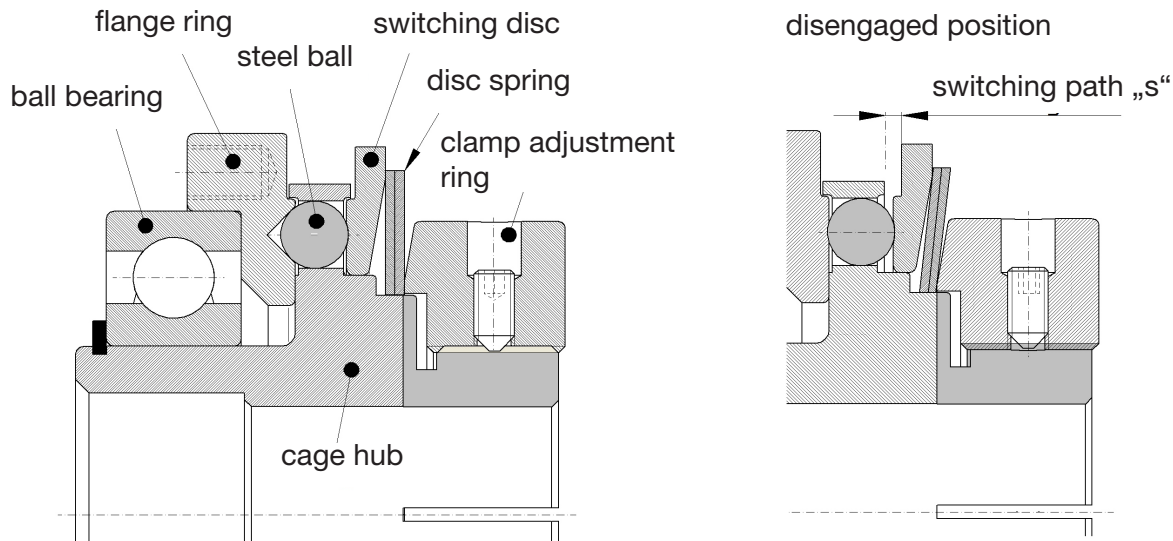


Safety Couplings I Technical Information



The axial stroke of the switching disc is immediately stopped by means of a non-contact or mechanical limit switch (emergency stop) of the drive.

JAKOB safety couplings are designed as predetermined separation points, collision protection or overload limitation in a direct or indirect drive train. The heart of the safety clutch is a high-precision, robust release mechanism with steel balls as a spring-loaded form-fit body. The torque is introduced into the centrally located hub via a non-positive and backlash-free clamp or cone connection. The hub is designed as a ball cage and is used to hold the flange ring, the switching disc with disc spring and the adjusting nut. Special disc springs press the balls into hardened countersinks via a pressure or switching disc bores (calottes) of the flange ring. In normal operation, this means that the drive torque is transmitted backlash-free to the flange ring. A compensating element (metal bellows, elastomer star), a toothed wheel or belt wheel or another connecting part is optionally attached to the flange ring. If the set release torque is exceeded, the flange ring twists relative to the cage hub and the balls are suddenly pushed out of the calottes, interrupting the drive train. The residual torque is a maximum of 10% of the set release torque.

The play-free ball detent mechanism

A backlash-free torque transmission with high torsional rigidity is guaranteed by a specially designed tensioning of the hardened and polished steel balls between the ball cage of the hub and the spherical caps of the flange ring. In reversing operation, the mechanics work equally for both directions of rotation.

The dynamic release behavior

JAKOB safety clutches are characterized by excellent dynamic release behavior. The reason for this is the degressive spring characteristic as well as the

minimized masses (ball and switching disc), which have to be accelerated axially when disengaging. This guarantees that the drive train is interrupted within a few milliseconds in the event of a collision. This results in a very low mass force that has to be added to the spring force. With many other safety clutch types, the dynamic release torque and the switching time can increase significantly due to the large switching masses and linear standard springs. The maximum operating speed should not exceed 4000 rpm (from size 1000Nm - 3000 rpm).

The re-entry – fixed-point switching

The balls or the cage bores and calottes are distributed asymmetrically around the circumference, so that only one angle-synchronous detent position is possible per 360°. The balls ratchet over once per revolution with little residual torque until they come to a standstill. The repetition accuracy of the set release torque is max. $\pm 5\%$. Special versions of the locking mechanism (6x60° or 8x45° locking) are available on request. After the cause of the failure has been rectified, the clutch automatically re-engages in the synchronous position when operated at low speed (< 30 rpm) and is ready for operation.

Sicherheitskupplungen - Drehzahlinformation

In general, when using safety clutches, the operating speed should be a maximum of 4000 rpm - for sizes from 1000 Nm a maximum of 3000 rpm. Rotationally symmetrical hub variants, as well as types with an elastomer coupling attachment, are for high speeds most suitable. Balancing is optionally possible.

Safety Couplings I Technical Information

The degressive spring characteristic

The function of the JAKOB safety couplings is significantly influenced by the disk springs specially developed for this application. Due to the design in the degressive characteristic curve area, the spring force decreases with increasing spring deflection (switching travel), which means that the torque drops immediately when it responds. With usual Spring-loaded overload clutches, on the other hand, increase the spring force and the release torque, e.g. T. significantly. This results in an undefined functional behavior between response and disengagement, as well as a significantly higher residual torque.

Mechanics with backstop

An additional freewheel, which serves as a backstop, prevents disengagement in the opposite direction. Irrespective of the set release torque, this ensures permanent forced driving with the nominal torque. (Upon request)

The unlock mechanic

In applications with high operating speeds (test benches) or long run-on times (immediate stop not possible), it may be necessary to supplement the locking mechanism with a release mechanism. For this purpose, JAKOB has several proven functional variants available, which prevent it from re-engaging until it comes to a standstill.

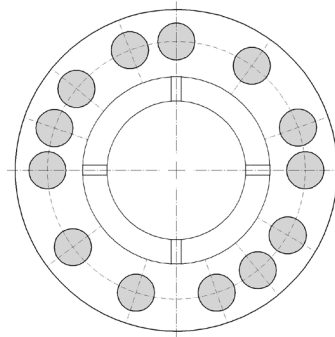
The Labyrinth Seal

In the SKB and SKW series, the locking mechanism is protected by a labyrinth seal against the ingress of coarse dirt particles or heavy leaching of the lubricant. If required, a complete encapsulation of the release mechanism is also possible (on request).

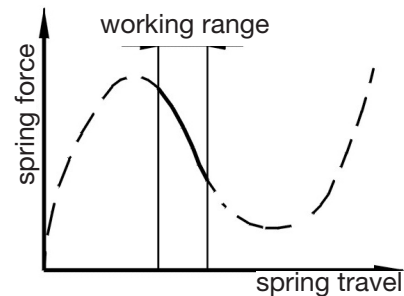
corrosion protection

Most of the series are optionally available in a corrosion-protected material version. A special surface coating of the steel components ensures excellent rust resistance - ball bearings, locking balls, etc. are made of stainless steel and the disc springs are nickel-plated. Safety couplings made entirely of stainless steel, e.g. for the food industry, can also be offered on request.

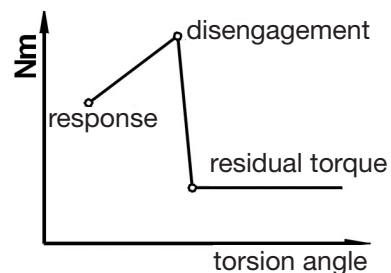
Fixed point switching - asymmetric ball position



Spring characteristics



Regular form-fit coupling



JAKOB Safety coupling

