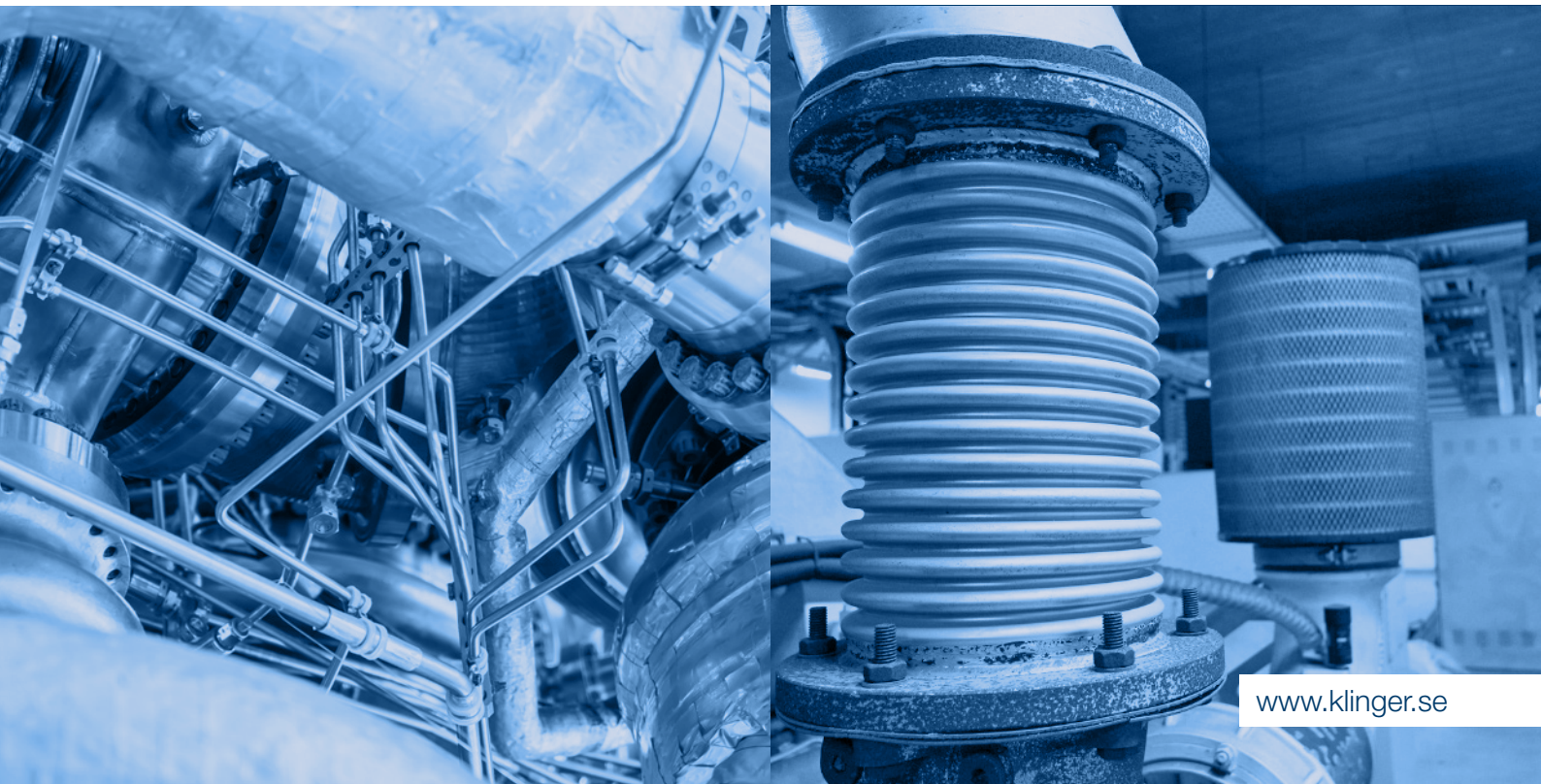




# EXPANSION JOINTS AND HOSES



# KLINGER GROUP

trusted.worldwide.

Formed in 1886 as family enterprise, the pioneers in gasket technology today presents themselves as a globally active Group. Independent global manufacturing, sales and service companies offer unique know-how and competent on-site consultancy services from a total of 60 countries worldwide.

Our customers comprise leading companies belonging to the manufacturing industry, infrastructure, automotive, marine, oil & gas, the chemical, pulp & paper, the energy sector, food & beverage, and the pharmaceutical industry. KLINGER employs around 2,800 people worldwide with a total annual sale of around 684 million Euros.

€ **684**  
million  
annual sales

684 million euros are generated by the KLINGER Group per year.



**2,800**  
EMPLOYEES

Our global workforce amounts to 2,800 persons worldwide.



**80**  
COUNTRIES

KLINGER Group has already exported to 80 countries and counting.



**18**  
PRODUCTION  
SITES



for seals, valves, instrumentation and expansion joints.



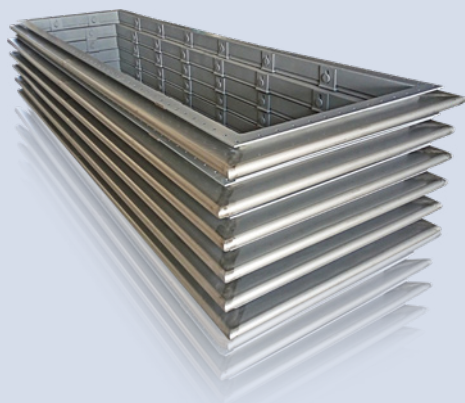
**60**  
COUNTRIES  
worldwide are home to a group subsidiary or representative.

# PRODUCT OVERVIEW

## Expansion Joints & Hoses

### METAL EXPANSION JOINTS

» 4-10



### FABRIC EXPANSION JOINTS

» 11-13



### RUBBER EXPANSION JOINTS

» 14-16



### PTFE EXPANSION JOINTS

» 17-19



### HOSES

» 20-23



### SEGMENT



# METAL EXPANSION JOINTS

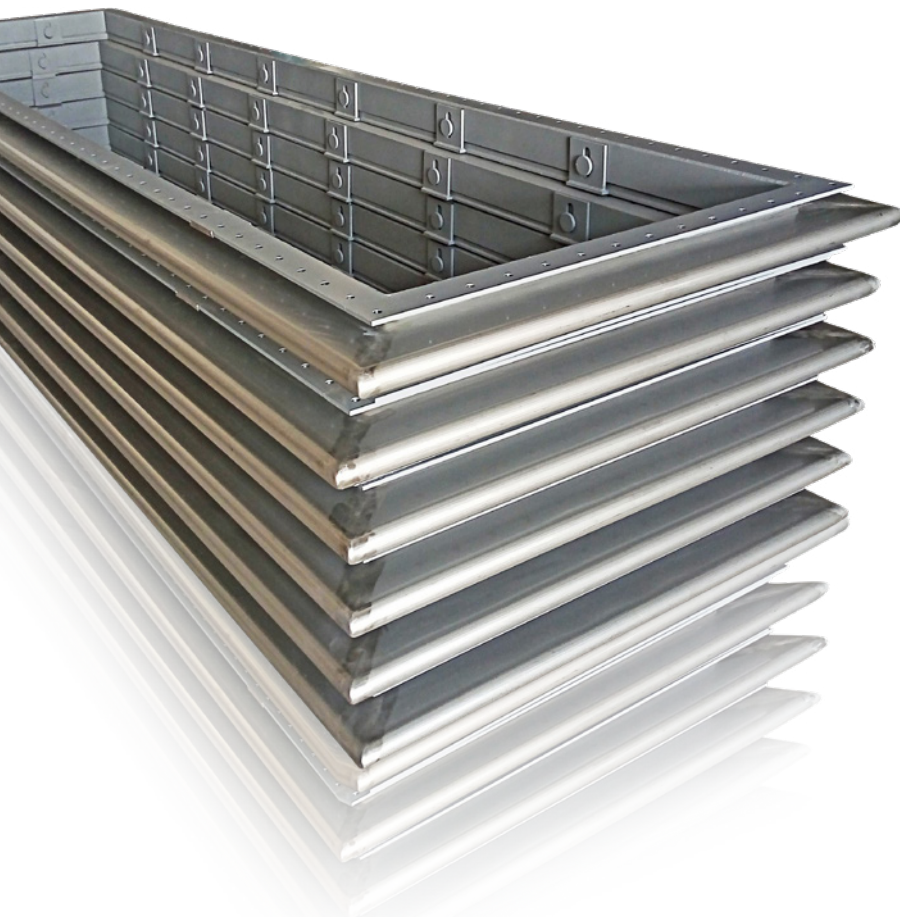
Specialized and Engineered Products

KLINGER Metal Expansion Joints are most common in either circular or rectangular shapes. The bellow elements are most common in stainless steel (SS) quality and for the Lens type, also available in carbon steel (CS) quality.

