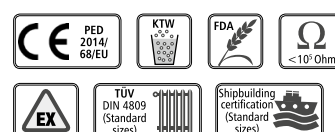


Angular expansion joint with one arch

- Design:** Hydrodynamic, single-arch rubber bellows with self-sealing rubber bulges and oval backing flanges with support collar and hinge tie rod
Optionally with vacuum support ring
- Nominal diameters:** NB 20 to NB 1200, intermediate sizes possible
- Installation length:** Standard $L_E = 130$ to 350 mm (► page 225–227)
Other installation lengths on request
- Pressure:** Depending on the nominal diameter up to 25 bar
Vacuum stability on request, with vacuum support ring up to 0.05 bar absolute.
Design in accordance with Pressure Equipment Directive PED 2014/68/EU
- Movement:** For angular movements (► page 225–227)

Application:

Cooling water systems, desalination plants, drinking water supply, plant construction, e.g. in pipelines, on pumps, as dismantling joints, on condensers and vessels



Assembly instruction download
www.ditec-adam.de/en/downloads.html

Standard rubber bellows

Rubber	Fabric		Max.	Application
EPDM / EPDM	PEEK		130 °C	Heating systems, cooling, hot air
IIR / EPDM	Nylon		100 °C	Drinking water, seawater, weak acids and alkalis, dilute weather resistant
NBR / CR	Nylon		90 °C	Oils, fuels, gases
NBRweiß / CR	Nylon		90 °C	Fat containing food, weather resistant
CSM / CSM	Nylon		100 °C	Chemicals, aggressive chemical wastewater, weather resistant
NBR / CR	Nylon		90 °C	Oils, fuels, gases, LPG, blast furnace gas, lubricants
CR / CR	Nylon		90 °C	Cold- and hot water, seawater, wastewater with oleaginous corrosion protection
NBR / CR	Stahl		90 °C	Oils, fuels, gases, fuel ethanol blends
NBR-LT / CR	Nylon		90 °C	Oils, fuels, gases, LPG, for tanker and filling stations
HNBR / CR	Stahl		100 °C	Oils, fuels, gases, LPG, high Temperature
FPM / ECO	Nylon		100 °C	Flue gas desulphurisation, biodiesel, benzene, xylene
IIR-D / EPDM	PEEK		130 °C	Steam, water
NBR / CR	PEEK		120 °C	Mineral oil, hydraulic oil
CSM / CR	PEEK		120 °C	Acids, alkalis

Non-standard rubber bellows

Rubber	Fabric	Marking	Max.	Application
EPDM	Nylon		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDM	Kevlar		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMht	Kevlar		120 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMtw	Nylon		100 °C	Drinking water
EPDMtw	Kevlar		100 °C	Drinking water
EPDMaf	Nylon		100 °C	Abrasive materials, water-sand extraction
EPDMaf	Kevlar		100 °C	Abrasive materials, water-sand extraction
EPDMbeige	Nylon		100 °C	Foodstuffs
EPDMbeige	Kevlar		100 °C	Foodstuffs
IIR	Nylon		100 °C	Hot water, acids, bases, gases
IIR	Kevlar		100 °C	Hot water, acids, bases, gases
CSM	Nylon		100 °C	Strong acids, bases, chemicals
CSM	Kevlar		100 °C	Strong acids, bases, chemicals
NBR	Nylon		100 °C	Oils, petrol, solvents, compressed air
NBR	Kevlar		100 °C	Oils, petrol, solvents, compressed air
NBRbeige	Nylon		100 °C	Oil, fatty foods
NBRbeige	Kevlar		100 °C	Oil, fatty foods
CR	Nylon		90 °C	Cooling water, slightly oily water, seawater
CR	Kevlar		90 °C	Cooling water, slightly oily water, seawater
FPM	Kevlar		180 °C	Corrosive chemicals, petroleum distillates
FPMbeige	Kevlar		180 °C	Oil, fatty foods
NR	Nylon		70 °C	Abrasive materials
Silicon	Kevlar or glass		200 °C	Air, saltwater atmosphere, foodstuffs, medical technology

Flanges

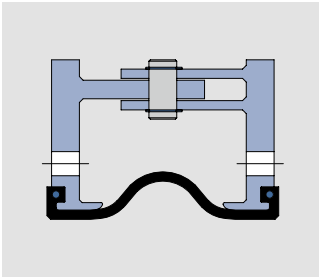
- Design:** Single-part, oval backing flanges with support collar, clearance holes, groove to accommodate the rubber bulges and hinge tie rod (control unit type F)
- Flange norms:** DIN, EN, ANSI, AWWA, BS, JIS, special measurements (▶ page 256)
- Materials:** Carbon steel: 1.0038 (S235JRG2)
1.0570 (S355J2G3))
Stainless steel: 1.4301 (X5CrNi18-10)
1.4571 (X6CrNiMoTi17-12-2)
Other materials on request
- Coating:** Primed, hot-dip galvanised, special paint

Optional accessories

- Protective hood:** UV protection cover, ground protective cover, fire protection cover, splash protective cover (▶ page 44)
- Flow liners:** Cylindrical flow liner, conical flow liner, telescoping flow liner (▶ page 43)

Hinge tie rod

- Design:** Dimensions according to design pressure (test pressure)
- Materials:** Carbon steel or stainless steel
- Coating:** Galvanised or hot-dip galvanised

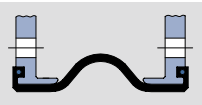


Type D110F
Hinge tie rod for angular movements on one level with plates and bolts to absorb the reaction forces in the event of pressure and vacuum. Axis of rotation in the middle of the installation gap

Support rings

TYPE		Vacuum support ring	Pressure	Movement
D110F		Without	Depending on the nominal diameter up to 25 bar, vacuum stability on request	▶ page 225
D111F		Vacuum support ring spiral (1.4310) up to NB 300, vacuum support ring starting at NB 350 Medium contact, inside the arch apex	Depending on the nominal diameter up to 25 bar, for vacuum up to 0.05 bar absolute	▶ page 226
D112F		No medium contact, embedded into the arch apex of the rubber bellows starting at NB 200	Depending on the nominal diameter up to 16 bar, for vacuum up to 0.05 bar absolute	▶ page 227

Materials		
Stainless steel:	1.4301 (X5CrNi18-10) 1.4539 (X1NiCrMoCu25-20-5) 1.4571 (X6CrNiMoTi17-12-2)	Other materials on request
Carbon steel:	1.0570 (S355J2G3) rubber coated	

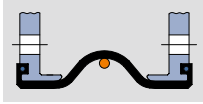


Installation length (L _E) at design pressure										
	up to 10 bar L _E = 130 mm		up to 10 bar L _E = 150 mm		up to 10 bar L _E = 175 mm		up to 10 bar L _E = 200 mm			
	higher pressures on request									
NB	Movement	A	Movement	A	Movement	A	Movement	A		
	 ±°	 cm ²	 ±°	 cm ²	 ±°	 cm ²	 ±°	 cm ²		
20	30.0	17								
25	30.0	17								
32	30.0	17								
40	35.0	18								
50	30.0	32								
65	30.0	53								
80	30.0	85	30.0	85						
100	20.0	128	20.0	128						
125	20.0	187	20.0	187						
150	20.0	259	20.0	259						
200	12.0	410			12.0	409	16.7	564		
250	12.0	596			12.0	599	13.5	799		
300	12.0	822			7.8	903	12.0	822		
350					6.7	1,134	8.0	907		
400					5.9	1,521	8.0	1,018		
450					5.2	1,878	7.6	2,116		
500					4.7	2,290	8.0	1,692		
600					3.9	3,187	8.0	3,078		
700					3.4	4,312	4.9	4,669		
800					2.9	5,555	4.3	5,958		
900					2.6	6,910	3.8	7,359		
1000					2.3	8,462	3.4	8,958		
1100					2.1	10,171	3.1	10,715		
1200					2.0	12,037	2.9	12,628		

Installation length (L _E) at design pressure								
	up to 10 bar L _E = 250 mm		up to 10 bar L _E = 275mm		up to 10 bar L _E = 300 mm		up to 10 bar L _E = 350 mm	
	higher pressures on request							
NB	Movement	A	Movement	A	Movement	A	Movement	A
	 ±°	 cm ²	 ±°	 cm ²	 ±°	 cm ²	 ±°	 cm ²
20								
25								
32								
40								
50								
65								
80								
100								
125								
150								
200								
250								
300								
350								
400	17.7	573	17.7	573	22.8	707	29.2	897
450	14.4	809	14.4	809	18.6	968	24.1	1,188
500	12.0	1,081	12.0	1,081	15.6	1,263	20.5	1,514
550	10.4	1,333	10.4	1,333	13.5	1,534	17.7	1,810
600	9.1	1,750	9.1	1,750	11.9	1,979	15.6	2,290
650	6.0	1,801	8.1	2,132	10.6	2,384	14.0	2,725
700	7.3	2,570	7.3	2,570	9.5	2,846	12.6	3,217
750	6.1	3,515	6.1	3,515	8	3,837	10.6	4,266
800	8.0	4,019	8.0	4,019	6.8	5,064	9.1	5,555
850	8.0	5,436	4.6	5,986	6	6,404	8.0	6,955
900	4.1	7,390	4.1	7,390	5	6,706	7.1	8,462
950	3.7	8,992	3.7	8,992	5	8,231	6.4	10,171
1000	3.3	10,751	3.3	10,751	4.4	11,310	5.8	12,037
1050	3.1	12,668	3.1	12,668	4	13,273	5.3	14,061

Standard sizes
Non-standard sizes

Individual fabrication possible



D111F

► with internal vacuum support ring

Installation length (L _E) at design pressure												
	up to 10 bar L _E = 130 mm		up to 10 bar L _E = 150 mm		up to 10 bar L _E = 175 mm		up to 10 bar L _E = 200 mm					
	higher pressures on request											
NB	Movement	A	Movement	A	Movement	A	Movement	A				
												
20	30.0	17										
25	30.0	17										
32	30.0	17										
40	35.0	18										
50	30.0	32										
65	30.0	53										
80	30.0	85										
100	20.0	128	30.0	85								
125	20.0	187	20.0	128								
150	20.0	259	20.0	187								
200	12.0	410	20.0	259								
250	12.0	596							12.0	409	13.2	564
300	12.0	822							12.0	599	10.6	799
350									6.5	903	12.0	822
400					5.5	1,134	8.0	907				
450					4.9	1,521	8.0	1,018				
500					4.3	1,878	6.0	2,116				
600					3.9	2,290	8.0	1,692				
700					3.2	3,187	8.0	3,078				
800					2.8	4,312	3.8	4,669				
900					2.4	5,555	3.4	5,958				
1000					2.2	6,910	3.0	7,359				
1100					1.9	8,462	2.7	8,958				
1200					1.8	10,171	2.4	10,715				
					1.6	12,037	2.2	12,628				

Installation length (L _E) at design pressure								
	up to 10 bar L _E = 250 mm		up to 10 bar L _E = 275 mm		up to 10 bar L _E = 300 mm		up to 10 bar L _E = 350 mm	
	higher pressures on request							
NB	Movement	A	Movement	A	Movement	A	Movement	A
								
20								
25								
32								
40								
50								
65								
80								
100								
125								
150								
200	14.3	573	14.3	573	17.5	707	22.5	897
250	11.5	809	11.5	809	14.1	968	18.4	1,188
300	9.6	1,081	9.6	1,081	11.9	1,263	15.5	1,514
350	8.3	1,333	8.3	1,333	10.2	1,534	13.3	1,810
400	7.3	1,750	7.3	1,750	9	1,979	11.7	2,290
450	6.0	1,801	6.5	2,132	8	2,384	10.5	2,725
500	5.8	2,570	5.8	2,570	7.2	2,846	9.4	3,217
600	4.9	3,515	4.9	3,515	6	3,837	7.9	4,266
700	8.0	4,019	8.0	4,019	5.1	5,064	6.8	5,555
800	8.0	5,436	3.6	5,986	4.5	6,404	5.9	6,955
900	3.2	7,390	3.2	7,390	5	6,706	5.3	8,462
1000	2.9	8,992	2.9	8,992	5	8,231	4.7	10,171
1100	2.7	10,751	2.7	10,751	3.3	11,310	4.3	12,037
1200	2.4	12,668	2.4	12,668	3	13,273	4.0	14,061

Standard sizes
Non-standard sizes

Individual fabrication possible



Installation length (L _E) at design pressure								
	up to 10 bar L _E = 130 mm		up to 10 bar L _E = 150 mm		up to 10 bar L _E = 175 mm		up to 10 bar L _E = 200 mm	
	higher pressures on request							
NB	Movement	A	Movement	A	Movement	A	Movement	A
	 ±°	 cm ²	 ±°	 cm ²	 ±°	 cm ²	 ±°	 cm ²
20								
25								
32								
40								
50								
65								
80								
100								
125								
150								
200					6.3	401	9.1	515
250					5	603	7.3	740
300					4.2	840	6.1	1,001
350					3.6	1,064	5.2	1,244
400					3.1	1,439	4.6	1,647
450					2.8	1,787	4.1	2,019
500					2.5	2,190	3.7	2,445
600					2.1	3,068	3.1	3,370
700					1.8	4,174	2.6	4,525
800					1.6	5,398	2.3	5,795
900					1.4	6,735	2	7,178
1000					1.3	8,268	1.8	8,758
1100					1.1	9,958	1.7	10,496
1200					1.1	11,805	1.5	12,390

