

TOOL CLAMPING

Components and complete systems



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About us

BERG Spanntechnik combines tradition and innovation with German quality engineering and great passion for technology. Our clamping systems are popular with suppliers and users in machine and plant engineering and with small niche companies all over the world.

We dedicate our development expertise to our customers. Decades of experience in implementing application-specific clamping technology and a team that is always ready to face technological challenges with creativity and a solution-minded approach are our keys to success in implementing customised clamping designs.

Top-quality clamping systems made in Germany

At the heart of the German region of East-Westphalia we produce modular clamping systems for cutting and forming processes in production facilities with an area of over 5,000 m². Our product range covers a total of four application areas: from tool and workpiece clamping through forming technology to clamping devices for special applications.

As a modern, medium-sized company we value a healthy mix of a down-to-earth attitude with a progress mindset. Motivation, reliability and mutual trust are the foundations of our company culture – both within our company and in the relationships with our customers and partners.

Customised product solutions

Our development is application-oriented and future-proof, we work closely with our customers and keep an eye on all the important trends. We view our-

selves as a development partner for our customers and support them in their projects from the first idea to the installation-ready product.

Our engineers modify existing standards or remain in close contact with customers to design completely new product solutions – always with the aim of providing clamping technology that is perfectly adapted to our customers' individual requirements.

For 100 years, these principles have allowed us to create precision products with the aim of offering our customers powerful clamping systems for their own quality products – or in a nutshell: Quality clamps quality.

Customer-specific product engineering:

- Requirement specification
- Design development
- Prototype presentation
- Serial production



Applications for our clamping technology

The right clamping system
for every application:



Tool clamping



Special application



Forming technology



Workpiece clamping



Tool clamping | From a gripper to a complete tool clamping system – our expertise is dedicated to clamping technology for various tool clamping units, in particular for use in machining spindles. Thanks to the wide variety of available system components, we can easily adapt our products to the specific customer and application requirements.



Special application | Our clamping systems for automatic change of pallets, devices and machining units are characterised by powerful, secure clamping. These products meet the demand for high system rigidity combined with maximum safety as a prerequisite for consistent workpiece quality.



Forming technology | Strong, powerful and durable: Our extensive product range includes clamping systems and couplings for the main applications in forming machines. This contains stationary and self-travelling systems for clamping top and bottom dies as well as clamping equipment for moving bolsters and workpiece transfer.



Workpiece clamping | Years of experience have made us an expert in the field of clamping technology for lathes. Our range of power chucks, associated actuation systems and a large selection of accessories ensure that we can offer high-performance products for application-flexible and set-up-saving workpiece clamping.

Tailor-made, economically efficient clamping systems for a long, productive life



East-Westphalian patience for finding the best product solution for any clamping task



Bundled competence of development, design, production and quality assurance in one location



Decades of industry and product expertise



Expertise in grippers

The right connection between a tool and the machine is the foundation for an ideal machining result. Our range of grippers includes adaptable standard products, which provide the tool with the required stability during machining. On top of that, our grippers are designed for multiple interfaces and universal applications.

As an expert in clamping technology for cutting-based machining processes, we are dedicated to reliable and production-oriented product solutions in tool clamping.

A lot has happened since the development of the first gripper for a steep taper tool in 1980: Thousands of grippers delivered around the globe have made us a respected partner in the machine tool industry.

Technology moves us

Market and customer demands are constantly changing and our enthusiasm for thinking outside of the box and developing new ideas has been the engine of the steady re-development and further development of our products from the very start.

The most important milestones in gripper development include grippers for use in universal spindles, grippers with a built-in holding function for a quick tool change and force-amplifying grippers for designing compact tool clamping systems.

For our customers we move technology

Therefore, we can offer a wide range of grippers, which continue to set standards for user friendliness, productivity

and size and provide the best prerequisites for customised adaptation.

Milestones:

2018	SK grippers for the interfaces ISO 10 and ISO 20
2017	HSK gripper with force amplifier for interface size < HSK-E20
2013	HSK gripper with force amplifier in compact design
2011	Manually-actuated PSC gripper
2009	SK gripper with force amplifier in compact design
2006	PSC gripper with force amplifier
2005	SK gripper with force amplifier
2002	PSC gripper with holding function
2001	SK gripper for spindles with simple through hole
2000	HSK gripper with force amplifier and optional holding function 2.0
1998	SK gripper with holding function
1997	HSK gripper with direct force transmission (clamping force > standard)
1993	HSK gripper with force amplifier
1984	SK gripper for uniformly designed inner spindle contours
1980	First gripper for the SK interface



100 %
function check



Maintenance-free
products



High component
availability



Customised
product adaptation

SK grippers

**Established, economically efficient
design in any version**

Despite the development and distribution of hollow taper shanks and polygonal taper shanks, the steep taper remains a frequently used tool interface. Its advantages are, above all, its excellent value for money and the already available machinery and tool

inventories. The steep taper continues to be used for cutting-based machining processes – from fine machining to heavy-duty cutting – by many users. This tool holder has proven its worth in practical use for decades and continues to be the most economical solu-

SK gripper in standard version with high force amplification factor, especially suitable for compact or modular machining spindles (type SSKV) ↓



tion for many applications today. No matter the size of the steep taper, the pull studs and the machining process, our SK gripper range includes a suitable connection between tools and machine for any application. Our SK grippers are primarily characterised by their high

clamping force or clamping force transmission, which permits compensation for deficits in speed and rigidity caused by the taper shape within the technical limits. The products can also be used for steep taper systems with face contact (BIG-PLUS®).

Special gripper with short stroke and integrated coolant lubricant transfer system, designed for high-speed spindles (type SSKES-KH) ↓



Force-amplifying grippers in standard design for steep taper size SK 60 and steep taper size SK 30 (type SSKV) ↙

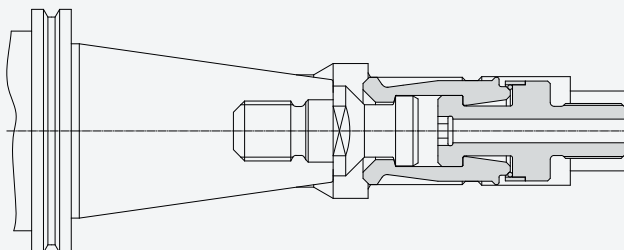
left: Gripper for inner spindle contour with simple through hole, incl. locking screw for infinitely variable adjustment and fixation in place (type SSKFI), **right:** Reliable standard gripper for inner spindle contour with control edge (type SSKE) ↓



Grippers for steep taper tools

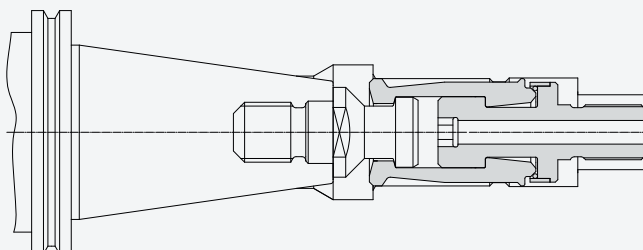
DIN ISO 7388-1 (DIN 69871) and MAS 403 BT

Standard SK gripper (SSK)



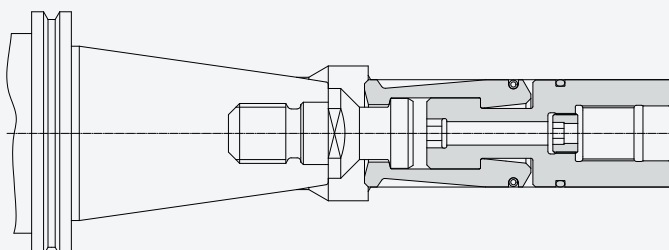
BERG gripper	DIN	ANSI	Pull studs		JIS	JBS	Developed for uniformly designed spindle	Opening of segments	Adjustment/ Fixation in place	Characteristics	Page
SSK	•	•	•	•				Control edge	Adjustment ring	Standard gripper	20 – 21
SSKE	•	•	•	•	•		•	Control edge	Adjusting washer	Standard gripper	22 – 23

SK gripper with short stroke (SSKE-KH)



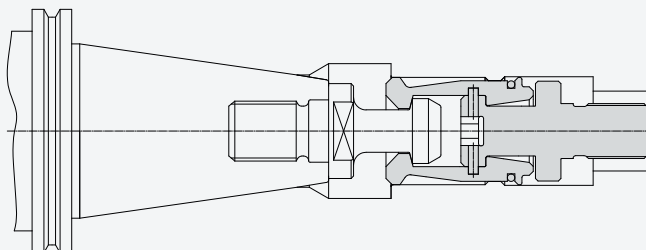
BERG gripper	DIN	ANSI	Pull studs		JIS	JBS	Developed for uniformly designed spindle	Opening of segments	Adjustment/ Fixation in place	Characteristics	Page
SSKE-KH	•	•	•	•			•	Control edge	Adjusting washer	Short axial stroke	24 – 25

SK gripper for spindle with simple through hole (SSKFI)



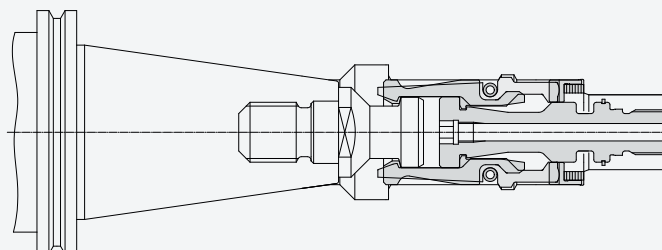
BERG gripper	DIN	ANSI	Pull studs		JIS	JBS	Developed for uniformly designed spindle	Opening of segments	Adjustment/ Fixation in place	Characteristics	Page
SSKF	•	•	•	•	•		•	Tension spring	Adjusting washer	Simple spindle bore	26 – 27
SSKFI	•	•	•	•			•	Tension spring	Locking screw	Simple spindle bore	28 – 29

SK gripper in high-speed version (SSK ... JBS)



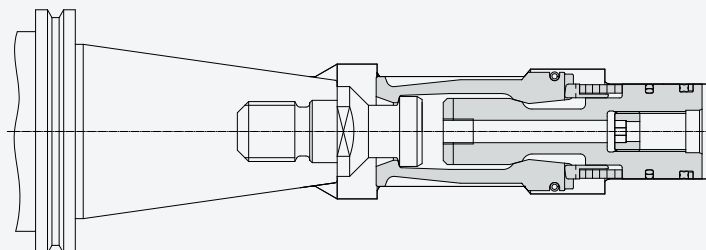
BERG gripper	DIN	ANSI	Pull studs		JIS	JBS	Developed for uniformly designed spindle	Opening of segments	Adjustment/ Fixation in place	Characteristics	Page
SSK ... JBS						•		Control edge	Adjusting washer	Guided clamping segments	31
SSKES	•	•	•	•	•		•	Control edge	Adjusting washer	Guided clamping segments	On request
SSKS	•	•	•	•				Control edge	Adjustment ring	Guided clamping segments	On request

SK gripper with holding function (SKR)



BERG gripper	DIN	ANSI	Pull studs		JIS	JBS	Developed for uniformly designed spindle	Opening of segments	Adjustment/ Fixation in place	Characteristics	Page
SKR	•	•					•	Control edge	Adjusting washer	Holding function	30

Force-amplifying SK gripper (SSKV)



BERG gripper	DIN	ANSI	Pull studs		JIS	JBS	Developed for uniformly designed spindle	Opening of segments	Adjustment/ Fixation in place	Characteristics	Page
SSKV	•	•	•	•			•	Tension spring	Locking screw	Force amplification	14 – 17

SSKV

Force-amplifying SK gripper



Gripper with special length and corresponding profile bush with measured clamping shoulder, designed as spindle insert [↑](#)



Grippers for steep taper size SK 50 in different overall lengths [↑](#)



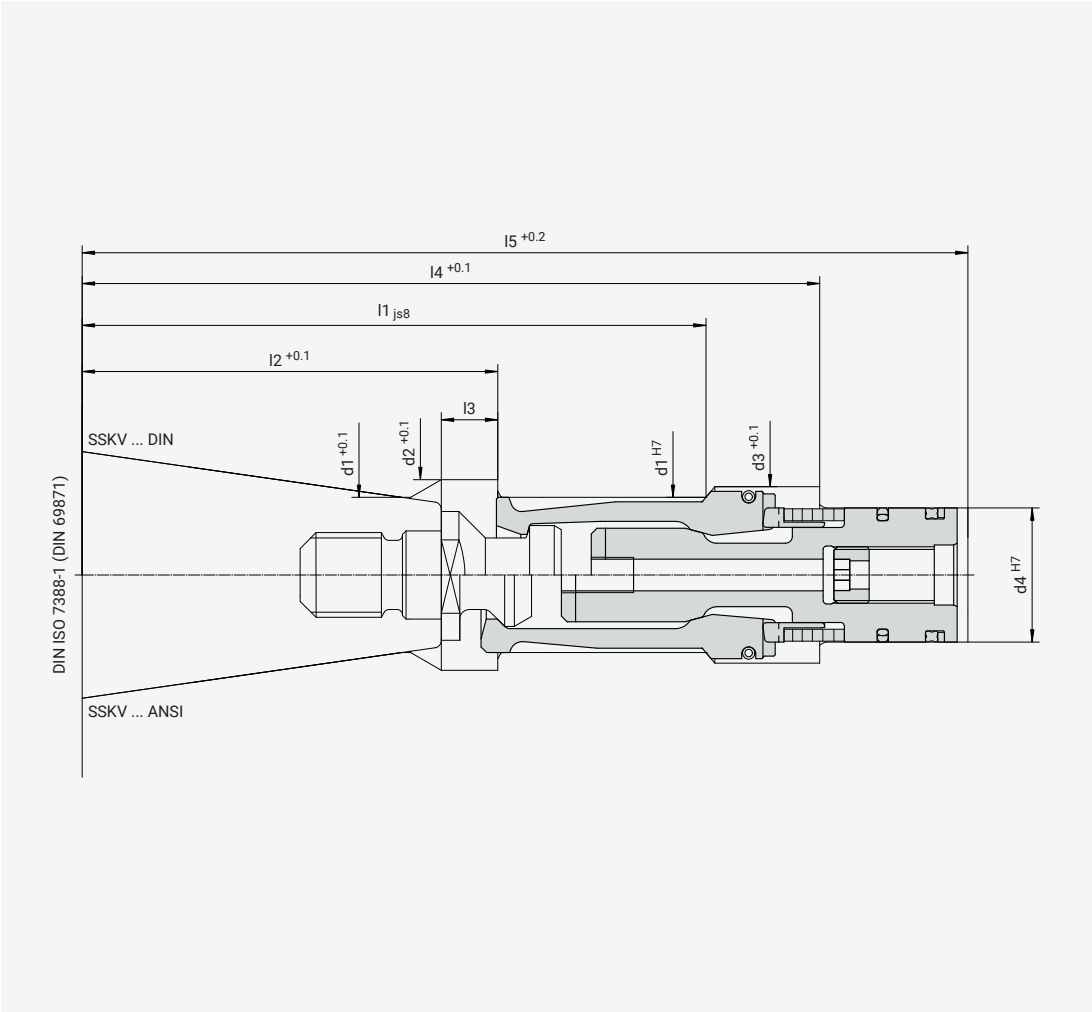
SK 60 gripper for reaching maximum clamping forces, in special design with integrated coolant transfer system [↑](#)



- APPLICATION** SSKV grippers combine reliable clamping of steep taper tools with the market demand for compact, modular spindles. The interface between clamping element and tool is formed by standardised pull studs in accordance with DIN, ANSI, MAS, JIS and ISO. The integrated force amplification allows reducing the size of the overall tool clamping unit so that high clamping forces are guaranteed even in compact motor and gear-driven spindles. Reduced actuation forces also permit use in modular spindles.
- FUNCTION** During clamping (pull direction), the clamping segments are pulled outward behind the clamping shoulders in the spindle shaft. The taper incline of the centrally located draw bolt increases the actuation force, achieving a clamping force that is many times higher. Moreover, a locking screw permits infinitely variable adjustment and fixation of the gripper in the eject position.
- TECHNICAL FEATURES**
- Laid out for uniformly designed inner spindle contours in connection with pull studs in accordance with DIN, ANSI, MAS, JIS and ISO
 - Maximum clamping force consistency thanks to special surface coating (no relubrication required)
 - Low actuation forces thanks to high force-amplifying factor
 - Easy installation and removal
- VARIANTS**
- In short version for even more compact tool clamping systems, e. g. in milling heads
 - With coolant transfer system
 - As repair gripper if the inner spindle contour requires reworking
 - With customer-specific geometries for special pull studs
- ACCESSORIES**
- Clamping force measuring systems
 - Clamping shoulder measuring systems
 - Profile bushes with measured clamping shoulder as spindle insert
 - Pull studs

SSKV
Force-amplifying SK gripper

APPLICATION
PROPOSAL

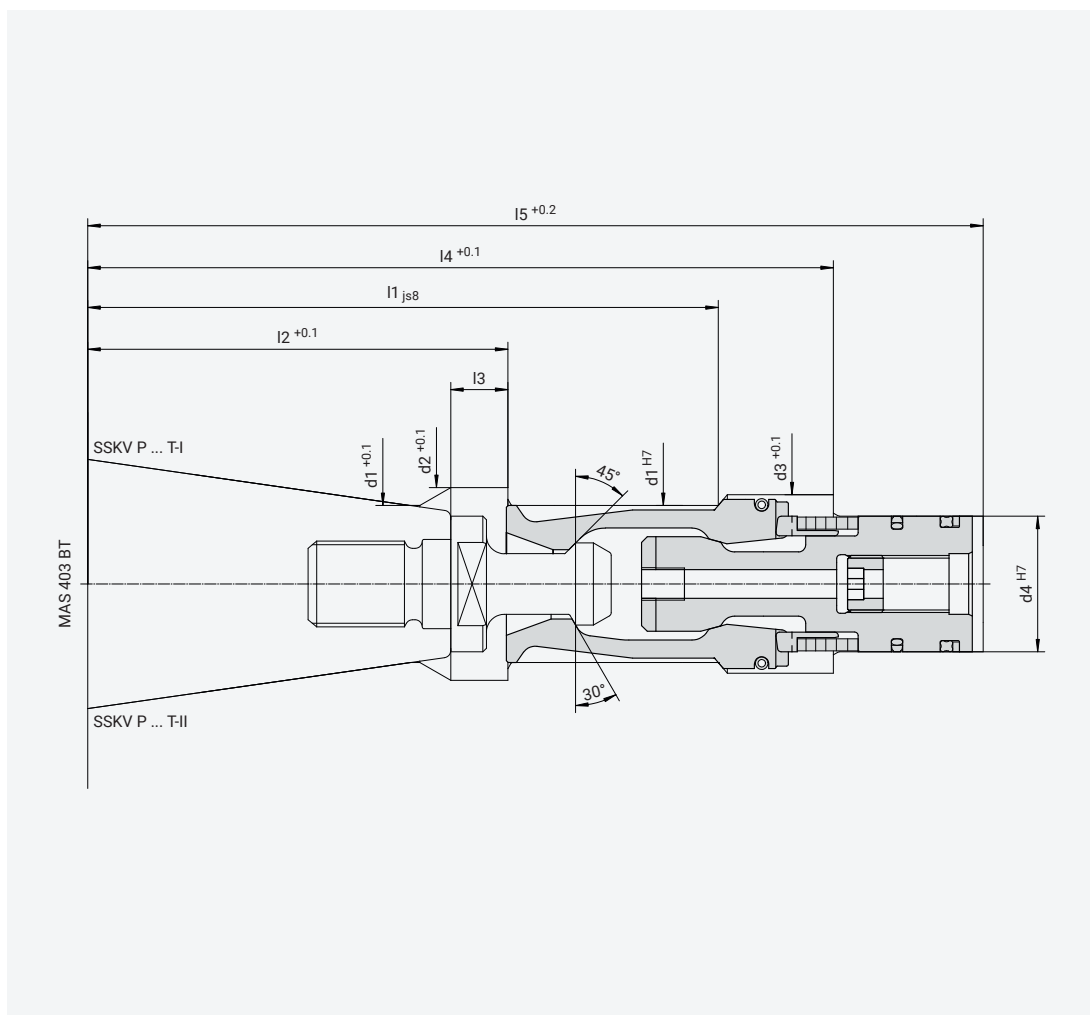


TECHNICAL
DATA

Type	d1	d2	d3	d4	l1	l2	l3	l4	l5	h _A	h _T	h _S	F _B max.	F _S max.
SSKV 30 DIN	20	25	23.5	19.5	81.8	55.4	7.9	94.4	121.3	0.5	7	5	3.3	10
SSKV 30 ANSI	20	25	23.5	19.5	81.8	55.4	7.9	94.4	121.3	0.5	7	5	3.3	10
SSKV 40 DIN	29	36	34	28	115	78.4	10	143	175	0.5	9	6	5	18
SSKV 40 ANSI	29	36	34	28	115	78.4	10	143	175	0.5	9	6	5	18
SSKV 50 DIN	44	54	50	38	176.75	117.75	16	209	251	0.5	12	9	9	35
SSKV 50 ANSI	44	54	50	38	176.75	117.75	16	209	251	0.5	12	9	9	35
SSKV 60 DIN	58	70	66.5	52	240	183	14	272.5	323.5	0.5	16	11	20	70
SSKV 60 ANSI	58	70	66.5	52	240	183	14	272.5	323.5	0.5	16	11	20	70

ABBREVIATIONS	d	Diameter (mm)	l	Length (mm)	h _A	Ejection stroke (mm)
	h _T	Total stroke (mm)	h _S	Clamping stroke (mm)	F _B	Actuation force (kN)
	F _S	Clamping force (kN)				

APPLICATION PROPOSAL



TECHNICAL DATA

Type	d1	d2	d3	d4	l1	l2	l3	l4	l5	h _A	h _T	h _S	F _B max.	F _S max.
SSKV P 30 T-I	20	25	23.5	19.5	81.8	55.4	7.9	94.4	121.3	0.5	7	5	3.3	10
SSKV P 30 T-II	20	25	23.5	19.5	81.8	55.4	7.9	94.4	121.3	0.5	7	5	3.3	10
SSKV P 40 T-I	29	36	34	28	115	78.4	10	143	175	0.5	9	6	5	18
SSKV P 40 T-II	29	36	34	28	115	78.4	10	143	175	0.5	9	6	5	18
SSKV P 50 T-I	44	54	50	38	176.75	117.5	16	209	251	0.5	12	9	9	35
SSKV P 50 T-II	44	54	50	38	176.75	117.5	16	209	251	0.5	12	9	9	35

ABBREVIATIONS

d Diameter (mm)
h_T Total stroke (mm)
F_S Clamping force (kN)

l Length (mm)
h_S Clamping stroke (mm)

h_A Ejection stroke (mm)
F_B Actuation force (kN)

SSK · SSKE · SSKE-KH · SSKF · SSKFI · SKR · SSK...JBS

SK grippers with direct force transmission



Grippers for tool holders ISO 10 and ISO 20 with guided segments for high-speed machining spindles and with short clamping strokes enabling long-lived spring stacks (type SSKFI ... ISO) [↑](#)



Standard gripper with holding function for quick tool change (type SKR) [↑](#)



Grippers for interfaces SK 60 and SK 10 (type SSK ... DIN and SSK ... JBS) [↑](#)



APPLICATION

SK grippers ensure ideal force distribution during clamping of steep taper tools in accordance with DIN ISO 7388-1 (DIN 69871) and MAS 403 BT. Grippers of this type are mainly used in milling, boring and grinding spindles, where they contribute significantly to quick automatic tool changes. They can be assembled without special tools.

The universal shape permits use of different grippers in a uniformly designed spindle, meaning tool shanks of the same steep taper size can be clamped with pull studs of different standards.¹⁾

FUNCTION

During clamping (pull direction), the clamping segments grab behind the head of the pull stud by closing as they pull into the spindle hole. The clamping force is transmitted form-closed from the draw bolt to the pull stud. Depending on the gripper type, the segments unclamp in the release position using either a control edge in the inner spindle contour or a tension spring integrated in the gripper.