KLINGER Metal Expansion Joints are as standard within the range as below. Metal expansion joints are highly specialized & engineered products and are to be installed where thermal processes occurred, which creates stresses, vibrations, noise and movements in the piping systems.

Metal Expansion Joints are relevant for many industries i.e. chemical, Petrochem, power generations, food & beverage, PtX, marine & offshore, onshore and not least also HVAC and automotive.

Our Metal Expansion Joints are designed and manufactured acc. to the latest norms & standards and the materials used are mainly harmonized.



## SPECIFICATIONS

### Type & Sizes

- » Circular DN 25 up to DN 5.000
- » Rectangular Customized sizes
- » Lens DN 200 up to DN 8.000

### Connections:

- » Flanges
- » Welding ends

### Bellow & connections material

- » AISI 304/321/316/316L/ Nickel Alloys and more
- » AISI 304/321/316/316L/P265/P355 and more (lens)

### Flange norms & standards

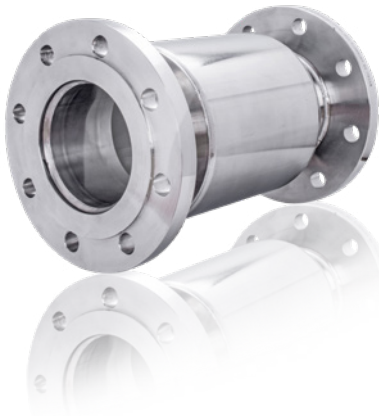
- » EN 1092 / ASME / JIS
- » Customized

### Design parameters

- » Up to 16 barG (circular & lens)
- » Up to 0,5 barG (rectangular)
- » Up to 400°C



## EXTERNALLY PRESSURISED DB TYPE



### BENEFITS / PROPERTIES

Externally pressurized expansion joints provide an excellent solution for systems requiring large axial movements. By using external pressurization, they effectively prevent "column-squirm" (buckling caused by instability from internal pressure). These joints are highly robust and feature an integrated inner sleeve for smooth flow and reduced pressure loss, along with an outer cover that protects the bellows from damage during shipping, installation, and operation.

The outer cover also makes them suitable for underground installations. While not designed for lateral movements, they can be supplied with welded ends or flange connections, adhering to various industrial standards.

Advantages over U-loops:

- » Minimized pressure losses
- » Reduced cost and space requirements
- » Easier and faster handling, installation, and maintenance

### SPECIFICATIONS

- » Size: DN 25 -1000
- » Design pressure: Up to 40 barG
- » Design temp.: Up to 400°C
- » Bellows material: AISI 304, 316, 321
- » Flanged material: Carbon steel, Stainless steel
- » Standard: EN / ASME
- » Accessories: Limit rods
- » Fluid / Applications: Gas / Liquid

These type of expansion joints can be supplied with limit rod.

### INDUSTRY APPLICATIONS / PROCESS

- » Hot & Cold Water
- » Superheated water
- » Steam and condensate lines
- » City district heating
- » HVAC applications
- » Chemical and process industries
- » Geothermal applications and many more...
- » Pulp & paper industry (applications)



## KB TYPE



### BENEFITS / PROPERTIES

Welded end expansion joints are available in various grades of carbon steel, stainless steel, or nickel alloy pipes. These can be manufactured according to industry standards or customized to your specifications. KLINGER offers a wide range of custom design capabilities.

Commonly used across industries, these joints can be designed as single or universal types, depending on design requirements. They are ideal for high pressure environments where welding is feasible, and leakage is a concern. Compared to flanged types, they are more economical due to the absence of costly flanges and gaskets, and they require no maintenance.

Advantages:

- » More economical than flanged joints
- » No gaskets required
- » Welded connections eliminate leakage

### SPECIFICATIONS

- » Size: DN 25 -1000 (for other sizes - check with us)
- » Design pressure: Up to 16 barG

- » Design temp.: Up to 400°C
- » Bellows material: AISI 304, 316, 321 or nickel alloys
- » Connections: Fixed flanges
- » Standard: EN / ASME
- » Accessories: Tierods / limit rods
- » Fluid / Applications: Gas / Liquid / Solids

These types of expansion joints can be supplied with limit rods, liners, covers, rods, hinges or gimbals.

### INDUSTRY APPLICATIONS / PROCESS

- » Hot & Cold Water
- » Superheated water
- » Steam and condensate lines
- » City district heating
- » HVAC applications
- » Chemical and process industries
- » Geothermal applications and many more...



## SF TYPE (Fixed flanged)



### BENEFITS / PROPERTIES

Fixed flanged expansion joints feature welded flange connections that meet various industrial standards (ASME, EN, DIN, JIS, etc.) or customized. The flanges, welded to bellows, are non-rotating. These joints are ideal for higher pressure applications where sealing is critical. It's recommended to match the flange material to the piping grade. Care should be taken to avoid bolt misalignment during installation. No on-site welding is required. Commonly used across industries, they can be designed as single or universal types based on design needs.

### SPECIFICATIONS

- » Size: DN 25 -1000 (for other sizes - check with us)
- » Design pressure: Up to 16 barG
- » Design temp.: Up to 400°C
- » Bellows material: AISI 304, 316, 321 or nickel alloys
- » Flanged material: CS, SS, Customized
- » Quick connection
- » Connections: Fixed flanges

- » Standard: EN / ASME / Customized
- » Accessories: Tierods / limit rods
- » Fluid / Applications: Gas / Liquid / Solids

These types of expansion joints can be supplied with limit rod, liners, covers, rods, hinges or gimbals.

### INDUSTRY APPLICATIONS / PROCESS

- » Digester/steam generating process/Preheater / TMP 2-stage refining.
- » Biomass boiler / Condensate, Evaporator and Heat exchanger boilers
- » District heating
- » Steam lines
- » Chemical and process industries
- » Steel and iron industries
- » Water (hot and cold) lines
- » Marine applications, exhaust systems
- » Geothermal applications and many more...



## DF TYPE (Floating flanged)



### BENEFITS / PROPERTIES

Floating flanged expansion joints feature rotating (Vanstone) flanges that comply with various industrial standards (ASME, EN, DIN, JIS, etc.) or customized. The rotating flanges are protected against internal media and enable alignment of the bolts during installation. These joints are suitable for lower/mid-range pressure applications, especially when dealing with corrosive media. They allow for the use of lower grade steel, offering cost savings. No welding is required on site, but they are not recommended for very high pressure environments where leakage may be a concern. Commonly used in various industries, they can be designed as single or universal types.

#### Advantages:

- » Easy installation without centering
- » Easily replaceable
- » Flange material is protected by bellows

### SPECIFICATIONS

- » Size: DN 25 -1000 (for other sizes - check with us)
- » Design pressure: Up to 16 barG
- » Design temp.: Up to 400°C

- » Bellows material: AISI 304, 316, 321 or nickel alloys
- » Fanged material: CS, SS, Customized
- » Quick connection
- » Connections: Floating flanges
- » Standard: EN / ASME / Customized
- » Accessories: Tierods / limit rods
- » Fluid / Applications: Gas / Liquid / Solids

These types of expansion joints can be supplied with limit rods, liners, covers, rods, hinges or gimbals.

### INDUSTRY APPLICATIONS / PROCESS

- » Digester/steam generating process/Preheater / TMP 2-stage refining.
- » Biomass boiler / Condensate, Evaporator and Heat exchanger boilers
- » District heating
- » Steam lines
- » Chemical and process industries
- » Steel and iron industries
- » Water (hot and cold) lines
- » Marine applications, exhaust systems
- » Geothermal applications and many more...



## UNIVERSAL TYPE FLANGED LOW PRESSURE



### BENEFITS / PROPERTIES

Universal expansion joints are available with fixed or rotating (Vanstone) flanges, meeting various industrial standards (ASME, EN, DIN, JIS, etc.) or custom specifications. They are like single bellows flanged types but offer greater lateral movement absorption. The rotating flange protects against internal media and reduces bolt misalignment during installation. These joints are ideal for lower pressure applications and corrosive media, allowing for cost savings by using lower-grade steel. No on-site welding is required, but they are not recommended for high-pressure environments with potential leakage concerns. Commonly used across industries.