Installation length (L _E) at design pressure								
	up to 10 bar L _E = 250 mm		up to 10 bar L _E = 275 mm		up to 10 bar L _E = 300 mm		up to 10 bar L _E = 350 mm	
	higher pressures on request							
NB	Movement	A	Movement	A	Movement	A	Movement	A
	 ±°	 cm ²	 ±°	 cm ²	 ±°	 cm ²	 ±°	 cm ²
20								
25								
32								
40								
50								
65								
80								
100								
125								
150								
200	9.9	531	9.9	531	12.4	661	16.4	804
250	8	760	8	760	10	913	13.3	1,081
300	6.7	1,024	6.7	1,024	8.3	1,201	11.1	1,392
350	5.7	1,269	5.7	1,269	7.2	1,466	9.6	1,676
400	5	1,676	5	1,676	6.3	1,901	8.4	2,140
450	4.4	2,051	4.4	2,051	5.6	2,299	7.5	2,561
500	4	2,481	4	2,481	5	2,753	6.7	3,039
600	3.3	3,411	3.3	3,411	4.2	3,728	5.6	4,060
700	2.9	4,572	2.9	4,572	3.6	4,939	4.8	5,320
800	2.5	5,849	2.5	5,849	3.1	6,263	4.2	6,691
900	2.2	7,238	2.2	7,238	2.8	7,698	3.8	8,171
1000	2	8,825	2	8,825	2.5	9,331	3.4	9,852
1100	1.8	10,568	1.8	10,568	2.3	11,122	3.1	11,690
1200	1.7	12,469	1.7	12,469	2.1	13,070	2.8	13,685

Standard sizes
Non-standard sizes

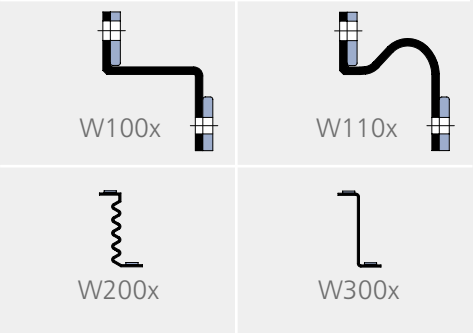
Individual fabrication possible

ANGULAR
swivel flange
D110F



Wall seals

W100x	Expansion joint without arch	▶ 230
W110x	Expansion joint with one arch	▶ 230
W200x	Membrane without steam barrier	▶ 238
W300x	Membrane with steam barrier	▶ 238

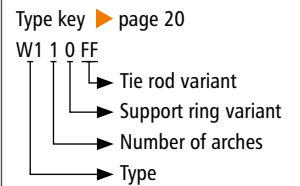


W100x (SS/FS/SF/FF) W110x (SS/FS/SF/FF)

NB 200 to NB 4000



- **Type W100x** (SS/FS/SF/FF)
without arch,
without vacuum support
ring
- **Type W110x** (SS/FS/SF/FF)
with arch,
without vacuum support
ring
- **Type W111x** (SS/FS/SF/FF)
with arch,
with vacuum support ring



Wall sealing expansion joint without arch or with one arch

- Design:** Depending on the arch and nominal diameter at the wall pipe and medium pipe with full faced rubber flanges and backing flanges or with a sleeve for clamp fixing
Optionally with vacuum support ring
Optional expansion joint with a field connection for installation after the pipeline is laid
Optional allowance for potential eccentricity between the medium pipe and wall pipe
- Nominal diameters:** Standard up to NB 4000
Intermediate sizes or other nominal diameter combinations possible
- Installation length:** Standard $L_E = 150$ to 250 mm (► page 234–236)
Other installation lengths on request
- Pressure:** Depending on nominal diameter up to 2.5 bar
Vacuum or external pressure not allowed without vacuum support ring
- Movement:** For axial, lateral and angular movements
(► page 234–236)

Application:
Power plants, plant construction, armature shafts, turbine houses
e. g. for building settlements at pipe or vessel penetrations, groundwater seals in district heating pipelines



Assembly instruction download
www.ditec-adam.de/en/downloads.html

Rubber bellows

Rubber	Fabric	Marking	Max.	Application
EPDM	Nylon		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDM	Kevlar		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMht	Kevlar		120 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMtw	Nylon		100 °C	Drinking water
EPDMtw	Kevlar		100 °C	Drinking water
EPDMaf	Nylon		100 °C	Abrasive materials, water-sand extraction
EPDMaf	Kevlar		100 °C	Abrasive materials, water-sand extraction
EPDMbeige	Nylon		100 °C	Foodstuffs
EPDMbeige	Kevlar		100 °C	Foodstuffs
IIR	Nylon		100 °C	Hot water, acids, bases, gases
IIR	Kevlar		100 °C	Hot water, acids, bases, gases
CSM	Nylon		100 °C	Strong acids, bases, chemicals
CSM	Kevlar		100 °C	Strong acids, bases, chemicals
NBR	Nylon		100 °C	Oils, petrol, solvents, compressed air
NBR	Kevlar		100 °C	Oils, petrol, solvents, compressed air
NBRbeige	Nylon		100 °C	Oil, fatty foods
NBRbeige	Kevlar		100 °C	Oil, fatty foods
CR	Nylon		90 °C	Cooling water, slightly oily water, seawater
CR	Kevlar		90 °C	Cooling water, slightly oily water, seawater
FPM	Kevlar		180 °C	Corrosive chemicals, petroleum distillates
FPMbeige	Kevlar		180 °C	Oil, fatty foods
NR	Nylon		70 °C	Abrasive materials
Silicon	Kevlar or glass		200 °C	Air, saltwater atmosphere, foodstuffs, medical technology

Flanges

- Design:

Single-part or multi-part round backing flanges with clearance holes
Optional support collar for high internal pressure
- Flange norms:

DIN, EN, ANSI, AWWA, BS, JIS, special measurements (▶ page 256)
- Materials:

Carbon steel: 1.0038 (S235JRG2)
1.0570 (S355J2G3)
Stainless steel: 1.4301 (X5CrNi18-10)
1.4571 (X6CrNiMoTi17-12-2)
Other materials on request
- Coating:

Primed, hot-dip galvanised, special paint

Fastening clamps

- Design:

Depending on pressure and nominal diameter, endless clamp belt or hinge bolt clamps
At higher pressures, 2 adjacent clamps per fastening side
- Width:

Endless clamp belt: ¾"
Hinge bolt clamp: depending on Ø: 18 – 30 mm
- Materials:

Endless clamp belt with screw lugs (tongs): 1.7300
Hinge bolt clamp, belt and housing: 1.4016 (Screw steel galvanised)

Support rings

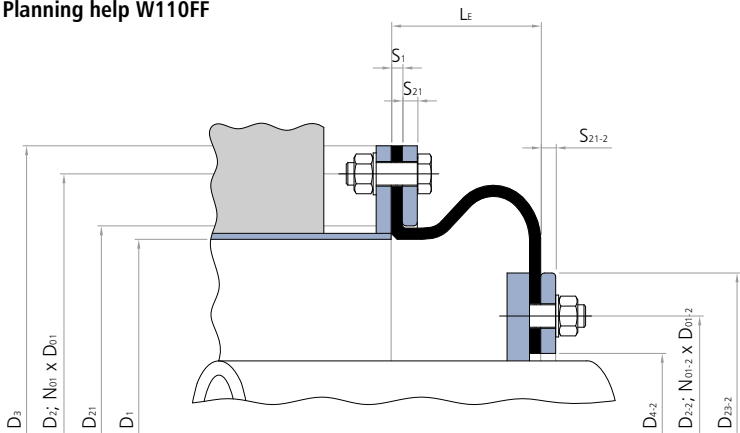
TYPE		Vacuum support ring	Pressure	Movement
W100x		Without	Depending on the nominal diameter up to 2.5 bar, vacuum stability on request	▶ page 234
W110x		Without	Depending on the nominal diameter up to 2.5 bar, vacuum stability on request	▶ page 235
W111x		Inside in the arch apex	Depending on nominal diameter up to 2.5 bar, tested for external pressure up to 1.3 bar	▶ page 236

Materials		
Stainless steel:	1.4301 (X5CrNi18-10) 1.4539 (X1NiCrMoCu25-20-5) 1.4571 (X6CrNiMoTi17-12-2)	Other materials on request
Carbon steel:	1.0570 (S355J2G3) rubber coated	

Optional accessories

Protective hood: UV protection cover; Ground protective cover; Fire protection cover; Splash protective cover (▶ page 44)

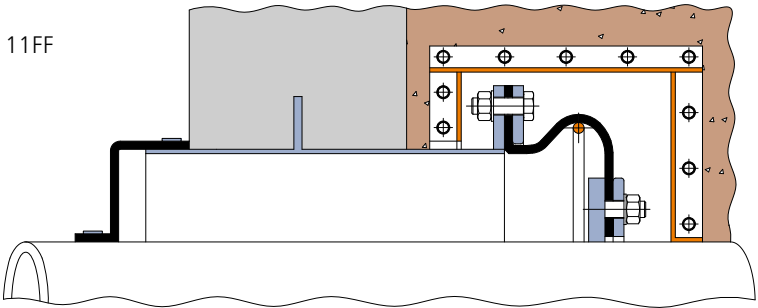
Planning help W110FF



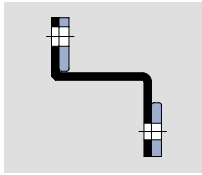
Fixing types

TYPE		At the wall pipe	At the medium pipe	Pressure	Nominal diameters
W110SS		Sleeve	Sleeve	slight	Medium pipe up to NB 1000
W110FS		Flange	Sleeve	slight	Medium pipe up to NB 1000
W110SF		Sleeve	Flange	slight	Wall pipe up to NB 1000
W110FF		Flange	Flange	up to 2.5 bar with vacuum support ring, tested for external pressure, up to 13 m water column	Wall pipe up to NB 4000
U110A ▶ page 52		Flange	Flange	high pressure	Wall pipe up to NB 4000

- Installation example**
- wall seal expansion joint type W111FF
 - wall pipe
 - ground protective cover
 - test expansion joint



W100x W110x



W100x (SS/FS/SF/FF)

► without arch, without vacuum support ring

Installation length (L _E) at design pressure																
		up to 2.5 bar L _E = 150 mm					up to 2.5 bar L _E = 200 mm					up to 2.5 bar L _E = 250 mm				
		higher pressures on request														
Wall pipe NB	Medium pipe NB	Movement				A	Movement				A	Movement				A
																
		mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²
200	80	8	5	9	2.9	314	10	6	12	3.4	314	13	8	14	4.6	314
250	100	8	5	8	2.3	491	10	6	11	2.7	491	13	8	14	3.7	491
300	125	8	5	8	1.9	716	10	6	11	2.3	716	13	8	13	3.1	716
	150	8	5	8	1.9	716	10	6	11	2.3	716	13	8	13	3.1	716
400	175	8	5	8	1.4	1,269	10	6	10	1.7	1,269	13	8	13	2.3	1,269
	200	8	5	8	1.4	1,269	10	6	10	1.7	1,269	13	8	13	2.3	1,269
500	250	8	5	7	1.1	1,987	10	6	10	1.4	1,987	13	8	12	1.8	1,987
	300	8	5	7	1.1	1,987	10	6	10	1.4	1,987	13	8	12	1.8	1,987
600	350	8	5	7	1.0	2,856	10	6	9	1.1	2,856	13	8	12	1.5	2,856
	400	8	5	7	1.0	2,856	10	6	9	1.1	2,856	13	8	12	1.5	2,856
700	450	8	5	7	0.8	3,893	10	6	9	1.0	3,893	13	8	11	1.3	3,893
	500	8	5	7	0.8	3,893	10	6	9	1.0	3,893	13	8	11	1.3	3,893
800	550	8	5	7	0.7	5,090	10	6	9	0.9	5,090	13	8	11	1.1	5,090
	600	8	5	7	0.7	5,090	10	6	9	0.9	5,090	13	8	11	1.1	5,090
900	650	8	5	6	0.6	6,433	10	6	9	0.8	6,433	13	8	11	1	6,433
	700	8	5	6	0.6	6,433	10	6	9	0.8	6,433	13	8	11	1	6,433
1000	750	8	5	6	0.6	7,933	10	6	8	0.7	7,933	13	8	10	0.9	7,933
	800	8	5	6	0.6	7,933	10	6	8	0.7	7,933	13	8	10	0.9	7,933
1100	850	8	5	6	0.5	9,590	10	6	8	0.6	9,590	13	8	10	0.8	9,590
	900	8	5	6	0.5	9,590	10	6	8	0.6	9,590	13	8	10	0.8	9,590
1200	950	8	5	6	0.5	11,404	10	6	8	0.6	11,404	13	8	10	0.8	11,404
	1000	8	5	6	0.5	11,404	10	6	8	0.6	11,404	13	8	10	0.8	11,404
1400	1050	8	5	6	0.4	15,504	10	6	8	0.5	15,504	13	8	10	0.7	15,504
	1100	8	5	6	0.4	15,504	10	6	8	0.5	15,504	13	8	10	0.7	15,504
	1150	8	5	6	0.4	15,504	10	6	8	0.5	15,504	13	8	10	0.7	15,504
	1200	8	5	6	0.4	15,504	10	6	8	0.5	15,504	13	8	10	0.7	15,504
1600	1250	8	5	6	0.4	20,232	10	6	8	0.4	20,232	13	8	10	0.6	20,232
	1300	8	5	6	0.4	20,232	10	6	8	0.4	20,232	13	8	10	0.6	20,232
	1350	8	5	6	0.4	20,232	10	6	8	0.4	20,232	13	8	10	0.6	20,232
	1400	8	5	6	0.4	20,232	10	6	8	0.4	20,232	13	8	10	0.6	20,232
1800	1450	8	5	6	0.3	25,588	10	6	7	0.4	25,588	13	8	9	0.5	25,588
	1500	8	5	6	0.3	25,588	10	6	7	0.4	25,588	13	8	9	0.5	25,588
	1600	8	5	6	0.3	25,588	10	6	7	0.4	25,588	13	8	9	0.5	25,588
2000	1650	8	5	5	0.3	31,573	10	6	7	0.3	31,573	13	8	9	0.5	31,573
	1700	8	5	5	0.3	31,573	10	6	7	0.3	31,573	13	8	9	0.5	31,573
	1800	8	5	5	0.3	31,573	10	6	7	0.3	31,573	13	8	9	0.5	31,573
2200	1900	8	5	5	0.3	38,186	10	6	7	0.3	38,186	13	8	9	0.4	38,186
	1950	8	5	5	0.3	38,186	10	6	7	0.3	38,186	13	8	9	0.4	38,186
	2000	8	5	5	0.3	38,186	10	6	7	0.3	38,186	13	8	9	0.4	38,186
2400	2100	8	5	5	0.2	45,428	10	6	7	0.3	45,428	13	8	9	0.4	45,428
	2200	8	5	5	0.2	45,428	10	6	7	0.3	45,428	13	8	9	0.4	45,428
2600	2250	8	5	5	0.2	53,297	10	6	7	0.3	53,297	13	8	9	0.4	53,297
	2300	8	5	5	0.2	53,297	10	6	7	0.3	53,297	13	8	9	0.4	53,297
	2400	8	5	5	0.2	53,297	10	6	7	0.3	53,297	13	8	9	0.4	53,297
2800	2500	8	5	5	0.2	61,795	10	6	7	0.2	61,795	13	8	9	0.3	61,795
	2550	8	5	5	0.2	61,795	10	6	7	0.2	61,795	13	8	9	0.3	61,795
	2600	8	5	5	0.2	61,795	10	6	7	0.2	61,795	13	8	9	0.3	61,795
3000	2700	8	5	5	0.2	70,922	10	6	7	0.2	70,922	13	8	8	0.3	70,922
	2800	8	5	5	0.2	70,922	10	6	7	0.2	70,922	13	8	8	0.3	70,922
3200	2850	8	5	5	0.2	80,676	10	6	7	0.2	80,676	13	8	8	0.3	80,676
	2900	8	5	5	0.2	80,676	10	6	7	0.2	80,676	13	8	8	0.3	80,676
	3000	8	5	5	0.2	80,676	10	6	7	0.2	80,676	13	8	8	0.3	80,676
3400	3100	8	5	5	0.2	91,059	10	6	7	0.2	91,059	13	8	8	0.3	91,059
	3150	8	5	5	0.2	91,059	10	6	7	0.2	91,059	13	8	8	0.3	91,059
	3200	8	5	5	0.2	91,059	10	6	7	0.2	91,059	13	8	8	0.3	91,059
3600	3300	8	5	5	0.2	102,071	10	6	6	0.2	102,071	13	8	8	0.3	102,071
	3400	8	5	5	0.2	102,071	10	6	6	0.2	102,071	13	8	8	0.3	102,071
3800	3450	8	5	5	0.2	113,710	10	6	6	0.2	113,710	13	8	8	0.2	113,710
	3600	8	5	5	0.2	113,710	10	6	6	0.2	113,710	13	8	8	0.2	113,710
4000	3800	8	5	5	0.1	125,978	10	6	6	0.2	125,978	13	8	8	0.2	125,978

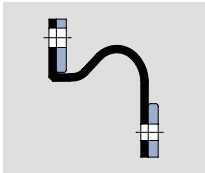
In the event of axial extension and simultaneous lateral displacement the above movements are reduced (► page 22).

Other installation lengths and combinations on request.

For larger movements see type W110x.

Individual fabrication possible

W110x (SS/FS/SF/FF)
► with arch, without vacuum support ring



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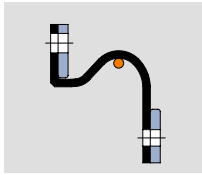
Installation length (L _E) at design pressure																
		up to 2.5 bar L _E = 150 mm					up to 2.5 bar L _E = 200 mm					up to 2.5 bar L _E = 250 mm				
		higher pressures on request														
Wall pipe NB	Medium pipe NB	Movement				A	Movement				A	Movement				A
																
		mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²
200	80	34	17	26	9.6	616	45	26	37	14.6	765	59	37	49	20.3	962
250	100	34	17	26	7.7	855	45	26	36	11.7	1,029	59	37	48	16.5	1,257
300	125	34	17	26	6.5	1,146	45	26	36	9.8	1,346	59	37	48	13.9	1,605
	150	34	17	26	6.5	1,146	45	26	36	9.8	1,346	59	37	48	13.9	1,605
400	175	34	17	25	4.9	1,825	45	26	35	7.4	2,075	59	37	46	10.5	2,393
	200	34	17	25	4.9	1,825	45	26	35	7.4	2,075	59	37	46	10.5	2,393
500	250	34	17	24	3.9	2,669	45	26	34	5.9	2,971	59	37	45	8.4	3,349
	300	34	17	24	3.9	2,669	45	26	34	5.9	2,971	59	37	45	8.4	3,349
600	350	34	17	24	3.2	3,664	45	26	33	5.0	4,015	59	37	45	7	4,453
	400	34	17	24	3.2	3,664	45	26	33	5.0	4,015	59	37	45	7	4,453
700	450	34	17	24	2.8	4,827	45	26	33	4.2	5,230	59	37	44	6	5,728
	500	34	17	24	2.8	4,827	45	26	33	4.2	5,230	59	37	44	6	5,728
800	550	34	17	23	2.4	6,151	45	26	33	3.7	6,604	59	37	43	5.3	7,163
	600	34	17	23	2.4	6,151	45	26	33	3.7	6,604	59	37	43	5.3	7,163
900	650	34	17	23	2.2	7,620	45	26	32	3.3	8,123	59	37	43	4.7	8,742
	700	34	17	23	2.2	7,620	45	26	32	3.3	8,123	59	37	43	4.7	8,742
1000	750	34	17	23	1.9	9,246	45	26	32	3.0	9,799	59	37	43	4.2	10,477
	800	34	17	23	1.9	9,246	45	26	32	3.0	9,799	59	37	43	4.2	10,477
1100	850	34	17	23	1.8	11,029	45	26	32	2.7	11,632	59	37	42	3.8	12,370
	900	34	17	23	1.8	11,029	45	26	32	2.7	11,632	59	37	42	3.8	12,370
1200	950	34	17	22	1.6	12,969	45	26	31	2.5	13,623	59	37	42	3.5	14,420
	1000	34	17	22	1.6	12,969	45	26	31	2.5	13,623	59	37	42	3.5	14,420
1400	1050	34	17	22	1.4	17,320	45	26	31	2.1	18,074	59	37	41	3	18,991
	1100	34	17	22	1.4	17,320	45	26	31	2.1	18,074	59	37	41	3	18,991
	1150	34	17	22	1.4	17,320	45	26	31	2.1	18,074	59	37	41	3	18,991
	1200	34	17	22	1.4	17,320	45	26	31	2.1	18,074	59	37	41	3	18,991
1600	1250	34	17	22	1.2	22,299	45	26	31	1.9	23,154	59	37	41	2.6	24,190
	1300	34	17	22	1.2	22,299	45	26	31	1.9	23,154	59	37	41	2.6	24,190
	1350	34	17	22	1.2	22,299	45	26	31	1.9	23,154	59	37	41	2.6	24,190
	1400	34	17	22	1.2	22,299	45	26	31	1.9	23,154	59	37	41	2.6	24,190
1800	1450	34	17	22	1.1	27,907	45	26	30	1.7	28,863	59	37	40	2.4	30,018
	1500	34	17	22	1.1	27,907	45	26	30	1.7	28,863	59	37	40	2.4	30,018
	1600	34	17	22	1.1	27,907	45	26	30	1.7	28,863	59	37	40	2.4	30,018
2000	1650	34	17	21	1.0	34,143	45	26	30	1.5	35,199	59	37	40	2.1	36,474
	1700	34	17	21	1.0	34,143	45	26	30	1.5	35,199	59	37	40	2.1	36,474
	1800	34	17	21	1.0	34,143	45	26	30	1.5	35,199	59	37	40	2.1	36,474
2200	1900	34	17	21	0.9	41,007	45	26	30	1.4	42,164	59	37	40	1.9	43,558
	1950	34	17	21	0.9	41,007	45	26	30	1.4	42,164	59	37	40	1.9	43,558
	2000	34	17	21	0.9	41,007	45	26	30	1.4	42,164	59	37	40	1.9	43,558
2400	2100	34	17	21	0.8	48,500	45	26	29	1.2	49,757	59	37	39	1.8	51,271
	2200	34	17	21	0.8	48,500	45	26	29	1.2	49,757	59	37	39	1.8	51,271
2600	2250	34	17	21	0.7	56,621	45	26	29	1.1	57,979	59	37	39	1.6	59,612
	2300	34	17	21	0.7	56,621	45	26	29	1.1	57,979	59	37	39	1.6	59,612
	2400	34	17	21	0.7	56,621	45	26	29	1.1	57,979	59	37	39	1.6	59,612
2800	2500	34	17	21	0.7	65,370	45	26	29	1.1	66,829	59	37	39	1.5	68,581
	2550	34	17	21	0.7	65,370	45	26	29	1.1	66,829	59	37	39	1.5	68,581
	2600	34	17	21	0.7	65,370	45	26	29	1.1	66,829	59	37	39	1.5	68,581
3000	2700	34	17	21	0.6	74,748	45	26	29	1.0	76,307	59	37	39	1.4	78,179
	2800	34	17	21	0.6	74,748	45	26	29	1.0	76,307	59	37	39	1.4	78,179
3200	2850	34	17	21	0.6	84,754	45	26	29	0.9	86,413	59	37	38	1.3	88,405
	2900	34	17	21	0.6	84,754	45	26	29	0.9	86,413	59	37	38	1.3	88,405
	3000	34	17	21	0.6	84,754	45	26	29	0.9	86,413	59	37	38	1.3	88,405
3400	3100	34	17	20	0.6	95,388	45	26	29	0.9	97,148	59	37	38	1.2	99,259
	3150	34	17	20	0.6	95,388	45	26	29	0.9	97,148	59	37	38	1.2	99,259
	3200	34	17	20	0.6	95,388	45	26	29	0.9	97,148	59	37	38	1.2	99,259
3600	3300	34	17	20	0.5	106,651	45	26	28	0.8	108,511	59	37	38	1.2	110,741
	3400	34	17	20	0.5	106,651	45	26	28	0.8	108,511	59	37	38	1.2	110,741
3800	3450	34	17	20	0.5	118,542	45	26	28	0.8	120,503	59	37	38	1.1	122,852
	3600	34	17	20	0.5	118,542	45	26	28	0.8	120,503	59	37	38	1.1	122,852
4000	3800	34	17	20	0.5	131,061	45	26	28	0.7	133,123	59	37	38	1.1	135,591

In the event of axial extension and simultaneous lateral displacement the above movements are reduced (► page 22).
Other installation lengths and combinations on request.
Larger movements on request.

Individual fabrication possible

Wall seals

W100x W110x



W111x (SS/FS/SF/FF)

► with arch, with vacuum support ring

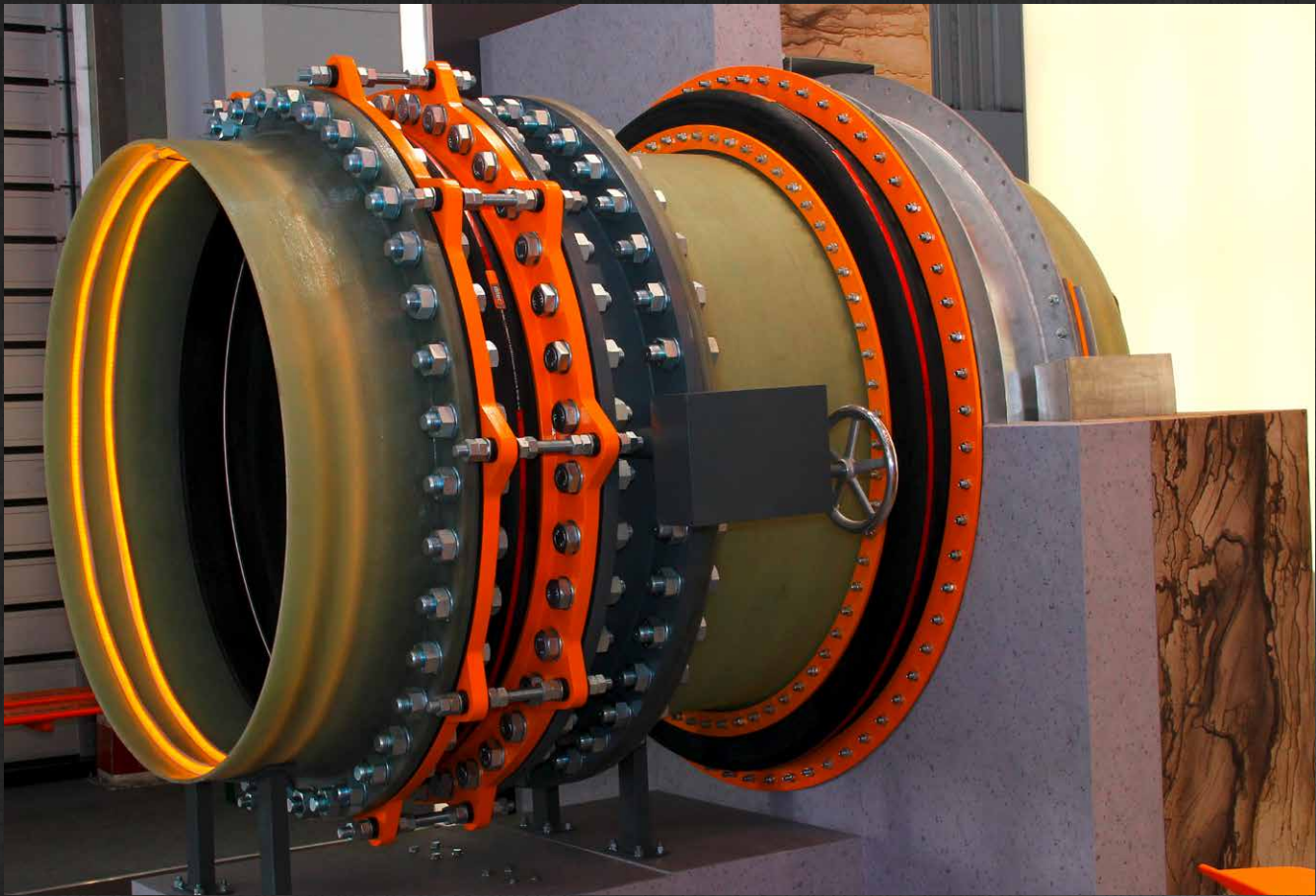
Installation length (L _E) at design pressure																
		up to 2.5 bar L _E = 150 mm					up to 2.5 bar L _E = 200 mm					up to 2.5 bar L _E = 250 mm				
		higher pressures on request														
Wall pipe NB	Medium pipe NB	Movement				A	Movement				A	Movement				A
																
		mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²
200	80	34	6	26	3.4	616	45	9	37	5.1	765	59	12	49	6.8	962
250	100	34	6	26	2.7	855	45	9	36	4.1	1,029	59	12	48	5.5	1,257
300	125	34	6	26	2.3	1,146	45	9	36	3.4	1,346	59	12	48	4.6	1,605
	150	34	6	26	2.3	1,146	45	9	36	3.4	1,346	59	12	48	4.6	1,605
400	175	34	6	25	1.7	1,825	45	9	35	2.6	2,075	59	12	46	3.4	2,393
	200	34	6	25	1.7	1,825	45	9	35	2.6	2,075	59	12	46	3.4	2,393
500	250	34	6	24	1.4	2,669	45	9	34	2.1	2,971	59	12	45	2.7	3,349
	300	34	6	24	1.4	2,669	45	9	34	2.1	2,971	59	12	45	2.7	3,349
600	350	34	6	24	1.1	3,664	45	9	33	1.7	4,015	59	12	45	2.3	4,453
	400	34	6	24	1.1	3,664	45	9	33	1.7	4,015	59	12	45	2.3	4,453
700	450	34	6	24	1.0	4,827	45	9	33	1.5	5,230	59	12	44	2	5,728
	500	34	6	24	1.0	4,827	45	9	33	1.5	5,230	59	12	44	2	5,728
800	550	34	6	23	0.9	6,151	45	9	33	1.3	6,604	59	12	43	1.7	7,163
	600	34	6	23	0.9	6,151	45	9	33	1.3	6,604	59	12	43	1.7	7,163
900	650	34	6	23	0.8	7,620	45	9	32	1.1	8,123	59	12	43	1.5	8,742
	700	34	6	23	0.8	7,620	45	9	32	1.1	8,123	59	12	43	1.5	8,742
1000	750	34	6	23	0.7	9,246	45	9	32	1.0	9,799	59	12	43	1.4	10,477
	800	34	6	23	0.7	9,246	45	9	32	1.0	9,799	59	12	43	1.4	10,477
1100	850	34	6	23	0.6	11,029	45	9	32	0.9	11,632	59	12	42	1.2	12,370
	900	34	6	23	0.6	11,029	45	9	32	0.9	11,632	59	12	42	1.2	12,370
1200	950	34	6	22	0.6	12,969	45	9	31	0.9	13,623	59	12	42	1.1	14,420
	1000	34	6	22	0.6	12,969	45	9	31	0.9	13,623	59	12	42	1.1	14,420
1400	1050	34	6	22	0.5	17,320	45	9	31	0.7	18,074	59	12	41	1	18,991
	1100	34	6	22	0.5	17,320	45	9	31	0.7	18,074	59	12	41	1	18,991
	1150	34	6	22	0.5	17,320	45	9	31	0.7	18,074	59	12	41	1	18,991
	1200	34	6	22	0.5	17,320	45	9	31	0.7	18,074	59	12	41	1	18,991
1600	1250	34	6	22	0.4	22,299	45	9	31	0.6	23,154	59	12	41	0.9	24,190
	1300	34	6	22	0.4	22,299	45	9	31	0.6	23,154	59	12	41	0.9	24,190
	1350	34	6	22	0.4	22,299	45	9	31	0.6	23,154	59	12	41	0.9	24,190
	1400	34	6	22	0.4	22,299	45	9	31	0.6	23,154	59	12	41	0.9	24,190
1800	1450	34	6	22	0.4	27,907	45	9	30	0.6	28,863	59	12	40	0.8	30,018
	1500	34	6	22	0.4	27,907	45	9	30	0.6	28,863	59	12	40	0.8	30,018
	1600	34	6	22	0.4	27,907	45	9	30	0.6	28,863	59	12	40	0.8	30,018
2000	1650	34	6	21	0.3	34,143	45	9	30	0.5	35,199	59	12	40	0.7	36,474
	1700	34	6	21	0.3	34,143	45	9	30	0.5	35,199	59	12	40	0.7	36,474
	1800	34	6	21	0.3	34,143	45	9	30	0.5	35,199	59	12	40	0.7	36,474
2200	1900	34	6	21	0.3	41,007	45	9	30	0.5	42,164	59	12	40	0.6	43,558
	1950	34	6	21	0.3	41,007	45	9	30	0.5	42,164	59	12	40	0.6	43,558
	2000	34	6	21	0.3	41,007	45	9	30	0.5	42,164	59	12	40	0.6	43,558
2400	2100	34	6	21	0.3	48,500	45	9	29	0.4	49,757	59	12	39	0.6	51,271
	2200	34	6	21	0.3	48,500	45	9	29	0.4	49,757	59	12	39	0.6	51,271
2600	2250	34	6	21	0.3	56,621	45	9	29	0.4	57,979	59	12	39	0.5	59,612
	2300	34	6	21	0.3	56,621	45	9	29	0.4	57,979	59	12	39	0.5	59,612
	2400	34	6	21	0.3	56,621	45	9	29	0.4	57,979	59	12	39	0.5	59,612
2800	2500	34	6	21	0.2	65,370	45	9	29	0.4	66,829	59	12	39	0.5	68,581
	2550	34	6	21	0.2	65,370	45	9	29	0.4	66,829	59	12	39	0.5	68,581
	2600	34	6	21	0.2	65,370	45	9	29	0.4	66,829	59	12	39	0.5	68,581
3000	2700	34	6	21	0.2	74,748	45	9	29	0.3	76,307	59	12	39	0.5	78,179
	2800	34	6	21	0.2	74,748	45	9	29	0.3	76,307	59	12	39	0.5	78,179
3200	2850	34	6	21	0.2	84,754	45	9	29	0.3	86,413	59	12	38	0.4	88,405
	2900	34	6	21	0.2	84,754	45	9	29	0.3	86,413	59	12	38	0.4	88,405
	3000	34	6	21	0.2	84,754	45	9	29	0.3	86,413	59	12	38	0.4	88,405
3400	3100	34	6	20	0.2	95,388	45	9	29	0.3	97,148	59	12	38	0.4	99,259
	3150	34	6	20	0.2	95,388	45	9	29	0.3	97,148	59	12	38	0.4	99,259
	3200	34	6	20	0.2	95,388	45	9	29	0.3	97,148	59	12	38	0.4	99,259
3600	3300	34	6	20	0.2	106,651	45	9	28	0.3	108,511	59	12	38	0.4	110,741
	3400	34	6	20	0.2	106,651	45	9	28	0.3	108,511	59	12	38	0.4	110,741
3800	3450	34	6	20	0.2	118,542	45	9	28	0.3	120,503	59	12	38	0.4	122,852
	3600	34	6	20	0.2	118,542	45	9	28	0.3	120,503	59	12	38	0.4	122,852
4000	3800	34	6	20	0.2	131,061	45	9	28	0.3	133,123	59	12	38	0.3	135,591

In the event of axial extension and simultaneous lateral displacement the above movements are reduced (► page 22).

Other installation lengths and combinations on request.

Larger movements on request.

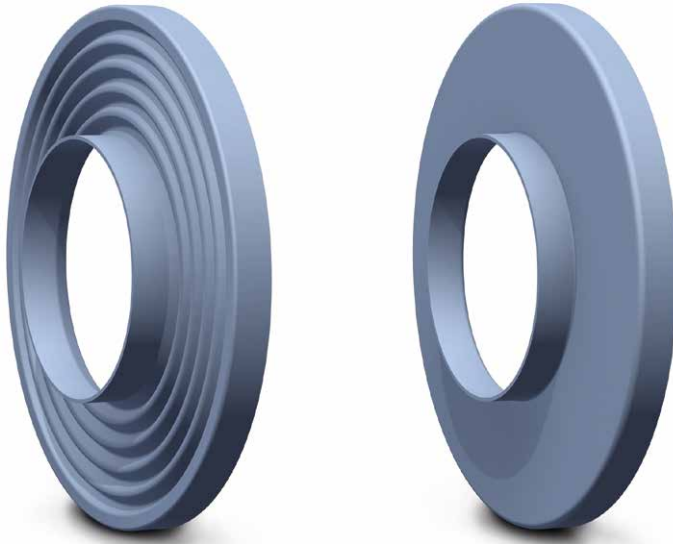
Individual fabrication possible



Exhibition model of size NB 1600
tied dismantling expansion joint in front of a butterfly valve
wall seal expansion joint for underground pipe penetration

W200x (SS/FS) W300x (SS/FS)

NB 50 to NB 1000



► **Type W200x (SS/FS)**
without steam diffusion barrier

► **Type W300x (SS/FS)**
with steam diffusion barrier

Type key ► page 20
W2 0 0 SS
└─ Tie rod variant
└─ Support ring variant
└─ Number of arches
└─ Type

Wall sealing membrane

Design: Wall sealing membrane with or without pre-formed folds
Depending on pressure and nominal diameter, using a sleeve for clamp fixing at the wall pipe or dowelled to the wall with a backing flange, with a sleeve for clamp fixing at the medium pipe
Optional steam diffusion barrier W300x (SS/FS)
Optional wall sealing membrane with field connection for installation after the pipeline is laid
Optional allowance for potential eccentricity between medium pipe and wall pipe

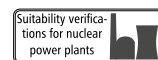
Nominal diameters: Standard up to NB 1000
Intermediate sizes or other nominal diameter combinations possible

Installation length: Standard $L_E = 60 \text{ mm}$
Other installation lengths on request

Pressure: Up to $\pm 20 \text{ mbar}$

Movement: For axial, lateral and angular movements
(► page 240–241)

Application:
Power plants, plant construction, turbine houses, e.g. as a airtight seal or splash guard for pipe penetrations, seals for district heating pipelines, seals for cooling water pipelines



Assembly instruction download
www.ditec-adam.de/en/downloads.html

Rubber bellows

Rubber grades			Carrier
up to 200 °C:	Silicon (Q)	Air, water, saltwater atmosphere	without
	Silicon special compound	Nuclear applications	

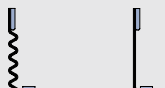
Fastening clamps

Design:	Screw thread belt or small clamps		
Width:	Screw thread belt:	1/2"	
	Small clamp:	depending on Ø: 9–12 mm	
Materials:	Screw thread belt with threaded screw lug:	1.4310	
	Small clamp, belt and housing:	1.4016 (Screw steel galvanised)	

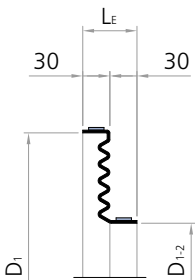
Flanges

Design:	Multi-part clamping flange with clearance holes		
Flange norms:	According to specification		
Materials:	Carbon steel:	1.0038 (S235JRG2)	
		1.0570 (S355J2G3)	
	Stainless steel:	1.4301 (X5CrNi18-10)	
		1.4571 (X6CrNiMoTi17-12-2)	
	Other materials on request		
Coating:	Primed, hot-dip galvanised, special paint		

Fixing types

TYPE		At the wall pipe	At the medium pipe	Pressure	Nominal diameters
W200SS W300SS		Sleeve	Sleeve	slight	Wall pipe up to NB 1000
W200FS W300FS		Flange	Sleeve	slight	Medium pipe up to NB 1000

Planning help W200SS





W200x (SS/FS)

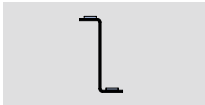
► without steam diffusion barrier

Potential combinations		Movement		
Wall pipe NB	Medium pipe NB			
50	10	15	15	13
	15	14	14	12
	20	12	12	10
	25	9	9	8
	32	6	6	5
65	15	19	19	16
	20	17	17	15
	25	15	15	13
	32	12	12	10
	40	10	10	8
80	20	22	22	19
	25	19	19	17
	32	16	16	14
	40	14	14	12
	50	10	10	9
100	25	28	28	24
	32	25	25	22
	40	23	23	20
	50	19	19	16
	65	13	13	11
125	32	34	34	29
	40	32	32	27
	50	28	28	24
	65	22	22	19
	80	18	18	15
150	40	42	42	36
	50	38	38	32
	65	32	32	28
	80	28	28	24
	100	19	19	16
200	65	50	50	43
	80	46	46	39
	100	37	37	31
	125	28	28	24
	150	18	18	15
250	80	64	64	55
	100	56	56	48
	125	47	47	40
	150	37	37	31
	200	19	19	16
300	100	73	73	63
	125	64	64	55
	150	54	54	47
	200	37	37	31
	250	18	18	15
350	125	76	76	65
	150	66	66	56
	200	48	48	41
	250	29	29	25
	300	11	11	10
400	150	83	83	71
	200	66	66	56
	250	47	47	40
	300	29	29	25
	350	18	18	15

Potential combinations		Movement		
Wall pipe NB	Medium pipe NB			
450	200	83	83	71
	250	64	64	55
	300	47	47	40
	350	36	36	30
	400	18	18	15
500	250	82	82	71
	300	64	64	55
	350	53	53	46
	400	36	36	30
	450	18	18	15
550	300	82	82	70
	350	71	71	61
	400	53	53	46
	450	36	36	30
	500	18	18	15
600	350	89	89	76
	400	71	71	61
	450	53	53	46
	500	36	36	30
	550	18	18	15
650	400	89	89	76
	450	71	71	61
	500	53	53	46
	550	36	36	30
	600	18	18	15
700	450	89	89	76
	500	71	71	61
	550	53	53	46
	600	36	36	30
	650	18	18	15
750	500	89	89	76
	550	71	71	61
	600	53	53	46
	650	36	36	30
	700	18	18	15
800	400	142	142	122
	450	124	124	107
	500	107	107	91
	600	71	71	61
	700	36	36	30
900	450	160	160	137
	500	142	142	122
	600	107	107	91
	700	71	71	61
	800	36	36	30
1000	500	178	178	152
	600	142	142	122
	700	107	107	91
	800	71	71	61
	900	36	36	30

For wall pipes use nominal diameters if possible.
For medium pipes, all diameters (whole mm) can be delivered.
Other combinations possible.