TECHNICAL FEATURES

- Maximum clamping force consistency
- Maintenance-free
- Easy installation and removal
- Laid-out for uniformly designed inner spindle contour in combination with pull studs in accordance with DIN, ANSI, MAS, JIS and ISO¹⁾

VARIANTS

- With coolant transfer tube
- Stainless steel version
- With customer-specific geometries for special pull studs

ACCESSORIES

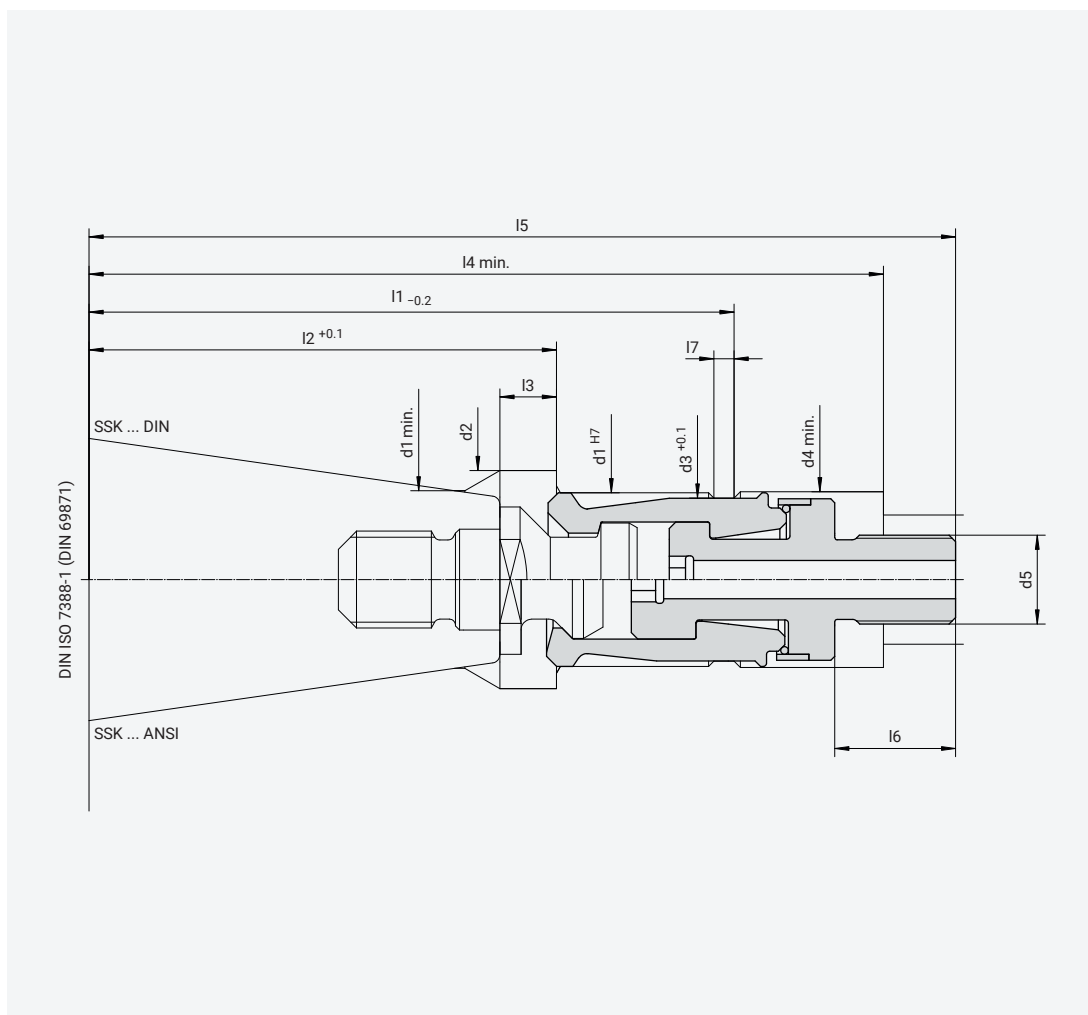
- Clamping force measuring systems
- Profile bushes with control edge
- Pull studs

¹⁾ Does not apply to gripper type SSK

SSK

SK gripper for spindle with control edge

APPLICATION PROPOSAL



TECHNICAL DATA

Type	d1	d2	d3	d4	d5	l1	l2	l3	l4	l5	l6	l7	h _A	h _S	F _S max.
SSK 30/1 DIN	19	24	17.8	20.2	M10	84.8	55.3	7.5	97.8	114.8	20	3.5	0.5	4	10
SSK 30/1 ANSI	19	24	17.8	20.2	M10	84.8	55.3	7.5	97.8	114.8	20	3.5	0.5	3	10
SSK 40 DIN	28	35	26.4	28.5	M16 x 1.5	111.9	77.4	9	144.4	155.4	22	4.5	0.5	5.5	18
SSK 40 ANSI	28	35	26.4	28.5	M16 x 1.5	111.9	77.4	9	144.4	155.4	22	4.5	0.5	4.5	18
SSK 45 DIN	36	45	33.7	36.5	M18 x 1.5	132.7	94.7	12	166.7	187.7	30	4.5	0.5	7.5	25
SSK 45 ANSI	36	45	33.7	36.5	M18 x 1.5	132.7	94.7	12	166.7	187.7	30	4.5	0.5	6.5	25
SSK 50 DIN	43	54	40.4	43.5	M22 x 1.5	159.75	115.75	14	196.75	218.75	30	5	0.5	8.5	35
SSK 50 ANSI	43	54	40.4	43.5	M22 x 1.5	159.75	115.75	14	196.75	218.75	30	5	0.5	7.5	35
SSK 60/1 DIN	62	74	58.6	62.5	M30 x 1.5	234.4	179.9	18	276.9	306.9	35	6.5	0.5	11	70
SSK 60/1 ANSI	62	74	58.6	62.5	M30 x 1.5	234.4	179.9	18	276.9	306.9	35	6.5	0.5	10.5	70

ABBREVIATIONS

d Diameter (mm)

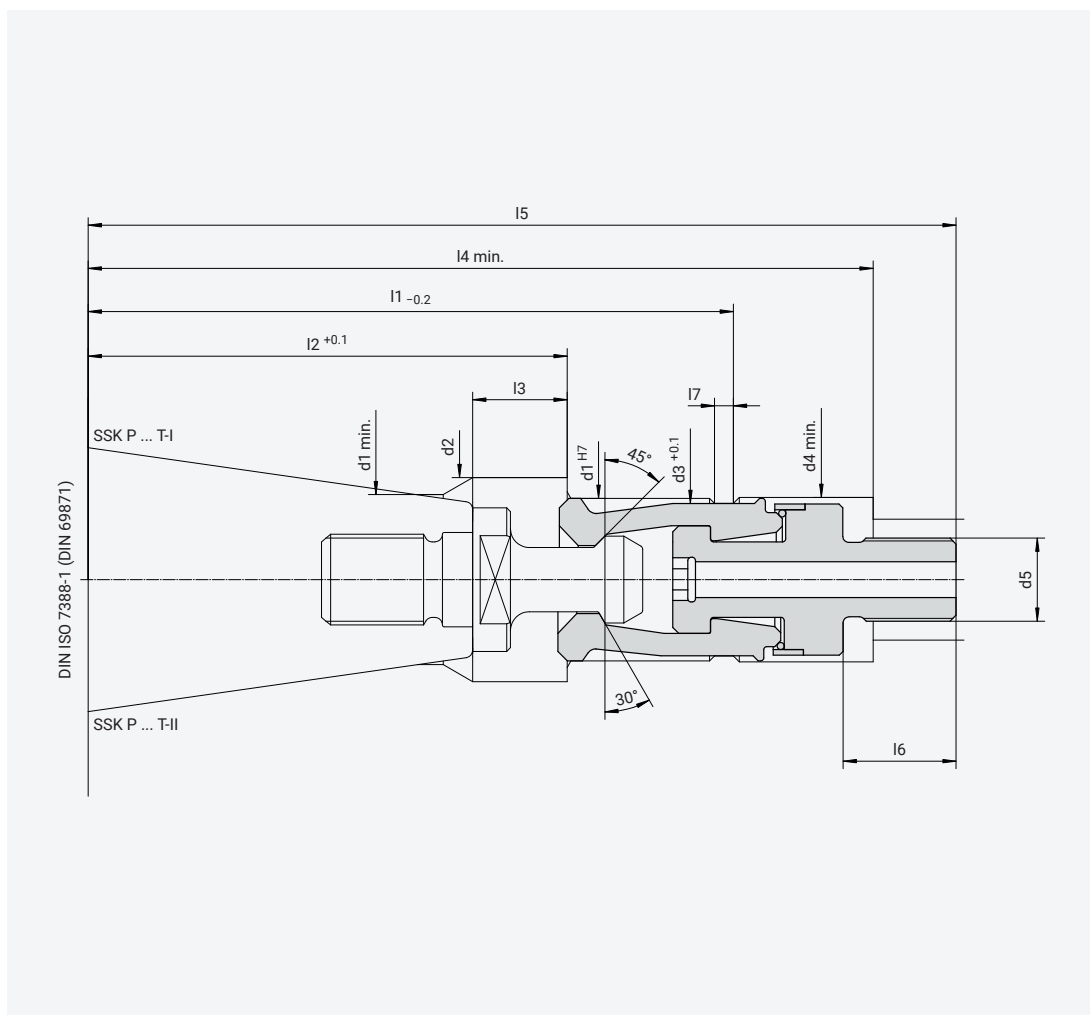
l Length (mm)

h_A Ejection stroke (mm)

h_S Clamping stroke (mm)

F_S Clamping force (kN)

APPLICATION PROPOSAL



TECHNICAL DATA

Type	d1	d2	d3	d4	d5	l1	l2	l3	l4	l5	l6	l7	h _A	h _S	F _S max.
SSK P 40 T-I	28	35	26.4	28.5	M16 x 1.5	120.9	86.4	18	154.4	164.4	22	4.5	0.5	5.5	18
SSK P 40 T-II	28	35	26.4	28.5	M16 x 1.5	120.9	86.4	18	154.4	164.4	22	4.5	0.5	5.5	18
SSK P 45 T-I	36	45	33.7	36.5	M18 x 1.5	142.7	104.7	22	176.7	197.7	30	4.5	0.5	7.5	25
SSK P 45 T-II	36	45	33.7	36.5	M18 x 1.5	142.7	104.7	22	176.7	197.7	30	4.5	0.5	7.5	25
SSK P 50 T-I ¹⁾	43	54	40.4	43.5	M22 x 1.5	170.75	126.75	25	207.75	229.75	30	5	0.5	8.5	35
SSK P 50 T-II ¹⁾	43	54	40.4	43.5	M22 x 1.5	170.75	126.75	25	207.75	229.75	30	5	0.5	8.5	35
SSK P 60 T-I	58	70	54.6	58.5	M26 x 1.5	259.4	202.4	40.5	299.9	329.9	35	6.5	0.5	11	50
SSK P 60 T-II	58	70	54.6	58.5	M26 x 1.5	259.4	202.4	40.5	299.9	329.9	35	6.5	0.5	11	50

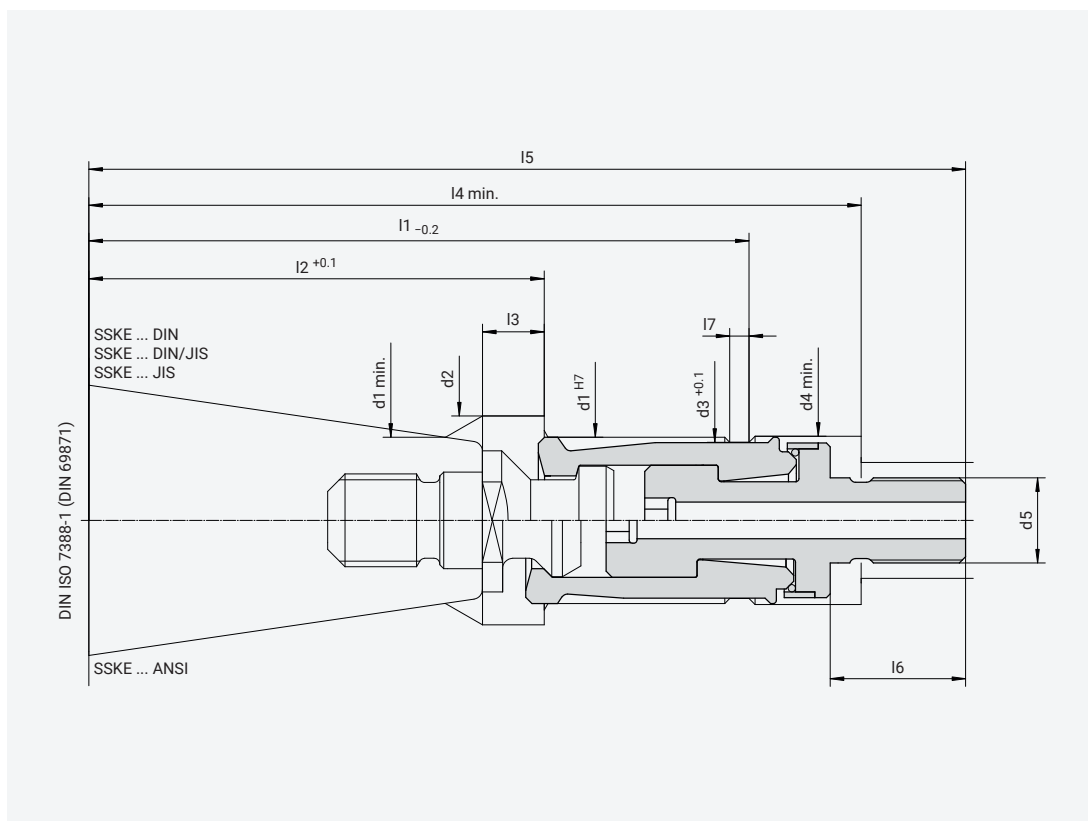
¹⁾ Also for tool shafts according to MAS 403 BT

ABBREVIATIONS d Diameter (mm) l Length (mm) h_A Ejection stroke (mm) h_S Clamping stroke (mm)
F_S Clamping force (kN)

SSKE

SK gripper for uniformly designed spindle with control edge

APPLICATION PROPOSAL

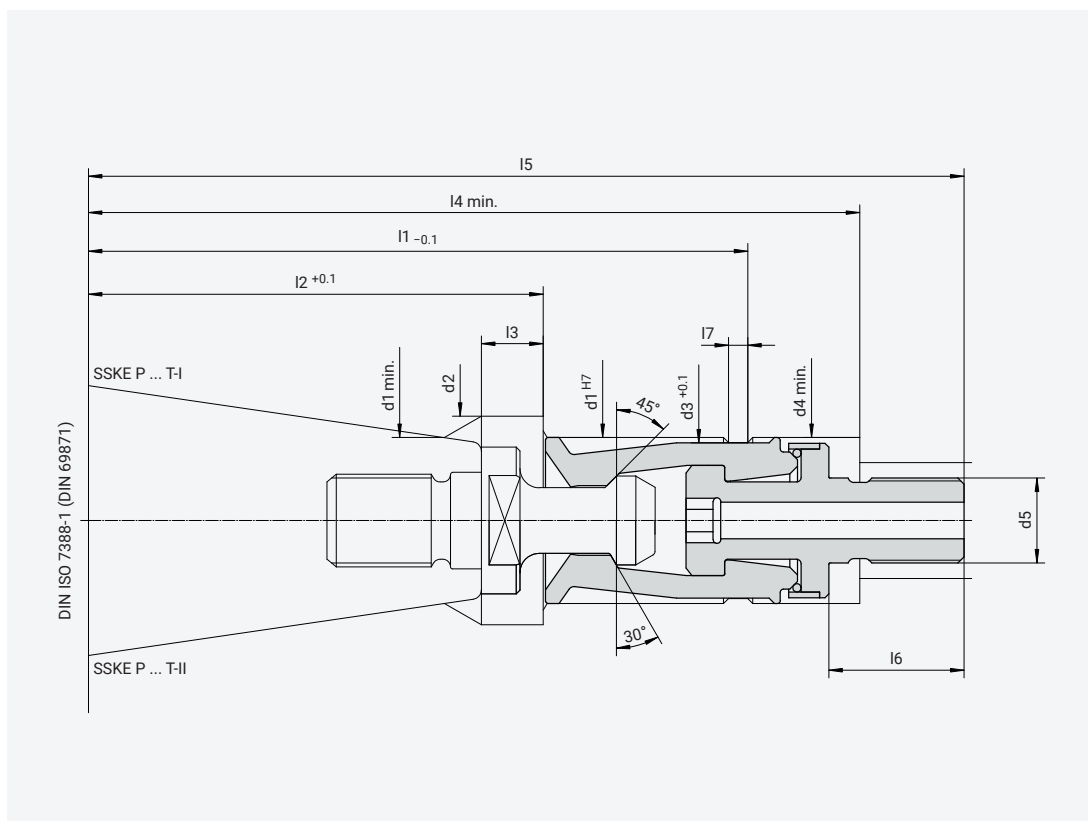


TECHNICAL DATA

Type	d1	d2	d3	d4	d5	I1	I2	I3	I4	I5	I6	I7	h _A	h _S	F _S max.
SSKE 30 DIN	19	24	17.8	20.2	M10	84.8	55.3	7.5	97.8	114.8	20	3.5	0.5	4	10
SSKE 30 JIS	19	24	17.8	20.2	M10	84.8	55.3	7.5	97.8	114.8	20	3.5	0.5	4	10
SSKE 30 ANSI	19	24	17.8	20.2	M10	84.8	55.3	7.5	97.8	114.8	20	3.5	0.5	3	10
SSKE 35 JIS	23	29	21.4	23.5	M12 x 1.5	98.9	65.4	9	114.4	131.4	20	4	0.5	4.5	12
SSKE 40 DIN	28	35	26.4	28.5	M16 x 1.5	120.4	78.4	10	150.4	164.4	26	4.5	0.5	5.5	18
SSKE 40 JIS	28	35	26.4	28.5	M16 x 1.5	120.4	78.4	10	150.4	164.4	26	4.5	0.5	5	18
SSKE 40 ANSI	28	35	26.4	28.5	M16 x 1.5	120.4	78.4	10	150.4	164.4	26	4.5	0.5	4.5	18
SSKE 45 DIN/JIS	36	45	34	36.5	M18 x 1.5	142.7	95.7	13	171.7	194.7	32	4.5	0.5	7.5	25
SSKE 45 ANSI	36	45	34	36.5	M18 x 1.5	142.7	95.7	13	171.7	194.7	32	4.5	0.5	6.5	25
SSKE 50 DIN/JIS	43	54	40.4	43.5	M22 x 1.5	170.75	117.75	16	199.75	226.75	35	5	0.5	8.5	35
SSKE 50 ANSI	43	54	40.4	43.5	M22 x 1.5	170.75	117.75	16	199.75	226.75	35	5	0.5	7	35
SSKE 55 JIS	55	67	52.4	55.5	M30 x 1.5	206.8	146.8	20	239.8	271.8	40	5	0.5	9.5	50
SSKE 60 DIN	62	77	58.6	62.5	M30 x 1.5	257.9	184.9	23	291.9	326.9	40	6.5	0.5	11	70
SSKE 60 JIS	62	77	58.6	62.5	M30 x 1.5	257.9	184.9	23	291.9	326.9	40	6.5	0.5	11	70
SSKE 60 ANSI	62	77	58.6	62.5	M30 x 1.5	257.9	184.9	23	291.9	326.9	40	6.5	0.5	10.5	70

ABBREVIATIONS d Diameter (mm) l Length (mm) h_A Ejection stroke (mm) h_S Clamping stroke (mm)
F_S Clamping force (kN)

APPLICATION PROPOSAL



TECHNICAL DATA

Type	d1	d2	d3	d4	d5	l1	l2	l3	l4	l5	l6	l7	h _A	h _S	F _S max.
SSKE P 30 T-I	19	24	17.8	20.2	M10	84.8	55.3	7.5	97.8	114.8	20	3.5	0.5	4	10
SSKE P 30 T-II	19	24	17.8	20.2	M10	84.8	55.3	7.5	97.8	114.8	20	3.5	0.5	4	10
SSKE P 35 T-I	23	29	21.4	23.5	M12 x 1.5	98.9	65.4	9	114.4	131.4	20	4	0.5	4.5	12
SSKE P 35 T-II	23	29	21.4	23.5	M12 x 1.5	98.9	65.4	9	114.4	131.4	20	4	0.5	4.5	12
SSKE P 40 T-I	28	35	26.4	28.5	M16 x 1.5	120.4	78.4	10	150.4	164.4	26	4.5	0.5	5.5	18
SSKE P 40/1 T-I ¹⁾	28	35	26.4	28.5	M16 x 1.5	120.4	78.4	10	150.4	164.4	26	4.5	0.5	5.5	18
SSKE P 40 T-II	28	35	26.4	28.5	M16 x 1.5	120.4	78.4	10	150.4	164.4	26	4.5	0.5	5.5	18
SSKE P 40/1 T-II ¹⁾	28	35	26.4	28.5	M16 x 1.5	120.4	78.4	10	150.4	164.4	26	4.5	0.5	5.5	18
SSKE P 45 T-I	36	45	34	36.5	M18 x 1.5	142.7	95.7	13	171.7	194.7	32	4.5	0.5	7.5	25
SSKE P 45 T-II	36	45	34	36.5	M18 x 1.5	142.7	95.7	13	171.7	194.7	32	4.5	0.5	7.5	25
SSKE P 50 T-I ²⁾	43	54	40.4	43.5	M22 x 1.5	170.75	117.75	16	199.75	226.75	35	5	0.5	8.5	35
SSKE P 50 T-II ²⁾	43	54	40.4	43.5	M22 x 1.5	170.75	117.75	16	199.75	226.75	35	5	0.5	8.5	35
SSKE P 60 T-I	62	77	58.6	62.5	M30 x 1.5	257.9	184.9	23	291.9	326.9	40	6.5	0.5	11	70
SSKE P 60 T-II	62	77	58.6	62.5	M30 x 1.5	257.9	184.9	23	291.9	326.9	40	6.5	0.5	11	70

¹⁾ Only for tool shafts according to MAS 403 BT

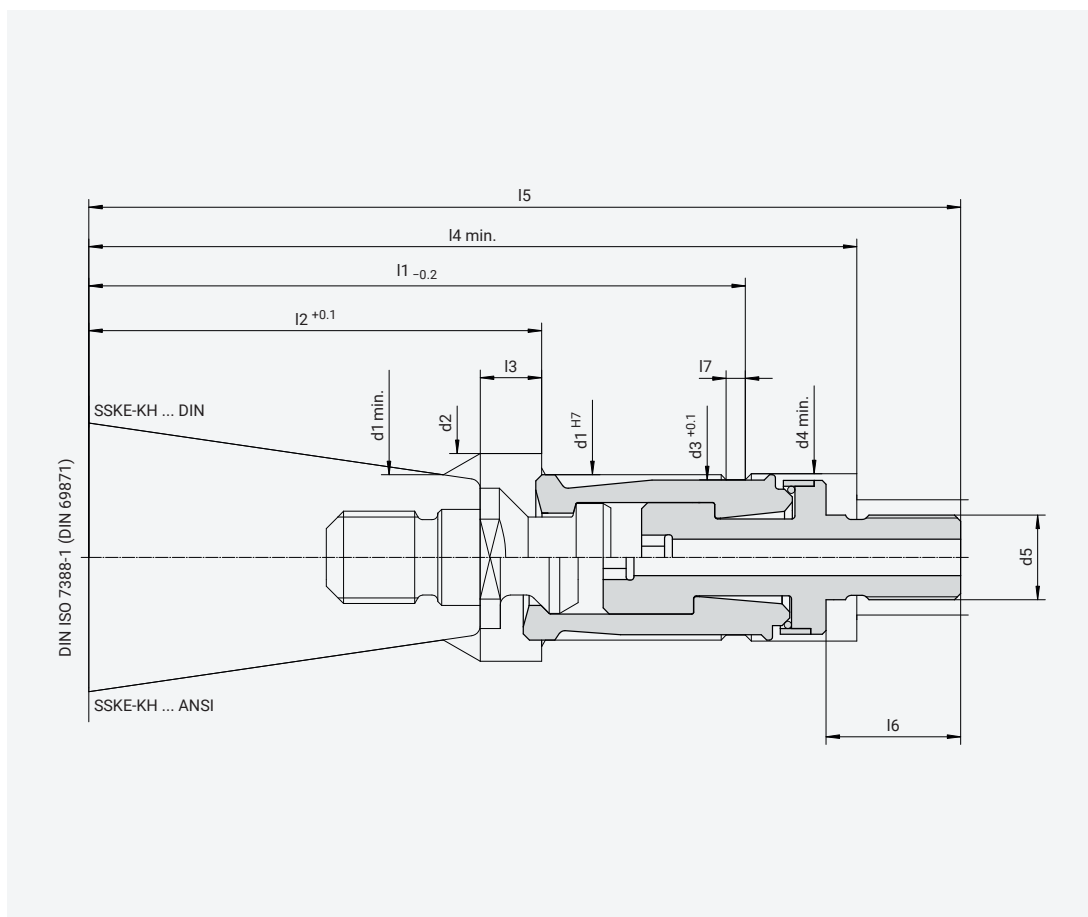
²⁾ Also for tool shafts according to MAS 403 BT

ABBREVIATIONS	d	Diameter (mm)	l	Length (mm)	h _A	Ejection stroke (mm)	h _S	Clamping stroke (mm)
	F _S	Clamping force (kN)						