#### Advantages:

- » Easy installation without centering
- » Easily replaceable
- » Flange material protected by bellows

### SPECIFICATIONS

- » Size: DN 25 -1000 (for other sizes - check with us)
- » Design pressure: Up to 6 barG
- » Design temp.: Up to 400°C

- » Bellows material: AISI 304, 316, 321 or nickel alloys
- » Fanged material: CS, SS, Customized
- » Quick connection
- » Connections: Floating / fixed flanges
- » Standard: EN / ASME / Customized
- » Accessories: Tierods / limit rods
- » Fluid / Applications: Gas / Liquid / Solids

These types of expansion joints can be supplied with limit rods, liners, covers, rods, hinges or gimbals.

### INDUSTRY APPLICATIONS / PROCESS

- » Digester/steam generating process/Preheater / TMP 2-stage refining.
- » Biomass boiler / Condensate, Evaporator and Heat exchanger boilers
- » District heating
- » Steam lines
- » Chemical and process industries
- » Steel and iron industries
- » Water (hot and cold) lines
- » Marine applications, exhaust systems
- » Geothermal applications and many more...



## UNIVERSAL TYPE FLANGED HIGH PRESSURE



### BENEFITS / PROPERTIES

Universal expansion joints come with either fixed or rotating (Vanstone) flanges, adhering to various industrial standards (ASME, EN, DIN, JIS, etc.) or custom specifications. They are like single bellows flanged types but offer greater lateral movement absorption. The rotating flanges are protected from internal media, and bolt misalignment during installation is minimized. These joints are ideal for high pressure applications, especially in corrosive environments, offering cost savings by using lower grade steel. No on-site welding is required, and they are suitable where leakage is a concern. Commonly used across industries.

#### Advantages:

- » Easy installation without centering
- » Easily replaceable
- » Flange material protected by bellows

### SPECIFICATIONS

- » Size: DN 25 -1000 (for other sizes - check with us)
- » Design pressure: Up to 16 barG
- » Design temp.: Up to 400°C

- » Bellows material: AISI 304, 316, 321 or nickel alloys
- » Fanged material: CS, SS, Customized
- » Quick connection
- » Connections: Floating / fixed flanges
- » Standard: EN / ASME / Customized
- » Accessories: Tierods / limit rods
- » Fluid / Applications: Gas / Liquid / Solids

These types of expansion joints can be supplied with limit rods, liners, covers, rods, hinges or gimbals.

### INDUSTRY APPLICATIONS / PROCESS

- » Digester/steam generating process/Preheater / TMP 2-stage refining.
- » Biomass boiler / Condensate, Evaporator and Heat exchanger boilers
- » District heating
- » Steam lines
- » Chemical and process industries
- » Steel and iron industries
- » Water (hot and cold) lines
- » Marine applications, exhaust systems
- » Geothermal applications and many more...



## UNIVERSAL TYPE WELDED ENDS



### BENEFITS / PROPERTIES

Universal type of expansion joints come with welded ends connections in CS/SS and alloyed materials. The properties are like the "single bellows" flanged types, though with much higher movement absorption in the lateral direction.

They are mainly used for lower pressure applications. With weld ends type of connection, welding is easily to be done onto existing piping system.

This type of expansion joints is commonly used at many industries and applications safely. They can be designed as single or universal expansion joint depending on design conditions..

### SPECIFICATIONS

- » Size: DN 25 -1000 (for other sizes - check with us)
- » Design pressure: Up to 6 barG
- » Design temp.: Up to 400°C
- » Bellows material: AISI 304, 316, 321 or nickel alloys
- » Flanged material: CS, SS, Customized
- » Quick connection

- » Connections: Weld ends
- » Standard: EN / ASME / Customized
- » Accessories: Tierods / limit rods
- » Fluid / Applications: Gas / Liquid / Solids

These types of expansion joints can be supplied with limit rods, liners, covers, rods, hinges or gimbals.

### INDUSTRY APPLICATIONS / PROCESS

- » Digester/steam generating process/Preheater
- » / TMP 2-stage refining.
- » Biomass boiler / Condensate, Evaporator and Heat exchanger boilers
- » District heating
- » Steam lines
- » Chemical and process industries
- » Steel and iron industries
- » Water (hot and cold) lines
- » Marine applications, exhaust systems
- » Geothermal applications and many more...



## CENTRAL HEATING SYSTEM



### BENEFITS / PROPERTIES

This type of expansion joint is an excellent design for large displacements inside buildings. They have an outer cover for protection against external damage to bellows and for aesthetic looks. They also have an inner sleeve for a smooth medium flow internally.

Standard material of choice for bellows is 316/316L and balance of materials is carbon steel painted in white color. They are also available in complete stainless steel.

They come with threaded connections up to DN65 and socket weld connections larger than DN65. They can be axially pre-set for movements. Inner sleeve minimizes pressure loss and "whistling" due to flow. Installation is easy and quick. Typically, one unit is sufficient for a 30 meter high building (about 10 story high residential building).

- » Easily replaced

### SPECIFICATIONS

- » Size: DN 15 -100
- » Design pressure: Up to 16 barG
- » Design temp.: Up to 400°C
- » Bellows material: AISI 304, 316, 321
- » Balanced material: Carbon steel, Stainless steel
- » Connections: Threadings
- » Standard: N/A
- » Accessories: N/A
- » Fluid / Applications: Central / District Heating Systems

Design movement: +/- 25mm

### INDUSTRY APPLICATIONS / PROCESS

- » Building structures for HVAC



## DISTRICT HEATING SYSTEM



### BENEFITS / PROPERTIES

This type of expansion joint is an excellent design for displacements in the district heating system, both in the distribution systems but also in the chambers. They have an outer cover for protection against external damage to bellows and for aesthetic looks. They also have an inner sleeve for a smooth medium flow internally.

Standard material of choice for bellows is 316/316L and balance of materials is carbon steel painted in white color. They are also available in all stainless steel versions.

They can be axially preset for movements. Inner sleeve minimizes pressure loss.

### SPECIFICATIONS

- » Size: DN 150 -1000
- » Design pressure: Up to 16 barG
- » Design temp.: Up to 400°C
- » Bellows material: AISI 304, 316, 321
- » Balanced material: Carbon steel, Stainless steel
- » Connections: Weld ends/flanged
- » Standard: N/A
- » Accessories: N/A
- » Fluid / Applications: Central / District Heating System

Design movement: customized

### INDUSTRY APPLICATIONS / PROCESS

- » Central / District Heating Systems

# VIBRATION ABSORBERS



## BENEFITS / PROPERTIES

Metal expansion joints can also be used to absorb vibration in systems. They are manufactured from thin, multi-layer bellows for excellent vibration absorbing capabilities. Multi-layer bellows help to dampen high frequency and low amplitude vibrations. While vibration absorbers are mostly used with flanged connections, they can also be supplied with welded connections.

A very typical accessory with this type of expansion joint is a limit rod / tie-rod to restrain pressure thrust of bellows or limit excessive design movements. Metal expansion joints are an excellent choice for absorbing vibrations where temperatures or pressures are too high for rubber expansion joints. Rubber washers can reduce noise and vibrations.

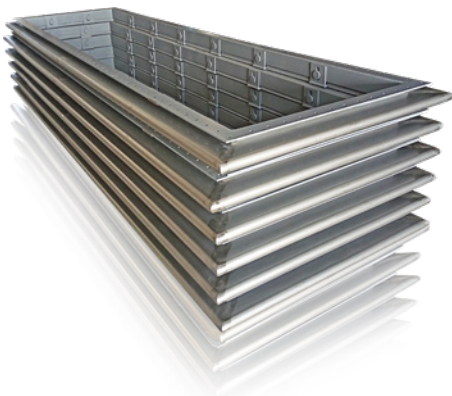
## SPECIFICATIONS

- » Size: DN50 - 500
- » Design pressure: Up to 16 barG
- » Design temp.: Up to 400°C
- » Bellows materials: AISI 304, 316L, 321
- » Flanged materials: Carbon steel, Stainless steel
- » Connections: Fixed flanges
- » Standard: EN / ASME / Customized
- » Accessories: Limit rods
- » Fluid / Applications: Vibrations

## INDUSTRY APPLICATIONS / PROCESS

- » Pumps for debarking/flume (generally after pumps)
- » Pumps (suction or discharge)
- » Rotating machinery and equipment
- » Engines
- » Exhaust applications
- » Shipbuilding industry and many more...