Individual fabrication possible



Potential combinations		Movement		
Wall pipe NB	Medium pipe NB			
		mm	mm	± mm
50	10	5	5	3
	15	5	5	3
	20	4	4	3
	25	3	3	2
	32	2	2	1
65	15	7	7	4
	20	6	6	4
	25	5	5	3
	32	4	4	3
	40	3	3	2
80	20	8	8	5
	25	7	7	4
	32	6	6	3
	40	5	5	3
	50	4	4	2
100	25	10	10	6
	32	9	9	5
	40	8	8	5
	50	7	7	4
	65	5	5	3
125	32	12	12	7
	40	11	11	7
	50	10	10	6
	65	8	8	5
	80	6	6	4
150	40	15	15	9
	50	14	14	8
	65	12	12	7
	80	10	10	6
	100	7	7	4
200	65	18	18	11
	80	16	16	10
	100	13	13	8
	125	10	10	6
	150	6	6	4
250	80	23	23	14
	100	20	20	12
	125	17	17	10
	150	13	13	8
	200	7	7	4
300	100	26	26	16
	125	23	23	14
	150	19	19	12
	200	13	13	8
	250	6	6	4
350	125	27	27	16
	150	23	23	14
	200	17	17	10
	250	10	10	6
	300	4	4	2
400	150	30	30	18
	200	23	23	14
	250	17	17	10
	300	10	10	6
	350	6	6	4

Potential combinations		Movement		
Wall pipe NB	Medium pipe NB			
		mm	mm	± mm
450	200	30	30	18
	250	23	23	14
	300	17	17	10
	350	13	13	8
	400	6	6	4
500	250	29	29	18
	300	23	23	14
	350	19	19	11
	400	13	13	8
	450	6	6	4
550	300	29	29	18
	350	25	25	15
	400	19	19	11
	450	13	13	8
	500	6	6	4
600	350	32	32	19
	400	25	25	15
	450	19	19	11
	500	13	13	8
	550	6	6	4
650	400	32	32	19
	450	25	25	15
	500	19	19	11
	550	13	13	8
	600	6	6	4
700	450	32	32	19
	500	25	25	15
	550	19	19	11
	600	13	13	8
	650	6	6	4
750	500	32	32	19
	550	25	25	15
	600	19	19	11
	650	13	13	8
	700	6	6	4
800	400	51	51	30
	450	44	44	27
	500	38	38	23
	600	25	25	15
	700	13	13	8
900	450	57	57	34
	500	51	51	30
	600	38	38	23
	700	25	25	15
	800	13	13	8
1000	500	64	64	38
	600	51	51	30
	700	38	38	23
	800	25	25	15
	900	13	13	8

For wall pipes use nominal diameters if possible.
For medium pipes, all diameters (whole mm) can be delivered.
Other combinations possible.

Individual fabrication possible

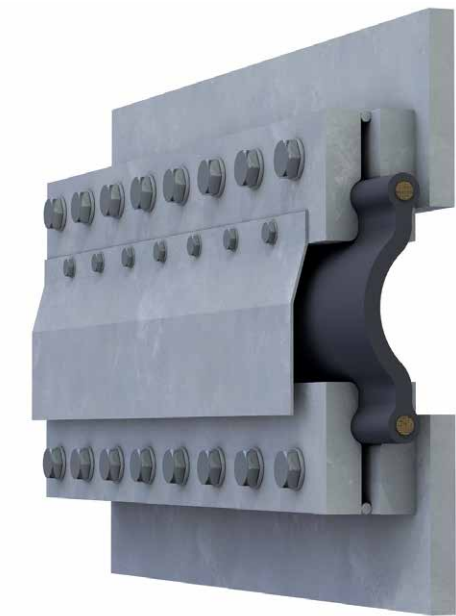


Special expansion joints

A selection from our range of products:

- Dog bone expansion joints ▶ 244
- Disc bellows ▶ 246
- Hoses for material conveyance ▶ 248
- Expansion bellows ▶ 249
- Rubber elements ▶ 250
- 2 ply safety rubber expansion joints ▶ 251
- Expansion joints with vulcanised steel parts and rubber coatings ▶ 251

Dog bone expansion joint



Dog-bone expansion joint without pre-formed arch

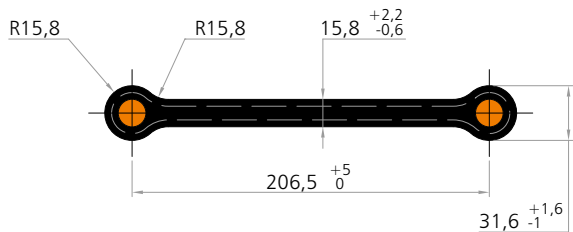
- Design:** Cylindrical belt expansion joint equipped on both sides with self-sealing rubber bulges, affixed to the connecting metal parts using clamps. Optionally available with ready installation seam for continuous vulcanisation at the job site
- Belt length:** According to customer specification
- Media:** Water, steam, air
- Media temperature:** EPDM (sulfur-cured): up to 100 °C, with peaks of 120 °C for a maximum of 24 hours
EPDM (peroxide-cured): up to 120 °C, with peaks of 140 °C for a maximum of 24 hours
- Pressure:** +/- 1 bar pressure / vacuum
- Movement:** Axial compression = max. 30 mm
Axial extension = 3 mm
Lateral displacement = max. 16 mm

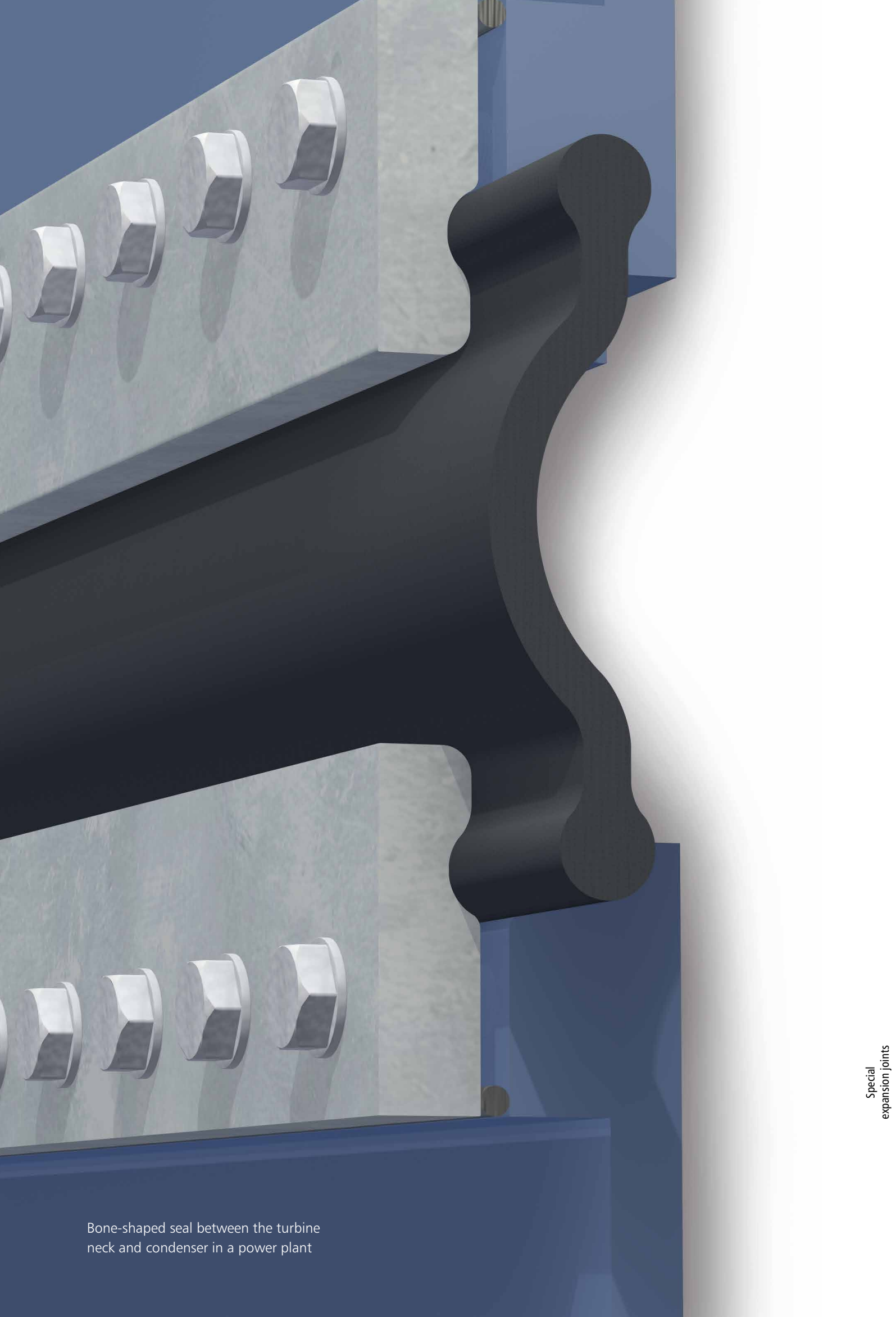
Application:
Knuckle-shaped seal
between the turbine
neck and condenser
in a power plant



Assembly instruction download
www.ditec-adam.de/en/downloads.html

Planning help





Bone-shaped seal between the turbine neck and condenser in a power plant

Disc bellows

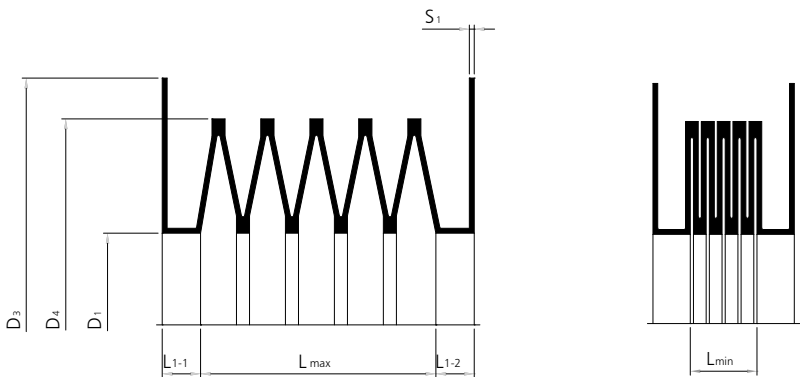


Disc bellows with customised number and depth of folds

Design:	Round disc bellows made of rubber with customised number and depth of folds
Nominal diameters:	NB 100 to NB 4000
Installation length:	Depending on L_{min} = folds completely flattened onto block and L_{max} = maximum length
Pressure:	Pressureless
Axial movement:	Depth of fold $Ft = (D4-D1)/2$ Number of folds $Fz = L_{max}/Ft$ $L_{min} = Fz \times S_1 \times 2$ $L_{max} = L_{min} + \text{stroke}$

Application:
Protective covers for hydraulic and pneumatic rods, threaded spindles, and processing machines. Machine components are reliably protected against dust, dirt, sawdust and metal filings, or liquids.