SSKE-KH

SK gripper with short stroke for uniformly designed spindle with control edge

APPLICATION PROPOSAL

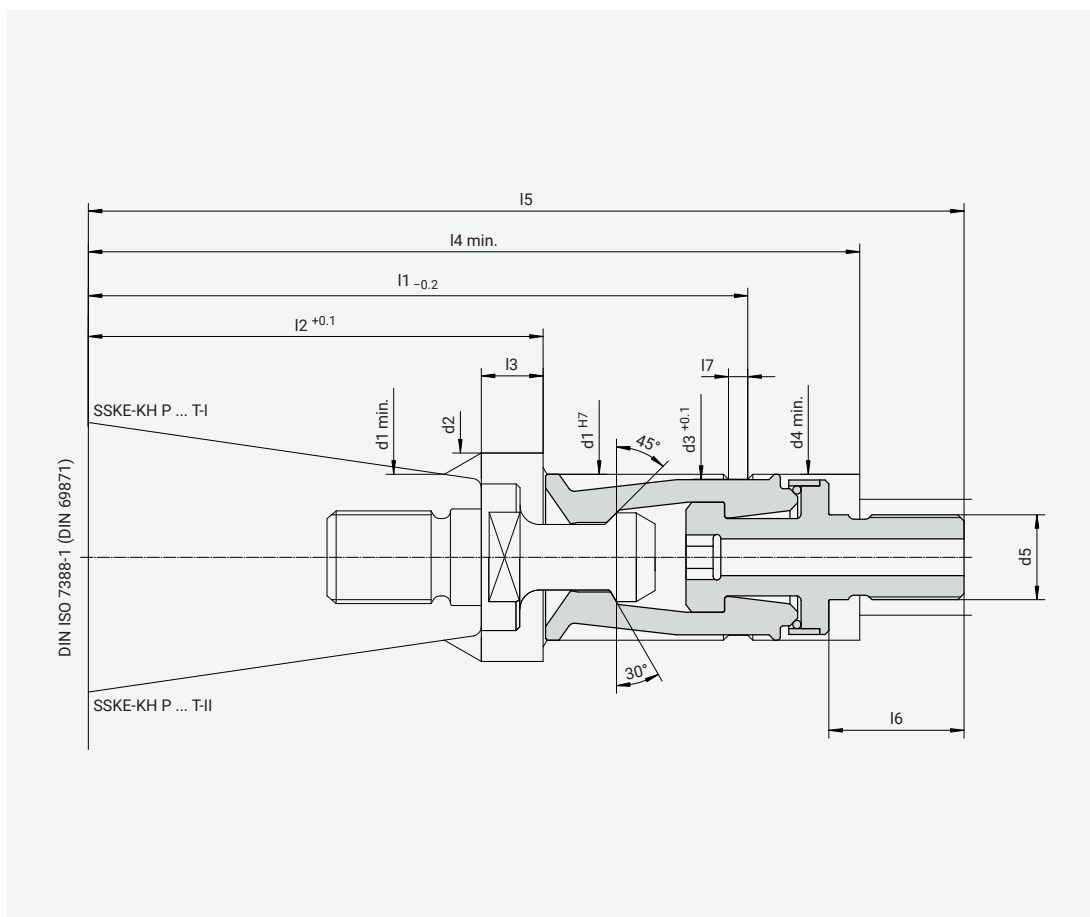


TECHNICAL DATA

Type	d1	d2	d3	d4	d5	l1	l2	l3	l4	l5	l6	l7	h _A	h _S	F _S max.
SSKE-KH 30 DIN	19	24	17.8	20.2	M10	84.8	55.3	7.5	96.3	114.8	20	3.5	0.5	2.7	7
SSKE-KH 30 ANSI	19	24	17.8	20.2	M10	84.8	55.3	7.5	96.3	114.8	20	3.5	0.5	2.7	7
SSKE-KH 40 DIN	28	35	26.4	28.5	M16 x 1.5	120.4	78.4	10	140.4	164.4	26	4.5	0.5	3.5	13
SSKE-KH 40 ANSI	28	35	26.4	28.5	M16 x 1.5	120.4	78.4	10	140.4	164.4	26	4.5	0.5	3.5	13
SSKE-KH 45 DIN	36	45	34	36.5	M18 x 1.5	142.7	95.7	13	164.7	194.7	32	4.5	0.5	4	18
SSKE-KH 45 ANSI	36	45	34	36.5	M18 x 1.5	142.7	95.7	13	164.7	194.7	32	4.5	0.5	4	18
SSKE-KH 50 DIN	43	54	40.4	43.5	M22 x 1.5	170.75	117.75	16	199.75	226.75	35	5	0.5	4	25
SSKE-KH 50 ANSI	43	54	40.4	43.5	M22 x 1.5	170.75	117.75	16	199.75	226.75	35	5	0.5	4	25
SSKE-KH 60 DIN	62	77	58.6	62.5	M30 x 1.5	257.9	184.9	23	289.4	326.9	40	6.5	0.5	5	65
SSKE-KH 60 ANSI	62	77	58.6	62.5	M30 x 1.5	257.9	184.9	23	289.4	326.9	40	6.5	0.5	5	65

ABBREVIATIONS	d	Diameter (mm)	l	Length (mm)	h _A	Ejection stroke (mm)	h _S	Clamping stroke (mm)
	F _S	Clamping force (kN)						

APPLICATION PROPOSAL



TECHNICAL DATA

Type	d1	d2	d3	d4	d5	l1	l2	l3	l4	l5	l6	l7	h _A	h _S	F _S max.
SSKE-KH P 30 T-I	19	24	17.8	20.2	M10	84.8	55.3	7.5	96.3	114.8	20	3.5	0.5	2.7	7
SSKE-KH P 30 T-II	19	24	17.8	20.2	M10	84.8	55.3	7.5	96.3	114.8	20	3.5	0.5	2.7	7
SSKE-KH P 35 T-I	23	29	21.4	23.5	M12 x 1.5	98.9	65.4	9	112.9	131.4	20	4	0.5	3.5	10
SSKE-KH P 35 T-II	23	29	21.4	23.5	M12 x 1.5	98.9	65.4	9	112.9	131.4	20	4	0.5	3.5	10
SSKE-KH P 40 T-I	28	35	26.4	28.5	M16 x 1.5	120.4	78.4	10	140.4	164.4	26	4.5	0.5	3.5	13
SSKE-KH P 40 T-II	28	35	26.4	28.5	M16 x 1.5	120.4	78.4	10	140.4	164.4	26	4.5	0.5	3.5	13
SSKE-KH P 45 T-I	36	45	34	36.5	M18 x 1.5	142.7	95.7	13	164.7	194.7	32	4.5	0.5	4	18
SSKE-KH P 45 T-II	36	45	34	36.5	M18 x 1.5	142.7	95.7	13	164.7	194.7	32	4.5	0.5	4	18
SSKE-KH P 50 T-I ¹⁾	43	54	40.4	43.5	M22 x 1.5	170.75	117.75	16	199.75	226.75	35	5	0.5	4	25
SSKE-KH P 50 T-II ¹⁾	43	54	40.4	43.5	M22 x 1.5	170.75	117.75	16	199.75	226.75	35	5	0.5	4	25
SSKE-KH P 60 T-I	62	77	58.6	62.5	M30 x 1.5	257.9	184.9	23	289.4	326.9	40	6.5	0.5	5	65
SSKE-KH P 60 T-II	62	77	58.6	62.5	M30 x 1.5	257.9	184.9	23	289.4	326.9	40	6.5	0.5	5	65

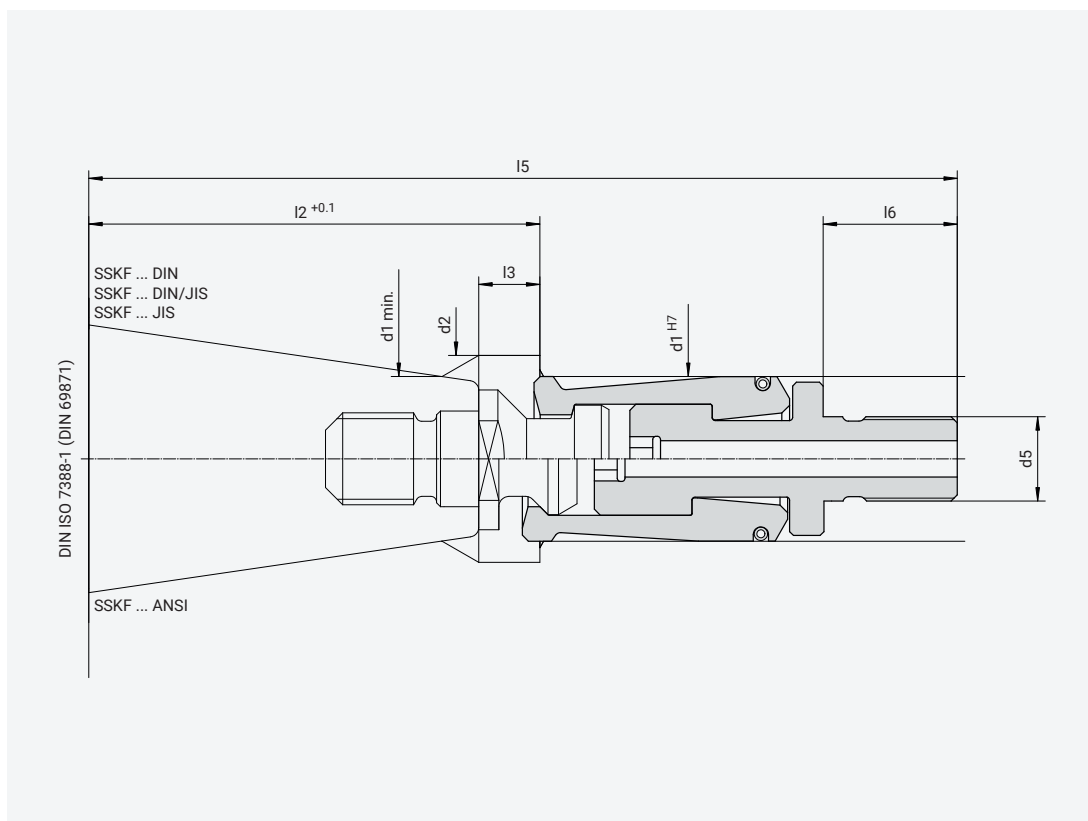
¹⁾ Also for tool shafts according to MAS 403 BT

ABBREVIATIONS	d	Diameter (mm)	l	Length (mm)	h _A	Ejection stroke (mm)	h _S	Clamping stroke (mm)
	F _S	Clamping force (kN)						

SSKF

SK gripper for uniformly designed spindle without control edge

APPLICATION PROPOSAL



TECHNICAL DATA

Type	d1	d2	d5	l2	l3	l5	l6	h_A	h_S	F_S max.
SSKF 30 DIN	19	24	M10	55.3	7.5	114.8	20	0.5	3.5	10
SSKF 30 JIS	19	24	M10	55.3	7.5	114.8	20	0.5	3.5	10
SSKF 30 ANSI	19	24	M10	55.3	7.5	114.8	20	0.5	3	10
SSKF 40 DIN	28	35	M16 x 1.5	78.4	10	164.4	26	0.5	4.5	18
SSKF 40 JIS	28	35	M16 x 1.5	78.4	10	164.4	26	0.5	4	18
SSKF 40 ANSI	28	35	M16 x 1.5	78.4	10	164.4	26	0.5	3.5	18
SSKF 45 DIN/JIS	36	45	M18 x 1.5	95.7	13	194.7	32	0.5	5.5	25
SSKF 45 ANSI	36	45	M18 x 1.5	95.7	13	194.7	32	0.5	4.5	25
SSKF 50 DIN/JIS	43	54	M22 x 1.5	117.75	16	226.75	35	0.5	6	35
SSKF 50 ANSI	43	54	M22 x 1.5	117.75	16	226.75	35	0.5	5	35
SSKF 60 DIN	62	77	M30 x 1.5	184.9	23	326.9	40	0.5	8	70
SSKF 60 JIS	62	77	M30 x 1.5	184.9	23	326.9	40	0.5	8	70
SSKF 60 ANSI	62	77	M30 x 1.5	184.9	23	326.9	40	0.5	7.5	70

ABBREVIATIONS

d Diameter (mm)

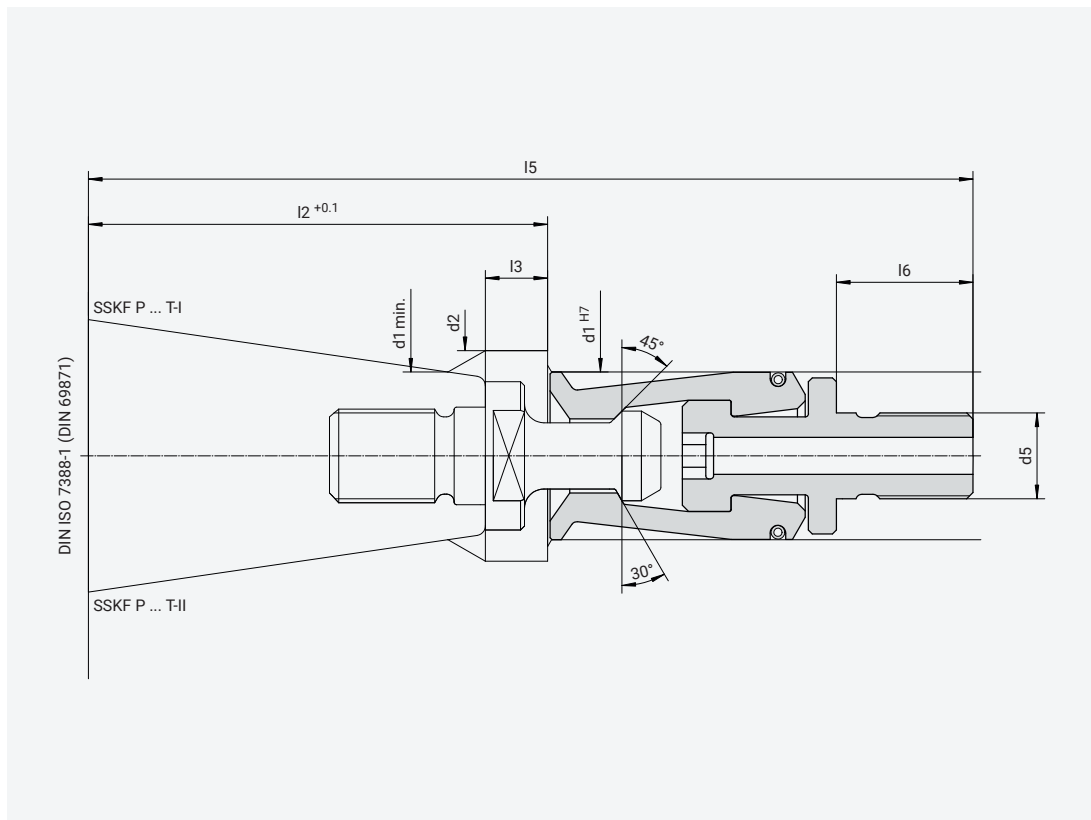
l Length (mm)

h_A Ejection stroke (mm)

h_S Clamping stroke (mm)

F_S Clamping force (kN)

APPLICATION PROPOSAL



TECHNICAL DATA

Type	d1	d2	d5	l2	l3	l5	l6	h _A	h _S	F _S max.
SSKF P 30 T-I	19	24	M10	55.3	7.5	114.8	20	0.5	3.5	10
SSKF P 30 T-II	19	24	M10	55.3	7.5	114.8	20	0.5	3.5	10
SSKF P 40 T-I	28	35	M16 x 1.5	78.4	10	164.4	26	0.5	4.5	18
SSKF P 40/1 T-I ¹⁾	28	35	M16 x 1.5	78.4	10	164.4	26	0.5	4.5	18
SSKF P 40 T-II	28	35	M16 x 1.5	78.4	10	164.4	26	0.5	4.5	18
SSKF P 40/1 T-II ¹⁾	28	35	M16 x 1.5	78.4	10	164.4	26	0.5	4.5	18
SSKF P 45 T-I	36	45	M18 x 1.5	95.7	13	194.7	32	0.5	5.5	25
SSKF P 45 T-II	36	45	M18 x 1.5	95.7	13	194.7	32	0.5	5.5	25
SSKF P 50 T-I ²⁾	43	54	M22 x 1.5	117.75	16	226.75	35	0.5	6	35
SSKF P 50 T-II ²⁾	43	54	M22 x 1.5	117.75	16	226.75	35	0.5	6	35
SSKF P 60 T-I	62	77	M30 x 1.5	184.9	23	326.9	40	0.5	8	70
SSKF P 60 T-II	62	77	M30 x 1.5	184.9	23	326.9	40	0.5	8	70

¹⁾ Only for tool shafts according to MAS 403 BT

²⁾ Also for tool shafts according to MAS 403 BT

ABBREVIATIONS

d Diameter (mm)

l Length (mm)

h_A Ejection stroke (mm)

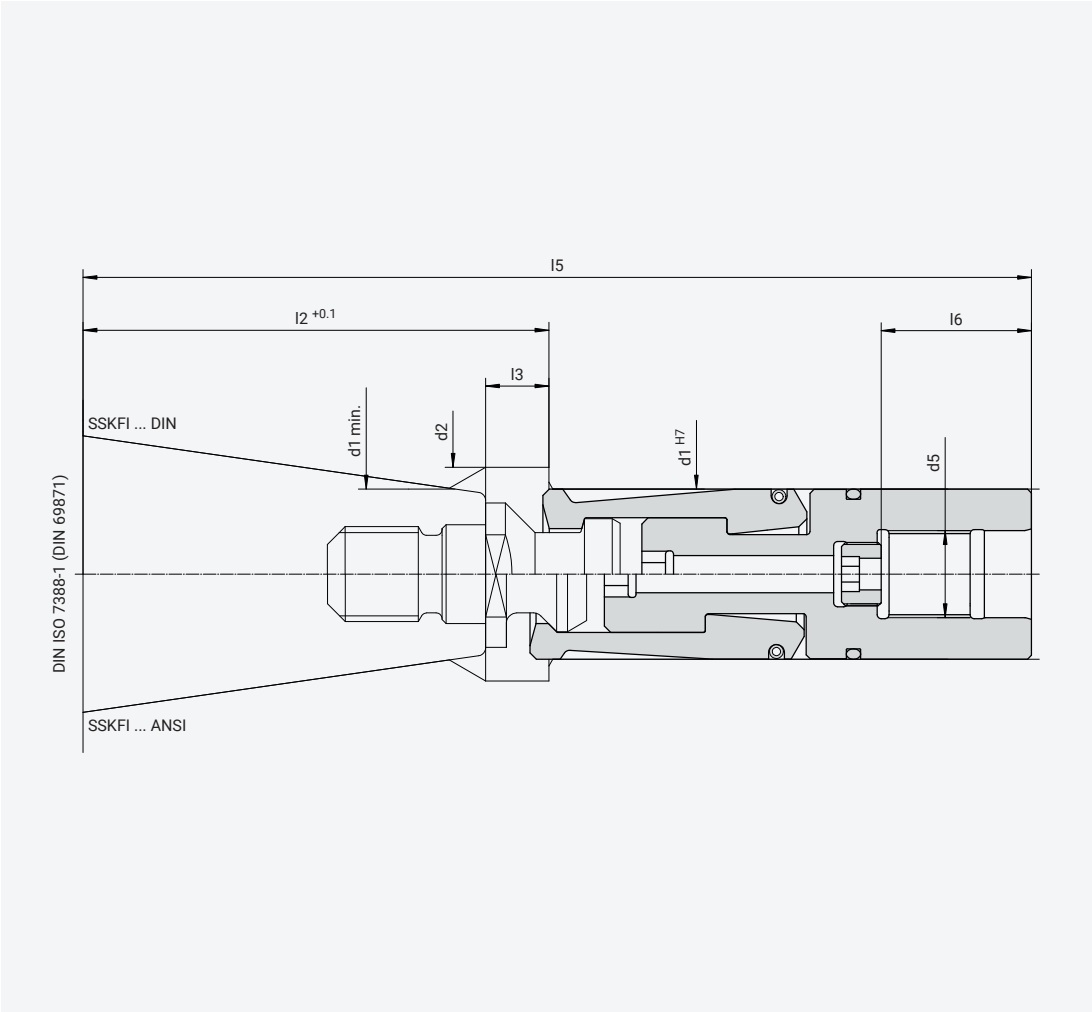
h_S Clamping stroke (mm)

F_S Clamping force (kN)

SSKFI

SK gripper for uniformly designed spindle without control edge (adjustable)

APPLICATION
PROPOSAL

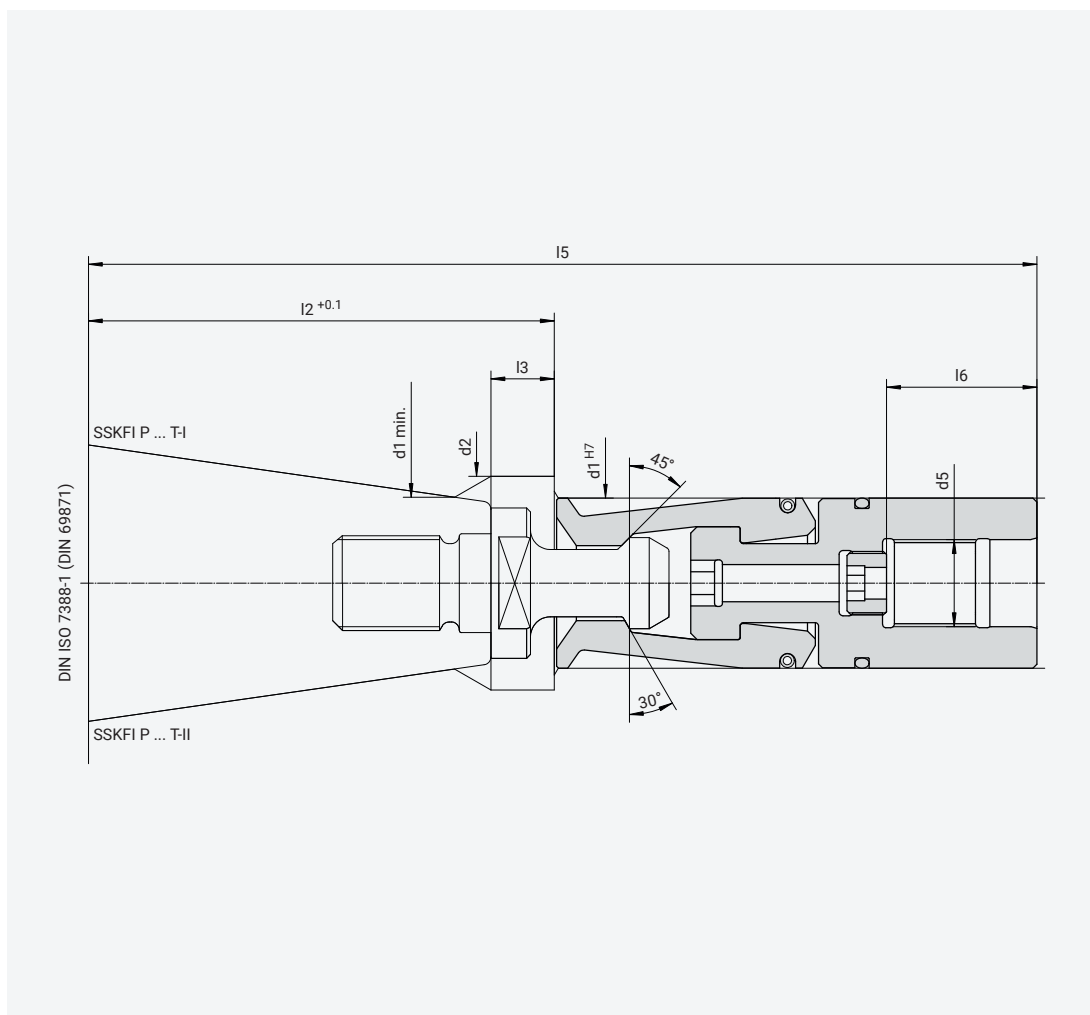


TECHNICAL
DATA

Type	d1	d2	d5	l2	l3	l5	l6	h _A	h _S	F _S max.
SSKFI 40 DIN	28	35	M16 x 1.5	78.4	10	168.4	26	0.5	4.5	18
SSKFI 40 ANSI	28	35	M16 x 1.5	78.4	10	168.4	26	0.5	3.5	18
SSKFI 50 DIN	43	54	M22 x 1.5	117.75	16	231.75	35	0.5	6	35
SSKFI 50 ANSI	43	54	M22 x 1.5	117.75	16	231.75	35	0.5	5	35

ABBREVIATIONS	d	Diameter (mm)	l	Length (mm)	h _A	Ejection stroke (mm)	h _S	Clamping stroke (mm)
	F _S	Clamping force (kN)						

APPLICATION PROPOSAL



TECHNICAL DATA

Type	d1	d2	d5	l2	l3	l5	l6	h _A	h _S	F _S max.
SSKFI P 40 T-I	28	35	M16 x 1.5	78.4	10	168.4	26	0.5	4.5	18
SSKFI P 40 T-II	28	35	M16 x 1.5	78.4	10	168.4	26	0.5	4.5	18
SSKFI P 50 T-I ¹⁾	43	54	M22 x 1.5	117.75	16	231.75	35	0.5	6	35
SSKFI P 50 T-II ¹⁾	43	54	M22 x 1.5	117.75	16	231.75	35	0.5	6	35