# RECTANGULAR



## BENEFITS / PROPERTIES

Rectangular expansion joints can be manufactured from various grades of carbon and stainless steels, nickel alloys custom designed for your needs.

They can also be supplied with inner sleeves to protect bellows against abrasion and enhance smooth flow. Limit rods also can be supplied to prevent excessive movements. These units can absorb movements in all directions (axial, lateral and angular).

The bellows can be designed and manufactured as U- and V-shapes and can be connected via various corner types (Single/Double/Camera V-shape corners or round corner U-shape) in accordance with required operating conditions. They are mostly used in ventilation systems, air ducts, HVAC applications, exhaust and fan systems. Typical industries include cement, power, gas turbines, chemical, steel and iron. The rectangular bellows are mostly designed for low pressure applications such as ducts, exhaust systems, ventilation systems etc.

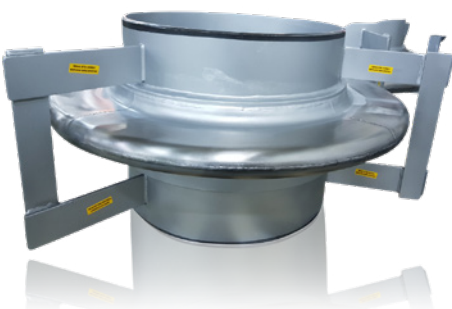
## SPECIFICATIONS

- » Size: Customized
- » Design pressure: Up to 1 barG
- » Design temp.: Up to 850°C
- » Bellow materials: CS, AISI 304, 316L, 321, Nickel Alloys
- » Hardware materials: CS, AISI 304, 316L, 321, Nickel Alloys
- » Connections: Flanged/Welded ends
- » Standard: EN / ASME / Customized
- » Accessories: N/A
- » Fluid / Applications: Exhaust / Ventilation systems

## INDUSTRY APPLICATIONS / PROCESS

- » Ventilation & Fan blowing
- » Air ducting
- » Exhaust systems and many more...

# LENS BELLOW



## BENEFITS / PROPERTIES

Lens bellows are manufactured from various grades of carbon and stainless steels, nickel alloys up to DN8000.

Each convolution is manufactured individually and then welded circumferentially. They are single layer bellows and bellows thickness can be up to 6mm. Applications include heat exchangers, large sized piping systems, cement industries and chemical industries. Their thick walls allow using carbon steel materials and hold up to corrosion better than thin walled bellows.

Drain couplings can be added at the lower extremities of convolutions to allow drainage. Weld repairs can be performed easily on-site. Very flexible manufacturing range due its manufacturing technique. They can be assembled on-site.

## SPECIFICATIONS

- » Size: DN 200 - 8000
- » Design pressure: Up to 16 barG
- » Design temp.: Up to 400°C
- » Bellow material: AISI 304, 316, 321, P265GH, P355GH etc.
- » Flanged & hardware material: Carbon steel, Stainless steel
- » Connections: Direct connection/ Flanged/ Welded ends
- » Standard: EN / ASME
- » Accessories: N/A
- » Fluid / Applications: Solids / abrasive systems

## INDUSTRY APPLICATIONS / PROCESS

- » Heat exchangers
- » Large diameter piping systems
- » Cement industries
- » Chemical industries and many more...





## EXPANSION JOINTS WITH RODS



### BENEFITS / PROPERTIES

Metal expansion joints with rods can also be used to absorb movements in piping systems due to earthquakes, ground settlements or landslides.

These events can cause large movements in piping systems and cause critical piping systems to fail. These expansion joints are an excellent choice for such applications. They are designed to absorb large axial and lateral movements.

They come with rods to control or limit excessive movements. They can have pipe ends or welded / rotating flange connections supplied in accordance with many industrial norms or special drillings.

### SPECIFICATIONS

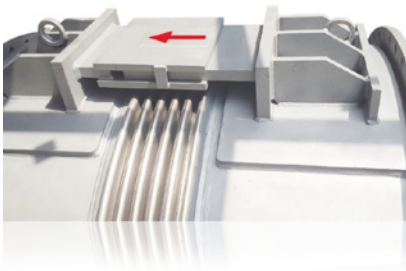
- » Size: DN 150 -5000
- » Design pressure: Up to 16 barG
- » Design temp.: Up to 400°C
- » Bellows material: AISI 304, 316, 321, Nickel alloys
- » Flanged & hardwares material: Carbon steel, Stainless steel
- » Connections: Flanged / Welded ends
- » Standard: EN / ASME
- » Accessories: Tie-rods/Limit rods
- » Fluid / Applications: Seismic & thermal movements

### INDUSTRY APPLICATIONS / PROCESS

- » Industrial applications
- » Hot and cold water pipelines
- » Firefighting systems
- » Steam and condensate lines and many more...



## EXPANSION JOINTS WITH HINGES



### BENEFITS / PROPERTIES

Metal expansion joints hinged types are designed to absorb large angular movements, in one plane (in special cases also axial). As universal design, also for lateral movements.

The hinges design concept is to absorb the movement and at the same time, control the pressure thrusts and keep the expansion joint from expanding/compressing undesirable.

They can have pipe ends, or flange connections supplied in accordance with many industrial norms or special drillings.

### SPECIFICATIONS

- » Size: DN 150 -5000
- » Design pressure: Up to 16 barG
- » Design temp.: Up to 400°C
- » Bellows material: AISI 304, 316, 321, Nickel alloys
- » Flanged & hardwares material: Carbon steel, Stainless steel
- » Connections: Flanged / Welded ends
- » Standard: EN / ASME
- » Accessories: Hinges
- » Fluid / Applications: Thermal movements

### INDUSTRY APPLICATIONS / PROCESS

- » Industrial applications
- » Hot and cold water pipelines
- » Firefighting systems
- » Steam and condensate lines and many more...



## EXPANSION JOINTS WITH GIMBALS



### BENEFITS / PROPERTIES

Metal expansion joints gimbal types are designed to absorb large angular and with universal design, also for lateral movements, in multiple planes.

The gimbals design concept is to absorb the movement and at the same time, control the pressure thrusts and keep the expansion joint from expanding/compressing undesirable.

They can have pipe ends, or flange connections supplied in accordance with many industrial norms or special drillings.

### SPECIFICATIONS

- » Size: DN 150 -5000
- » Design pressure: Up to 16 barG
- » Design temp.: Up to 400°C
- » Bellows material: AISI 304, 316, 321, Nickel alloys
- » Flanged & hardwares material: Carbon steel, Stainless steel
- » Connections: Flanged / Welded ends
- » Standard: EN / ASME
- » Accessories: Gimbals
- » Fluid / Applications: Thermal movement

### INDUSTRY APPLICATIONS / PROCESS

- » Industrial applications
- » Hot and cold water pipelines
- » Firefighting systems
- » Steam and condensate lines and many more...

## IN-LINE PRESSURE BALANCED



### BENEFITS / PROPERTIES

Metal expansion joints pressure balanced types are designed to absorb large axial and lateral movements, in multiple planes, mostly for "straight / in-line" pipe lines.

The design concept is to absorb the movement and at the same time, also keep the pressure thrusts within expansion joint without transferring these onto the piping system.

They can have pipe ends, or flange connections supplied in accordance with many industrial norms or special drillings.

### SPECIFICATIONS

- » Size: DN 300 -5000
- » Design pressure: Up to 16 barG
- » Design temp.: Up to 400°C
- » Bellows material: AISI 304, 316, 321, Nickel alloys
- » Flanged & hardwares material: Carbon steel, Stainless steel
- » Connections: Flanged / Welded ends
- » Standard: EN / ASME
- » Accessories: Rods
- » Fluid / Applications: Thermal movements

### INDUSTRY APPLICATIONS / PROCESS

- » Industrial applications
- » Hot and cold water pipelines
- » »Firefighting systems
- » Steam and condensate lines and many more...

## ELBOW PRESSURE BALANCED



### BENEFITS / PROPERTIES

Metal expansion joints pressure balanced types are designed to absorb large axial and lateral movements, in multiple planes, mostly for "cornered" places in the pipe lines.

The design concept is to absorb the movement and at the same time, also keep the pressure thrusts within expansion joint without transferring these onto the piping system.

They can have pipe ends, or flange connections supplied in accordance with many industrial norms or special drillings.