Planning help



Rubber bellows

Rubber	Fabric	Marking	Max.	Application
EPDM	Nylon		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDM	Kevlar		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMht	Kevlar		120 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMtw	Nylon		100 °C	Drinking water
EPDMtw	Kevlar		100 °C	Drinking water
EPDMaf	Nylon		100 °C	Abrasive materials, water-sand extraction
EPDMaf	Kevlar		100 °C	Abrasive materials, water-sand extraction
EPDMbeige	Nylon		100 °C	Foodstuffs
EPDMbeige	Kevlar		100 °C	Foodstuffs
IIR	Nylon		100 °C	Hot water, acids, bases, gases
IIR	Kevlar		100 °C	Hot water, acids, bases, gases
CSM	Nylon		100 °C	Strong acids, bases, chemicals
CSM	Kevlar		100 °C	Strong acids, bases, chemicals
NBR	Nylon		100 °C	Oils, petrol, solvents, compressed air
NBR	Kevlar		100 °C	Oils, petrol, solvents, compressed air
NBRbeige	Nylon		100 °C	Oil, fatty foods
NBRbeige	Kevlar		100 °C	Oil, fatty foods
CR	Nylon		90 °C	Cooling water, slightly oily water, seawater
CR	Kevlar		90 °C	Cooling water, slightly oily water, seawater
FPM	Kevlar		180 °C	Corrosive chemicals, petroleum distillates
FPMbeige	Kevlar		180 °C	Oil, fatty foods
NR	Nylon		70 °C	Abrasive materials
Silicon	Kevlar or glass		200 °C	Air, saltwater atmosphere, foodstuffs, medical technology

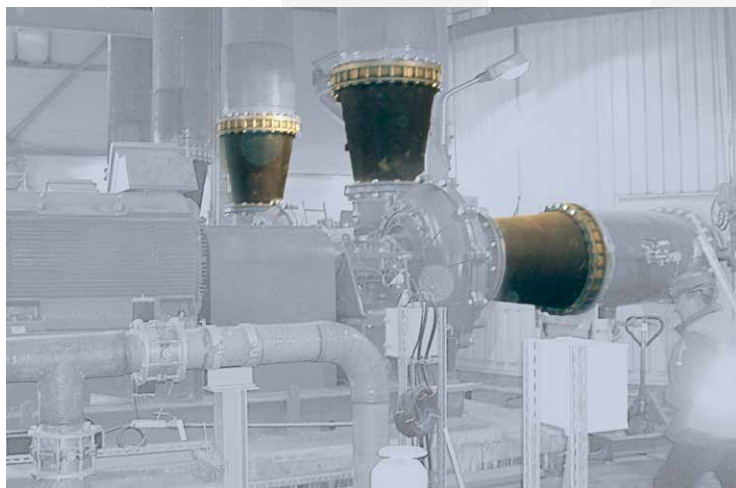
Fixing types

	Fixing variant 1	Fixing variant 2		Fixing variant 1	Fixing variant 2
	Sleeve	Sleeve		Spacer flange	Flange
	Sleeve	Sleeve with different diameters		Spacer flange	Sleeve
	Flange	Flange		Spacer flange	Spacer flange with different diameters
	Flange	Sleeve		Spacer flange	Sleeve with different diameters
	Spacer flange	Spacer flange		Flange	Sleeve with different diameters

Hoses for material conveyance



Wear-proof hose with embedded support rings
for water and slag removal in a steel mill
NB 900, wall thickness 80 mm, length 3900 mm



Conical reducer rubber expansion joint on
suction and discharge pump nozzle
NB 900/600, 4 bar



Rubber bend in pressure test
NB 100, 40 bar

Expansion bellows



Wear-proof hose for water and sand conveyance on a dredger, at pressure test NB 580, 3 bar



Expansion bellows, oval, as actuating rod protection



Expansion bellows for hot air duct



Expansion bellows with embedded steel flanges and stay bolt for a radial-flow scrubber NB 780, -0.2 bar



Protective bellows with hook and loop fastener

Rubber elements



Wall sealing membrane
as splash guard



Diffuser for lime water injection



Wall seal



Inflation bellows



Expansion bellows



Ring gap seal with
hexagonal penetration

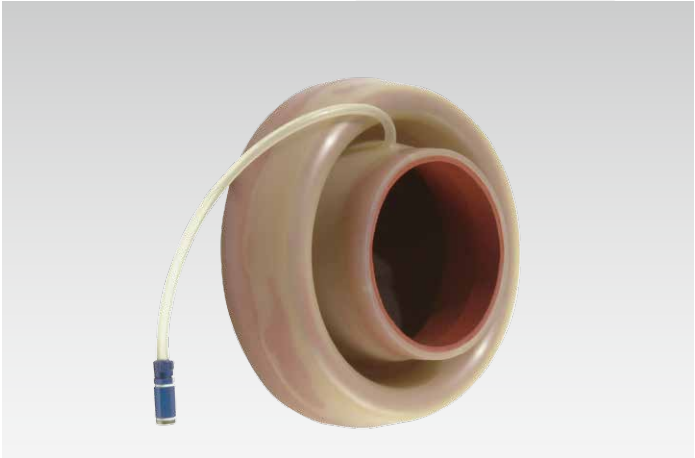


Silicon ring gap seal

2 ply safety rubber expansion joints



Expansion joints to reduce oscillation transfer in a transverse thruster of a ship
NB 2400, 2 bar



Double-walled expansion joint in a coal pulveriser with a connection for a leak sensor
NB 250 – NB 140

Expansion joints

with vulcanised steel parts and rubber coatings



Expansion bellows with clamp joint



Conical adapter with embedded flange and internal rubber coated flange tube



Appendix

Stiffness rates and resistance number ζ ▶ 254

Flange tables ▶ 256

Stiffness rates

U110A / D110 non-standard

Axial stiffness rates (average forces from full way)

NB	Stiffness rate for					
	0 bar N/mm	1 bar N/mm	2.5 bar N/mm	4 bar N/mm	6 bar N/mm	10 bar N/mm
100	32	50	64	113	161	235
125	35	58	71	121	175	267
150	38	65	77	129	189	298
175	42	72	84	136	202	329
200	45	79	90	144	216	360
250	51	88	107	166	246	405
300	56	98	118	180	269	454
350	73	129	153	239	350	599
400	40	70	83	131	190	322
450	48	85	102	152	235	389
500	55	99	118	171	265	457
550	62	109	127	195	296	501
600	68	119	136	218	326	544
650	69	120	142	223	332	551
700	70	121	147	228	338	557
750	72	126	151	232	346	583
800	73	129	153	239	350	599
850	84	149	178	270	408	685
900	95	169	202	300	466	770
950	116	207	247	361	561	950
1000	136	245	291	422	656	1129
1050	173	322	377	589	893	1497
1100	210	399	462	756	1130	1865
1150	225	429	500	816	1204	2001
1200	240	458	538	876	1277	2136
1250	242	460	537	883	1287	2151
1300	243	461	535	889	1297	2165
1350	244	462	534	896	1307	2179
1400	245	463	532	902	1316	2193
1450	250	478	560	923	1360	2244
1500	255	492	587	944	1403	2295
1600	310	597	685	1138	1668	2821
1650	350	630	752	1303	1905	3195
1700	390	662	818	1468	2142	3569
1800	480	926	1051	1819	2616	4416
1900	550	1064	1216	2050	3021	5049
1950	620	1202	1381	2281	3426	5682
2000	690	1339	1546	2512	3830	6314
2100	835	1607	1879	2998	4676	7690
2200	910	1747	2029	3367	4969	8099
2250	957	1830	2141	3516	5210	8550
2300	1004	1913	2252	3664	5451	9000
2400	1050	1995	2363	3812	5691	9450
2500	1143	2170	2573	4146	6194	10279
2550	1189	2257	2678	4313	6445	10693
2600	1235	2345	2783	4481	6697	11107
2700	1328	2519	2992	4815	7200	11936
2800	1420	2694	3202	5149	7703	12765
2850	1466	2781	3307	5316	7954	13179
2900	1513	2869	3412	5483	8205	13593
3000	1605	3044	3622	5818	8708	14422
3100	1698	3218	3831	6152	9211	15250
3150	1744	3306	3936	6319	9463	15665
3200	1790	3393	4041	6486	9714	16079
3300	1883	3568	4251	6820	10217	16908
3400	1975	3743	4461	7155	10720	17736
3450	2021	3830	4565	7322	10971	18151
3500	2068	3917	4670	7489	11223	18565
3600	2160	4092	4880	7823	11726	19394
4000	2530	4791	5719	9160	13737	22708

Lateral stiffness rates (average forces from full way)

NB	Stiffness rate for					
	0 bar N/mm	1 bar N/mm	2.5 bar N/mm	4 bar N/mm	6 bar N/mm	10 bar N/mm
100	100	147	165	196	250	302
125	125	193	216	254	323	381
150	150	239	266	312	395	459
175	175	284	316	370	468	538
200	200	330	366	428	540	616
250	220	370	407	475	605	686
300	250	425	470	545	695	783
350	280	482	529	610	781	882
400	180	315	347	400	513	576
450	190	338	371	420	536	604
500	200	330	366	428	540	616
550	218	359	398	466	588	670
600	235	388	430	503	635	724
650	273	455	502	587	744	846
700	310	521	574	670	853	967
750	310	527	583	676	862	970
800	340	585	643	741	949	1071
850	350	613	673	769	982	1108
900	360	641	702	796	1015	1145
950	370	657	726	876	1049	1181
1000	380	673	749	956	1083	1216
1050	388	643	716	929	1075	1217
1100	395	612	683	901	1067	1217
1150	418	668	733	963	1132	1304
1200	440	724	783	1025	1197	1390
1250	450	734	807	1052	1231	1424
1300	460	744	831	1079	1264	1458
1350	470	754	855	1106	1297	1492
1400	480	763	878	1133	1330	1526
1450	505	824	940	1197	1405	1617
1500	530	885	1002	1261	1479	1707
1600	645	1109	1238	1548	1819	2090
1650	678	1207	1308	1636	1969	2223
1700	710	1304	1378	1723	2118	2355
1800	775	1418	1519	1899	2217	2519
1900	813	1506	1618	2008	2332	2652
1950	852	1594	1717	2117	2448	2786
2000	890	1682	1816	2225	2563	2919
2100	886	1692	1852	2304	2596	2835
2200	1050	2016	2226	2940	3150	3465
2250	1153	2223	2527	3275	3528	3820
2300	1257	2431	2828	3610	3906	4175
2400	1360	2638	3128	3944	4284	4529
2500	1449	2829	3364	4244	4592	4834
2550	1494	2925	3482	4393	4746	4986
2600	1539	3020	3601	4543	4900	5139
2700	1628	3211	3837	4843	5208	5444
2800	1718	3403	4073	5142	5517	5749
2850	1762	3498	4191	5292	5671	5901
2900	1807	3594	4309	5442	5825	6053
3000	1896	3785	4546	5741	6133	6358
3100	1986	3976	4782	6041	6441	6663
3150	2030	4071	4900	6190	6595	6816
3200	2075	4167	5018	6340	6749	6968
3300	2164	4358	5254	6640	7057	7273
3400	2254	4549	5491	6939	7365	7578
3450	2298	4645	5609	7089	7519	7730
3500	2343	4740	5727	7239	7673	7883
3600	2433	4932	5963	7538	7982	8188
4000	2790	5696	6908	8736	9214	9407

Stiffness rates

D110A standard

Axial stiffness rates (average forces from full way)

NB	Stiffness rate for					
	0 bar N/mm	1 bar N/mm	2.5 bar N/mm	4 bar N/mm	6 bar N/mm	10 bar N/mm
50	25	42	51	98	134	173
65	24	43	53	100	150	190
80	28	48	58	104	148	185
100	35	59	71	116	206	274
125	36	59	71	137	214	282
150	49	84	102	189	293	390
200	100	153	180	365	568	735
250	105	173	207	388	609	778
300	123	206	248	448	658	883
350	105	153	177	349	567	753
400	154	225	261	516	535	1090
450	167	269	320	581	903	1162
500	196	316	376	686	1060	1364
600	208	264	292	692	1123	1441
700	140	179	198	521	714	954
800	180	240	270	594	975	1258
900	200	320	380	690	1080	1395
1000	225	355	420	742	1248	1568

Lateral stiffness rates (average forces from full way)

NB	Stiffness rate for					
	0 bar N/mm	1 bar N/mm	2.5 bar N/mm	4 bar N/mm	6 bar N/mm	10 bar N/mm
50	50	60	65	80	105	145
65	40	65	78	115	150	165
80	35	59	74	136	155	173
100	55	74	88	143	168	192
125	100	162	200	261	293	383
150	120	206	260	309	366	466
200	323	555	723	836	949	1219
250	379	624	806	1022	1173	1479
300	392	647	837	1068	1216	1542
350	305	508	610	762	875	1098
400	338	541	642	817	946	1199
450	342	540	639	821	971	1200
500	426	687	818	1048	1204	1495
600	456	708	834	1062	1295	1586
700	516	798	939	1191	1449	1775
800	558	826	960	1055	1557	1758
900	800	1253	1480	1984	2248	2560
1000	960	1536	1824	2361	2736	2976

