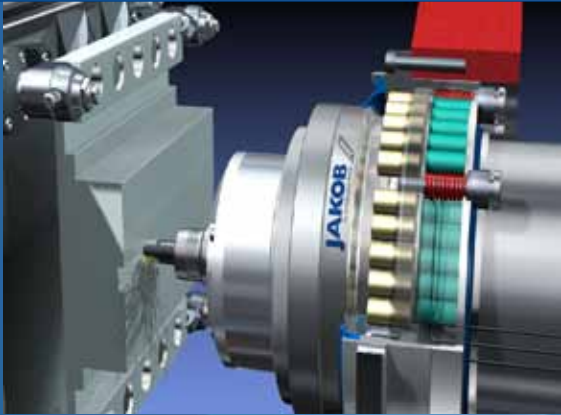


Motor-Spindle Safety System MS³



GAM

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Collision Protection

The Problem

In machine tool crashes, tool collisions with high feed rates cause high impact force peak values on motor spindles. As a result, spindle damage is common and the cost to repair and or replace a spindle as well as loss productivity and downtime can run into the tens of thousands of dollars.

The Solution

The newly developed patented motor spindle safety system from Jakob will immediately disconnect the power transmission at the interface between the machine tool headstock and the motor spindle during a machine collision. Therefore, the shock sensitive components from the motor spindle are protected from the peak impact forces of the collision.



The Results

The motor spindle safety system will protect components such as spindle bearings, shafts, clamping systems, transmitter, and rotary feed when a collision occurs.

The Design Principle

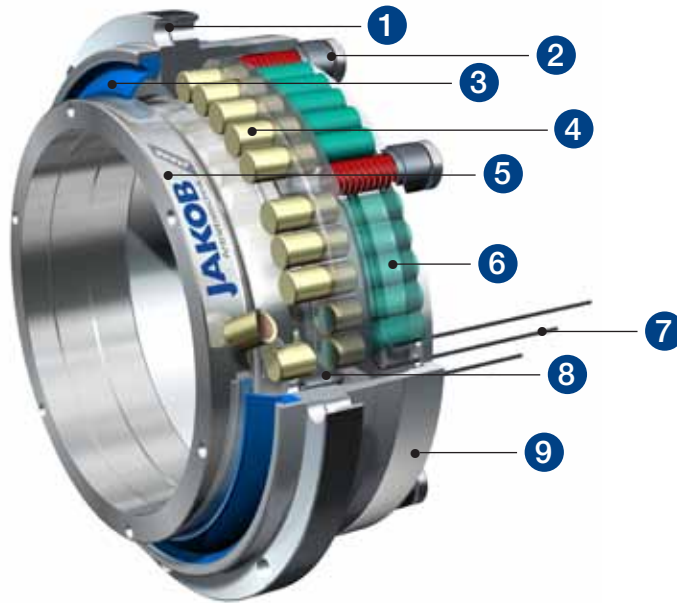
A twin mounted flange system incorporates precision integrated magnets for high retention forces and ultra stiffness. The spring and damper elements combine the advantages of automatic resetting and shock absorption of the motor spindle.

Advantages

- + Available for all motor spindle designs and dimensions
- + Maintenance free
- + No external power sources required
- + High stiffness and holding forces
- + High position accuracy
- + Integrated sensor for position control
- + Shock Absorption through dampening element
- + Automatic re-engagement

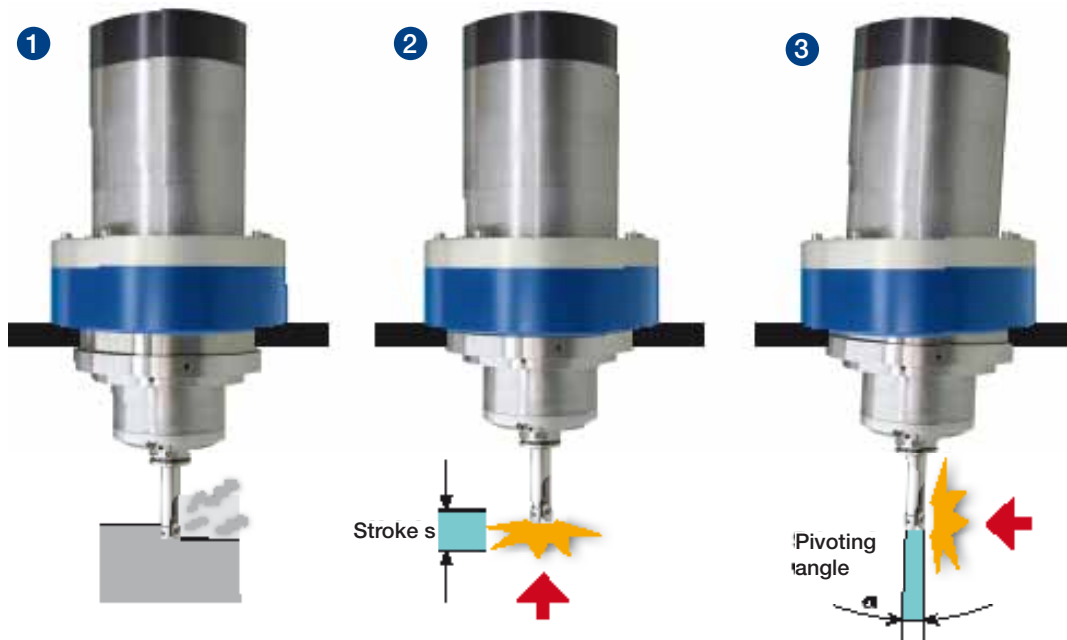
Motor-Spindle Safety System Design

- 1 Machine tool flange
- 2 Spring element
- 3 Protection sealing
- 4 Magnet system
- 5 Spindle flange
- 6 Damper pad
- 7 Sensor cable
- 8 Position pin
- 9 Protection cover