### SPECIFICATIONS

- » Size: DN 300 -5000
- » Design pressure: Up to 16 barG
- » Design temp.: Up to 400°C
- » Bellows material: AISI 304, 316, 321, Nickel alloys
- » Flanged & hardwares material: Carbon steel, Stainless steel
- » Connections: Flanged / Welded ends
- » Standard: EN / ASME
- » Accessories: Rods
- » Fluid / Applications: Thermal movements

### INDUSTRY APPLICATIONS / PROCESS

- » Industrial applications
- » Hot and cold water pipelines
- » Firefighting systems
- » Steam and condensate lines and many more...

## REFRACTORY LINE



### BENEFITS / PROPERTIES

These types are typically used for high temperatures such as furnaces and refractory processes i.e. in petrochem or cement industries.

They are designed to absorb large axial and lateral movements. They can have pipe ends or welded / rotating flange connections supplied in accordance with many industrial norms or special drillings.

Internal insulation is common for these types to withstand the very high temperatures combined with aggressive media(s).

### SPECIFICATIONS

- » Size: DN 500 - 5000
- » Design pressure: Up to 16 barG
- » Design temp.: Up to 400°C
- » Bellows material: AISI 304, 316, 321, Nickel alloys
- » Flanged & hardwares material: Carbon steel, Stainless steel
- » Connections: Floating/Fixed flanges/welding neck
- » Standard: EN / ASME
- » Accessories: Gimbals
- » Fluid / Applications: Thermal movements

### INDUSTRY APPLICATIONS / PROCESS

- » Industrial applications
- » Hot and cold water pipelines
- » Firefighting systems
- » Steam and condensate lines and many more...

## TESTABLE BELLOWS

### BENEFITS / PROPERTIES

These types are used in sensitive process lines, where any "downtime" is critical and "not allowed". The design concept is to detect when the inner layer starts leaking and hereby alerts the user about this. The outer layer keeps the expansion joint running in sufficient time, in most cases, until a new joint is ready to be replaced. They can have pipe ends, or flange connections supplied in accordance with many industrial norms or special drillings.

### SPECIFICATIONS

- » Size: DN 500 - 5000
- » Design pressure: Up to 16 barG
- » Design temp.: Up to 400°C
- » Bellows material: AISI 304, 316, 321, Nickel alloys
- » Flanged & hardwares material: Carbon steel, Stainless steel
- » Connections: Customized
- » Standard: EN / ASME
- » Accessories: Leak detections
- » Fluid / Applications: Thermal movements

### INDUSTRY APPLICATIONS / PROCESS

- » Industrial applications
- » Hot and cold water pipelines
- » Steam and condensate lines and many more...

# FABRIC EXPANSION JOINTS

## Flexible Products for Industrial Use

KLINGER Fabric Expansion Joints are most common in either circular or rectangular shapes. Fabric Expansion Joints are different compared to Metal and Rubber Expansion Joints. They are used when pressure is low and temperature high, and they are much more flexible compared to metal and rubber by installation length.

KLINGER Fabric Expansion Joints are “make to order” and not standard of the shelf, unless it's tailor made for a specific product range for a specific customer.

Fabric Expansion Joints can for special industries be highly engineered products and are to be installed where thermal processes occurred, which creates stresses, noise and movements in the piping systems. Similarly to metal and rubber, our fabric Expansion Joints can be useful for many industries.

Our Fabric Expansion Joints are designed and manufactured according to the latest norms and standards and the materials specified based on the applications.



## SPECIFICATIONS

### Type & Sizes

- » Circular  
Customized sizes
- » Rectangular  
Customized sizes

### Connections:

- » Flanges
- » Welding ends
- » Clamping bands
- » Customized

### Bellow & connections material

- » Customized bellow materials
- » AISI 304/321/316/316L/P265/P355 and more

### Design parameters

- » Up to 0,5 barG
- » Up to 800°C

## RECTANGULAR - FLANGED



### BENEFITS / PROPERTIES

These are manufactured from several layers of special fabric and insulation materials. The fabrics are usually specially coated to enhance their resistance against various media & conditions. The shape are typically rectangular/quadrant, and are available in many different steel qualities.

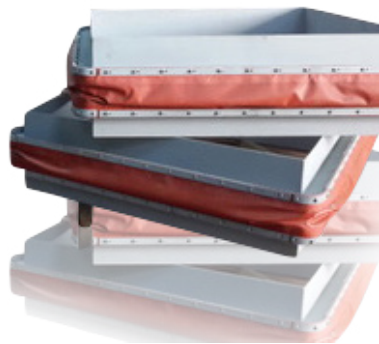
These are with flanges and often are customized and this gives many options to the piping designers to fit in the ducting & piping systems. They are ideal for low pressures and high temperatures, up to 850°C. They are extremely flexible considered to their "shorter" installation length, and they have very low reaction forces to the piping system.

With liners to protect from high flow and prevent abrasion and to keep the insulation in place.

### SPECIFICATIONS

- » Can be designed and manufactured in various types in accordance with required operating conditions.
- » High vibration and noise elimination
- » Compensation on thermal expansion
- » High flexibility
- » Working & design temperature up to 800°C
- » Design pressure up to 0,5 barG
- » Minimum reaction force

## RECTANGULAR - WELDED ENDS



### BENEFITS / PROPERTIES

Similarly to the rectangular flanged types, we also design and manufacture these FEJ with weld ends. They are on most cases customized and this gives many options to the piping designers to fit in the ducting & piping systems.

They are ideal for low pressures and high temperatures, up to 850°C. They are extremely flexible considered to their "shorter" installation length, and they have very low reaction forces to the piping system.

With liners to protect from high flow and prevent abrasion and to keep the insulation in place..

### SPECIFICATIONS

- » Can be designed and manufactured in various types in accordance with required operating conditions.
- » High vibration and noise elimination
- » Compensation on thermal expansion
- » High flexibility
- » Working & design temperature up to 800°C
- » Design pressure up to 0,5 barG
- » Minimum reaction force

## CIRCULAR - FLANGED



### BENEFITS / PROPERTIES

These are manufactured from several layers of special fabric and insulation materials. The fabrics are usually specially coated to enhance their resistance against various media & conditions. They are circular shaped and are available in many different steel qualities.

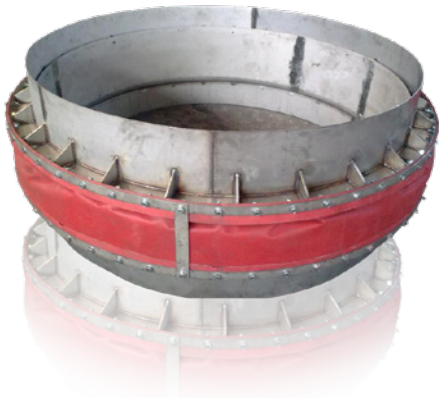
These are with flanges and often are customized and this gives many options to the piping designers to fit in the ducting & piping systems. They are ideal for low pressures and high temperatures, up to 850°C. They are extremely flexible considered to their "shorter" installation length, and they have very low reaction forces to the piping system.

With liners to protect from high flow and prevent abrasion and to keep the insulation in place.

### SPECIFICATIONS

- » Can be designed and manufactured in various types in accordance with required operating conditions.
- » High vibration and noise elimination
- » Compensation on thermal expansion
- » High flexibility
- » Working & design temperature up to 800°C
- » Design pressure up to 0,5 barG
- » Minimum reaction force

## CIRCULAR - WELDED ENDS



### BENEFITS / PROPERTIES

Similarly to the circular flanged types, we also design and manufacture these with welded ends. They are in most cases customized and this gives many options to the piping designers to fit in the ducting & piping systems.

They are ideal for low pressures and high temperatures, up to 850°C. They are extremely flexible considering their “shorter” installation length, and they have very low reaction forces to the piping system.

With liners to protect from high flow and prevent abrasion and to keep the insulation in place.

### SPECIFICATIONS

- » Can be designed and manufactured in various types in accordance with required operating conditions.
- » High vibration and noise elimination
- » Compensation on thermal expansion
- » High flexibility
- » Working & design temperature up to 800°C
- » Design pressure up to 0,5 barG
- » Minimum reaction force

## CLAMPING BANDS



### BENEFITS / PROPERTIES

Besides the flanged and welded end types, we also design and manufacture these for installation with clamping bands. They are in most cases customized and this gives many options to the piping designers to fit in the ducting & piping systems.

They are ideal for low pressures and high temperatures, up to 850°C. They are extremely flexible considering their “shorter” installation length, and they have very low reaction forces to the piping system.

Liners from existing systems often can be re-used.