D210A standard

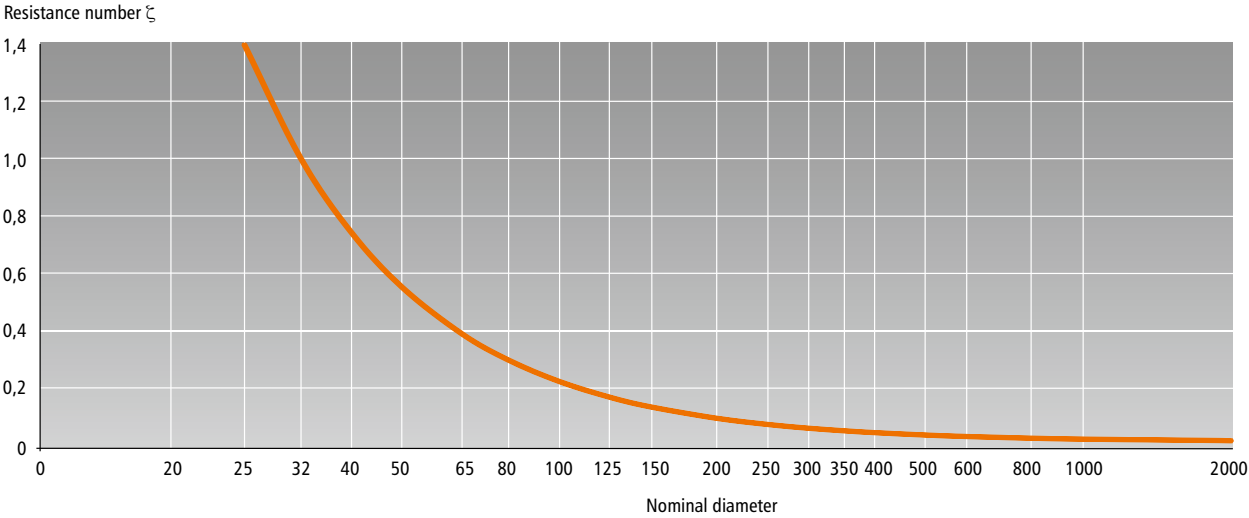
Axial stiffness rates (average forces from full way)

NB	Stiffness rate for					
	0 bar N/mm	1 bar N/mm	2.5 bar N/mm	3 bar N/mm	6 bar N/mm	10 bar N/mm
32	14	30	56	62	116	180
40	14	30	56	62	116	180
50	12	30	66	76	142	220
65	14	45	87	99	189	286
80	33	75	135	150	258	396
100	28	80	156	176	320	480
125	30	95	186	218	374	580
150	8	68	144	248	320	528
200	42	90	178	204	370	594
250	20	112	224	256	480	768
300	22	108	236	277	520	854
350	28	128	270	310	570	940
400	44	140	296	342	646	1052
500	46	172	354	416	792	1264

Lateral stiffness rates (average forces from full way)

NB	Stiffness rate for					
	0 bar N/mm	1 bar N/mm	2.5 bar N/mm	3 bar N/mm	6 bar N/mm	10 bar N/mm
32	11	17	27	30	45	63
40	11	17	27	30	45	63
50	17	35	47	54	79	107
65	21	37	61	61	96	136
80	32	56	92	94	144	204
100	38	77	112	123	180	243
125	45	88	133	150	225	315
150	48	80	116	123	188	265
200	103	155	221	238	343	473
250	126	208	179	308	442	603
300	167	267	337	400	550	750
350	137	263	385	418	587	833
400	187	293	423	457	633	900
500	203	380	536	573	840	1140

Guideline values for pressure loss



Flange tables

		PN 2.5				PN 6				PN 10				PN 16			
NB	NB "	D ₃	D ₂	N ₀₁	D ₀₁	D ₃	D ₂	N ₀₁	D ₀₁	D ₃	D ₂	N ₀₁	D ₀₁	D ₃	D ₂	N ₀₁	D ₀₁
100	4	210	170	4	18	210	170	4	18	220	180	8	18	220	180	8	18
125	5	240	200	8	18	240	200	8	18	250	210	8	18	250	210	8	18
150	6	265	225	8	18	265	225	8	18	285	240	8	22	285	240	8	22
175	7	295	255	8	18	295	255	8	18	315	270	8	22	315	270	8	22
200	8	320	280	8	18	320	280	8	18	340	295	8	22	340	295	12	22
250	10	375	335	12	18	375	335	12	18	395	350	12	22	405	355	12	26
300	12	440	395	12	22	440	395	12	22	445	400	12	22	460	410	12	26
350	14	490	445	12	22	490	445	12	22	505	460	16	22	520	470	16	26
400	16	540	495	16	22	540	495	16	22	565	515	16	26	580	525	16	30
450	18	595	550	16	22	595	550	16	22	615	565	20	26	640	585	20	30
500	20	645	600	20	22	645	600	20	22	670	620	20	26	715	650	20	33
550	22																
600	24	755	705	20	26	755	705	20	26	780	725	20	30	840	770	20	36
650	26																
700	28	860	810	24	26	860	810	24	26	895	840	24	30	910	840	24	36
750	30																
800	32	975	920	24	30	975	920	24	30	1015	950	24	33	1025	950	24	39
850	34																
900	36	1075	1020	24	30	1075	1020	24	30	1115	1050	28	33	1125	1050	28	39
950	38																
1000	40	1175	1120	28	30	1175	1120	28	30	1230	1160	28	36	1255	1170	28	42
1050	42																
1100	44					1290	1230	28	33	1345	1270	32	36	1370	1280	28	48
1150	46																
1200	48	1375	1320	32	30	1405	1340	32	33	1455	1380	32	39	1485	1390	32	48
1250	50																
1300	52					1520	1450	32	36	1565	1485	32	42	1585	1490	36	48
1350	54																
1400	56	1575	1520	36	30	1630	1560	36	36	1675	1590	36	42	1685	1590	36	48
1450	58																
1500	60					1730	1660	36	36	1795	1705	36	48	1810	1705	36	56
1600		1790	1730	40	30	1830	1760	40	36	1915	1820	40	48	1930	1820	40	56
1650	66																
1700						1940	1865	40	39	2015	1920	44	48	2030	1920	44	56
1800	72	1990	1930	44	30	2045	1970	44	39	2115	2020	44	48	2130	2020	44	56
1900						2155	2075	44	42	2220	2125	48	48	2240	2125	44	62
1950	78																
2000		2190	2130	48	30	2265	2180	48	42	2325	2230	48	48	2345	2230	48	62
2100	84					2375	2285	48	42	2440	2335	48	56				
2200		2405	2340	52	33	2475	2390	52	42	2550	2440	52	56	2555	2440	52	62
2250	90																
2300																	
2400	96	2605	2540	56	33	2685	2600	56	42	2760	2650	56	56	2765	2650	56	62
2500						2795	2705	56	48	2860	2750	56	56	2865	2750	60	62
2550	102																
2600		2805	2740	60	33	2905	2810	60	48	2960	2850	60	56	2965	2850	60	62
2700	108																
2800		3030	2960	64	36	3115	3020	64	48	3180	3070	64	56				
2850	114																
2900																	
3000	120	3230	3160	68	36	3315	3220	68	48	3405	3290	68	62				
3100																	
3150	126																
3200		3430	3360	72	36	3525	3430	72	48								
3300	132																
3400		3630	3560	76	36	3735	3640	76	48								
3450	138																
3600	144	3840	3770	80	36	3970	3860	80	56								
3800		4045	3970	80	39												
4000		4245	4170	84	39												

D₃ Flange external dimension
D₂ Hole circle
N₀₁ Hole quantity
D₀₁ Hole diameter

Flange tables

		PN 25				AWWA C207 Class D				ASME B 16.47 Series A 150 lbs				ASME B 16.47 Series B 150 lbs			
NB	NB "	D ₃	D ₂	N ₀₁	D ₀₁	D ₃	D ₂	N ₀₁	D ₀₁	D ₃	D ₂	N ₀₁	D ₀₁	D ₃	D ₂	N ₀₁	D ₀₁
100	4	235	190	8	22	228.6	190.5	8	19.0								
125	5	270	220	8	26	235.0	215.9	8	22.2								
150	6	300	250	8	26	279.4	241.3	8	22.2								
175	7	330	280	12	26												
200	8	360	310	12	26	342.9	298.4	8	22.2								
250	10	425	370	12	30	406.4	361.9	12	25.4								
300	12	485	430	16	30	482.6	431.8	12	25.4	482.6	431.8	12	25.4				
350	14	555	490	16	33	533.4	476.2	12	28.6	533.4	476.3	12	28.6				
400	16	620	550	16	36	596.9	539.7	16	28.6	596.9	539.8	16	28.6				
450	18					635.0	577.8	16	31.8	635.0	577.9	16	31.8				
500	20	730	660	20	33	698.5	635.0	20	31.8	698.5	635.0	20	31.8				
550	22					749.3	692.2	20	34.9	749.3	692.2	20	34.9				
600	24	845	770	20	39	812.8	749.3	20	34.9	812.8	749.3	20	34.9				
650	26					870.0	806.4	24	34.9	870.0	806.4	24	34.9	785.9	744.5	36	22.4
700	28	960	875	24	42	927.1	863.6	28	34.9	927.1	863.6	28	34.9	836.7	795.3	40	22.4
750	30					984.3	914.4	28	34.9	984.3	914.4	28	34.9	887.5	846.1	44	22.4
800	32	1085	990	24	48	1060.5	977.9	28	41.3	1060.5	977.9	28	41.3	941.3	900.2	48	22.4
850	34					1111.3	1028.7	32	41.3	1111.3	1028.7	32	41.3	1004.8	957.3	40	25.4
900	36	1185	1090	28	48	1168.4	1085.8	32	41.3	1168.4	1085.9	32	41.3	1057.1	1009.7	44	25.4
950	38					1238.3	1149.4	32	41.3	1238.3	1149.4	32	41.3	1124.0	1069.8	40	28.4
1000	40	1320	1210	28	56	1289.1	1200.2	36	41.3	1289.1	1200.2	36	41.3	1174.8	1120.6	44	28.4
1050	42					1346.2	1257.3	36	41.3	1346.2	1257.3	36	41.3	1225.6	1171.4	48	28.4
1100	44					1403.4	1314.5	40	41.3	1403.4	1314.5	40	41.3	1276.4	1222.2	52	28.4
1150	46					1454.2	1365.3	40	41.3	1454.2	1365.3	40	41.3	1341.4	1284.2	40	31.8
1200	48					1511.3	1422.4	44	41.3	1511.3	1422.4	44	41.3	1392.2	1335.0	44	31.8
1250	50					1568.5	1479.6	44	47.6	1568.5	1479.6	44	47.6	1435.4	1385.8	48	31.8
1300	52					1625.6	1536.7	44	47.6	1625.6	1536.7	44	47.6	1493.8	1436.6	52	31.8
1350	54					1682.7	1593.8	44	47.6	1682.7	1593.8	44	47.6	1549.4	1492.3	56	31.8
1400	56					1746.3	1651.0	48	47.6	1746.3	1651.0	48	47.6	1600.2	1543.1	60	31.8
1450	58					1803.4	1708.2	48	47.6	1803.4	1708.2	48	47.6	1674.9	1611.4	48	35.1
1500	60					1854.2	1758.9	52	47.6	1854.2	1759.0	52	47.6	1725.7	1662.2	52	35.1
1600																	
1650	66					2032.0	1930.4	52	47.6								
1700																	
1800	72					2197.1	2095.5	60	47.6								
1900																	
1950	78					2362.2	2260.6	64	54.0								
2000																	
2100	84					2533.7	2425.7	64	54.0								
2200																	
2250	90					2705.1	2590.8	68	61.9								
2300																	
2400	96					2876.5	2755.9	68	61.9								
2500																	
2550	102					3048.0	2908.3	72	68.3								
2600																	
2700	108					3219.5	3067.1	72	68.3								
2800																	
2850	114					3390.9	3219.5	76	74.6								
2900																	
3000	120					3562.4	3371.9	76	74.6								
3100																	
3150	126					3734	3537	80	81								
3200																	
3300	132					3905	3702	80	81								
3400																	
3450	138					4077	3861	84	87								
3600	144					4248	4020	84	87								
3800																	
4000																	

D₃ Flange external dimension
D₂ Hole circle
N₀₁ Hole quantity
D₀₁ Hole diameter

Flange tables

		ASME B 16.5 - 150 lbs				API Standard 605 - 150 lbs				MSS SP-44				BS Table E			
NB	NB "	D ₃	D ₂	N ₀₁	D ₀₁	D ₃	D ₂	N ₀₁	D ₀₁	D ₃	D ₂	N ₀₁	D ₀₁	D ₃	D ₂	N ₀₁	D ₀₁
100	4	228.6	190.5	8	19.0									215.9	177.8	8	19.0
125	5	235.0	215.9	8	22.2									254.0	209.5	8	19.0
150	6	279.4	241.3	8	22.2									279.4	234.9	8	22.2
175	7	311.2	269.9	8	22.2									304.8	260.3	8	22.2
200	8	342.9	298.4	8	22.2									336.5	292.1	8	22.2
250	10	406.4	361.9	12	25.4									406.4	355.6	12	22.2
300	12	482.6	431.8	12	25.4									457.2	406.4	12	25.4
350	14	533.4	476.2	12	28.6									527.0	469.9	12	25.4
400	16	596.9	539.7	16	28.6									577.8	520.7	12	25.4
450	18	635.0	577.8	16	31.8									641.3	584.2	16	25.4
500	20	698.5	635.0	20	31.8									704.8	641.3	16	25.4
550	22	749.3	692.2	20	34.9												
600	24	812.8	749.3	20	34.9									825.5	755.7	16	25.4
650	26					785.8	744.5	36	22.2	870.0	806.4	24	34.9	870.0	806.4	24	34.9
700	28					836.6	795.3	40	22.2	927.1	863.6	28	34.9	927.1	863.6	28	34.9
750	30					887.4	846.1	44	22.2	984.3	914.4	28	34.9	984.3	914.4	28	34.9
800	32					941.4	900.1	48	22.2	1060.5	977.9	28	41.3	1060.5	977.9	28	41.3
850	34					1004.9	957.3	40	25.4	1111.3	1028.7	32	41.3	1111.3	1028.7	32	41.3
900	36					1057.3	1009.6	44	25.4	1168.4	1085.8	32	41.3	1168.4	1085.8	32	41.3
950	38									1238.3	1149.4	32	41.3	1238.3	1149.4	32	41.3
1000	40									1289.1	1200.2	36	41.3	1289.1	1200.2	36	41.3
1050	42					1225.5	1171.6	48	28.6	1346.2	1257.3	36	41.3	1346.2	1257.3	36	41.3
1100	44									1403.4	1314.5	40	41.3	1403.4	1314.5	40	41.3
1150	46									1454.2	1365.3	40	41.3	1454.2	1365.3	40	41.3
1200	48					1392.2	1335.1	44	31.7	1511.3	1422.4	44	41.3	1511.3	1422.4	44	41.3
1250	50									1568.5	1479.6	44	47.6				
1300	52									1625.6	1536.7	44	47.6				
1350	54					1549.4	1492.3	56	31.7	1682.7	1593.8	44	47.6				
1400	56									1746.3	1651.0	48	47.6				
1450	58									1803.4	1708.2	48	47.6				
1500	60					1725.6	1662.1	52	34.9	1854.2	1758.9	52	47.6				
1600																	
1650	66																
1700																	
1800	72																
1900																	
1950	78																
2000																	
2100	84																
2200																	
2250	90																
2300																	
2400	96																
2500																	
2550	102																
2600																	
2700	108																
2800																	
2850	114																
2900																	
3000	120																
3100																	
3150	126																
3200																	
3300	132																
3400																	
3450	138																
3600	144																
3800																	
4000																	