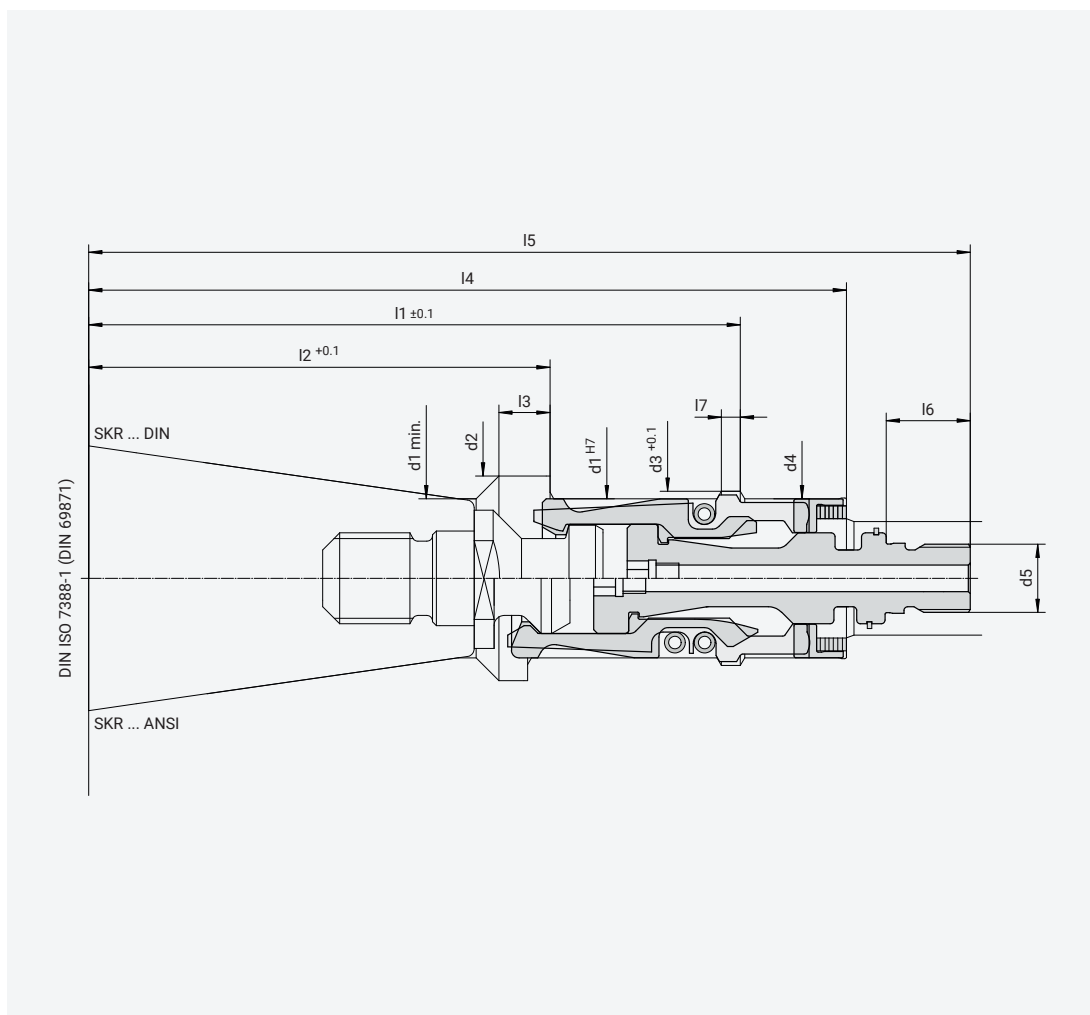
¹⁾ Also for tool shafts according to MAS 403 BT

ABBREVIATIONS	d	Diameter (mm)	l	Length (mm)	h _A	Ejection stroke (mm)	h _S	Clamping stroke (mm)
	F _S	Clamping force (kN)						

SKR

SK gripper with holding function for uniformly designed spindle

APPLICATION PROPOSAL



TECHNICAL DATA

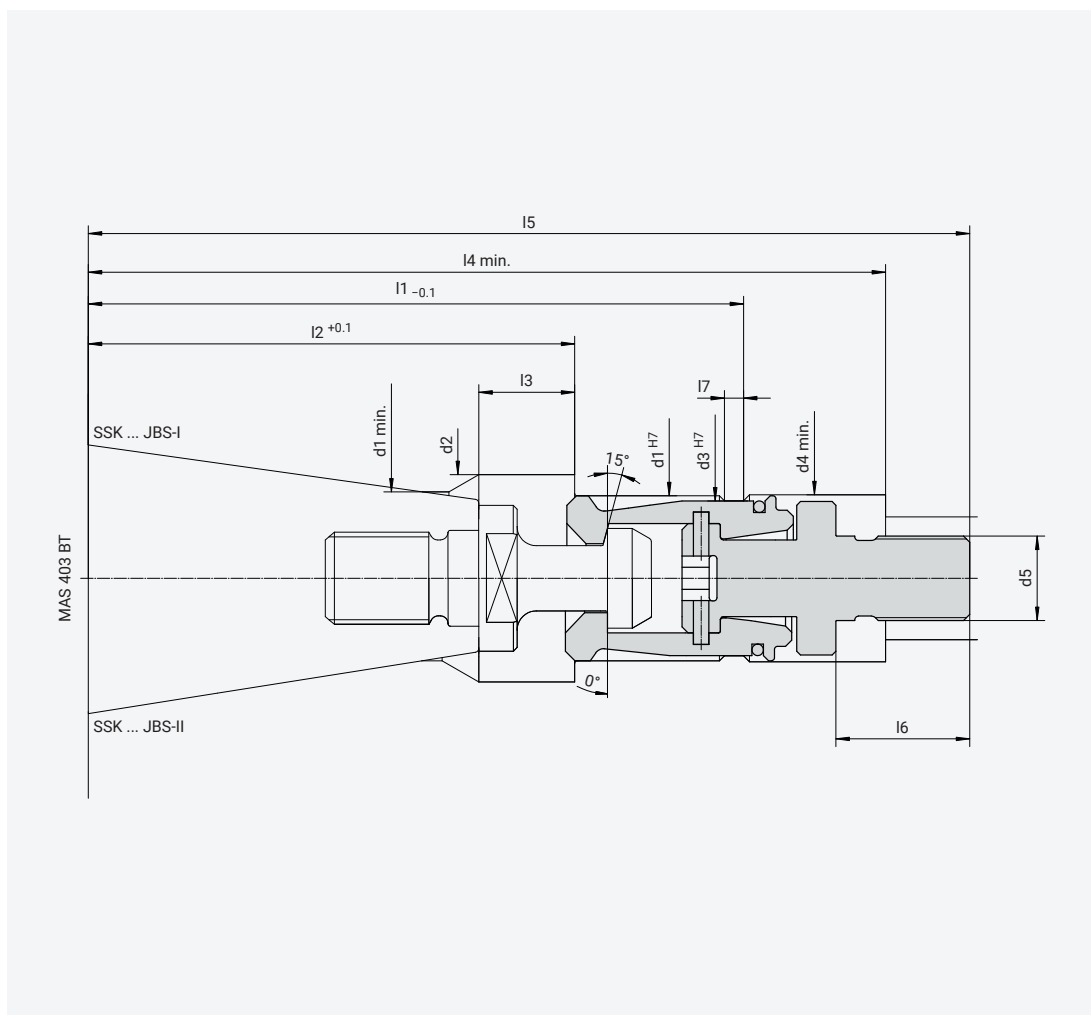
Type	d1	d2	d3	d4	d5	I1	I2	I3	I4	I5	I6	I7	h _A	h _T	h _S	F _S max.	F _H max.
SKR 40 DIN	28	35	31	28	M14 x 1.5	118.5	84.5	11	139	167.2	22	3	0.6	6	4.5	12	200
SKR 40 ANSI	28	35	31	28	M14 x 1.5	118.5	78.5	5	139	167.2	22	3	0.6	6	4.5	12	90
SKR 50 DIN	42	54	46	42	M18 x 1.5	172	121.75	13.5	200	233	22.5	5	0.6	8.2	7	20	300
SKR 50 ANSI	42	54	46	42	M18 x 1.5	172	115.85	7.6	200	233	22.5	5	0.6	8.2	7	20	180

ABBREVIATIONS	d	Diameter (mm)	I	Length (mm)	h _A	Ejection stroke (mm)
	h _T	Total stroke (mm)	h _S	Clamping stroke (mm)	F _S	Clamping force (kN)
	F _H	Holding force (N)				

SSK...JBS

SK gripper in high-speed version for spindle with control edge

APPLICATION PROPOSAL



TECHNICAL DATA

Type	d1	d2	d3	d4	d5	l1	l2	l3	l4	l5	l6	l7	h _A	h _S	F _S max.
SSK 10 JBS-I	10	12.4	9.55	11	M5	38.6	26.5	4.5	47	54.2	9.7	2	0.5	3	1.2
SSK 10 JBS-II	10	12.4	9.55	11	M5	38.6	26.5	4.5	47	54.2	9.7	2	0.5	3	1.2
SSK 15 JBS-I	11.5	14	11	12.5	M6	46.8	32.5	5.5	55.5	64	11	2	0.5	3	1.7
SSK 15 JBS-II	11.5	14	11	12.5	M6	46.8	32.5	5.5	55.5	64	11	2	0.5	3	1.7
SSK 20 JBS-I	12.5	15	11.9	13.5	M6	55	40	7	64	73	11	2.5	0.5	3.5	3
SSK 20 JBS-II	12.5	15	11.9	13.5	M6	55	40	7	64	73	11	2.5	0.5	3.5	3
SSK 25 JBS-I	14	17	13.4	15	M8 x 1	65	48	8	75	85	12	3.5	0.5	4	4
SSK 25 JBS-II	14	17	13.4	15	M8 x 1	65	48	8	75	85	12	3.5	0.5	4	4

ABBREVIATIONS d Diameter (mm) l Length (mm) h_A Ejection stroke (mm) h_S Clamping stroke (mm)
F_S Clamping force (kN)

Pull studs

APPLICATION | FEATURES

As a link between the clamping system and the tool, pull studs are crucial for precise workpiece machining. Once screwed into tool shanks or workpiece carriers, they support automatic tool and workpiece changes. Our pull studs are characterised by constant hardness and rigidity values as well as excellent

surface quality. They can be assembled without special tools. Their dimensions and tolerances match customary standards in the market. Moreover, customer-specific sizes and shapes as well as special versions, for instance with a coolant transfer system, are available.

Pull stud for tool holders of steep taper size SK 60 (type AZB ... DIN) with miniature pull stud (type AZB ... JBS-I) →

Pull studs of different sizes without through hole (type AZB P ... T) ↘

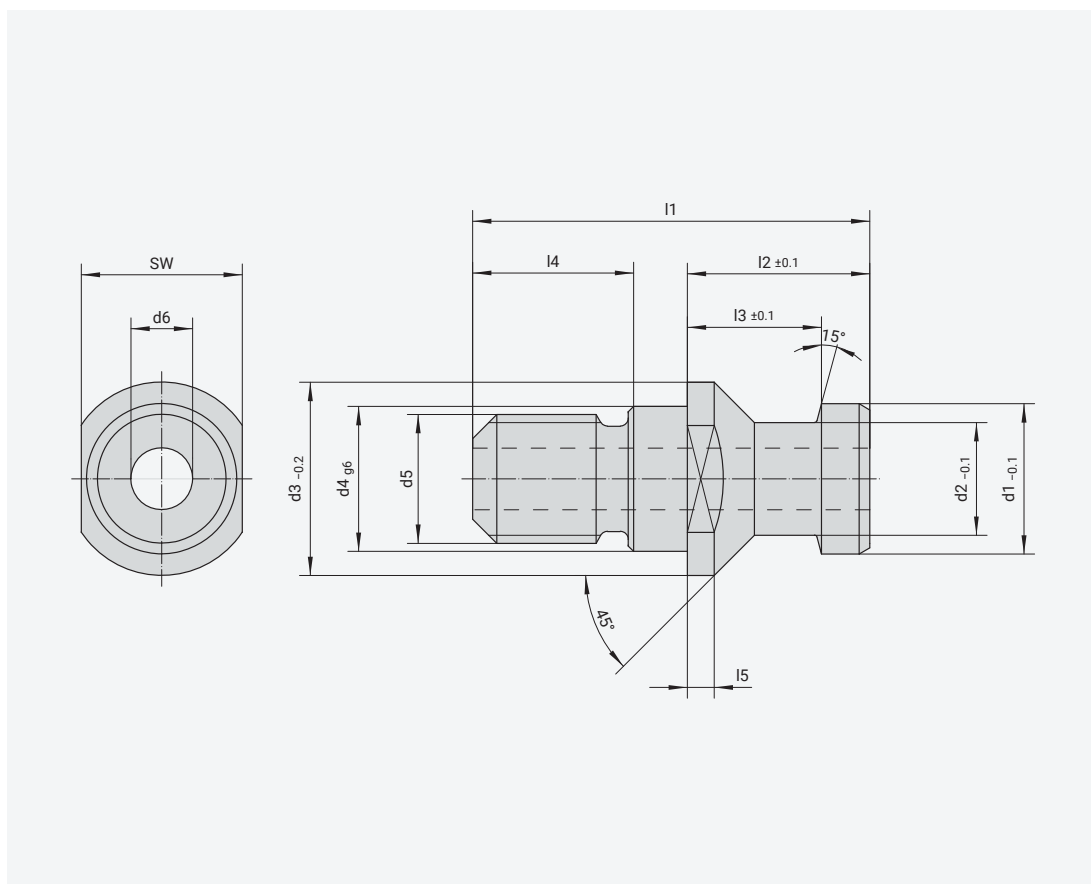
Standard version of pull stud with a through hole (type AZB ... DIN) ↓



AZB...DIN

Pull stud according to DIN 69872 shape A with through hole

APPLICATION PROPOSAL



TECHNICAL DATA

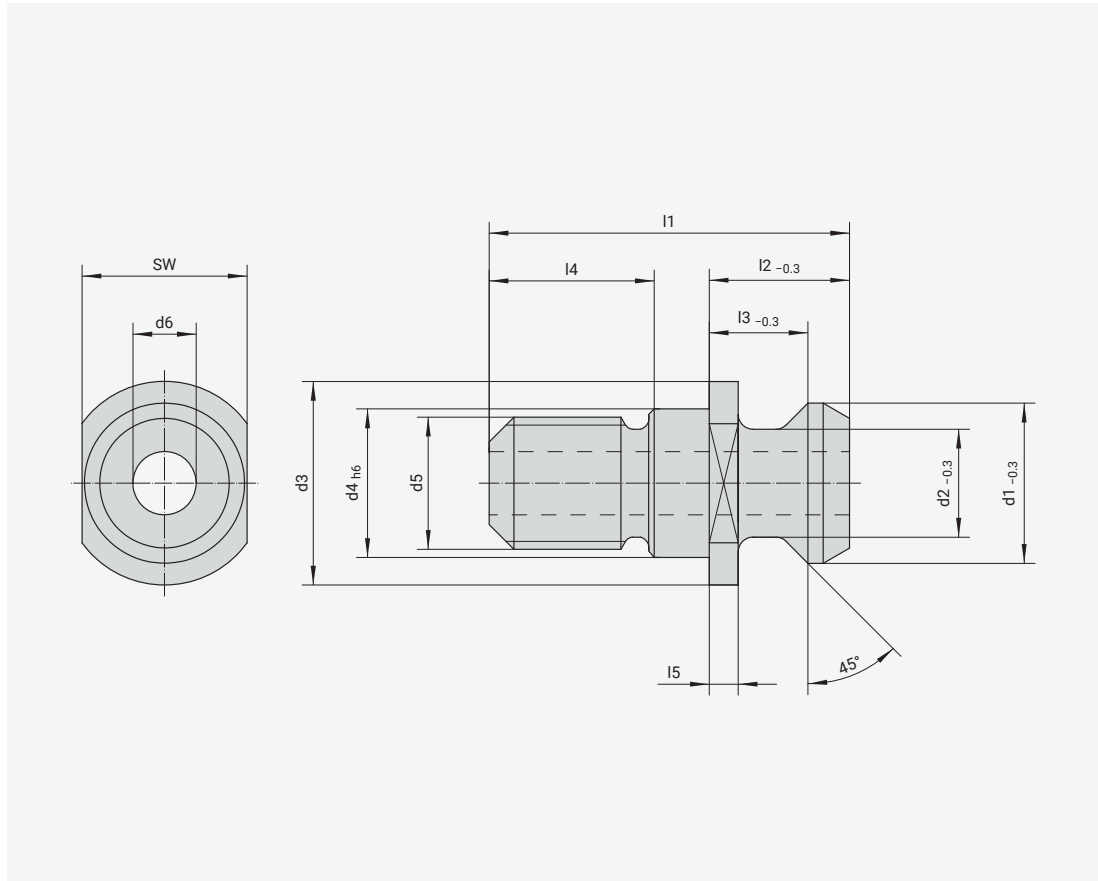
Type	d1	d2	d3	d4	d5	d6	l1	l2	l3	l4	l5	SW	F _s max.
AZB 30/1 DIN	13	9	17	13	M12	–	44	24	19	15	4	14	10
AZB 40 DIN	19	14	23	17	M16	7	54	26	20	21	4	19	18
AZB 45 DIN	23	17	30	21	M20	9.5	65	30	23	27	5	24	25
AZB 50 DIN	28	21	36	25	M24	11.5	74	34	25	30	5	30	35
AZB 60/1 DIN	40	30	52	32	M30	14	90	40	30	37	6	46	70

ABBREVIATIONS d Diameter (mm) l Length (mm) SW Width across flats (mm) F_s Clamping force (kN)

AZB...ISO-B

Pull stud according to ISO 7388 shape B with through hole

APPLICATION PROPOSAL



TECHNICAL DATA

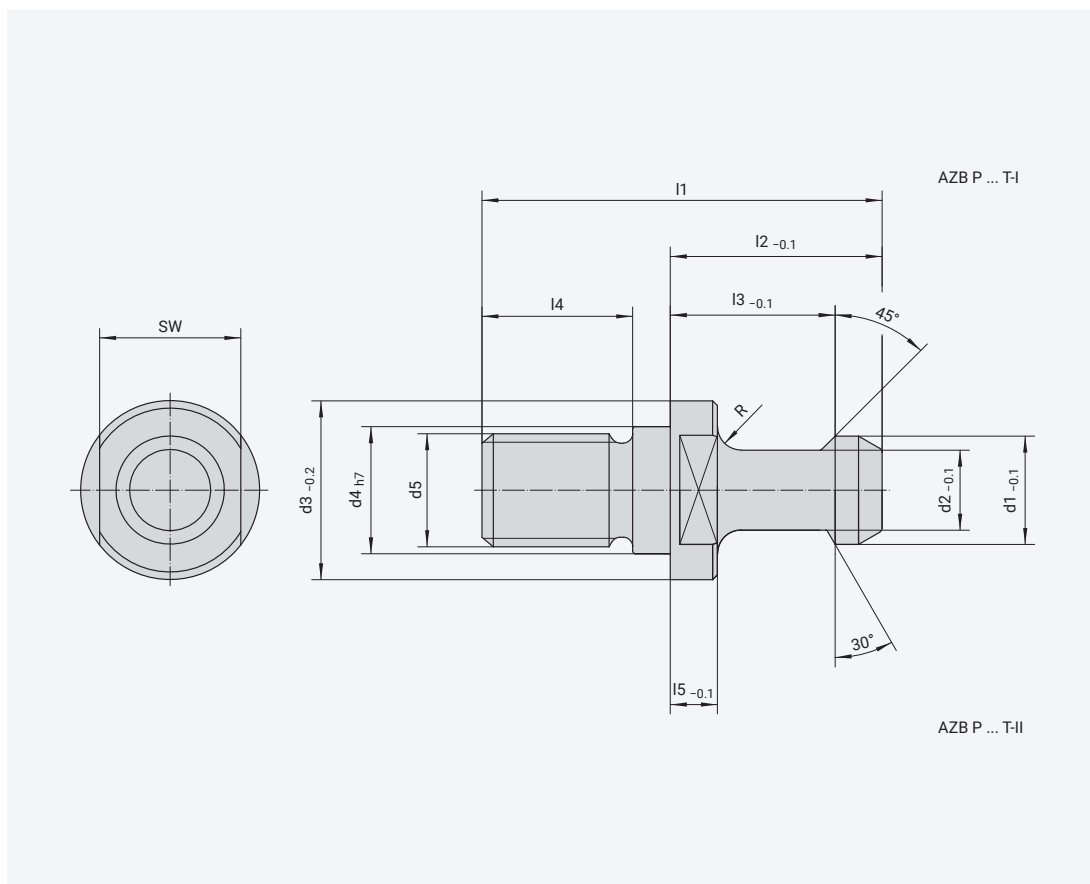
Type	d1	d2	d3	d4	d5	d6	l1	l2	l3	l4	l5	SW	F _s max.
AZB 30 ISO-B	13.35	9.3	17	13	M12	4	34	11.8	8.15	17.2	2.75	14	10
AZB 40 ISO-B	18.95	12.95	22.5	17	M16	7.35	44.5	16.4	11.15	21.1	3.25	18	18
AZB 45 ISO-B	24.05	16.3	30	21	M20	9.25	56	20.95	14.85	27.05	4.25	24	25
AZB 50 ISO-B	29.1	19.6	37	25	M24	11.55	65.5	25.55	17.95	29.95	5.25	30	35
AZB 60/1 ISO-B	37.25	24.95	50	32	M30	14	88	38.15	27.65	37	7.75	36	70

ABBREVIATIONS d Diameter (mm) l Length (mm) SW Width across flats (mm) F_s Clamping force (kN)

AZB P...T

Pull stud according to JIS B 6339 (MAS 403 BT) shape A

APPLICATION PROPOSAL



TECHNICAL DATA

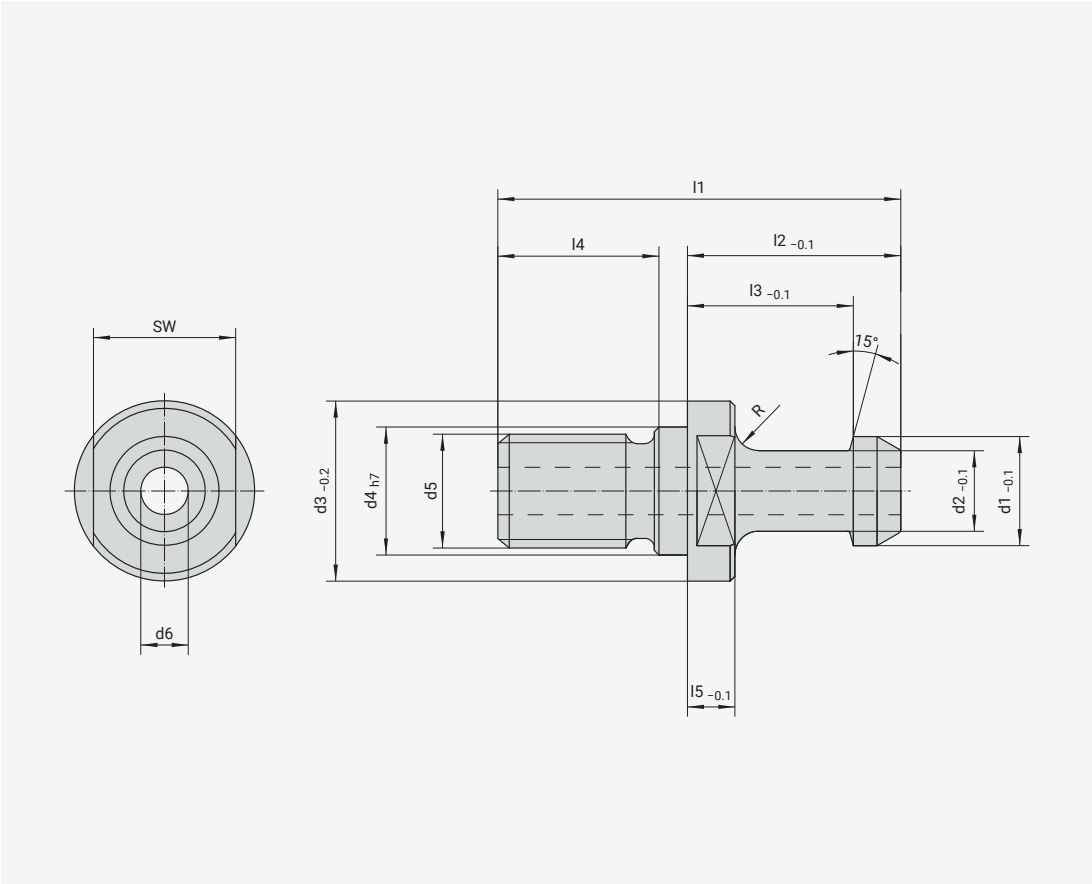
Type	d1	d2	d3	d4	d5	l1	l2	l3	l4	l5	R	SW	F _s max.
AZB P 30 T-I	11	7	16.5	12.5	M12	43	23	18	16	5	2	13	10
AZB P 30 T-II	11	7	16.5	12.5	M12	43	23	18	16	5	2	13	10
AZB P 35 T-I	13	8.5	20	12.5	M12	48	28	22.5	16	5	2	17	12
AZB P 35 T-II	13	8.5	20	12.5	M12	48	28	22.5	16	5	2	17	12
AZB P 40 T-I	15	10	23	17	M16	60	35	28	20	6	3	19	18
AZB P 40 T-II	15	10	23	17	M16	60	35	28	20	6	3	19	18
AZB P 45 T-I	19	14	31	21	M20	70	40	31	24	8	4	24	25
AZB P 45 T-II	19	14	31	21	M20	70	40	31	24	8	4	24	25
AZB P 50 T-I	23	17	38	25	M24	85	45	35	32	10	5	30	35
AZB P 50 T-II	23	17	38	25	M24	85	45	35	32	10	5	30	35
AZB P 55 T-I	32	24	48	31	M30	115	65	53	40	14	5	41	50
AZB P 55 T-II	32	24	48	31	M30	115	65	53	40	14	5	41	50
AZB P 60 T-I	32	24	56	31	M30	115	65	53	40	14	5	46	70
AZB P 60 T-II	32	24	56	31	M30	115	65	53	40	14	5	46	70