Mounting Example

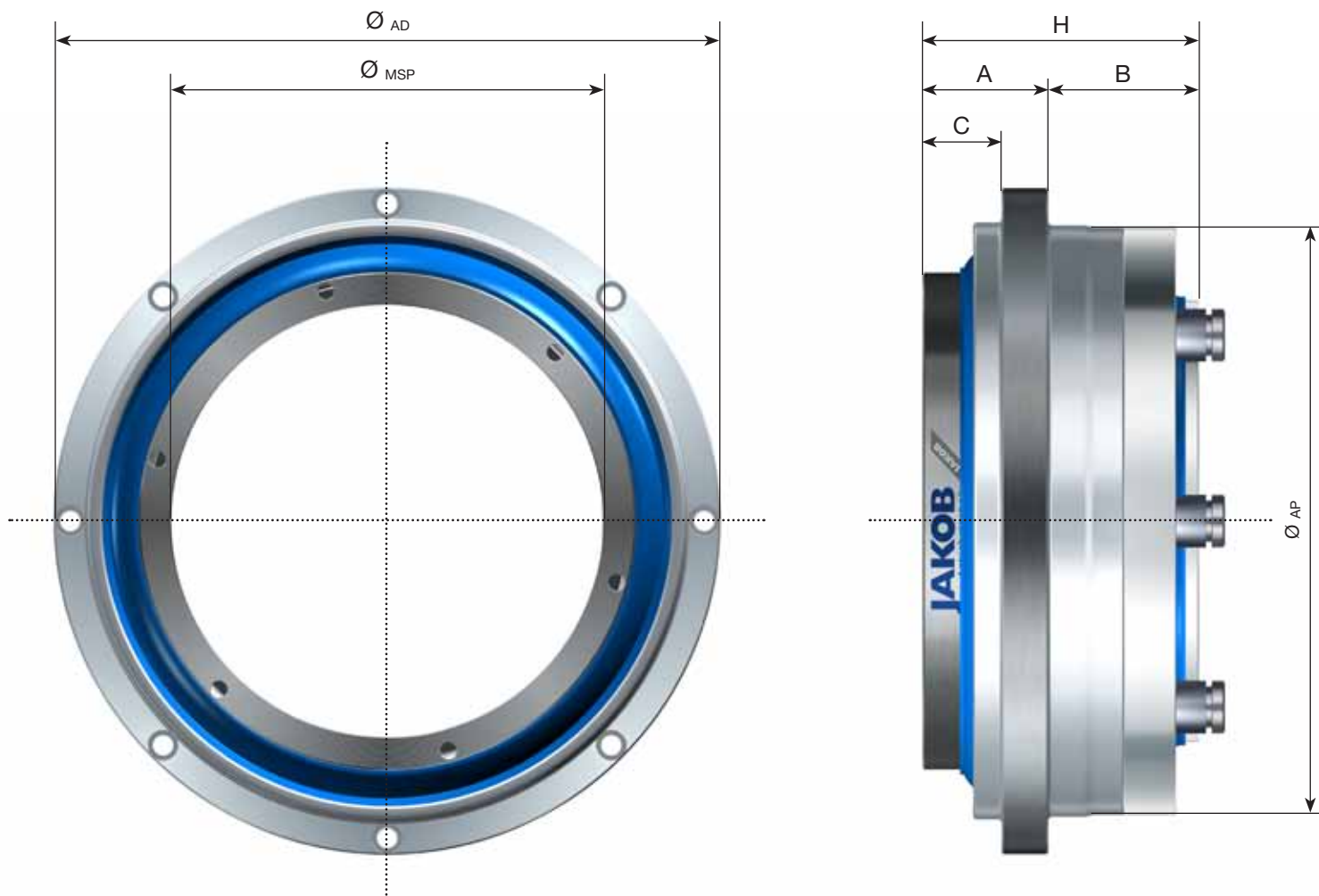
Steps in Axial and Angular Movement



- 1 Milled machining: Safety System remains in zero position.
- 2 Axial tool collision: Safety System disengages at stroke s .
- 3 Radial tool collision: Safety System swivels out at angle α .



Motor-Spindle Safety System MS³



Technical Data

Parameter	Symbol	Unit	Dimensions	
Interface	HSK/SK	[-]	63/40	100
Spindle adjustment	\varnothing_{MSP}	[mm]	230	280
Matching headstock	\varnothing_{AP}	[mm]	315	370
Flange diameter	\varnothing_{AD}	[mm]	335	400
Length A	A	[mm]	66	66
Length B	B	[mm]	68	68
Length C	C	[mm]	43	43
Height	H	[mm]	135	135
Cross-axial force	F_{GA}	[kN]	12 - 17	16 - 20
Torque limit	M_G	[kNm]	1,6 - 1,8	2,4 - 2,6
System weight	m	[kg]	22	25 - 30
Swing angle	α	[°]	4	4
Hub	h	[mm]	20	20