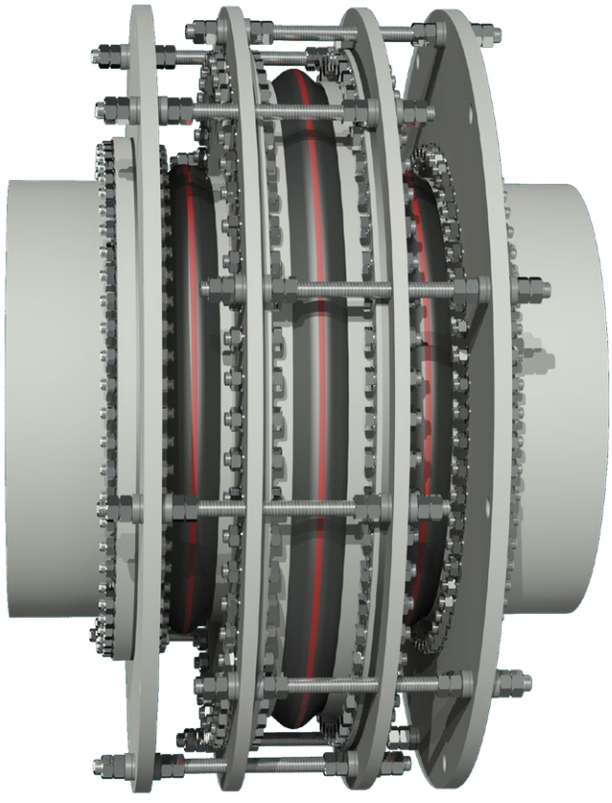
# U110M IPB ⌀ 80 - 4,000 mm



> **Type U110M IPB**
without vacuum rings

> **Type U111M IPB**
with internal vacuum rings

> **Type U112M IPB**
with embedded vacuum rings

Type key > page 22

U1 1 0 M IPB
- M → Tie rod variant
- 0 → Support ring variants
- 1 → Number of arches
- U1 → Type

## In-line pressure balanced expansion joint

**Design:**

In-line pressure balanced expansion joints are designed to absorb movements from a pipe system. They can accommodate axial and lateral movements where anchoring of the pipe system is difficult or impractical due to structural or economic considerations. Pressure balanced expansion joints do not transfer the internal pressure thrust on to the fix points, adjacent equipment, or structures. In-line pressure balanced rubber expansion joints are the only effective solution for directly absorbing large axial movements while continuously self-restraining the pressure thrust forces. This arrangement consists of tie devices inter-connecting its main joint sections to its opposing balancing joint section.

Therefore, pressure balanced expansion joints can offer significant advantages, where pipe systems are connected with turbines, pumps, valves or other equipment, that are unable to withstand pressure thrust loads. Although pressure balanced expansion joints eliminate pressure thrust, it's important to note that the existing load on the surrounding equipment is the total sum of the spring rates of both the two main bellows and the balancing bellow. The balancing rubber expansion joint needs to be twice the effective area as the main rubber expansion joints. In operation the main bellows of the pressure balanced unit will contract from axial movement of the piping while the balancing bellow will expand.

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

CE PED 2014/68/EU · KTW WRAS · FDA · <10⁵ Ohm · EX

Request assembly instructions at:
**www.ditec-adam.de/en/contact**

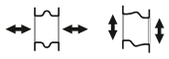
In-line pressure balanced rubber expansion joints are high elastic, streamlined, have depending from the expected axial or lateral movements single or multiple wide archs with full faced rubber flanges, have a cycle life in the tens of millions, are constructed with a high-grade leak-proof tube, multiple layers of high-strength cord, a seamless cover, and backing flanges with support collar. Optional with vacuum rings. In compliance with PED 2014/68/EU, FSA Technical Handbook and ASTM F1123 - 87.

**Diameters:** ∅ 80 to 4,000 mm, custom diameters possible

**Length:** Custom length on request

**Pressure:** Up to 40 bar depending on diameter and length
Vacuum stability on request, with vacuum ring up to 0.05 bar absolute

**Movement:** For axial and lateral movements

 (> page 212–217)

**Spring rate:** The total axial spring rate is the axial spring rate of the balancing expansion joint plus once the axial spring rate of the main bellow
The total lateral spring rate is 1/3 of each bellows lateral spring rate plus the friction forces of the tie rods bearings

## Bellows elastomers and reinforcements

| Elastomer | Fabric | Marking | °C | Application |
|---|---|---|---|---|
| EPDM | Polyamid | | -40 \| +100 | Cooling water, hot water, seawater, acids, dilute chlorine compounds |
| EPDM | Aramid | | -40 \| +100 | Cooling water, hot water, seawater, acids, dilute chlorine compounds |
| EPDMht | Aramid | | -40 \| +120 | Cooling water, hot water, seawater, acids, dilute chlorine compounds |
| EPDMwras | Polyamid | | -40 \| +100 | Drinking water, foodstuffs |
| EPDMwras | Aramid | | -40 \| +100 | Drinking water, foodstuffs |
| EPDMbeige | Polyamid | | -40 \| +100 | Foodstuffs |
| EPDMbeige | Aramid | | -40 \| +100 | Foodstuffs |
| IIR | Polyamid | | -20 \| +100 | Hot water, acids, bases, gases |
| IIR | Aramid | | -20 \| +100 | Hot water, acids, bases, gases |
| CSM | Polyamid | | -20 \| +100 | Strong acids, bases, chemicals |
| CSM | Aramid | | -20 \| +100 | Strong acids, bases, chemicals |
| NBR | Polyamid | | -30 \| +100 | Oils, petrol, solvents, compressed air |
| NBR | Aramid | | -30 \| +100 | Oils, petrol, solvents, compressed air |
| NBRbeige | Polyamid | | -30 \| +100 | Oil, fatty foods |
| NBRbeige | Aramid | | -30 \| +100 | Oil, fatty foods |
| CR | Polyamid | | -20 \| +90 | Cooling water, slightly oily water, seawater |
| CR | Aramid | | -20 \| +90 | Cooling water, slightly oily water, seawater |
| FPM | Aramid | | -20 \| +180 | Corrosive chemicals, petroleum distillates |
| FPMbeige | Aramid | | -20 \| +180 | Oil, fatty foods |
| NR | Polyamid | | -20 \| +70 | Abrasive materials |
| Silicon | Aramid Glass | | -60 \| +200 | Air, saltwater atmosphere, foodstuffs, medical technology |