### SPECIFICATIONS

- » Can be designed and manufactured in various types in accordance with required operating conditions.
- » High vibration and noise elimination
- » Compensation on thermal expansion
- » High flexibility
- » Working & design temperature up to 800°C
- » Design pressure up to 0,5 barG
- » Minimum reaction force

## ONLY FABRICS PART



### BENEFITS / PROPERTIES

When only the soft parts of fabric are needed, and the customer is capable of doing the joining/service & replacement by themselves, we also have the possibility to supply only the bellow as softparts.

The connection can be done with clamping bands / making the bolt holes at site etc. The remaining design parameters are much like the assembled units.

They are ideal for low pressures and high temperatures, up to 850°C. They are extremely flexible considering their “shorter” installation length, and they have very low reaction forces to the piping system.

Liners from existing systems often can be re-used.

### SPECIFICATIONS

- » Can be designed and manufactured in various types in accordance with required operating conditions.
- » High vibration and noise elimination
- » Compensation on thermal expansion
- » High flexibility
- » Working & design temperature up to 800°C
- » Design pressure up to 0,5 barG
- » Minimum reaction force

# RUBBER EXPANSION JOINTS

## Best Solution for Vibration and Noise

KLINGER Rubber Expansion Joints consist of two main groups, standard – and special molded. The bellow elements are most common in EPDM & NBR materials, but other are materials also available, similarly for the flanges, which can be from CS, SS or customized materials.

KLINGER Rubber Expansion Joints are as standard within the range below.

Similarly to Metal Expansion Joints, our Rubber Expansion Joints can be from the shelf as standard products, but also, they can be highly specialized/ engineered products for the same industries & processes. The main differences from the Metal and Rubber Expansion Joints are the temperature and pressure limits, but for corrosive applications at lower temperature, our Rubber Expansion Joints are perfect.

Our Rubber Expansion Joints are also relevant for many industries i.e. chemical, petrochem, power generation, food & beverage, PtX, marine & offshore, onshore and not least also HVAC and engines.

Our Rubber Expansion Joints are designed and manufactured acc. to the latest norms & standards and the materials used are mainly harmonized.



## SPECIFICATIONS

### Type & Sizes

- » Standard molded bellows  
DN 25 up to DN 800
- » Special molded bellows  
DN 25 up to DN 4.000

### Connections:

- » Flanges
- » Union (threaded)

### Bellow & connections material

- » EPDM / NBR / CR / SBR / CSM  
/ IIR / VITON
- » AISI 304/321/316/316L/P265/  
P355 and more

### Flange norms & standards

- » EN 1092 / ASME / JIIS
- » Customized

### Design parameters

- » Up to 16 barG
- » Up to 110°C

# STANDARD MOLDED



## BENEFITS / PROPERTIES

KLINGER's standard rubber expansion joints are available in EPDM, NBR, CR, SBR in the most "standard" lengths. Flanges are rotatable in carbon, stainless steel and cast iron acc. to various industry standards. Working temperatures are up to 110°C and 16 barG working pressures.

Our joints are used in a variety of applications, especially to absorb vibrations. They are relatively low cost, low weight and can be supplied fast as standard products. No gasket is required for installation, as the rubber body acts as a gasket. Our rubber expansion joints are good at absorbing shock movements and movements in axial, lateral, and angular.

Rubber body is typically reinforced with nylon-cord keeping its flexibility.

## SPECIFICATIONS

- » Size: DN 25 - 800
- » Bellow material: EPDM, NBR, CR, SBR.
- » Design pressure: Up to 16 barG
- » Design temp.: 110°C
- » Flanged material: CS, SS, Cast iron
- » Vacuum support in SS

# CUSTOMIZED



## BENEFITS / PROPERTIES

KLINGER's customized rubber expansion joints are available in EPDM, NBR, CR, SBR in the most "standard" lengths, with customized flanges/hardwares. Flanges are rotatable and customized.

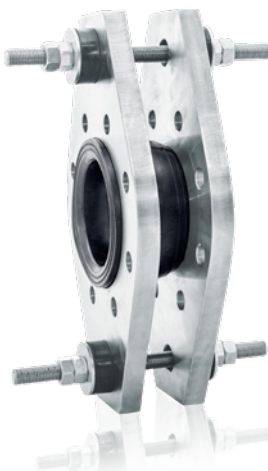
Working temperatures are up to 110°C and 16 barG working pressures or higher. Our joints are used in a variety of applications, especially to absorb vibrations. No gasket is required for installation, as the rubber body acts as a gasket.

Our customized joints are good at absorbing shock movements and with the hardwares are to restrain the pressure thrusts and excessive movements. Rubber body is typically reinforced with nylon-cord keeping its flexibility.

## SPECIFICATIONS

- » Size: DN 25 - 800 (for larger ask us)
- » Bellow material: EPDM, NBR, CR, SBR, Special
- » Design pressure: Up to 16 barG and higher
- » Design temp.: 110°C
- » Flanged material: CS, SS, Cast iron, Special
- » Hardware material: CS,SS, customized
- » Vacuum support in SS

# W/TIE-RODS



## BENEFITS / PROPERTIES

KLINGER's rubber expansion joints are most used for a large variety of applications, especially to absorb vibrations. Flanges are rotatable and customized. Tie-rods are installed with rubber bushings which reduce vibration and noise transfer to the joint at the same time keep it flexible for designed movements. Bellow material is like our standard types, same or even higher for temperature and pressures.

Gasket is not required for installation, as the rubber body acts as a gasket.

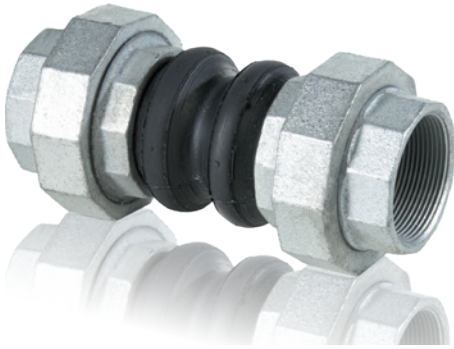
Our customized joints are good at absorbing shock movements and with the hardwares are to restrain the pressure thrusts and excessive movements.

Rubber body is typically reinforced with nylon-cord keeping its flexibility.

## SPECIFICATIONS

- » Size: DN 25 - 800 (for larger ask us)
- » Bellow material: EPDM, NBR, CR, SBR, Special
- » Design pressure: Up to 16 barG and higher
- » Design temp.: 110°C
- » Flanged material: CS, SS, Cast iron, Special
- » Hardware material: CS,SS, customized
- » Vacuum support in SS

## THREADED UNION



### BENEFITS / PROPERTIES

KLINGER's rubber expansion joints also come with threaded unions acc. ISO 228-1. The rubber body material in EPDM / NBR and connection in galvanized steel / AISI 304 (EN 1.4301).

Rubber body is typically reinforced with reinforced fabric keeping it strong & maintain flexibility at the same time.

### SPECIFICATIONS

- » Size: 32 - 600
- » Bellow (modulation) material: EPDM, NBR
- » Design pressure: Up to 16 barG
- » Design temp.: 80°C (NBR) and 100°C (EPDM)
- » Flanged material: CS, SS.

## LOW PRESSURE FLANGED



### BENEFITS / PROPERTIES

KLINGER's rubber expansion joints for lower pressures, but also vacuum, are mostly useful as vibration absorbers. Flanges are fixed and often customized. Bellow material is mostly EPDM/NBR/customized.

Our joints are used in a variety of applications, especially to absorb vibrations. No gasket is required for installation, as the rubber body acts as a gasket.

### SPECIFICATIONS

- » Size: customized
- » Bellow material: customized
- » Design pressure: Up to 0,33 barG, higher ask us
- » Design temp.: Up to 100°C
- » Flanged material: CS, SS, customized
- » Vacuum support in SS

## LOW PRESSURE PIPE CONNECTION



### BENEFITS / PROPERTIES

KLINGER's rubber expansion joints for lower pressures, but also vacuum, are mostly useful as vibration absorbers. Connections are to be made directly on the pipes by using clamps.

Bellow material is mostly EPDM/NBR/customized. Our joints are used in a variety of applications, especially to absorb vibrations.

### SPECIFICATIONS

- » Size: customized
- » Bellow material: customized
- » Design pressure: Up to 0,33 barG, higher ask us
- » Design temp.: Up to 100°C
- » Flanged material: CS, SS, customized
- » Vacuum support in SS



# PTFE EXPANSION JOINTS

## Medium Pressure & High Corrosivity Resistance



Our PTFE expansion joints are available in circular shapes. They are by principle builded similarly to Metal and Rubber types. They are for mid-range pressures but high corrosivity resistance.

