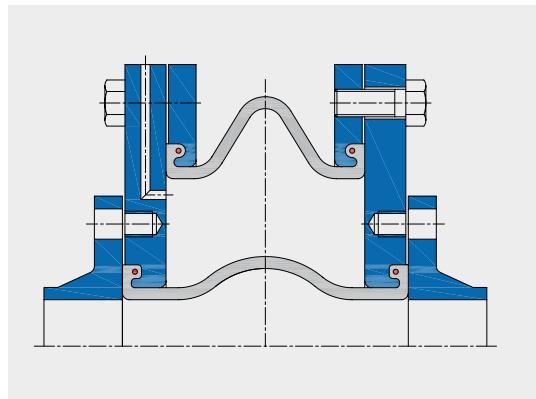


## WILLBRANDT Special Designs

### Safety expansion joint

Safety expansion joints are used wherever highly aggressive media are transported and where human life or production plants are at risk if the expansion joint fails. The safety expansion joint consists of two pressure-resistant expansion joints that must be selected according to the medium. The bellows are mounted together in such a way that a tight gap is created, which can be monitored by a pressure gauge or pressure sensor. This expansion joint can be produced with or without a length limiter and for axial, lateral or angular expansion.

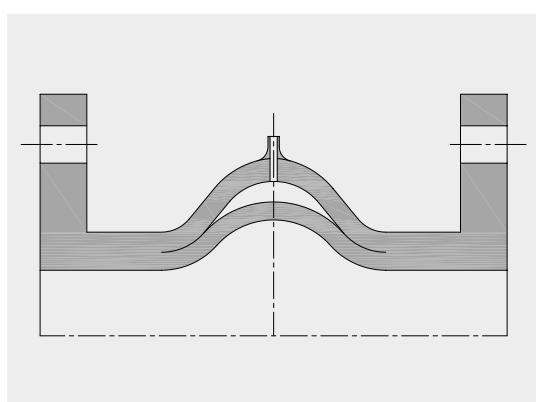
Both expansion joints are designed for the full operating pressure. If the inner expansion joint is damaged, the outer expansion joint cover is still fully operational.



### Safety bellow

Rubber expansion joints with safety bellow are used where highly abrasive or aggressive media are transported and where human life or production plants are at risk if the expansion joint fails.

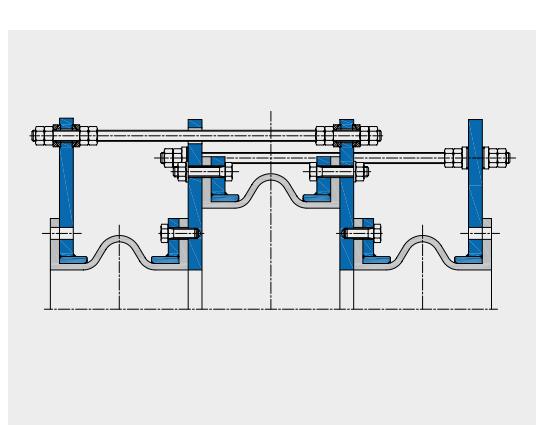
The safety bellow is a rubber bellow with an intermediate separating layer and an outlet sleeve incorporated into the outer layer. This can be fitted with a measuring probe, a pressure gauge or a drain so that a corresponding signal can be given when the inner layer is worn.



### Axial balanced expansion joint

The axially balanced rubber expansion joint is used when axial movement occurs in the pipe system and cannot be absorbed by fixed points, such as on turbine nozzles, pump housings and tank nozzles.

The principle of this expansion joint is to neutralise the reaction forces caused by the two small working expansion joints (DN pipe) in the plus direction by the expansion joint twice the size. This means that only the axial adjustment forces of the expansion joint unit have to be taken into account when loading the nozzle.



### Pressure-balanced expansion joint

This type of expansion joint is always used when axial expansion occurs but high nozzle loads are not permitted, e.g. on turbine nozzles or tank nozzles, which are very sensitive to axial shear forces.

The way the pressure-balanced expansion joint works is that the medium is deflected at a 90° angle between the bellows and an expansion joint with a blind flange absorbs the reaction force of the expansion joint absorbing the movement.

The connecting rod between the two expansion joints is to be regarded as a cardanic cage that absorbs the reaction force. The stiffness rates from axial and lateral movement are still transmitted to the fixed point or connection nozzles.

