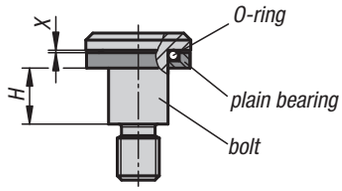
Technical information about floating joint units

The floating joint units are screws for connecting two components while permitting the desired movement of those components in relation to each other.

The floating joint unit consists of three parts. Bolt, plain bearing and O-ring.

The plain bearing compresses the O-ring when the bolt is screwed into the hole. This occurs by max.the dimension X, the plain bearing will now be seated under the bolt head. The travel is accordingly limited. The dimension H increases the more the O-ring is compressed.



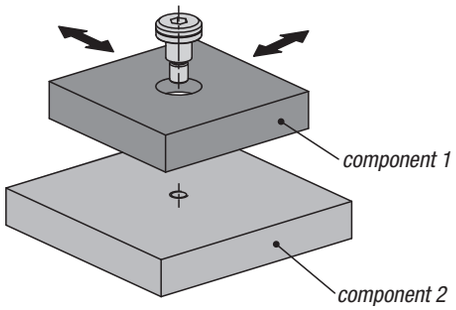
Installing the floating joint unit

Screw the bolt into component 2. Between them lies component 1. It is pressed onto component 2 during assembly with the plain bearing, the O-ring is deformed. The hole in component 1 is larger than the bolt diameter, accordingly component 1 can now be pushed towards component 2 with slight force.

The components can be moved in relation to each other in the direction of the arrows. When only using one floating joint unit, rotation around the bolt axis is also possible.

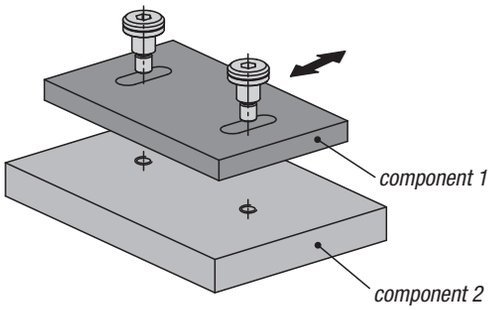
A movement of the components in the screw axis can take place by a maximum of the remaining travel X after assembly.

Component 1 must not be thicker than the screw height H of the bolt, otherwise the plain bearing would be compressed and movement would be very tight.



Compensation in only one direction

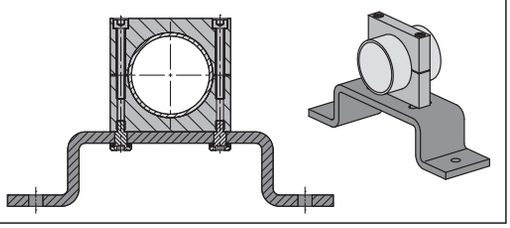
Two floating joint units are required if the compensation is to be made in one direction only. The collar of the floating joint unit has a h9 fit. This means that the direction of movement is predefined.



Mounting example by thermal stresses

A pipe is clamped in a pipe clamp. If the pipe gets warm, it becomes longer, this thermal expansion must be compensated for.

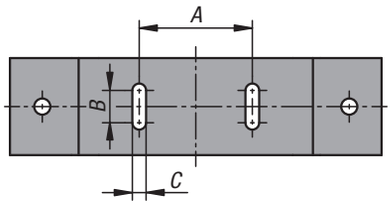
If the pipe clamp is fixed to the sheet metal with floating joint units, it can follow the movement of the pipe without causing thermal stress.



The two slotted holes must be slightly larger than the bolt diameter to compensate for manufacturing tolerances.

Accordingly, the distance between the slotted holes (A) must also be toleranced.

The length of the slotted hole (B) limits the possible movement of the pipe clamp. The width of the slotted hole (C) corresponds to the diameter of the SLIX collar (dimension D1 in the catalogue) plus 0.5 mm to compensate for the manufacturing tolerance of dimension A.



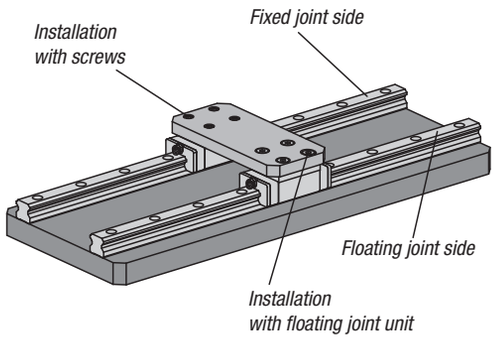
Technical information about floating joint units

Mounting example with machining tolerances

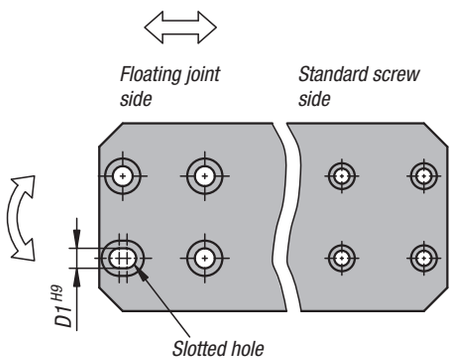
Fixed and floating joint arrangements are necessary in machine construction to prevent static over determination of a system.

Guides must be play-free to ensure the required precision. If 2 guides are mounted in parallel, the distance between the guide rails must be very precise, otherwise they will jam. Manufacturers of recirculating ball guides stipulate a deviation of a few µm from the nominal value. In practice, this precision can only be achieved with a great deal of effort. This high precision is often only required in measuring machines or machine tools. If the deviation is greater, the components deform elastically to accommodate those deviations. The loads on the guides and components are correspondingly higher. This increases wear and shortens the service life.

By using floating joint units, the stresses are reduced, the friction is lower and the service life increases.

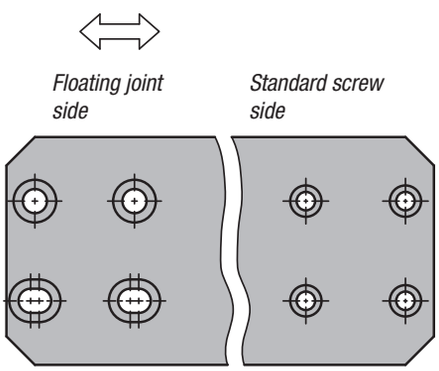


The mounting holes for the above installation example look as follows:



One of the floating joint units is mounted in a slotted hole, the other holes are round and permit movement in 2 directions. The arrows show that pivoting around the slotted hole and movement in one direction is possible on the side where the floating joint units are mounted. With this arrangement, the carriage does not absorb any torque in the direction of the pivot arrow on the floating joint side.

The slotted hole should be as narrow as possible so that movement is limited. This is why it is recommended that the bolt diameter D1 has an H9 tolerance. A wider slotted hole could allow the plates to shift and lead to increased abrasion.



With 2 oblong holes, the torque can be absorbed by the carriage and it is only possible to move in the direction of the arrow.