ABBREVIATIONS d Diameter (mm) l Length (mm) R Radius (mm) SW Width across flats (mm)
F_s Clamping force (kN)

AZB...JIS

Pull stud according to JIS B 6339 (MAS 403 BT) shape B with through hole

APPLICATION
PROPOSAL



TECHNICAL
DATA

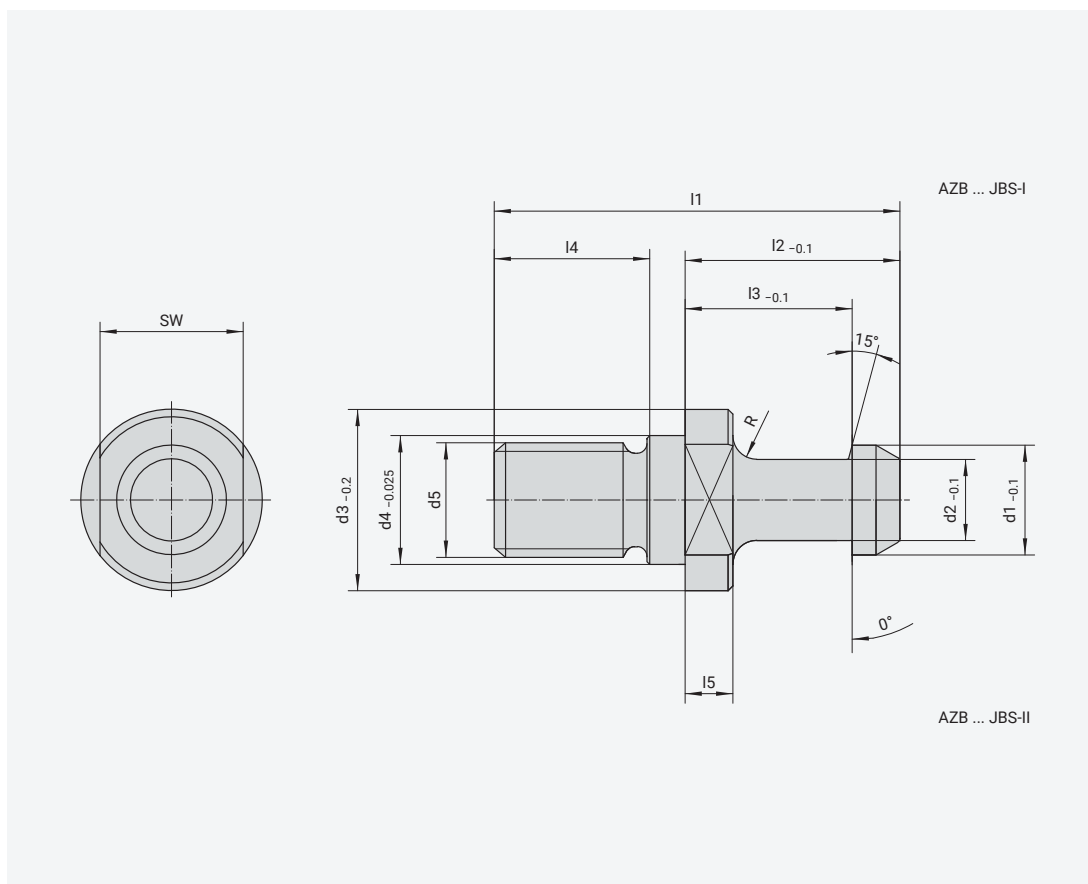
Type	d1	d2	d3	d4	d5	d6	l1	l2	l3	l4	l5	R	SW	F _s max.
AZB 30 JIS	12	8	16.5	12.5	M12	4	43	23.4	18.4	15.6	5	2	13	10
AZB 35 JIS	15	11	20	12.5	M12	5	44	24	19	16	5	2	17	12
AZB 40 JIS	19	14	23	17	M16	7	54	29	23	20	7	3	19	18
AZB 45 JIS	23	17	31	21	M20	8.5	60	30	23	24	7	4	24	25
AZB 50 JIS	28	21	38	25	M24	10	74	34	25	32	7	5	30	35
AZB 55 JIS	36	27	48	31	M30	12	98	48	36	40	11	5	41	70
AZB 60 JIS	36	27	48	31	M30	12	98	48	36	40	11	5	41	70

ABBREVIATIONS d Diameter (mm) l Length (mm) R Radius (mm) SW Width across flats (mm)
 F_s Clamping force (kN)

AZB...JBS

Pull stud in special design according to JBS

APPLICATION PROPOSAL



TECHNICAL DATA

Type	d1	d2	d3	d4	d5	l1	l2	l3	l4	l5	R	SW	F _s max.
AZB 10 JBS-I	6	4	8.5	5.5	M5	20	10.5	7.5	7.5	2	1	7	1.2
AZB 10 JBS-II	6	4	8.5	5.5	M5	20	10.5	7.5	7.5	2	1	7	1.2
AZB 15 JBS-I	7	5	10	7	M6	23	12	8.5	9	3	1.2	9	1.7
AZB 15 JBS-II	7	5	10	7	M6	23	12	8.5	9	3	1.2	9	1.7
AZB 20 JBS-I	8.5	6	11	7	M6	25	14	10	9	3.5	1.2	9	3
AZB 20 JBS-II	8.5	6	11	7	M6	25	14	10	9	3.5	1.2	9	3
AZB 25 JBS-I	10	7	12	9	M8	28	16	11.5	10	3.5	1.6	10	4
AZB 25 JBS-II	10	7	12	9	M8	28	16	11.5	10	3.5	1.6	10	4

ABBREVIATIONS

d Diameter (mm)

l Length (mm)

R Radius (mm)

SW Width across flats (mm)

F_s Clamping force (kN)

HSK grippers

Powerful and 100 % maintenance-free

Nowadays, the hollow taper shank is the standard interface for cutting machine tools. Face contact together with high clamping forces ensure precise positioning as well as high static and dynamic rigidity. This leads to precise

machining results and excellent repeat accuracy. Due to the pre-tension between the taper and the spindle holder, the hollow taper shank can withstand even extremely high spindle speeds without a decrease in performance.

Maintenance-free HSK gripper in standard version with very high force amplification, designed for simple 90° inner spindle contours (type HK) [↓](#)



The main characteristics of our HSK grippers are their compact design, maintenance-free operation and long service life. High clamping forces ensure permanent contact between tool holder and spindle and can furthermore

increase the critical limit load of the interface. Another significant advantage of our grippers for the HSK interface is the easy to manufacture spindle contour.

Force-amplifying gripper with draw bolt in special design for interface HSK-A 100 with force-amplifying miniature gripper for special interface < HSK-E 20 (type HK) ↓



Force-amplifying grippers for interface HSK-A 63 with different lengths (type HKR and HK) ↑



Standard HSK grippers with force amplification in different sizes (type HK) ↑

HK(R)

Force-amplifying HSK gripper with optional holding function



APPLICATION

The grippers of design type HK and HKR are used to clamp hollow taper shank tools in accordance with DIN 69893. The integrated force amplification permits an efficient design for the complete tool clamping unit with a long service life. For this reason, HK(R) grippers are particularly suitable for highly compact spindles. Moreover, they can be used for modular spindles – matching to the related SK and PSC size. Installation requires no special assembly aids or special tools.

FUNCTION

The taper of the centrally located draw bolt pushes the clamping segments outward behind the tool shoulder during clamping (pull direction). In this process the actuation force is boosted, achieving a clamping force that is many times higher. The locking screw permits infinitely variable adjustment and fixation of the gripper in the z axis. The HKR gripper has an additional holding function, which holds the tool securely in the spindle in its release position to permit quick tool changes.

TECHNICAL FEATURES

- Special surface coating for maximum clamping force consistency and wear resistance (no relubrication required)
- Low actuation forces thanks to high force-amplifying factor
- Designed for simple 90° inner spindle contours with no need of special measuring equipment
- Holding function on gripper type HKR for quicker tool change

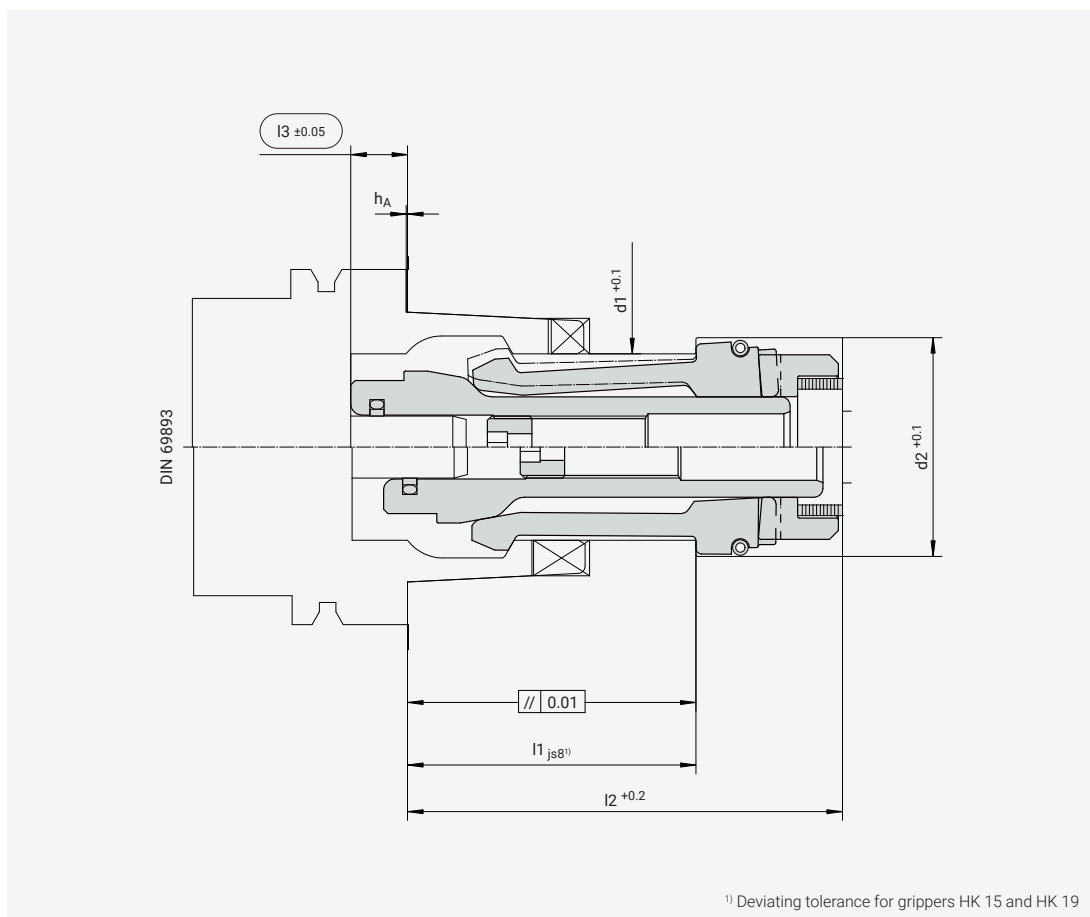
VARIANTS

- With special clamping force, e. g. for titanium machining
- In compact design
- With increased through hole size for plungers or control shafts
- As repair gripper if the inner spindle contour requires reworking
- With reduced actuation forces for minimum release forces, e. g. when using pneumatic cylinders
- With customer-specific holding forces

ACCESSORIES

- Clamping force measuring systems

APPLICATION PROPOSAL



TECHNICAL DATA

HSK form and HSK size	Type	d1	d2	l1	l2	l3	h _A	h _T	h _S	F _B max.	F _S max.	F _H max. ²)
E 20	HK 15	11	12.5	19 _{js6}	29	5.3	0.3	5	3	0.5	1.8	–
A/T/E 25 · B/F 32	HK 19	14	16	25 _{js7}	38	6.3	0.3	5	3.5	0.7	3	–
A/T/E 32 · B/F 40	HK(R) 24	17	21	30	49	8.3	0.3	7	4.5	1.4	6	65
A/T/E 40 · B/F 50	HK(R) 30	21	25	44	70	8.3	0.3	8.5	5	1.7	7	120
A/T/E 50 · B/F 63	HK(R) 38	26	31	45	74	10.3	0.3	9	5.5	3.2	15	120
A/T/E 63 · B/F 80	HK(R) 48	34	39.8	52	82	10.3	0.3	10	6.4	4.7	22	130
A/T/E 80 · B/F 100	HK(R) 60	42	49.3	65	98	12.8	0.3	11	7.4	6.6	35	320
A/T/E 100 · B/F 125	HK(R) 75	53	62.4	80	119	12.8	0.3	12.2	8	11	52	240
A/T/E 125 · B/F 160	HK 95	67	76.8	98	139	16.5	0.5	15	11	17	100	–
A 160	HK 120	85	98	113	159	16.5	0.5	16	12.5	26	150	–

²) Only for gripper type HKR

ABBREVIATIONS

d	Diameter (mm)	l	Length (mm)	h _A	Ejection stroke (mm)
h _T	Total stroke (mm)	h _S	Clamping stroke (mm)	F _B	Actuation force (kN)
F _S	Clamping force (kN)	F _H	Holding force (N)		

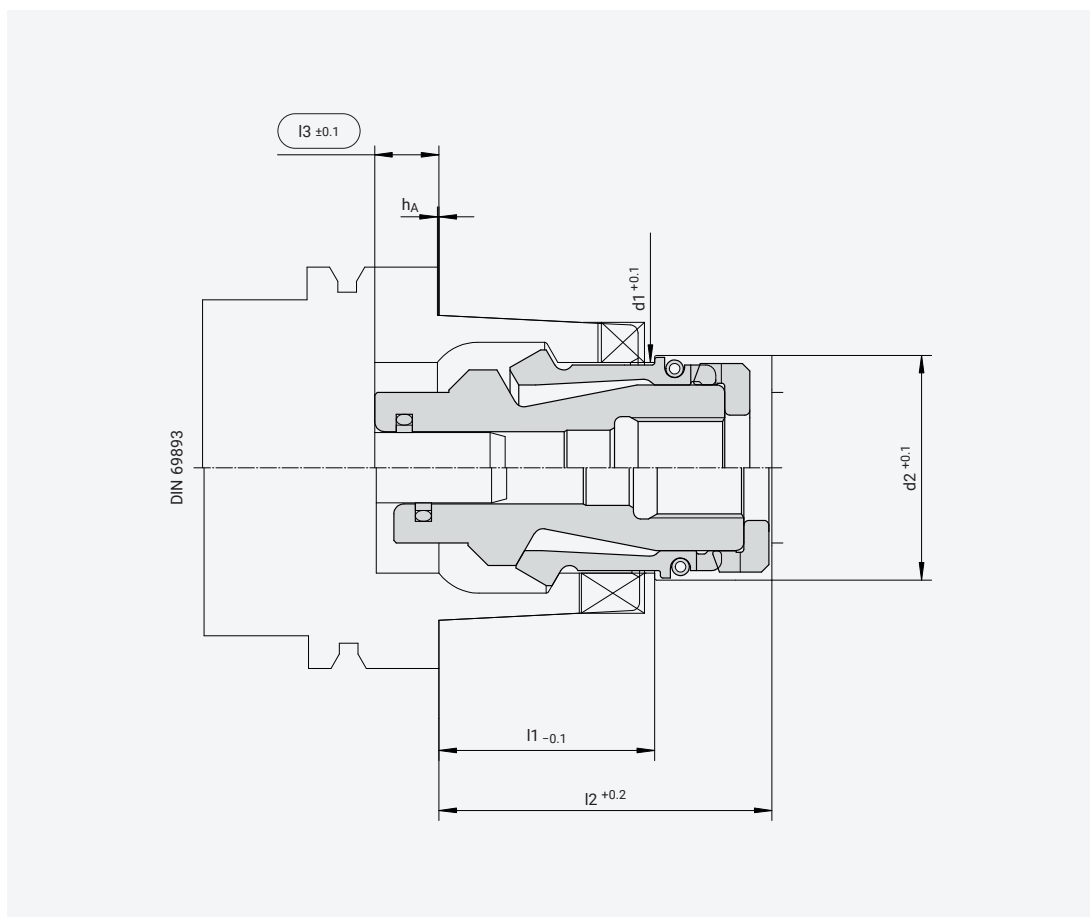
HSH

HSK gripper with direct force transmission



APPLICATION	HSH grippers are designed for clamping hollow taper shank tools in accordance with DIN 69893. Thanks to short clamping strokes and the resulting reduced load on the spring stack, they are part of a strong, long-lived tool clamping system. They are mainly used in milling, boring and grinding spindles and do not require a complicated spindle contour. They can also be assembled quickly and without special tools.
FUNCTION	During clamping (pull direction), the centrally located draw bolt transmits the actuation force directly to the tool without any further force deflection. The clamping segments serve as purely pressure-loaded coupling elements.
TECHNICAL FEATURES	▪ Extremely high clamping force transmission ▪ Direct frictional connection between draw bolt, clamping segment and tool ▪ Compact and maintenance-free ▪ Designed for simple inner spindle contours ▪ Short clamping strokes for compact spring stacks with long service life
VARIANTS	▪ With connection thread according to customer request ▪ Stainless steel version ▪ With increased through hole size for plunger/adjustment shaft
ACCESSORIES	▪ Clamping force measuring systems

APPLICATION PROPOSAL



TECHNICAL DATA

HSK form and HSK size	Type	d1	d2	I1	I2	I3	h_A	h_T	h_S	F_B max.	F_S max.
A/T/E 25 · B/F 32	HSH 19	14	17	15.5	28	6.3	0.3	3.5	2.5	2.5	2.5
A/T/E 32 · B/F 40	HSH 24	17	20	18.5	30	8.3	0.3	3.9	3	6	6
A/T/E 40 · B/F 50	HSH 30	21	25	22.5	39	8.5	0.3	3.3	2.5	10	10
A/T/E 50 · B/F 63	HSH 38	26	29.2	27.5	44.3	10.5	0.5	3.8	3	20	20
A/T/E 63 · B/F 80	HSH 48	34	37	35	54.5	10.3	0.3	4.5	3.3	30	30
A/T/E 80 · B/F 100	HSH 60	42	44.8	43	66.4	12.8	0.3	4.6	3.8	55	55
A/T/E 100 · B/F 125	HSH 75	53	56.4	53	78.8	12.8	0.3	4.8	4	75	75
A/T/E 125 · B/F 160	HSH 95	67	73	66	106	16.5	0.5	6	5	100	100
A 160	HSH 120	85	91	85	127	16.5	0.5	7.5	6	150	150

ABBREVIATIONS

d	Diameter (mm)	I	Length (mm)	h_A	Ejection stroke (mm)
h_T	Total stroke (mm)	h_S	Clamping stroke (mm)	F_B	Actuation force (kN)
F_S	Clamping force (kN)				

PSC grippers

Designed for high demands in rotating and stationary applications

During development of the polygonal taper shank, essential cutting-based machining methods were taken into account. For this reason, this interface has become particularly popular for use in multi-functional machining centres. Its unique characteristics are

the conical polygonal shape, the face contact and the large taper diameter, giving the PSC interface a particularly high positioning and repeat accuracy. Other crucial features of the polygonal taper shank are its rigidity and torque strength, making it suitable for both

Force-amplifying PSC 100 gripper with built-in holding function for quick and stable tool changes, particularly suitable for compact modular spindles (type CVR) [↓](#)



rotating and stationary applications. As a Sandvik system partner from the very beginning, we have the necessary knowledge and expertise required for designing and manufacturing grippers for tool holders with a polygonal shank. For this reason, we systematically fo-

cused on various specific functions when developing our standard PSC grippers in order to meet the requirements of many different application cases.

Gripper with force amplification and holding function for PSC size 80 and a corresponding profile bush with measured clamping shoulder as spindle insert (type CVR) [↓](#)



Manually actuated PSC grippers with integrated holding force in various sizes (type C ...-M) [↓](#)

Force-amplifying PSC 63 gripper without holding function (type CV) [↓](#)



CV(R)

Force-amplifying PSC gripper with optional holding function



APPLICATION

Grippers of the types CV and CVR are used for clamping PSC tools in milling spindles. They comply with ISO 26623, but do not achieve the clamping forces defined for the Capto interface by Sandvik Coromant. Thanks to the force amplification during the clamping force build-up, CV(R) grippers can be used for compact, long-lived tool clamping units. Their design, clamping strokes and actuation forces are developed for use in modular spindles with the related HSK or SK sizes. CV and CVR grippers are exclusively used as tool clamping units together with BERG spring stacks.

FUNCTION

The taper incline of the centrally located draw bolt pushes the clamping segments outward behind the clamping shoulder in the spindle shaft during clamping (pull direction). In this way the actuation force is intensified, achieving a clamping force that is many times higher. A locking screw permits infinitely variable adjustment of the gripper and fixation in place in the z axis. The holding function of the type CVR holds the tool in the release position in the spindle, permitting a quick, safe tool change.

TECHNICAL FEATURES

- Low actuation forces thanks to integrated force amplification
- Maximum clamping force consistency
- Strong and maintenance-free thanks to special surface coating
- Simple and quick assembly without special tools
- Holding function of gripper type CVR for stable tool changes

VARIANTS

- In compact design
- With customer-specific holding forces

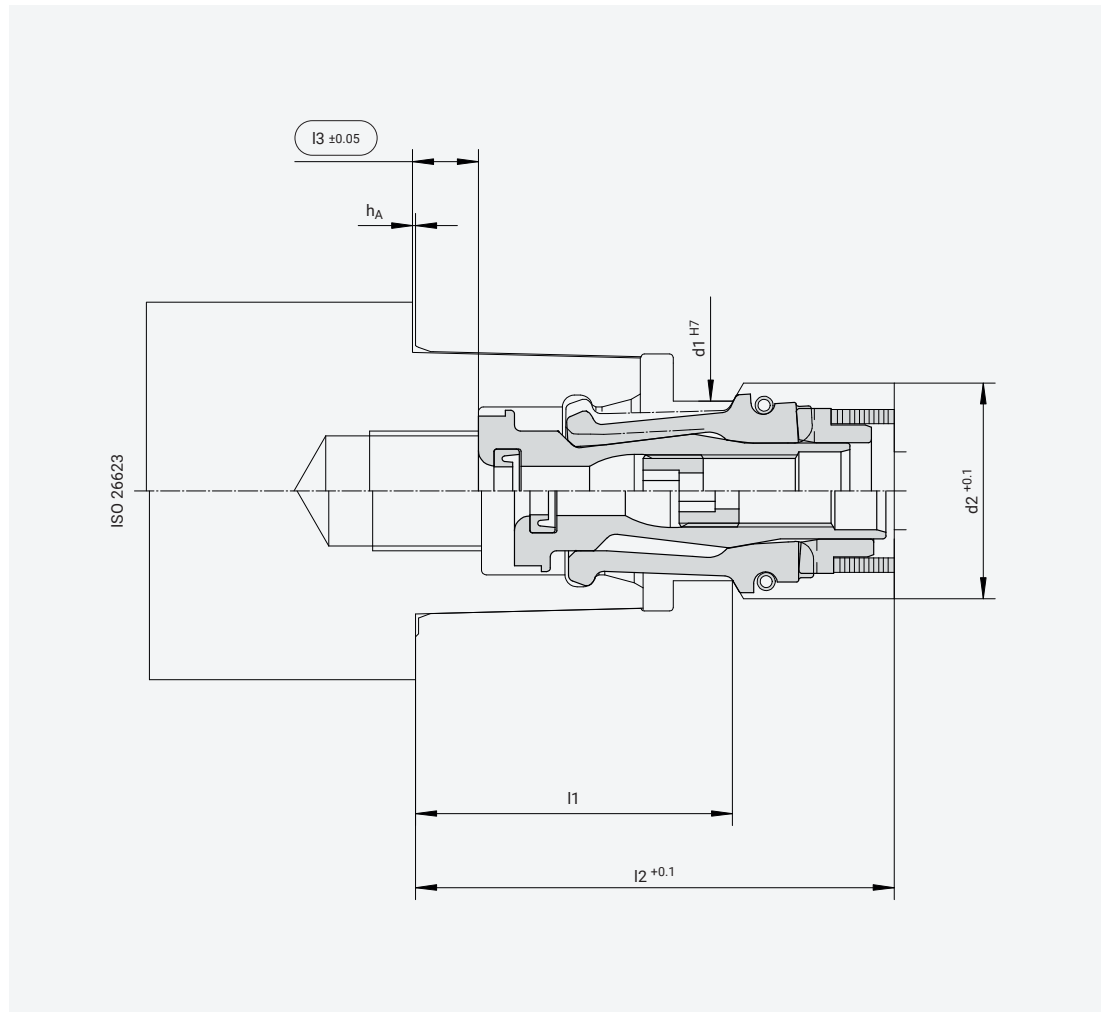
ACCESSORIES

- Clamping force and clamping shoulder measuring systems
- Profile bushes with measured clamping shoulder as spindle insert
- Coolant transfer tubes
- PSC tool flanges

COMMENT

The maximum clamping forces deviate from the recommended clamping forces for the Coromant Capto® interface. For this reason only appropriately reduced cutting forces are permissible during turning operation.