Our PTFE joints are certified for up to 100.000 cycles. (one cycle is defined as neutral-compression-neutral – extension-neutral)

Our PTFE expansion joints can be useful for many industries, especially in chemical, food & beverage industries, where high corrosion properties are required.

Our PTFE Expansion Joints are designed and manufactured acc. to the latest norms & standards.

The bellow is flared over the flanges, which eliminates the need for separate gaskets. They offer low spring rates to protect sensitive equipment.



## SPECIFICATIONS

### Type & Sizes

- » DN 25 up to DN 500

### Connections:

- » Flanges

### Bellow & connections material

- » PTFE
- » SS i.e. AISI 304/321/316/316L and more
- » CS / Ductile iron

### Design parameters

- » Up to 10 barG
- » Up to 200°C



## R-SERIES 2 CONV.



### BENEFITS / PROPERTIES

The bellows for the R-series is made from extruded PTFE by a patented process.

They can be supplied for over pressure and vacuum applications and are certified for up to 100.000 cycles.

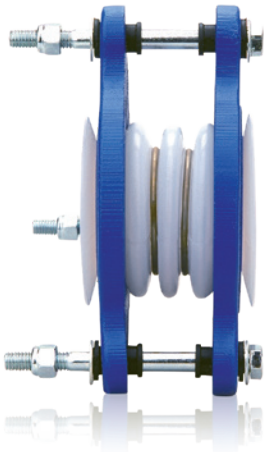
Rods allow and control the movements at the same time, they also limit axial over extension and misalignment and restrict/prevent harmful torsion to occurring to the joint. The rods are pre-set from factory and must not be modified, which ensures the correct design conditions acc. specification. Reinforced rings provide pressure strength for the bellow.

The PTFE bellow material provides excellent resistance for chemical and corrosion/aggressive media at high temperatures. The smooth bellow surfaces make these bellows very suitable for applications where CIP occurs. For angular movements, please consult with us!

### SPECIFICATIONS

- » Size: From DN25 - 500
- » Design pressure: Up to 14 barG
- » Design temp.: Up to 230°C
- » Connections: Flanges (CS, SS, Alloys)
- » Standards: EN / ASME / Customized
- » Bellow material: PTFE
- » Fluid / Applications: Gas / Liquid

## R-SERIES 3 CONV.



### BENEFITS / PROPERTIES

The bellows for the R-series is made from extruded PTFE by a patented process.

They can be supplied for over pressure and vacuum applications and are certified for up to 100.000 cycles.

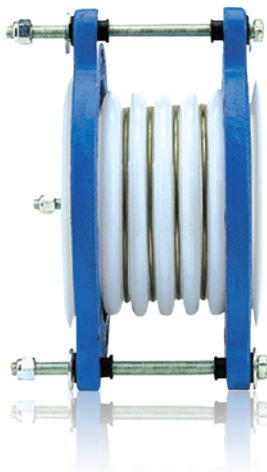
Rods allow and control the movements at the same time, they also limit axial over extension and misalignment and restrict/prevent harmful torsion to occurring to the joint. The rods are pre-set from factory and must not be modified, which ensures the correct design conditions acc. specification. Reinforced rings provide pressure strength for the bellow.

The PTFE bellow material provides excellent resistance for chemical and corrosion/aggressive media at high temperatures. The smooth bellow surfaces make these bellows very suitable for applications where CIP occurs. For angular movements, please consult with us!

### SPECIFICATIONS

- » Size: From DN25 - 500
- » Design pressure: Up to 10 barG
- » Design temp.: Up to 230°C
- » Connections: Flanges (CS, SS, Alloys)
- » Standards: EN / ASME / Customized
- » Bellow material: PTFE
- » Fluid / Applications: Gas / Liquid

## R-SERIES 5 CONV.



### BENEFITS / PROPERTIES

The bellows for the R-series is made from extruded PTFE by a patented process.

They can be supplied for over pressure and vacuum applications and are certified for up to 100.000 cycles.

Rods allow and control the movements at the same time, they also limit axial over extension and misalignment and restrict/prevent harmful torsion to occurring to the joint. The rods are pre-set from factory and must not be modified, which ensures the correct design conditions acc. specification. Reinforced rings provide pressure strength for the bellow.

The PTFE bellow material provides excellent resistance for chemical and corrosion/aggressive media at high temperatures. The smooth bellow surfaces make these bellows very suitable for applications where CIP occurs. For angular movements, please consult with us!

### SPECIFICATIONS

- » Size: From DN25 - 500
- » Design pressure: Up to 6 barG
- » Design temp.: Up to 230°C
- » Connections: Flanges (CS, SS, Alloys)
- » Standards: EN / ASME / Customized
- » Bellow material: PTFE
- » Fluid / Applications: Gas / Liquid



## E-SERIES 2 CONV.



### BENEFITS / PROPERTIES

The bellows for the E-series is made from extruded PTFE by a patented process, They are certified for up to 100.000 cycles.

Main differences from the R-series are:

- » Even more compact installation with no protruding from bolt ends.
- » Greater lateral & angular misalignment due to the rigidity from the bolts.
- » Unlike bolts the cables cannot be misadjusted unintended once installed.
- » Cables cannot prevent torsion
- » Less strength than rods and require more often service.
- » Installation can unintended be done with lateral misalignments beyond allowable limits.

Reinforced rings provide pressure strength for the bellow.

The PTFE bellow material provides excellent resistance for chemical and corrosion/aggressive media at high temperatures. The smooth bellow surfaces make these bellows very suitable for applications where CIP occurs. For angular movements, please consult with us!

### SPECIFICATIONS

- » Size: From DN25 - 300
- » Design pressure: Up to 14 barG
- » Design temp.: Up to 230°C
- » Connections: Flanges (CS, SS, Alloys)
- » Standards: EN / ASME / Customized
- » Bellow material: PTFE
- » Fluid / Applications: Gas / Liquid



## E-SERIES 3 CONV.



### BENEFITS / PROPERTIES

The bellows for the E-series is made from extruded PTFE by a patented process, They are certified for up to 100.000 cycles.

Main differences from the R-series are:

- » Even more compact installation with no protruding from bolt ends.
- » Greater lateral & angular misalignment due to the rigidity from the bolts.
- » Unlike bolts the cables cannot be misadjusted unintended once installed.
- » Cables cannot prevent torsion
- » Less strength than rods and require more often service.
- » Installation can unintended be done with lateral misalignments beyond allowable limits.

Reinforced rings provide pressure strength for the bellow.

The PTFE bellow material provides excellent resistance for chemical and corrosion/aggressive media at high temperatures. The smooth bellow surfaces make these bellows very suitable for applications where CIP occurs. For angular movements, please consult with us!

### SPECIFICATIONS

- » Size: From DN25 - 200
- » Design pressure: Up to 10 barG
- » Design temp.: Up to 230°C
- » Connections: Flanges (CS, SS, Alloys)
- » Standards: EN / ASME / Customized
- » Bellow material: PTFE
- » Fluid / Applications: Gas / Liquid



## E-SERIES 5 CONV.



### BENEFITS / PROPERTIES

The bellows for the E-series is made from extruded PTFE by a patented process, They are certified for up to 100.000 cycles.

Main differences from the R-series are:

- » Even more compact installation with no protruding from bolt ends.
- » Greater lateral & angular misalignment due to the rigidity from the bolts.
- » Unlike bolts the cables cannot be misadjusted unintended once installed.
- » Cables cannot prevent torsion
- » Less strength than rods and require more often service.
- » Installation can unintended be done with lateral misalignments beyond allowable limits.

Reinforced rings provide pressure strength for the bellow.

The PTFE bellow material provides excellent resistance for chemical and corrosion/aggressive media at high temperatures. The smooth bellow surfaces make these bellows very suitable for applications where CIP occurs. For angular movements, please consult with us!

### SPECIFICATIONS

- » Size: From DN25 - 150
- » Design pressure: Up to 6 barG
- » Design temp.: Up to 230°C
- » Connections: Flanges (CS, SS, Alloys)
- » Standards: EN / ASME / Customized
- » Bellow material: PTFE
- » Fluid / Applications: Gas / Liquid

# KLINGER HOSES

## Highly Specialized Products for Multiple Purposes

KLINGER Hoses come in a wide range, mostly with metal body and outer braiding, but also with PTFE body with reinforcement or with lining with PTFE / other materials as customized.