PTFE-lining: Firmly embedded against chemical attacks on the interior at the rubber bellows, available starting at ∅ 300 mm. Take the restriction of the listed movement into account (> page 212–217)

## Backing flanges

**Design:** Single-part integral backing flanges with support collar, clearance holes and tie rod holders (tie rod type M)

**Flange norms:** DIN, EN, ANSI, AWWA, BS, JIS, special measurements (> page 298)

**Materials:** Carbon steel, stainless steel

**Coating:** Primed, hot-dip galvanised, special paint

## Accessories

**Protective covers:** Ground protective shield
Protective shield or cover
Fire protective cover (> page 58)

**Flow liners:** Cylindrical flow liner
Conical flow liner
Telescoping flow liner (> page 57)

## Tie rods

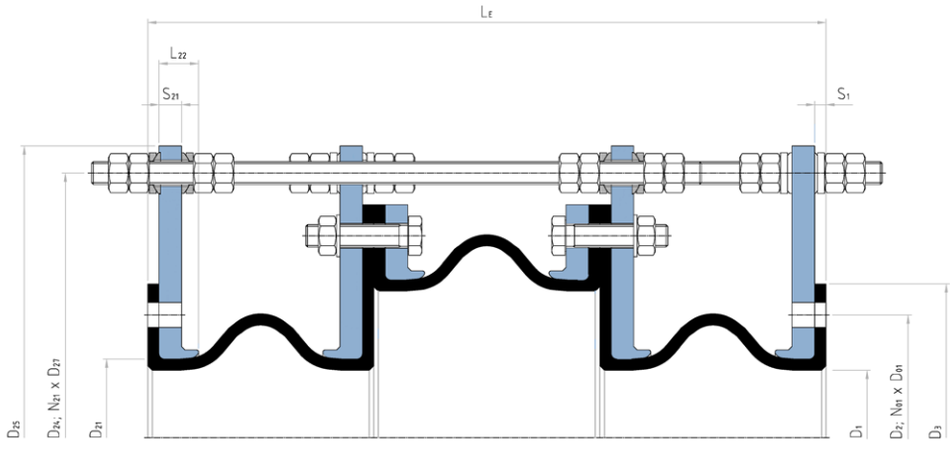
**Design:** Dimensioning according to design pressure (test pressure) based on the Pressure Equipment Directive

**Materials:** Carbon steel
Stainless steel

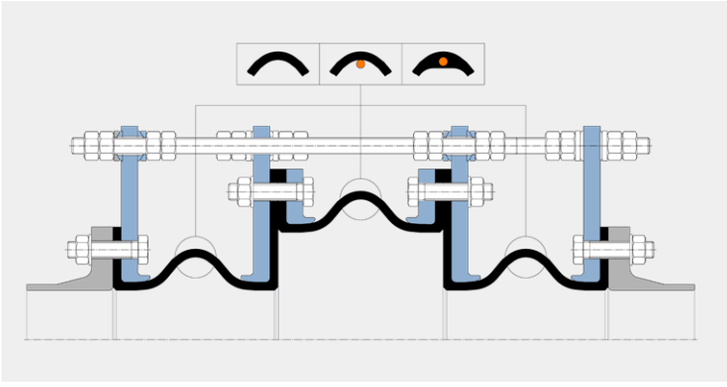
**Coating:** Spherical washers/ball disks: PTFE coated
Tie rods: galvanised, hot-dip galvanised or PTFE-coated

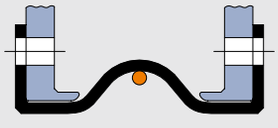
Example: Type U112M IPB

**Cross section U110M IPB**




## Support rings



| TYPE | Support rings | Vacuum ring | Pressure | Movement |
|---|---|---|---|---|
| **U110M IPB** |  | None | Depending on the diameter up to 40 bar, vacuum stability on request | > page 212–213 |
| **U111M IPB** |  | Medium contact, inside the arch apex | Depending on the diameter up to 40 bar, for vacuum up to 0.05 bar absolute | > page 214–215 |
| **U112M IPB** |  | No medium contact, embedded in the arch | Depending on the diameter up to 25 bar, for vacuum up to 0.05 bar absolute | > page 216–217 |

| Materials | | |
|---|---|---|
| Stainless steel | Carbon steel, rubberised | Carbon steel, embedded |

In-line pressure balanced rubber expansion joint of size ⌀ 800 mm