APPLICATION PROPOSAL



TECHNICAL DATA

PSC size	Type	d1	d2	l1	l2	l3	h _A	h _T	h _S	F _B max.	F _S max. ¹⁾	F _H ²⁾
80	CV(R) 8	35	44	70.3 _{js7}	103	19	1	10	7	10	50	170
100	CV(R) 10	45	55	85 _{js8}	125	19	1	12	8	12	70	170

¹⁾ Maximum clamping forces deviating from interface Coromant Capto®

²⁾ Only for gripper type CVR

ABBREVIATIONS

d Diameter (mm)

l Length (mm)

h_A Ejection stroke (mm)

h_T Total stroke (mm)

h_S Clamping stroke (mm)

F_B Actuation force (kN)

F_S Clamping force (kN)

F_H Holding force (N)

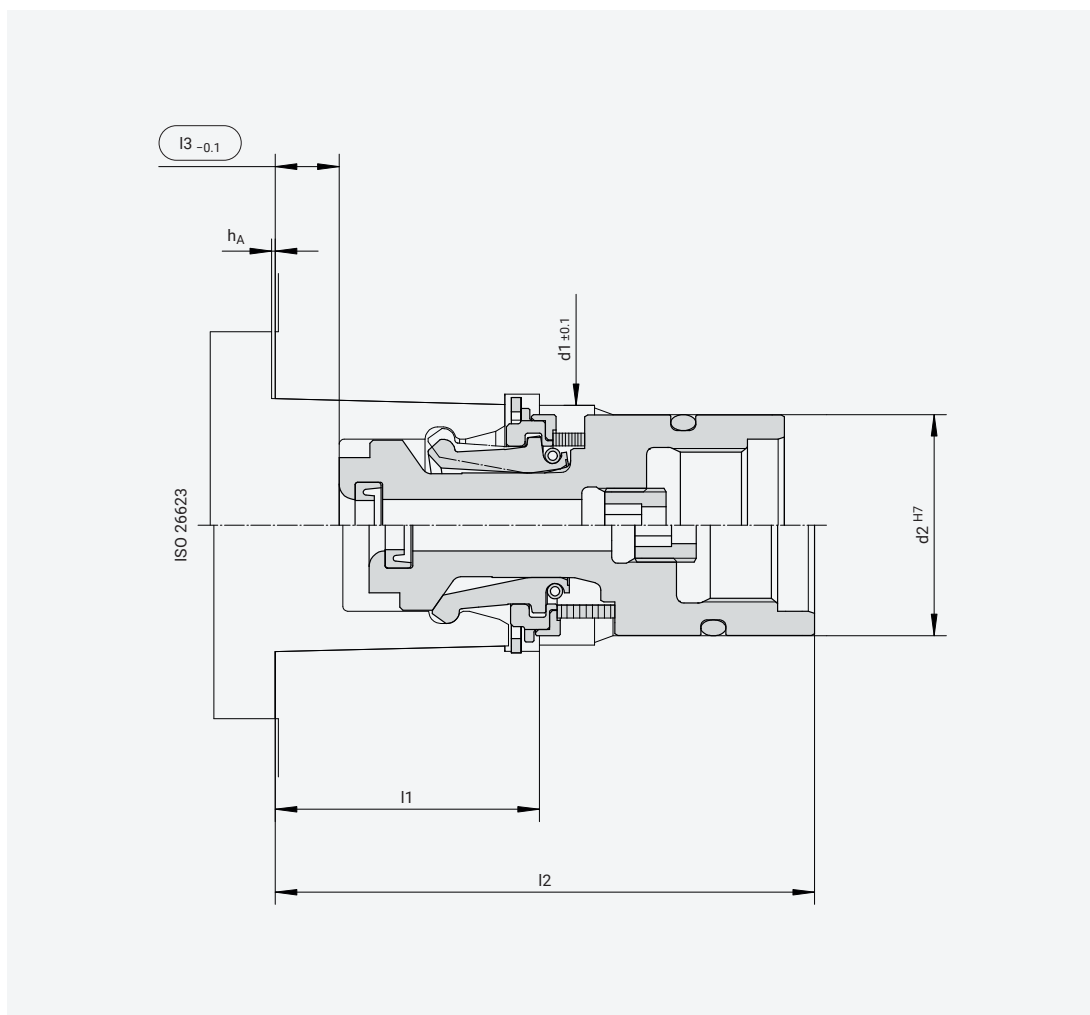
Capto C...(R)

PSC gripper with direct force transmission and optional holding function



APPLICATION	The Capto C...(R) grippers are designed for clamping tools with a polygonal shank in accordance with ISO 26623 (Capto interface). They are particularly suitable for use in milling and turning spindles as well as special applications requiring maximum cutting performance.
FUNCTION	During clamping, the centrally located draw bolt transmits the actuation force directly to the tool without any further force deflection. The clamping segments serve as purely pressure-loaded coupling elements. A locking screw permits infinitely variable installation of the gripper from the front in the z axis. The gripper type Capto C...R has an additional integrated holding mechanism. It holds the tool securely in the spindle in its release position to permit quick tool changes.
TECHNICAL FEATURES	▪ Minimised installation diameter for installation from the front through the polygonal profile ▪ Designed for maximum clamping forces ▪ Strong and maintenance-free ▪ Completely sealed for reliable medium transfer (blast air, coolant lubricant and minimum quantity lubrication) ▪ Short strokes for compact spring stacks ▪ With optional holding function for improved tool changing times
VARIANTS	▪ Connection thread according to customer request ▪ As tool clamping unit with force-amplifying gear and spring stack
ACCESSORIES	▪ Clamping force measuring systems ▪ PSC tool flanges

APPLICATION PROPOSAL



TECHNICAL DATA

PSC size	Type	d1	d2	l1	l2	l3	h _A	h _T	h _S	F _S max.	F _H ¹⁾
40	Capto C4(R)	26	24	28	60	8.3	0.5	3.7	3	25	120
50	Capto C5(R)	32	30	35	65	9.2	0.6	4.5	3.7	35	160
63	Capto C6(R)	39	36	43	85	10.2	0.8	5.7	5.1	45	190
80	Capto C8(R)	49	45	52	100	19.2	0.8	7	6	55	200

¹⁾ Only for gripper type Capto C...R

ABBREVIATIONS

d	Diameter (mm)	l	Length (mm)	h _A	Ejection stroke (mm)
h _T	Total stroke (mm)	h _S	Clamping stroke (mm)	F _S	Clamping force (kN)
F _H	Holding force (N)				

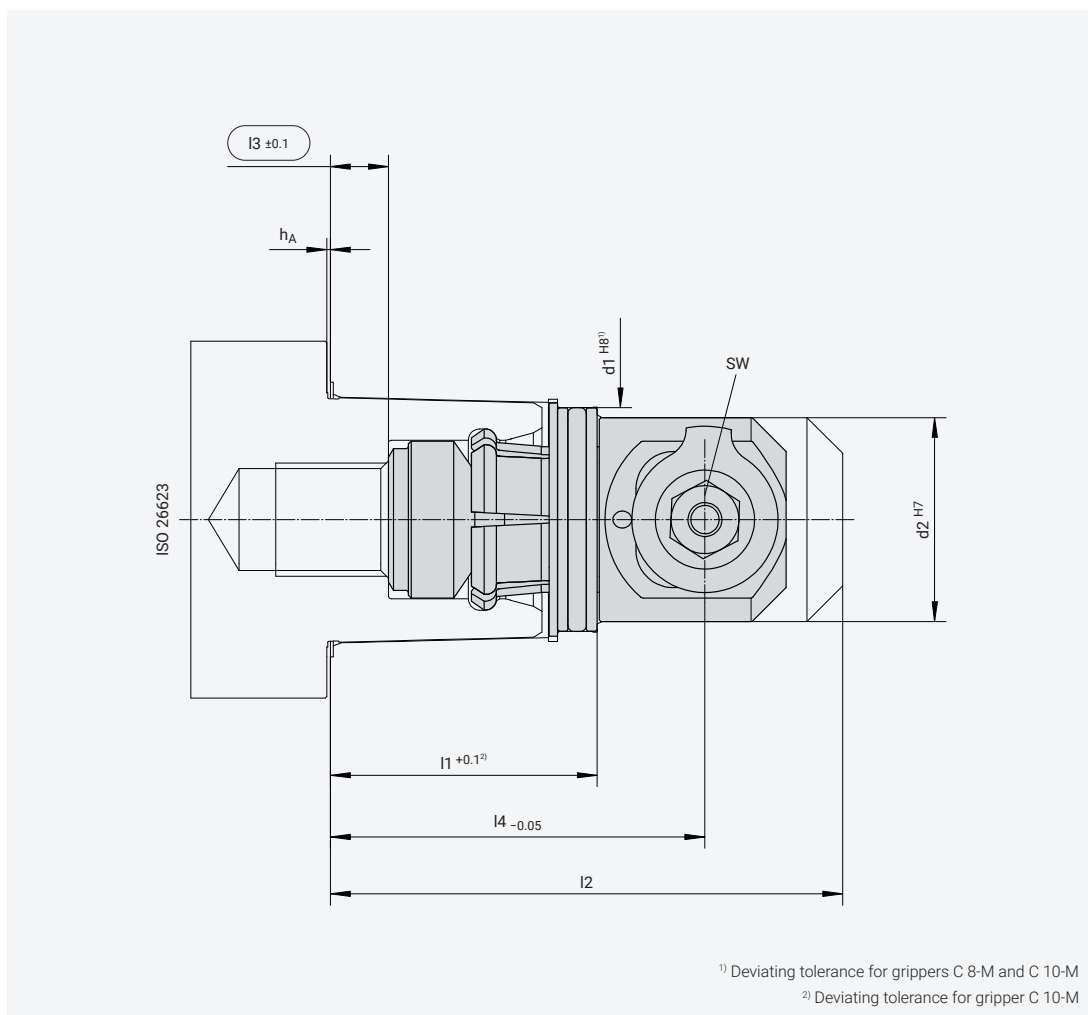
C...-M

Manually-actuated PSC gripper



APPLICATION	PSC grippers of type C ...-M are intended for manual clamping of tools in accordance with ISO 26623 (Capto interface). A characteristic feature of these grippers is their compact design, making them suitable for extremely small spaces in static tool holders as well as driven tool systems. Moreover, the small installation diameter permits easy assembly from the front through the polygonal tool flange.
FUNCTION	The manually-actuated grippers clamp tools securely and self-locking with high forces. The clamping force is built up by the radially arranged eccentric shaft using a torque key. The centrally positioned tension piston transmits the force to the clamping segments, where it acts directly as clamping force without further deflection.
TECHNICAL FEATURES	▪ Compact, particularly short design ▪ Minimised installation diameter for installation from the front through the polygonal profile ▪ With integrated holding force for user-friendly tool changes ▪ Completely sealed for reliable transfer of blast air, coolant lubricant and minimum quantity lubrication
VARIANTS	▪ Manual grippers in special lengths
ACCESSORIES	▪ Clamping force measuring systems ▪ PSC tool flanges

APPLICATION PROPOSAL



TECHNICAL DATA

PSC size	Type	d1	d2	I1	I2	I3	I4	h_A	h_S	SW	M_B	$F_{S \text{ max.}}$	F_H
32	C 3-M	19.8	18.5	24.8	49.85	5.3	36.45	0.75	2.35	6	35	20.8	20
40	C 4-M	25.2	24	29.7	58	8.3	43	0.74	2.75	8	45	29.4	45
50	C 5-M	33	30	37	70	9.2	53	0.82	3.35	10	70	38	70
63	C 6-M	39.5	36	47.1	86.8	10.2	66	0.8	4	12	90	51.8	90
80	C 8-M	$49^{+0.05}$	45	58.3	104	19	81.26	1	4.5	14	130	60.8	130
100	C 10-M	$100^{+0.01}$	80	$56.5^{+0.2}$	145	19	103	1	7	17	370	100	–

ABBREVIATIONS

d	Diameter (mm)	I	Length (mm)	h_A	Ejection stroke (mm)
h_S	Clamping stroke (mm)	SW	Width across flats (mm)	M_B	Operating torque (Nm)
F_S	Clamping force (kN)	F_H	Holding force (N)		



Expertise in clamping systems

Modern manufacturing technology demands flexible clamping technology. Our tool clamping systems are complete solutions tailor-made for each application. They represent reliable performance, compact dimensions and a long service life. Using our tried-and-tested individual components guarantees the functionality and performance of the entire system.

The field of tool clamping systems is where a provider's skills get to shine. The requirements for clamping technology in the area of cutting-based machining processes are complex.

Mechanical, hydraulic and electrical complete clamping units suitable for nearly every type of machining spindle.

A constant clamping force, system rigidity suitable for the specific demands and consistent accuracy are just as required as a long service life and a maintenance-free design. Moreover, the demand for product solutions for process monitoring and space-limited applications has seen a steady increase.

Tool clamping with systematic structure

Thanks to close collaboration with leading spindle and machine manufacturers and a wide range of system components which we adapt precisely to each other during configuration, we are able to offer the perfect clamping system for a wide range of different needs.

More than just a clamping system

We make systematic modifications to our standard modules to adapt performance parameters in order to create new options for our customers.

Our primary fields of expertise include grippers, force-amplifying gear units, spring stacks and release cylinders as well as systems for medium transfer and position measurement. The result:

Milestones:

2014	Modular compact system with BERG rotary union and analogue position measurement system ($\leq 20,000$ rpm)
2011	HSK clamping system for spindle speeds $\leq 80,000$ rpm
2010	Modular compact clamping system with rotary union ($\leq 6,000$ rpm)
2008	Mechanical SK clamping system < 300 mm with rotary union ($\leq 6,000$ rpm)
2007	HSK clamping system with service life > 5 million clamping cycles
2006	Mechanical PSC clamping system
2005	Mechanical SK clamping system 2.0
2001	Mechanical HSK clamping system incl. special spindle shaft
2000	Mechanical HSK clamping system 2.0
1997	Hydraulic, self-locking clamping system
1993	Mechanical HSK clamping system ($\leq 30,000$ rpm)
1989	Hydraulic SK clamping system ($\leq 15,000$ rpm)
1985	Mechanical SK clamping system
1980	Electromechanical SK clamping system



All components from one source



Short development times



Flexible product architecture



Worldwide sales and service

Spring-actuated complete clamping systems

Flexible clamping system solutions for the entire range of spindle tech- nology

The machining process, clamping tasks and available installation space determine the specific design of a clamping system. For this reason, our mechanical tool clamping systems are exclusively customer/application-specific complete system designs. Systematic configuration and modification of the available

modular components makes it possible to supply the optimum clamping system for any common interface in an efficient manner. For these systems we primarily use force-amplifying grippers that achieve a clamping force that is many times higher than the actuating force. Moreover, the force amplification

top: SK tool clamping system with stationary, single-acting release cylinder, **center and bottom:** Clamping systems with SK grippers in different lengths and with different spindle-integrated, bearing-relieving rotary unions ↓



permits a compact design of the entire tool clamping system. In addition, the spring stacks we use are characterised by their excellent clamping force consistency, high balancing quality and long service life. They form the foundation for the durability of the entire system. The choice of release unit de-

pends, among other things on the desired actuation type, the available installation space and the required release or ejection force. Additional configuration details, e. g. the blow-out air routing, clamping stroke detection, rotary union for coolant lubricant are also adapted to customer requirements.

Tool clamping system with release unit and installation-ready spindle insert consisting of SK gripper, profile bush with measured clamping shoulder and spring stack ↓



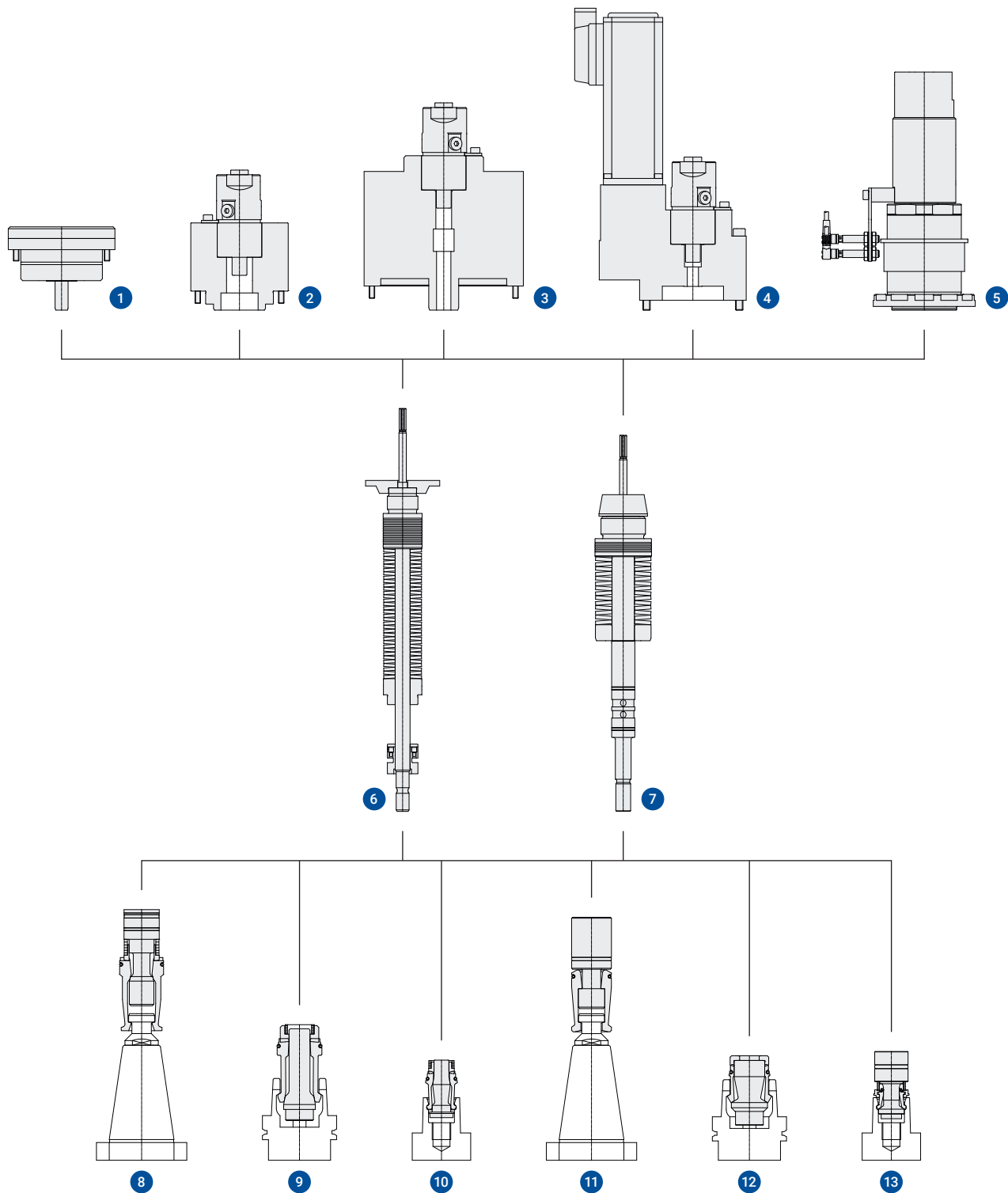
Highly compact HSK clamping system with high clamping forces for swivelling turrets ↓



Complete clamping system with HSK gripper, connection piece for eccentric blast air transfer, spring stack and release cylinder ↑

Clamping systems with a modular design principle

System component overview



- 1 Hydraulic unclamping units (type: HLZ)
 - Stationary cylinder
 - Single-acting (unclamping by spring or bearing reset)
 - Integrated rotary union for coolant lubricant
- 2 Hydraulic unclamping units (type: HDZ)
 - Stationary cylinder
 - Double-acting (unclamping by hydraulic pressure)
 - Insertable, bearing-mounted rotary union for coolant lubricant (optional)
- 3 Pneumatic unclamping units (type: PDZ)
 - Stationary cylinder
 - Double-acting (unclamping by pneumatic pressure)
 - Insertable, bearing-mounted rotary union for coolant lubricant (optional)
- 4 Electrical unclamping units (type: EDZ)
 - Stationary cylinder
 - Insertable, bearing-mounted rotary union for coolant lubricant (optional)
- 5 Hydraulic unclamping units (type: HLZ-RK)
 - Rotating cylinder
 - Single-acting (unclamping by spring or bearing reset)
 - Integrated rotary union for coolant lubricant
- 6 Spring stacks for motor spindles
 - Incl. connection piece for medium transfer
 - Cylindrical signal wheel
 - Coolant lubricant transfer tube
- 7 Spring stacks for gear-driven spindles
 - Incl. connection piece for medium transfer
 - Conical signal wheel
 - Coolant lubricant transfer tube
- 8 SK grippers with force amplification
- 9 HSK grippers with force amplification
- 10 PSC grippers with force amplification
- 11 SK grippers with direct force transmission
- 12 HSK grippers with direct force transmission
- 13 PSC grippers with direct force transmission

The configuration of our spring-actuated tool clamping systems uses a modular principle. This allows us to quickly implement new product variants and offer customised solutions from a single source with the greatest possible practice orientation and efficiency, irrespective of the desired quantity.

Our complete clamping systems usually consist of the components gripper, spring stack including draw tube and connecting piece for medium transfer as well as unclamping unit with rotary union for coolant lubricant. Mechanisms for process monitoring are added based on specific requirements.

For system development, we have access to a wide range of standard products. Individual components are modified as required and adapted with regard to clamping force, installation space, speed range, etc. This ensures that our customers always get the best clamping system, without compromises.

Clamping systems with a modular design principle

System component specifications

Clamping

Our gripper range is characterised by a unique spectrum of available products. It includes grippers with direct force transmission and force-amplifying grippers for SK, HSK and PSC interfaces. All clamping equipment is designed to endure, completely maintenance-free and offers the greatest possible clamping force consistency. The force-amplifying grippers allow us to build particularly compact tool clamping systems. They are also suitable for configuring systems with spring stacks in an identical size and release cylinders for modular spindles.

In addition to the basic versions of our grippers, a variety of options is also available, e. g.:

- Holding function for quick, stable tool change
- Compact design
- With coolant transfer system
- Special clamping force > standard
- Short stroke version for compact spring stacks
- High-speed function
- Large through holes for plunger/control shafts
- Stainless steel version

Medium transfer

In the simplest design, the gripper is directly connected to the draw tube. Cooling medium and blast air are routed centrally to the tool via a through hole. To clean interfaces with face contact, it is possible to guide the air through an off-centred connection piece to the taper while the system is in the tool change position.

Alternatively, we use small valve housings, which can be replaced at the front together with the gripper. The advantage of this version is an uninterrupted hole with a large passage to the tool holder. The valve housings distribute the cleaning air to the blow-out channels and lock the air supply, which runs separately through the spindle shaft, so that no cooling medium can enter the spindle or the spring stack during operation.



Actuation

BERG spring stacks are maintenance-free for life and simultaneously have high endurance and are fully tested. They are supplied as an installation-ready assembly group with draw tube, medium transfer and gripper. A characteristic feature is the single layer of disc springs with severely restricted clearance in relation to the tie rod, leading to ideal force consistency on the one hand and excellent, stable balance quality on the other. The high energy density permits construction of compact spindles.

Our spring stacks allow extremely flexible configuration and are always adapted precisely to customer-specific requirements such as space, clamping force or load cycles. Other design options include:

- Service life > 5 million load cycles
- Stainless steel disc springs for corrosion protection
- With integrated clamping stroke detection or prepared for the customer's clamping stroke detection
- As installation cartridge for quick assembly from the front
- With coolant transfer tube

Clamping stroke detection

Monitoring systems permit automatic control of a smooth automatic tool change. They also help to detect malfunctions in the clamping process at an early stage. Checking the stroke position of the gripper is one time-tested method, for instance. For this purpose, we use switches or analogue position measuring systems. The signal encoders are signal wheels or plunger coil systems.



Unclamping

Our unclamping units for mechanical clamping systems are available with hydraulic, pneumatic and electrical actuation. The hydraulic and pneumatic units are available in two versions: as single-acting cylinders (unclamping using spring or bearing reset) and as double-acting cylinders (unclamping using hydraulic or pneumatic system). In addition to standardised stationary and rotating cylinders, we primarily produce special solutions adapted to the available installation space.