KLINGER Hoses are as standard within the range as below. Our hoses are highly specialized products for multiple purposes and similarly to Expansion Joints, they can be installed where thermal processes occurred, which creates stresses, vibrations, noise and offsets in the piping systems or to connect from one vessel unit to another (units/ equipment).

Our Hoses are relevant for many industries i.e. chemical, Petrochem, power generations, food & beverage, PtX, marine & offshore, onshore and not least also HVAC, engines and automotive and more.

Our Hoses are designed and manufactured acc. to the latest norms & standards and the materials used are mainly harmonized.



## SPECIFICATIONS

### Type & Sizes

- » DN 6 up to DN 150

### Connections:

- » Flanges
- » Fittings
- » Customized

### Hose & connections material

- » AISI 316/316L/ Nickel Alloys and more (hose body)
- » AISI 304 (braiding)
- » CS / SS and more

### Design parameters

- » Up to 145 barG
- » Up to 400°C (Metal body) & up to 200°C for others



## FLEXIBLE METAL HOSES



### BENEFITS / PROPERTIES

- » Long product life
- » Useful for moving parts/equipment
- » High pressures & temperatures
- » Easy to assemble
- » Useful for hygienic applications

### SPECIFICATIONS

- » Size: From DN6 – 50
- » Design pressure: 0 - 245 BarG

- » Design temp.: Various
- » Connections: Various
- » Standards: EN ISO 3834-2
- » Bellow material:  
Hose material: AISI 304/316L/321  
Braid material: AISI 304/316L
- » Weld end material: AISI 304/316L/Others
- » Accessories: N/A
- » Fluid / Applications: Various



## HIGH PRESSURE METAL HOSES



### BENEFITS / PROPERTIES

- » Can withstand high pressures without braid
- » Used in moving parts
- » Long product life

### SPECIFICATIONS

- » Size: From DN6 – 150
- » Design pressure: 0 - 345 BarG
- » Design temp.: Various

- » Connections: Various
- » Standards: EN ISO 3834-2
- » Bellow material:  
Hose material: AISI 304/316L/321  
Braid material: AISI 304/306
- » Weld end material: AISI 304/316L/Others
- » Accessories: N/A
- » Fluid / Applications: Various



## METAL HOSES FOR SOLAR



### BENEFITS / PROPERTIES

- » Easy installation with its flexible body and screwed fittings
- » Lightweight and easy to transport
- » Large surface areas
- » Excellent heat transfer properties
- » Can be supplied in one long piece lengths
- » Applicable to heat pump and hybrid systems

### SPECIFICATIONS

- » Size: From DN6 – 50
- » Design pressure: 0 - 21 BarG
- » Design temp.: Various
- » Connections: Various
- » Standards: EN ISO 3834-2
- » Bellow material:  
Hose material: AISI 304/316L/321
- » Weld end material: AISI 304/316L/Others
- » Accessories: N/A
- » Fluid / Applications: Various



## METAL HOSES FOR BOILERS



### BENEFITS / PROPERTIES

- » Large surface areas
- » High heat transfer efficiency
- » Can be supplied in one long piece lengths
- » Heating surface without calcification for heating
- » High acid and corrosion resistance with its stainless steel body
- » Can be installed easily different boiler type with its flexible body

### SPECIFICATIONS

- » Size: From DN20 – 40
- » Design pressure: 0 - 10 BarG
- » Design temp.: Various
- » Connections: Various
- » Standards: EN ISO 3834-2
- » Bellow material:  
Hose material: AISI 316L
- » Weld end material: AISI 304/316L/Others
- » Accessories: N/A
- » Fluid / Applications: Various



## METAL HOSES FOR FAN CONNECTORS



### BENEFITS / PROPERTIES

- » Fan-coil connectors are used for flexible connections of fan-coil units to the heating / cooling system distribution piping
- » Easy to assemble

### SPECIFICATIONS

- » Size: From DN12 – 50
- » Design pressure: 0 - 21 BarG
- » Design temp.: Various
- » Connections: Various
- » Standards: EN ISO 3834-2
- » Bellow material:
  - Hose material: AISI 304/316L
  - Braid material: AISI 304
- » Weld end material: AISI 304/316L/Others
- » Accessories: N/A
- » Fluid / Applications: Various



## METAL HOSES FOR DISTRICT HEATING



### BENEFITS / PROPERTIES

- » High temperature resistant internal layer
- » Middle layer of standard crosslinked PUR insulation
- » Weather and UV resistant protective outer layer

### SPECIFICATIONS

- » Size: From DN30 – 150
- » Design pressure: 0 - 21 BarG
- » Design temp.: Various
- » Connections: Various
- » Standards: EN ISO 3834-2
- » Bellow material:
  - Hose material: AISI 304/316L
- » Weld end material: AISI 304/316L/Others
- » Accessories: N/A
- » Fluid / Applications: Various



## METAL HOSES FOR HEAT EXCHANGER COILS



### BENEFITS / PROPERTIES

- » Complete heat-exchanger
- » Coil with frame tailor made according to customer specifications
- » Easy assembly

### SPECIFICATIONS

- » Size: From DN6 – 50
- » Design pressure: 0 - 21 BarG
- » Design temp.: Various
- » Connections: Various
- » Standards: EN ISO 3834-2
- » Bellow material:
  - Hose material: AISI 316L
- » Weld end material: AISI 304/316L/Others
- » Accessories: N/A
- » Fluid / Applications: Various



## HT COMPOSITE PRE-INSULATED HOSES



### BENEFITS / PROPERTIES

- » Insulated hoses can be used at high temperature resistant inside layer
- » Weather and UV resistant protective outer layer
- » Easy assembly
- » Middle layer of standard crosslinked PE insulation

### SPECIFICATIONS

- » Size: From DN12 – 25
- » Design pressure: 0 - 21 BarG
- » Design temp.: Various
- » Connections: Various
- » Standards: EN ISO 3834-2
- » Bellow material:
  - Hose material: AISI 316L
- » Insulate material: Composite
- » Accessories: N/A
- » Fluid / Applications: Various



## METAL HOSES W/ COPPER FITTINGS



### BENEFITS / PROPERTIES

- » Quick connection
- » Easy installation
- » Easily replaced
- » Can be restrained
- » Lower overall length with respect to weld end expansion joints

### SPECIFICATIONS

- » Size: From DN6 – 50
- » Design pressure: 0 - 5 BarG
- » Design temp.: Various
- » Connections: Various
- » Standards: EN ISO 3834-2
- » Bellow material:  
Hose material: AISI 304 / 316L / 321
- » Fittings material: Copper
- » Accessories: N/A
- » Fluid / Applications: Various



## METAL HOSES ANNEALED



### BENEFITS / PROPERTIES

- » Easy to assemble
- » Takes desired shape easily
- » Keeps its shape when bent
- » Saves Money and time
- » It reduces the risk of leakage since it is monolithic
- » Not required a lot of extra part for assembly

### SPECIFICATIONS

- » Size: From DN12 – 50
- » Design pressure: 0 - 21 BarG
- » Design temp.: Various
- » Connections: Various
- » Standards: EN ISO 3834-2
- » Bellow material:  
Hose material: AISI 304/316L/321
- » Weld end material: AISI 304/316L/Others
- » Accessories: N/A
- » Fluid / Applications: Various



## PTFE HOSES WELDED ENDS



### BENEFITS / PROPERTIES

- » Teflon® PTFE inner core provides outstanding corrosion resistance and material compatibility.
- » Open pitch, helical convolutions allow for smooth product flow and easy cleaning.
- » Rated for both medium pressure and full vacuum applications.
- » Wide variety of crimp style end fittings in various metallurgies.
- » Tighter bend radius compared to smooth bore hose styles.

### SPECIFICATIONS

- » Size: From DN10 – 100
- » Design pressure: Up to 98,2 BarG
- » Design temp.: Up to 177°C
- » Connections: Various
- » Standards: Various
- » Bellow material:  
Hose material: PTFE  
Braid material: AISI 316
- » Accessories: N/A
- » Fluid / Applications: Various



## PTFE HOSES FLANGED



### BENEFITS / PROPERTIES

Additional to our welded ends type (as above).

Flared collars allow Teflon® PTFE protection of all wetted surfaces, eliminating metal corrosion and process contamination.

### SPECIFICATIONS

- » Size: From DN126 – 100
- » Design pressure: Up to 34,5 BarG
- » Design temp.: Up to 177°C
- » Connections: Various
- » Standards: Various
- » Bellow material:  
Hose material: PTFE  
Braid material: AISI 316
- » Accessories: N/A
- » Fluid / Applications: Various

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