- D₃ Flange external dimension
- D₂ Hole circle
- N₀₁ Hole quantity
- D₀₁ Hole diameter

Flange tables

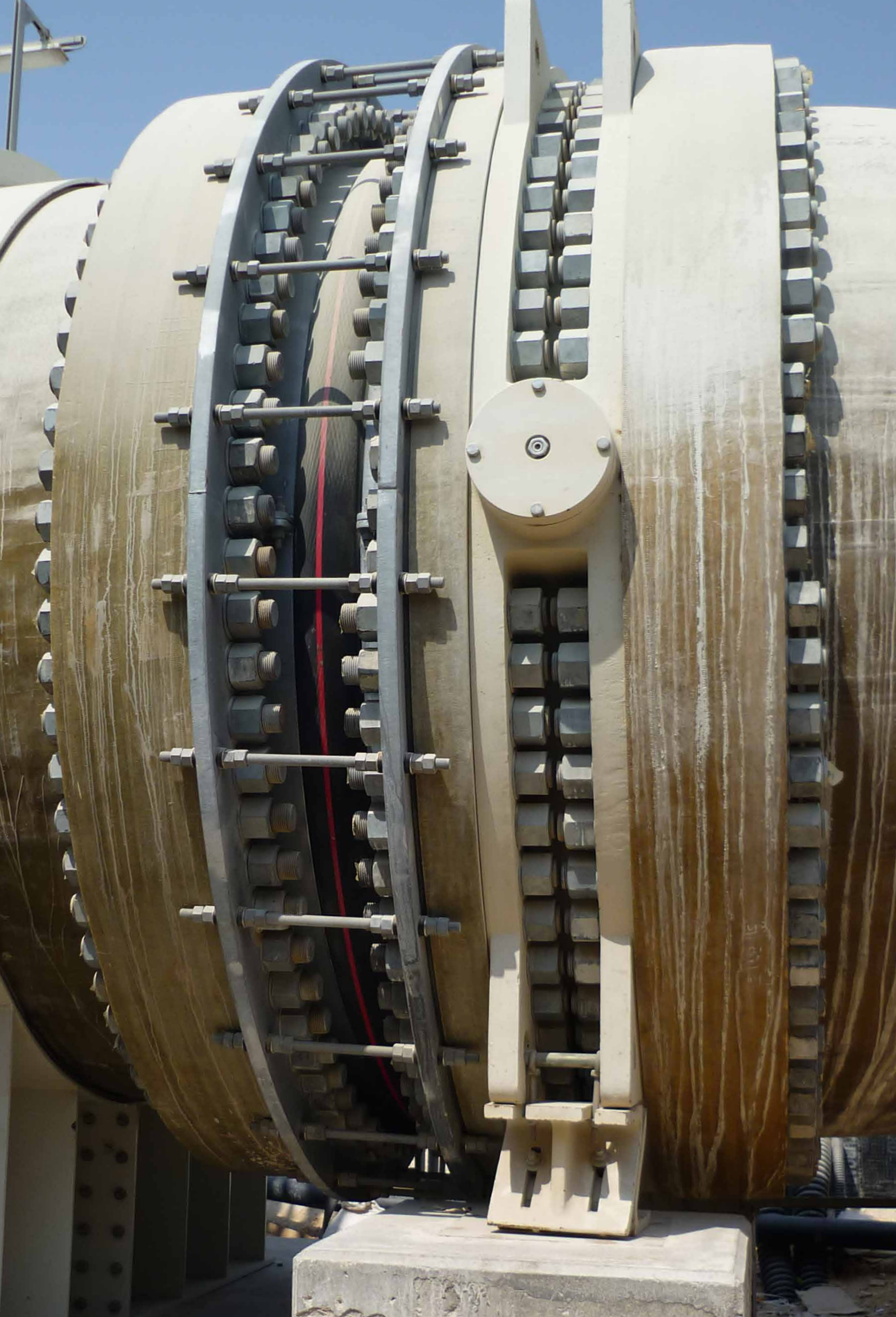
		JIS B2220 5K				JIS B2220 10K				JIS B2220 16K			
NB	NB "	D ₃	D ₂	N ₀₁	D ₀₁	D ₃	D ₂	N ₀₁	D ₀₁	D ₃	D ₂	N ₀₁	D ₀₁
100	4	200.0	165.0	8	19.0	210.0	175.0	8	19.0	225.0	185.0	8	23.0
125	5	235.0	200.0	8	19.0	250.0	210.0	8	23.0	270.0	225.0	8	25.0
150	6	265.0	230.0	8	19.0	280.0	240.0	8	23.0	305.0	260.0	12	25.0
175	7	300.0	260.0	8	23.0	305.0	265.0	12	23.0				
200	8	320.0	280.0	8	23.0	330.0	290.0	12	23.0	350.0	305.0	12	25.0
250	10	385.0	345.0	12	23.0	400.0	355.0	12	25.0	430.0	380.0	12	27.0
300	12	430.0	390.0	12	23.0	445.0	400.0	16	25.0	480.0	430.0	16	27.0
350	14	480.0	435.0	12	25.0	490.0	445.0	16	25.0	540.0	480.0	16	33.0
400	16	540.0	495.0	16	25.0	560.0	510.0	16	27.0	605.0	540.0	16	33.0
450	18	605.0	555.0	16	25.0	620.0	565.0	20	27.0	675.0	605.0	20	33.0
500	20	655.0	605.0	20	25.0	675.0	620.0	20	27.0	730.0	660.0	20	33.0
550	22	720.0	665.0	20	27.0	745.0	680.0	20	33.0	795.0	720.0	20	39.0
600	24	770.0	715.0	20	27.0	795.0	730.0	24	33.0	845.0	770.0	24	39.0
650	26	825.0	770.0	24	27.0	845.0	780.0	24	33.0	895.0	820.0	24	39.0
700	28	875.0	820.0	24	27.0	905.0	840.0	24	33.0	960.0	875.0	24	42.0
750	30	945.0	880.0	24	33.0	970.0	900.0	24	33.0	1020.0	935.0	24	42.0
800	32	995.0	930.0	24	33.0	1020.0	950.0	28	33.0	1085.0	990.0	24	48.0
850	34	1045.0	980.0	24	33.0	1070.0	1000.0	28	33.0	1135.0	1040.0	24	48.0
900	36	1095.0	1030.0	24	33.0	1120.0	1050.0	28	33.0	1185.0	1090.0	28	48.0
950	38												
1000	40	1195.0	1130.0	28	33.0	1235.0	1160.0	28	39.0	1320.0	1210.0	28	56.0
1050	42												
1100	44	1305.0	1240.0	28	33.0	1345.0	1270.0	28	39.0	1420.0	1310.0	32	56.0
1150	46												
1200	48	1420.0	1350.0	32	33.0	1465.0	1380.0	32	39.0	1530.0	1420.0	32	56.0
1250	50												
1300	52									1645.0	1530.0	32	62.0
1350	54	1575.0	1505.0	32	33.0	1630.0	1540.0	36	45.0	1700.0	1590.0	32	62.0
1400	56									1755.0	1640.0	36	62.0
1450	58												
1500	60	1730.0	1660.0	36	33.0	1795.0	1700.0	40	45.0	1865.0	1750.0	36	62.0
1600													
1650	66												
1700													
1800	72												
1900													
1950	78												
2000													
2100	84												
2200													
2250	90												
2300													
2400	96												
2500													
2550	102												
2600													
2700	108												
2800													
2850	114												
2900													
3000	120												
3100													
3150	126												
3200													
3300	132												
3400													
3450	138												
3600	144												
3800													
4000													

D₃Flange external dimension

D₂Hole circle

N₀₁Hole quantity

D₀₁Hole diameter





Lateral expansion joint
type U110M
in the cooling water system of a
coal-fired power plant.
NB 2600, 4 bar
▶ page 17



Lateral expansion joint
type U110R
on the pump pressure side of a lye pipe in a paper factory.
NB 125, 5 bar
▶ page 17



Lateral expansion joints
used as dismantling joints
in a valve pit
NB 2000, PN6
▶ page 17



Type U110A universal expansion joint
Cooling water intake basin
NB 3600
▶ page 45



Type U150A universal expansion joint
Cooling water intake basin
NB 3600
▶ page 45



Lateral expansion joints type U121E
for a marine supply line
NB 2000, +2 / -1 bar
▶ page 65



Universal expansion joint U110A
in a cooling tower
NB 3100, 4 bar, axial / lateral ± 40 mm
► page 75



Universal expansion joint, type U152A
with PTFE lining in a GRP pipe in a copper mill
NB 2000, -0.17 bar, earthquake movements all sides ± 150 mm
► page 79



Universal expansion joint, type U142A
with PTFE lining for a sulphuric acid reclamation plant
NB 2800, -0.15 bar, 80 °C
► page 79



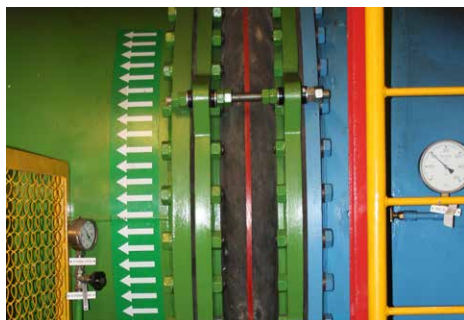
Lateral expansion joint, type U110M
in the cooling water system
of a coal-fired power plant
NB 2600, 4 bar
► page 83



Conical expansion joints, type U300A
on the suction and discharge side of a gypsum slurry pump
in a desulphurization unit of a power plant
► page 87



Construction of coal fired power plant in Turkey
ditec supply of rubber and fabric expansion joints
► page 87



Lateral expansion joint, type U111M
installation location: condenser outlet
NB 1800, operating pressure 3 bar
▶ page 93



Universal expansion joint, type D110A
on the suction side of quenching water pumps in a waste incineration plant
NB 150, 16 bar
▶ page 105



Universal expansion joint, type D110A
in a plastic pipe of a paper plant
NB 150, design pressure 6 bar
▶ page 120



Expansion joints with swivel flanges, type D110A
pumping header installation
NB 300, operating pressure 10 bar
▶ page 121



Pipe penetration seal and clamped EPDM rubber expansion joint
penetration seal made from silicone rubber with open seam
for afterwards closing on site
▶ page 127



Universal expansion joint, type B310
as a drum connection
NB 900 / NB 650, 0.1 bar
▶ page 149



Large bore lateral rubber expansion joint, type U110M
GRP pipe NB 3600 of a utility plant
work-shop hydraulic test at 13 bar
▶ page 155



Lateral expansion joint, type U110R
on the pump pressure side in a paper mill
NB 50, 10 bar
▶ page 187



Universal and lateral expansion joint
on a lye pump suction and discharge side
NB 125, 5 bar
▶ page 189



Lateral expansion joints, type U111M
for the power plant of an aluminium oxide mill
NB 1300 to NB 2700, +9/-1 bar
▶ page 197



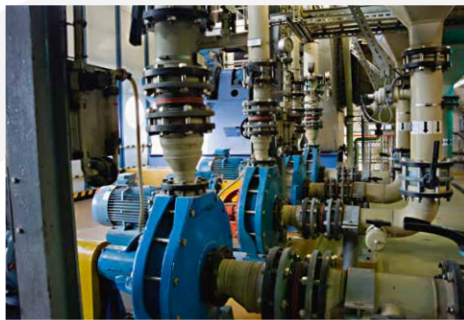
2-ply safety rubber expansion joint, type U110A
NB 2400, 3 bar,
in a jet bow thruster in a cruise liner
▶ page 263



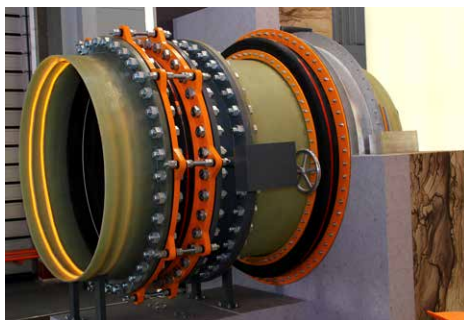
2-ply safety rubber expansion joint, type U110A
NB 2400, 3 bar,
in a jet bow thruster in a cruise liner
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Standard rubber expansion joint, D210A
▶ page 210



Typical pump station arrangement
with expansion joints to decouple pump vibrations from pipeline
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Exhibition model of size NB 1600
tied dismantling expansion joint in front of a butterfly valve
wall seal expansion joint for underground pipe penetration
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