BERG unclamping units are designed to be as short and compact as possible. They have an integrated rotary union for coolant lubricant or are designed to accommodate conventional rotary unions. Moreover, different additional functions are available:

- Spindle bearing relief
- Clamping stroke detection
- Position control of the release piston
- Separate transfer of blow-out air
- Coolant lubricant leak detection



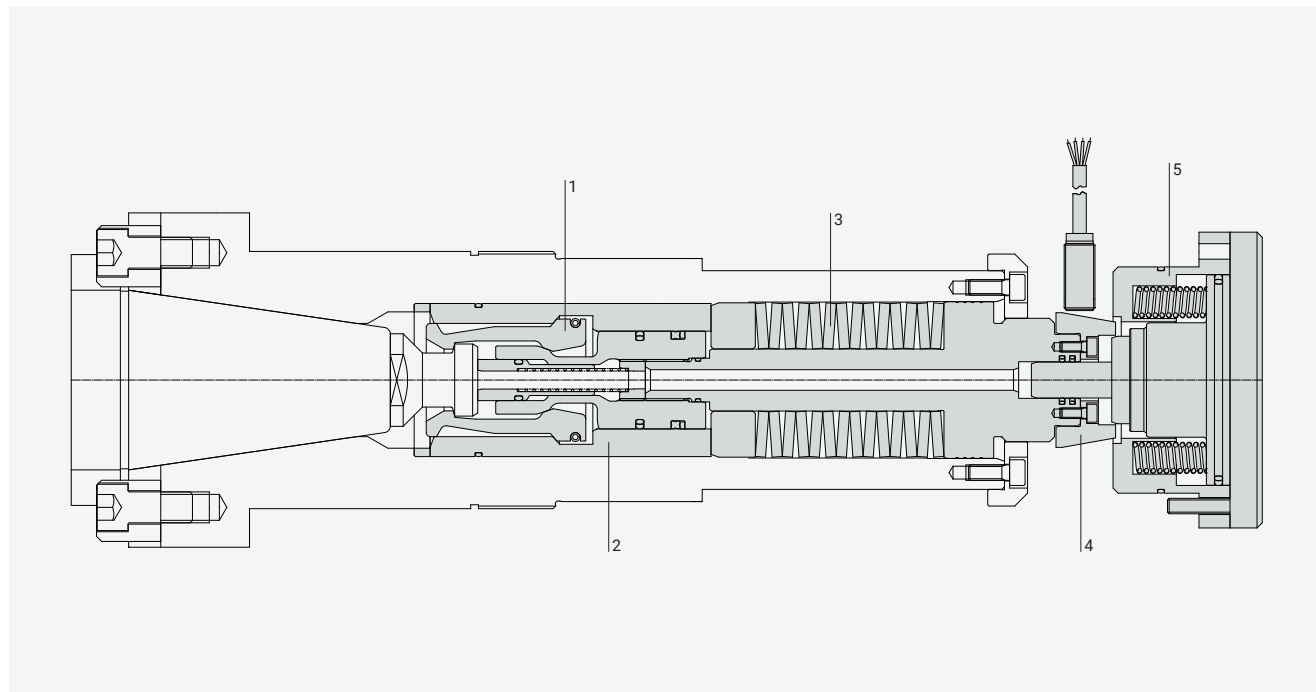
Rotary unions

Our compact rotary unions ensure secure coolant medium transfer to the rotating spindle. They are characterised by large through holes and a permanently closed sealing gap. High-quality components and a temperature-optimised design permit high spindle speeds and long service lives. The medium and leakage connection is either radial or axial. All types can be equipped with an additional membrane enabling blow-out air for taper cleaning.

The adaptation of established standard products is the key to qualified, low-risk implementation of customised clamping system solutions. Another advantage of modular product development becomes obvious when considering the steadily increasing number of different versions of individual component groups.

MS-SSKV .../HLZ

Clamping system for gear-driven spindles (1)



EXAMPLE SYSTEM 1

This tool clamping system is characterised by its compact design and the high, constant clamping force. The strong clamping unit is highly suitable for high-torque applications with limited space in heavy-duty machining, in particular for milling heads. ↑

MODULES

- 1 Force-amplifying SK gripper in compact design, incl. medium transfer system
- 2 Profile bush with measured clamping shoulder as spindle insert
- 3 Spring stack with high energy density for compact spindles
- 4 Conical signal wheel for analogue clamping stroke monitoring
- 5 Stationary, compact unclamping unit with spring reset and integrated rotary union for coolant lubricant

EXAMPLE SYSTEM 2

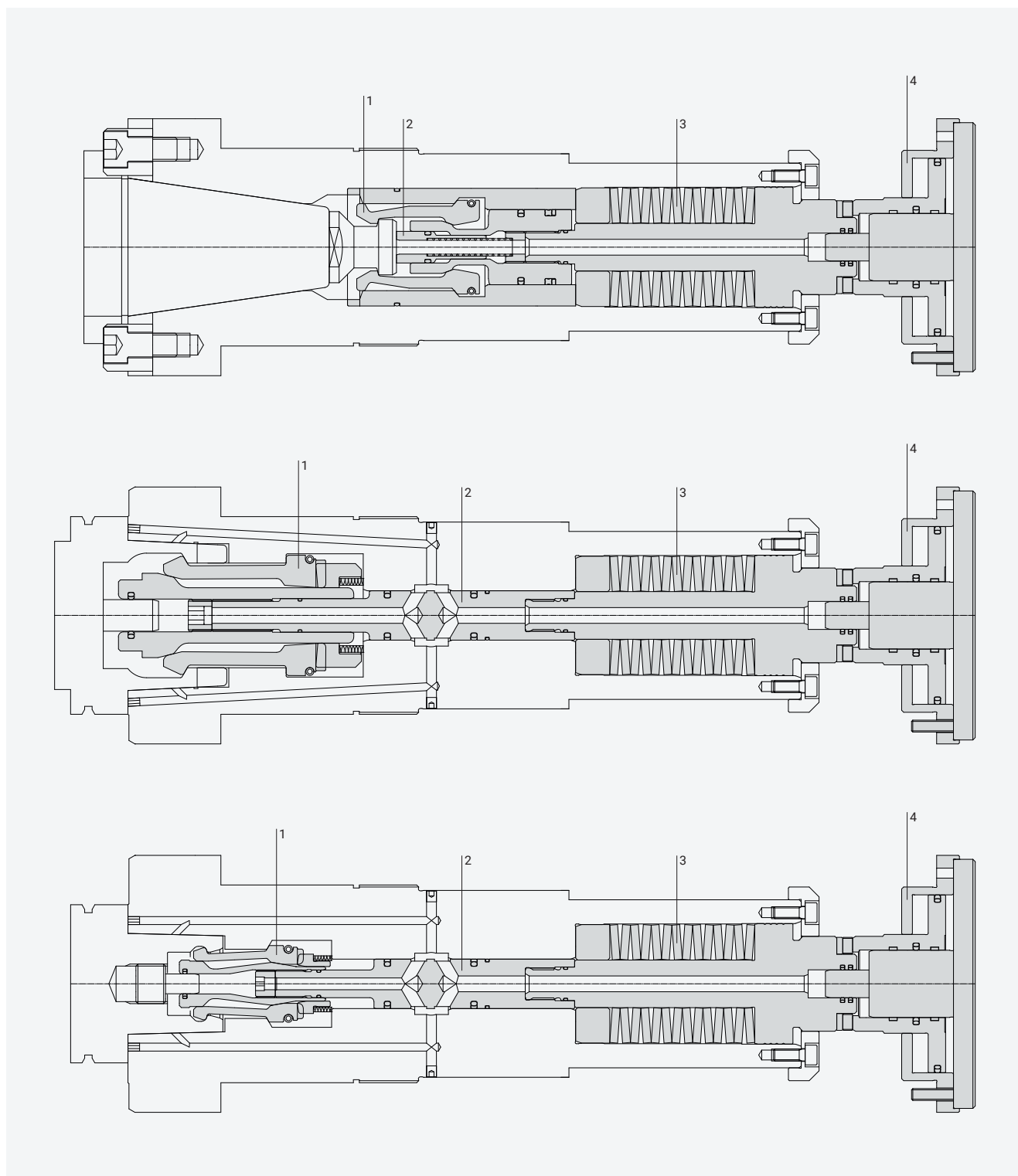
The modular clamping system permits use of grippers for different tool interfaces with identical spring stacks and actuation units while spindle dimensions remain unchanged. The system is designed for high spindle torques, in particular in compact gear-driven spindles. →

MODULES

- 1 SK, HSK, PSC gripper with high force amplification factor
- 2 Connecting pieces with interface-specific medium transfer systems
- 3 Spring stacks with high energy density for compact spindles
- 4 Stationary hydraulic unclamping units with bearing reset and integrated rotary union for coolant lubricant

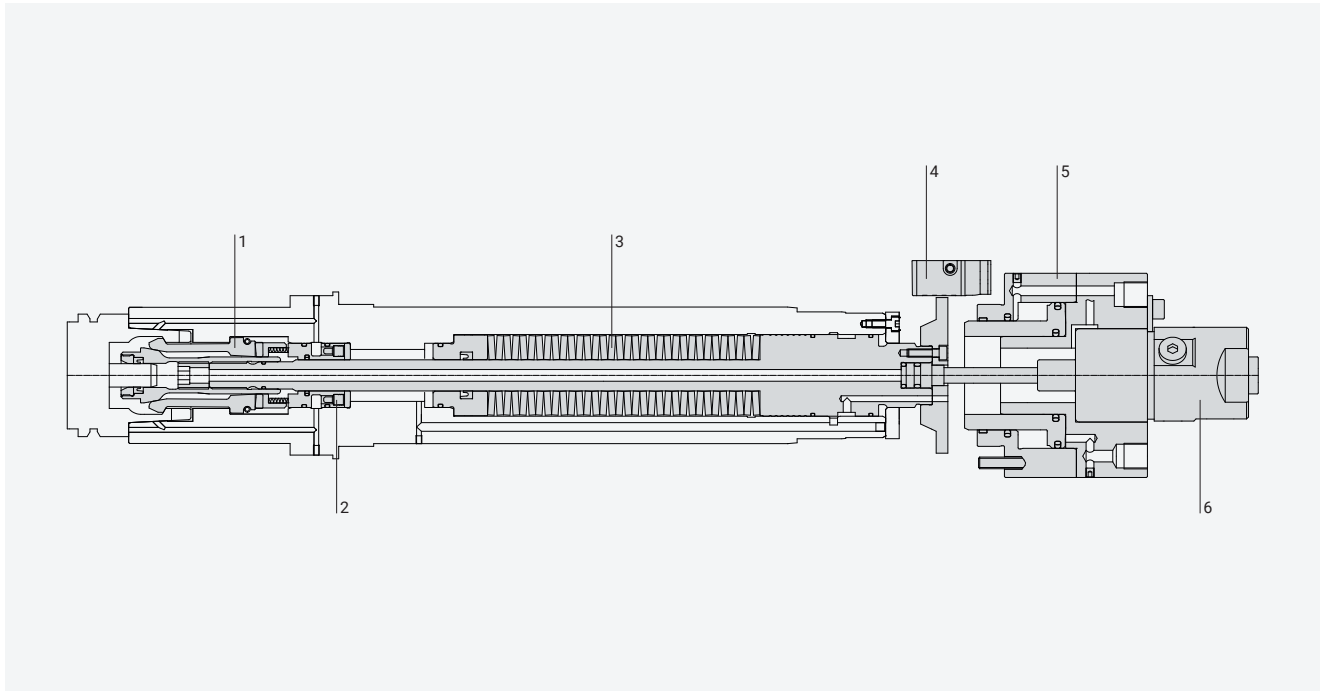
MS-SSKV.../HLZ · MS-HK.../HLZ · MS-CVR.../HLZ

Clamping systems for gear-driven spindles (2)



MS-HK.../HDZ

Clamping system for motor spindles



EXAMPLE SYSTEM

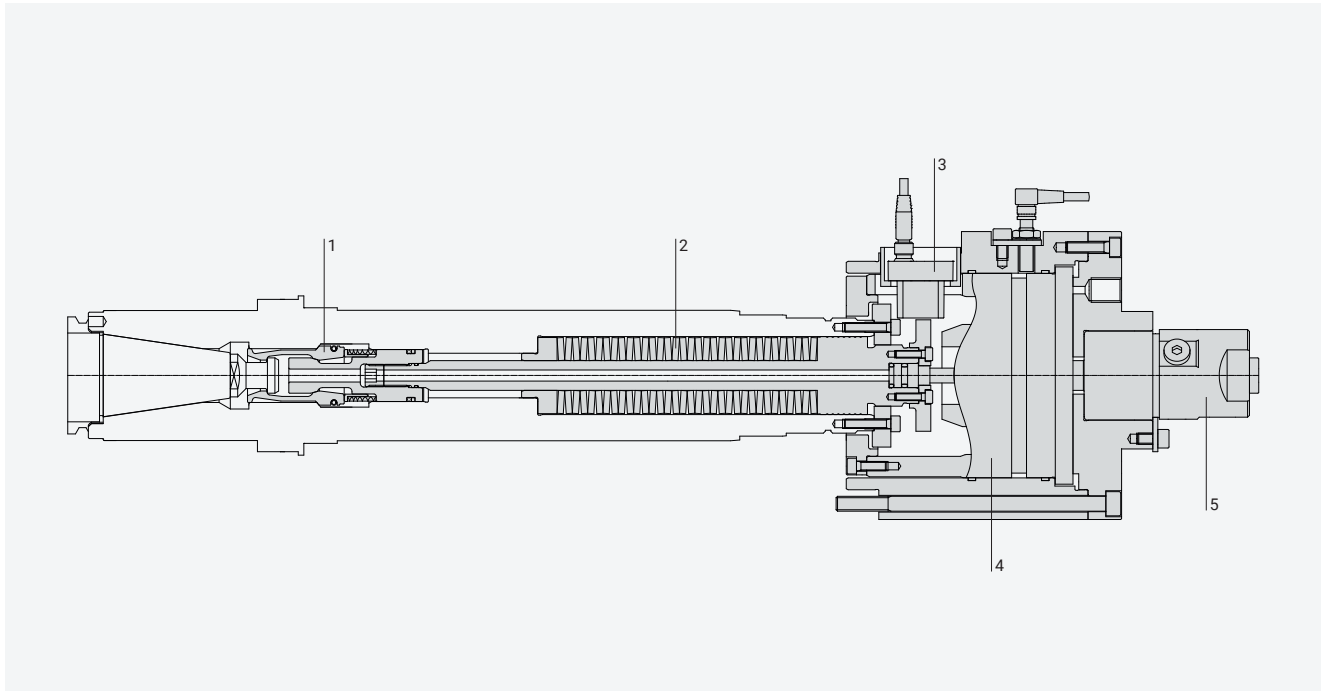
This maintenance-free tool clamping system is characterised by excellent true-running properties and a long service life. Its running smoothness and durability are achieved through the highly accurate guidance of the draw bar in the spindle shaft with the aid of selected material pairings. The force amplification of the gripper and the high energy density of the disc springs permit short spindle lengths. The clamping system is suitable for the entire range of cutting-based machining processes.

MODULES

- 1 HSK gripper with high force amplification factor
- 2 Valve housing for separate eccentric blow-out air with sealing toward gripper and spring stack
- 3 High-performance spring stack for long service life (up to 5 million load cycles) and maximum clamping force consistency
- 4 Analogue position measuring system for clamping stroke detection using signal wheel
- 5 Stationary, 2-channel hydraulic unclamping unit with integrated mounting for conventional rotary unions for coolant lubricant
- 6 Insertable, bearing-mounted rotary union for coolant lubricant

MS-SSKV .../HDZE

Clamping system for motor spindles



EXAMPLE SYSTEM

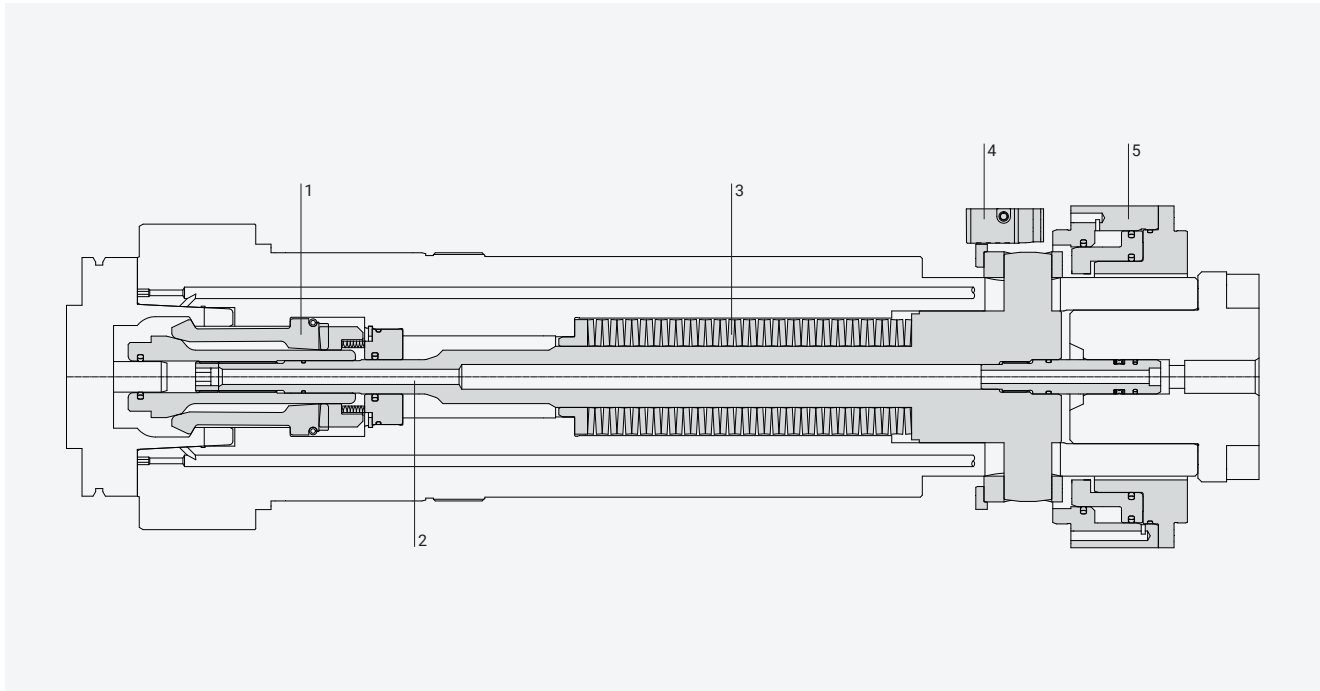
The severely restricted clearance of the disc springs in relation to the draw bar ensures stable, excellent balancing quality. The clamping system is maintenance-free and long-lived. The system is suitable for both roughing and precise fine machining. Moreover, the combination of a force-amplifying gripper and the high energy density of the spring stack permits short spindle lengths, thereby making installation in small spaces possible.

MODULES

- 1 Force-amplifying SK gripper
- 2 Compact, durable spring stack with constant high clamping forces
- 3 Cylindrical signal wheel with analogue sensor for clamping stroke detection
- 4 Stationary, 2-channel hydraulic unclamping unit with spindle bearing relief during tool release and ejection, incl. integrated mounting for conventional rotary unions and position monitoring of the release piston by sensor
- 5 Insertable, bearing-mounted rotary union for central coolant lubricant transfer and blow-out air transfer for taper cleaning

MS-HK.../HDZ

Clamping system for inline spindles



EXAMPLE SYSTEM

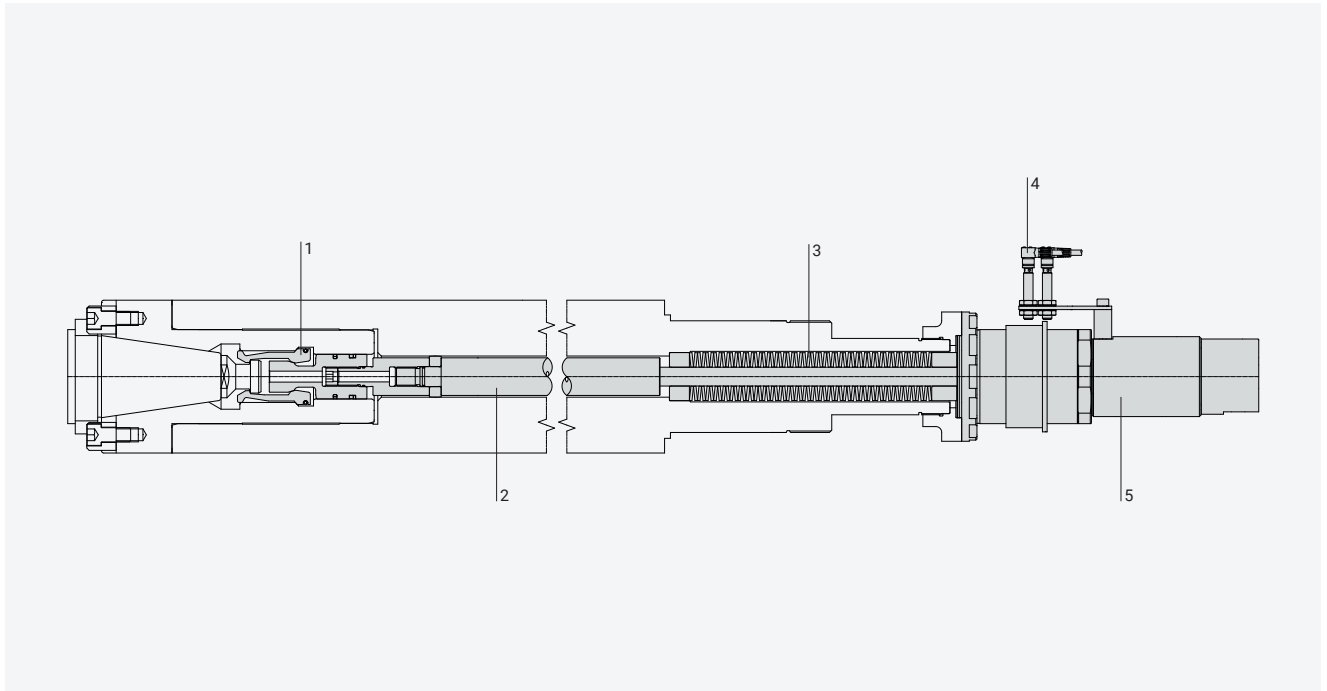
In this tool clamping system, the central hydraulic hollow piston cylinder is located between the milling spindle and motor. The release force is transmitted to the spring stack by a pressure ring. The system permits high clamping forces in a compact front spindle. It is maintenance-free and meets the performance and spindle speed requirements of inline spindles without any reductions in effectiveness or service life.

MODULES

- 1 HSK gripper with high force amplification factor
- 2 Central coolant lubricant line
- 3 Spring stack with high energy density for compact spindles
- 4 Analogue sensor for monitoring the gripper's stroke position
- 5 Compact unclamping unit integrated in the spindle shaft

MS-SSKV .../HLZ-RK

Clamping system for boring spindles



EXAMPLE SYSTEM

This clamping system is designed for long, narrow mandrel spindles, which are, for instance, used in horizontal and vertical boring and milling machines or in vertical lathes. The rotating hydraulic unclamping cylinder protects the spindle bearing and is designed as installation-ready clamping cartridge together with the spring stack. Combined with the force-amplifying gripper, this tool clamping system achieves high clamping forces, thereby contributing to an ideal cutting performance during machining of medium to large workpieces.

MODULES

- 1 SK gripper with high force amplification factor and large coolant lubricant passage
- 2 Connection piece in application-specific length with large passage for central coolant lubricant and blow-out air transfer
- 3 High energy density spring stack
- 4 Clamping stroke monitoring using proximity switches
- 5 Rotating unclamping unit with integrated rotary union for coolant lubricant

Hydromechanical tool clamping units

Compact power for safe clamping

Maximum clamping force and clamping security in minimum space – these are the characteristics of our product range for hydraulically operated, self-locking clamping systems. They are particularly suitable for use in extremely short

milling head spindles and for machining processes requiring an extremely high clamping force performance. Our SHR clamping units are compatible with all conventional tool interfaces. The effective self-locking feature of the system

Self-locking hydraulic clamping units for HSK, SK and PSC interfaces with corresponding bearing-mounted rotary union for medium transfer ↓



guarantees high mechanical rigidity of the interface combined with maximum safety during the entire workpiece machining process. For actuation of the clamping unit with hydraulic oil and for transfer of the blow-out air and coolant

lubricant, we use a compact and bearing-mounted rotary union. The clamping stroke detection, medium transfer and tool flange are customised for the project.

Tool clamping unit in housed version for interface HSK-A 100, designed for central medium supply line ↓



Clamping unit for PSC 63 interface with ready-to-install high-precision tool flange ↙

Bearing-mounted rotary union for hydraulic oil, air and coolant lubricant transfer ↘



HS-SHR-SSKF .../HDF · HS-SHR.../HDF · HS-SHR-C.../HDF

Compact clamping units with tool flange, spindle shaft and rotary union



SYSTEM

The highly compact structure of gripper, force-amplifying wedge gear and rotary union permits use in particularly short machining spindles with extremely limited space. A double-acting piston uses hydraulic pressure to actuate the wedge gear, which is connected rigidly with the gripper via the tie rod and pulls in the tool. When face or taper contact is reached, the wedge gear builds up clamping force, generating a very high energy density even in very small spaces thanks to the force amplification.

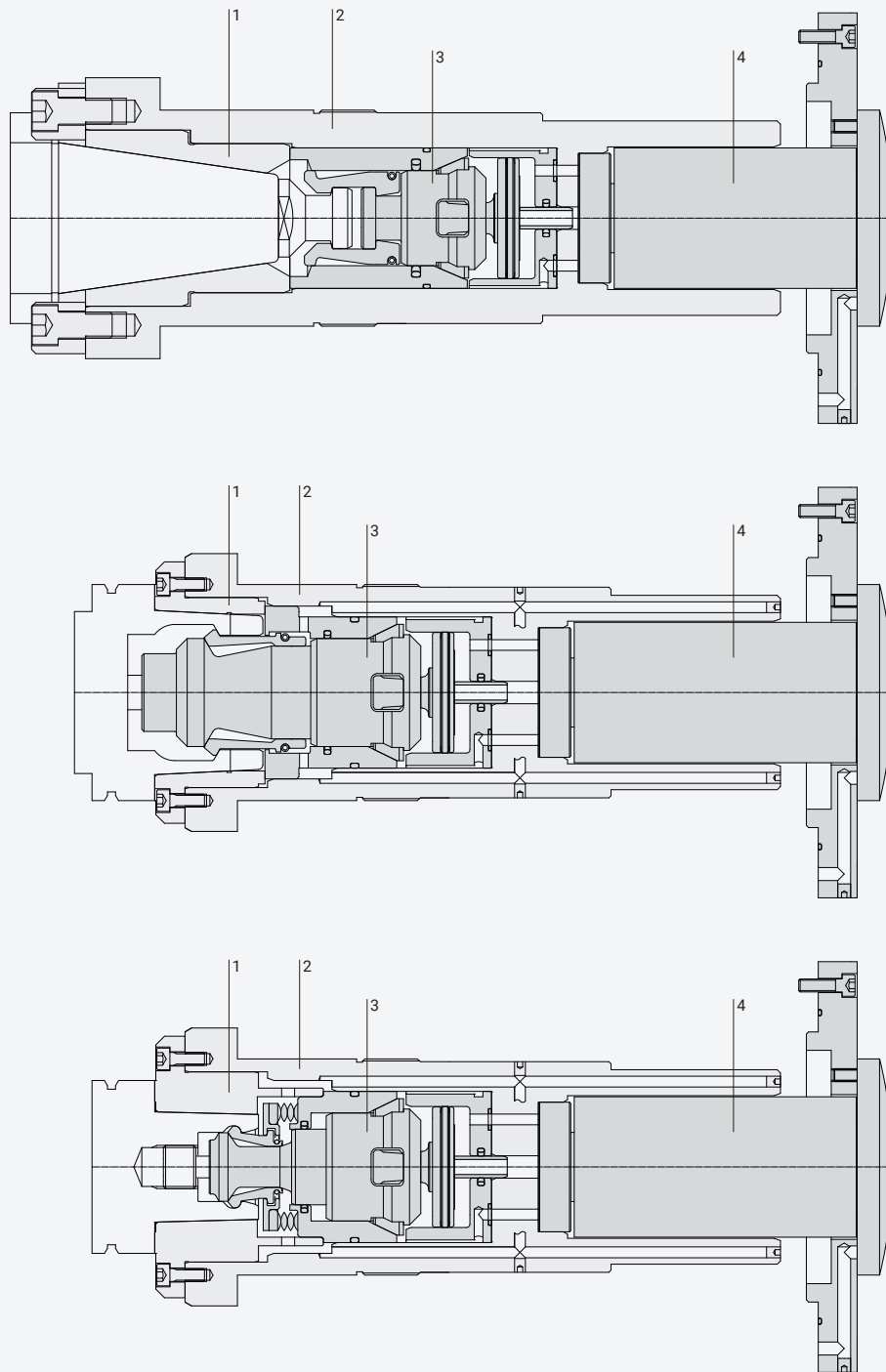
MODULES

- 1 Application-specific tool flanges for installation of the clamping unit from the front
- 2 Highly precise, compact spindle shafts incl. separate blow-out air channels for HSK and PSC designs
- 3 Completely self-locking, maintenance-free clamping units with strong SK, HSK, PSC gripper and force-amplifying wedge gear for maximum clamping forces
- 4 Bearing-mounted compact rotary union for max. 4,000 rpm for hydraulic oil and coolant lubricant transfer during rotation, with separate blow-out air transfer during spindle standstill for HSK and PSC designs

TECHNICAL DATA

Interface	Type	F _S max.	F _A min.
SK 40	SHR-SSKF 40	18	12
SK 50	SHR-SSKF 50	35	14
SK 60	SHR-SSKF 60	65	29
HSK-A/T/E 63 · HSK-B/F 80	SHR 48	40	10
HSK-A/T/E 80 · HSK-B/F 100	SHR 75	50	19
HSK-A/T/E 100 · HSK-B/F 125	SHR 95	75	22
HSK-A/T/E 125 · HSK-B/F 160	SHR 95	120	37
PSC 63	SHR-C6	55	16
PSC 80	SHR-C8	75	24
PSC 100	SHR-C10	100	35

ABBREVIATIONS F_S Clamping force (kN) F_A Ejection force (kN)



Hydraulic and electrical standard clamping systems

High clamping and release forces without load on the spindle bearings

The central element of both clamping systems is the rotating hydraulic or electrical clamping-releasing unit connected with the gripper by a draw bar. The length of the connection pieces varies depending on the application.

These systems are primarily equipped with our robust standard grippers, which guarantee high clamping force transmission. These tool clamping systems are primarily used in machining spindles running at low to moderate

back: Rotating clamping-releasing unit with electric actuation (type ESK), **front:** Rotating hydraulic clamping-releasing unit with rotary union for coolant lubricant and position monitoring system (type OHLK) ↓



speeds, e. g. in boring and milling machines. Compared to spring-actuated clamping systems, the clamping force can be adjusted within a wide range. The rotating cylinders are firmly connected with the spindle, ensuring direct

force transmission and a highly rigid interface. Analogue or inductive proximity switches are used for stroke monitoring. The hydraulic system is prepared for installation of a rotary transmission lead-through for a central coolant supply.

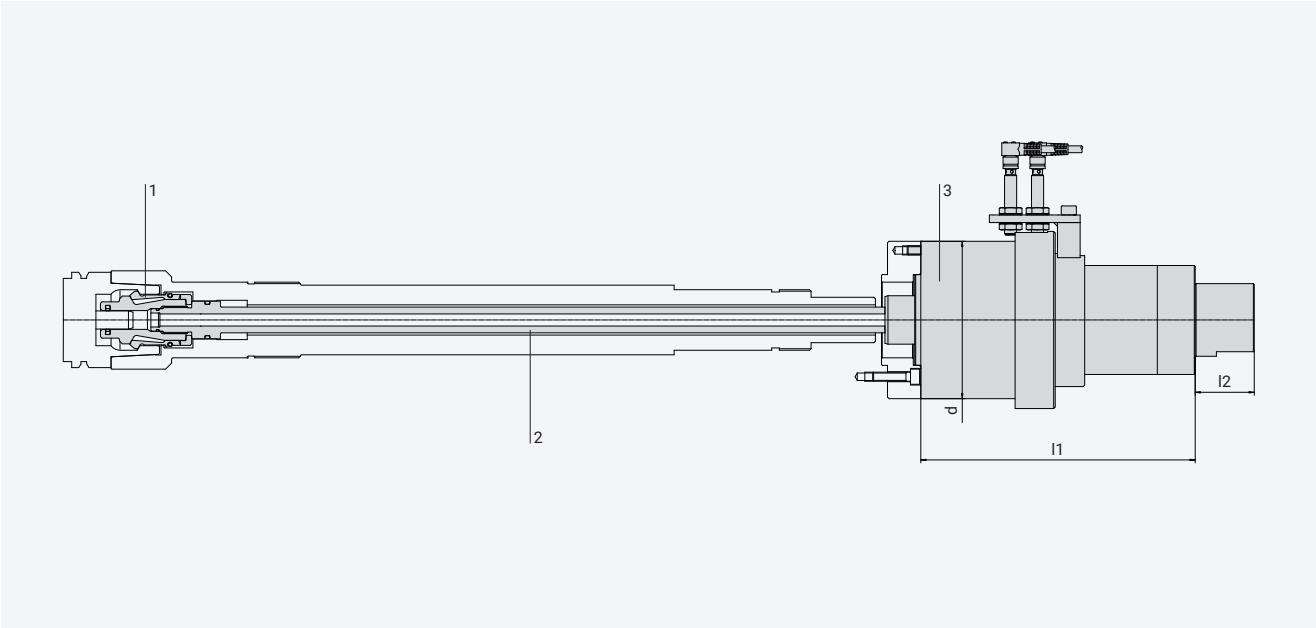
Complete system consisting of time-tested SK gripper for spindle with simple through hole, draw bar and robust electric clamp incl. stroke monitoring and holder for rotary union for coolant lubricant ↓



Tool clamping system with compact hydraulic clamping-releasing unit, draw bar, connecting piece and SK gripper ↑

HS-OHL(K) ...-1

Hydraulic clamping system



SYSTEM

This system consisting of a hydraulic clamping-releasing unit, draw bar and HSK gripper is a powerful, maintenance-free clamping system for machining spindles with a medium speed. The clamping-releasing unit consists of the function groups cylinder, rotary union for oil and rotary transmission lead-through for coolant lubricant. It is firmly connected with the spindle so that no axial forces act on the spindle bearing during release and ejection of tools. The advantage of this system is its even, easily monitored clamping force with practically infinitely variable regulation using hydraulic pressure. If the hydraulic system fails, the unlockable non-return valve prevents a sudden loss of pressure.

- MODULES**
- 1 Strong HSH gripper with direct force transmission
 - 2 Single-section draw bar with large through hole
 - 3 Compact clamping-releasing unit (type OHLK) with integrated blow-out air routing, stroke control monitoring device, protective hood and rotary transmission lead-through for coolant lubricant (type KDE 8-2)

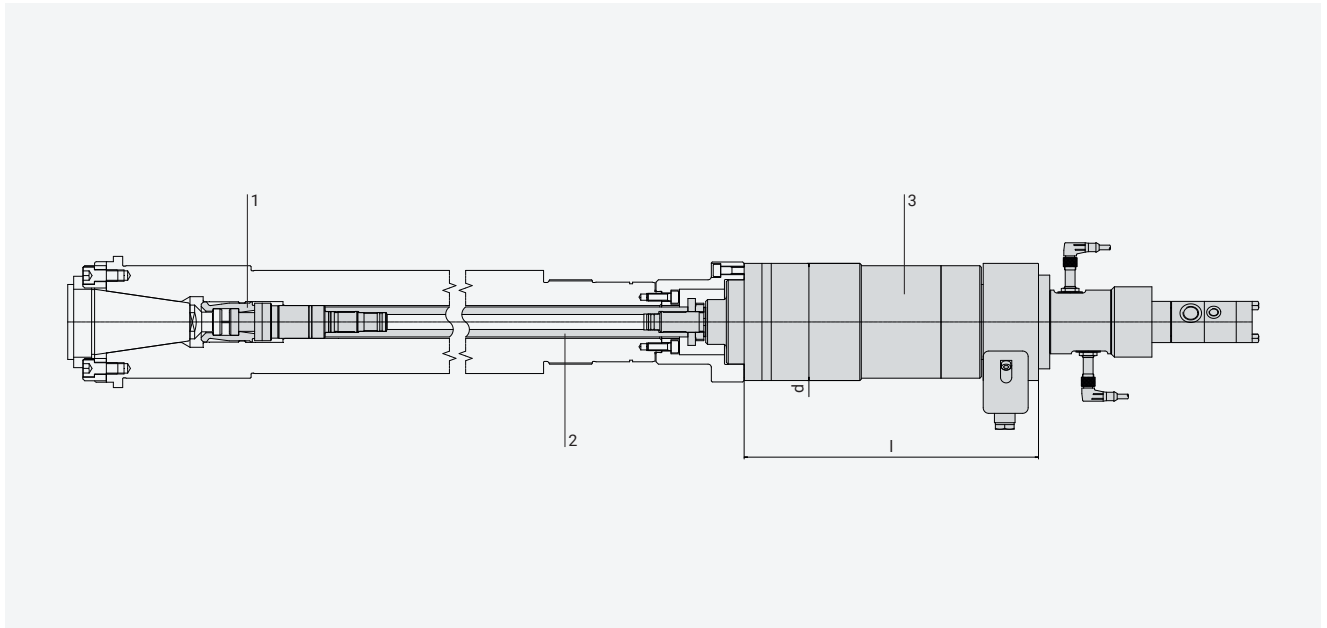
Type	d	l1	l2 ¹⁾	F _S max.	F _L max.	P _S max.	P _L max.	P _{KL} max. ¹⁾	n max.	Designed for
OHL(K) 13-1	85	185	39	13	23	60	105	80	12,500	SK, HSK grippers
OHL(K) 25-1	104	190	39	26	43	65	105	80	12,500	SK, HSK, PSC grippers
OHL(K) 35-1	120	192	39	35	57	65	105	80	12,500	SK, HSK ²⁾ , PSC grippers
OHL(K) 70-1	165	202	39	75	100	70	95	80	10,000	SK, HSK ²⁾ , PSC grippers

¹⁾ Only for type OHLK
²⁾ Only for gripper type HSH

ABBREVIATIONS	d	Diameter (mm)	l	Length (mm)	F _S	Clamping force (kN)
	F _L	Release force (kN)	P _S	Clamping pressure (bar)	P _L	Release pressure (bar)
	P _{KL}	Coolant lubricant pressure (bar)	n	Spindle speed (rpm)		

ES-ESK

Electrical clamping system



SYSTEM

This electrical clamping system is particularly suitable for low-speed applications demanding a high clamping force and a very rigid interface. It consists of a rotating clamping-releasing unit (electric clamp) with a draw bar and a steep taper gripper.

The electric clamp is equipped with a three-phase braking motor with collector ring power supply as well as a planetary and a screw gear. The self-locking, maintenance-free system saves energy thanks to the integrated snap coupling with shut-down unit. The clamping force can be adjusted within predetermined ranges using a cam ring. A proximity switch is used for automatic control. The electric clamp and spindle are firmly connected, so that no axial forces act on the spindle bearing during release of the tool.

MODULES

- 1 Time-tested SK gripper for uniformly designed spindle with control edge
- 2 Draw bar with connecting piece incl. non-return valve
- 3 Maintenance-free, energy-saving electric clamp with torque and position monitoring as well as pinched rotary union for coolant lubricant

TECHNICAL DATA

Type	d	l	F _S max.	F _L max.	n max.	U	Designed for
ESK 35	125	330	35	65	4,000	3 x 380/220	SK 50 grippers
ESK 70	150	360	70	100	4,000	3 x 380/220	SK 60 grippers

ABBREVIATIONS	d	Diameter (mm)	l	Length (mm)	F _S	Clamping force (kN)	F _L	Release force (kN)
	n	Spindle speed (rpm)	U	Voltage (VAC)				



Measuring equipment

Measuring equipment is indispensable for any modern production facility to secure consistent workpiece quality. It is therefore an elementary part of quality management. Our clamping shoulder and clamping force measuring equipment is practice-approved, highly precise equipment for testing and ensuring the clamping forces in machining spindles.

Different factors are important for selecting the right clamping device. The clamping task, workpiece, tool and machining process play the main role. Accordingly, the requirements for a clamping system differ significantly. However, with regard to performance, the following is always true: The system has to clamp precisely and securely with consistent clamping force – ideally for hundreds of thousands of load cycles.

Better measuring

Clamping forces that do not meet specifications can lead to increased tool wear and improper workpiece surface. The worst case scenario is machine failure. For this reason, a regular clamping force check is crucial to detect changes early and respond quickly, if action is required.

Developed for ourselves, available to everyone

As a clamping system manufacturer, we consider precise measurement of clamping forces essential. In accordance with our quality philosophy, all clamps are tested 100 %. For this purpose, we developed our own range of measuring systems, which permit quick and uncomplicated measurement of the clamping force and clamping shoulder incline (for our force-amplifying SK and PSC grippers). Our measuring

equipment is characterised not just by perfect precision but also by a simple handling, reliability and robust design.

Leave nothing to chance

Moreover, we offer our customers a highly reliable factory calibration service on fair terms, which guarantees compliance with all standards applicable to measuring equipment monitoring.

Milestones:

- | | |
|-------------|--|
| 2019 | Trade show debut of wireless clamping force measuring systems of the M-Visio range |
| 2015 | Clamping shoulder measuring system 2.0 |
| 2013 | Hand-held display unit showing the recorded clamping force measurement curve on a new touch display |
| 2011 | First clamping shoulder measuring system for force-amplifying SK and PSC grippers |
| 2008 | Basic version of clamping force measuring system for all commercially available tool interfaces |
| 2003 | Measuring cartridges for clamping force measurement on PSC grippers |
| 1999 | First clamping force measuring system for the SK and HSK interface with PC data transmission (comfort version) |



Precise measurement results



Simple handling



Developed for our own requirements



Professional calibration service

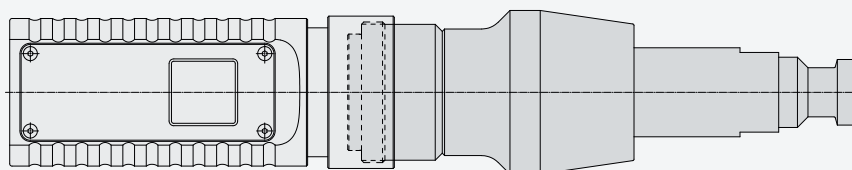
SKM-Visio

Wireless clamping force measuring systems with display and WLAN data transmission



APPLICATION	Measuring systems of the SKM-Visio series enable wireless clamping force measurement and data transmission for all common tool interfaces. They can be operated easily and intuitively via the touch display or connected end devices. Operation and wireless technology facilitate regular clamping force checks in order to identify possible deviations at an early stage and to achieve a production process with continuously high workpiece quality.
FUNCTION	The clamping force is measured by using a securely mounted, factory-calibrated force sensor in the associated measuring adapter. The adapter, freely exchangeable depending on the interface, is inserted into the tool holder and drawn in by the clamping system to be tested. The determined actual clamping force can be read directly on the display unit. In addition, the WLAN module transfers the results as numerical value and diagram to smart devices and PCs with Windows or OS operating systems. Furthermore, the supplied software for Windows PCs enables data export for further processing.
TECHNICAL FEATURES	▪ Universal display unit for all interfaces ▪ Integrated WLAN module for wireless data transmission ▪ Laid out for high loads (higher than standard clamping forces) ▪ Energy supply via powerful lithium-ion accumulator ▪ Handy, robust structure with high rigidity for highly precise measurements
VARIANTS	▪ Measuring adapter with face contact adjustment for HSK and PSC interfaces to simulate tool tolerances ▪ Measuring adapter with groove for clamping force measuring using automatic tool changer
ACCESSORIES	▪ Precision measuring pull studs for SK clamping force measurement
DELIVERY SCOPE	▪ Waterproof display unit incl. lithium-ion accumulator, micro USB connector, WLAN interface, data memory and OLED touch display ▪ Interface-specific measuring adapter ▪ Operating manual, PC software, test certificate ▪ Practical transport case

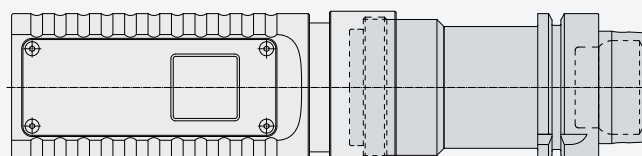
Display unit with measuring adapter M-Visio SK



SK size	Measuring adapter	Maximum load
30	M-Visio SK 30	18 kN
40	M-Visio SK 40	24 kN
45	M-Visio SK 45	38 kN

SK size	Measuring adapter	Maximum load
50	M-Visio SK 50	70 kN
60	M-Visio SK 60	100 kN

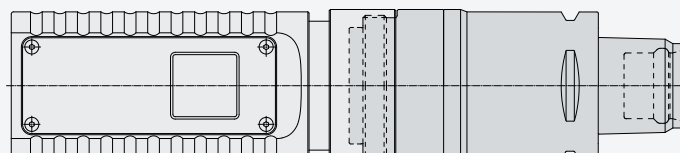
Display unit with measuring adapter M-Visio HSK



HSK form and HSK size	Measuring adapter	Maximum load
E 20	M-Visio HSK 15	4 kN
A/T/E 25	M-Visio HSK 19	6 kN
A/T/E 32 · B/F 40	M-Visio HSK 24	15 kN
A/T/E 40 · B/F 50	M-Visio HSK 30	20 kN
A/T/E 50 · B/F 63	M-Visio HSK 38	24 kN

HSK form and HSK size	Measuring adapter	Maximum load
A/T/E 63 · B/F 80	M-Visio HSK 48	50 kN
A/T/E 80 · B/F 100	M-Visio HSK 60	80 kN
A/T/E 100 · B/F 125	M-Visio HSK 75	100 kN
A/T/E 125 · B/F 160	M-Visio HSK 95	120 kN
A/T/E 160	M-Visio HSK 120	160 kN

Display unit with measuring adapter M-Visio Capto



PSC size	Measuring adapter	Maximum load
32	M-Visio Capto C3	20 kN
40	M-Visio Capto C4	33 kN
50	M-Visio Capto C5	43 kN

PSC size	Measuring adapter	Maximum load
63	M-Visio Capto C6	55 kN
80	M-Visio Capto C8	75 kN
100	M-Visio Capto C10	130 kN

SKM(B)

Clamping force measuring systems with transmission cable



APPLICATION This measuring system is suitable for static clamping force measurement for the tool interfaces SK, HSK and PSC. It guarantees precise detection of clamping force deviations and thereby ensures consistent workpiece quality.

FUNCTION By connecting measuring cartridge and display unit with the transmission cable, the clamping force measuring system is ready for operation. The clamping system pulls in the measuring adapter inserted in the tool holder. The actual clamping force is then determined via strain gauges in the device and transmitted directly to the display.

The serial interface of the SKM comfort version permits measuring data transmission to any PC with a Windows operating system. Using the supplied software, data can be visualised in a force/time diagram or saved in MS Excel format.

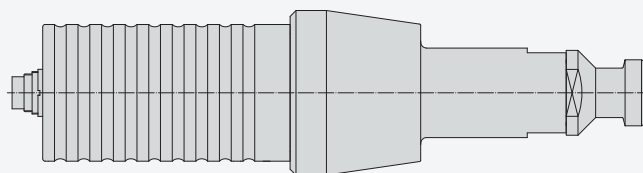
- TECHNICAL FEATURES**
- Powered by (rechargeable) battery, depending on version
 - Designed for high loads (higher than standard clamping forces)
 - Simple operation and immediately ready
 - Handy, robust structure with high rigidity for highly precise measurements
 - Expandable by universal display unit

- VARIANTS**
- Measuring cartridges for machine-specific applications, e. g. with lateral cable duct

- ACCESSORIES**
- Precision measuring pull studs

- DELIVERY SCOPE**
- Practical transport case
 - Display unit, measuring cartridge, transmission cable, operating manual, test certificate
 - The comfort version also includes: Display unit with PC interface, PC software, PC connection cable incl. USB adapter and power pack

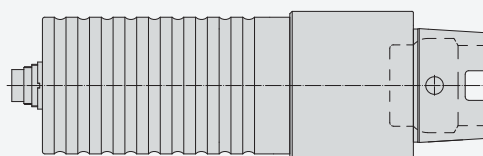
Measuring cartridge M-SK



SK size	Measuring cartridge	Maximum load
30	M-SK 30	18 kN
40	M-SK 40	24 kN
45	M-SK 45	38 kN

SK size	Measuring cartridge	Maximum load
50	M-SK 50	70 kN
60	M-SK 60	100 kN

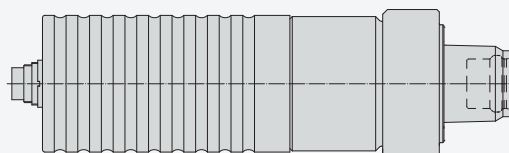
Messpatrone M-HSK



HSK form and HSK size	Measuring cartridge	Maximum load
E 20	M-HSK 15	4 kN
A/T/E 25	M-HSK 19	6 kN
A/T/E 32 · B/F 40	M-HSK 24	15 kN
A/T/E 40 · B/F 50	M-HSK 30	20 kN
A/T/E 50 · B/F 63	M-HSK 38	24 kN

HSK form and HSK size	Measuring cartridge	Maximum load
A/T/E 63 · B/F 80	M-HSK 48	50 kN
A/T/E 80 · B/F 100	M-HSK 60	80 kN
A/T/E 100 · B/F 125	M-HSK 75	100 kN
A/T/E 125 · B/F 160	M-HSK 95	120 kN
A/T/E 160	M-HSK 120	160 kN

Messpatrone M-Capto



PSC size	Measuring cartridge	Maximum load
32	M-Capto C3	20 kN
40	M-Capto C4	33 kN
50	M-Capto C5	43 kN

PSC size	Measuring cartridge	Maximum load
63	M-Capto C6	55 kN
80	M-Capto C8	75 kN
100	M-Capto C10	130 kN

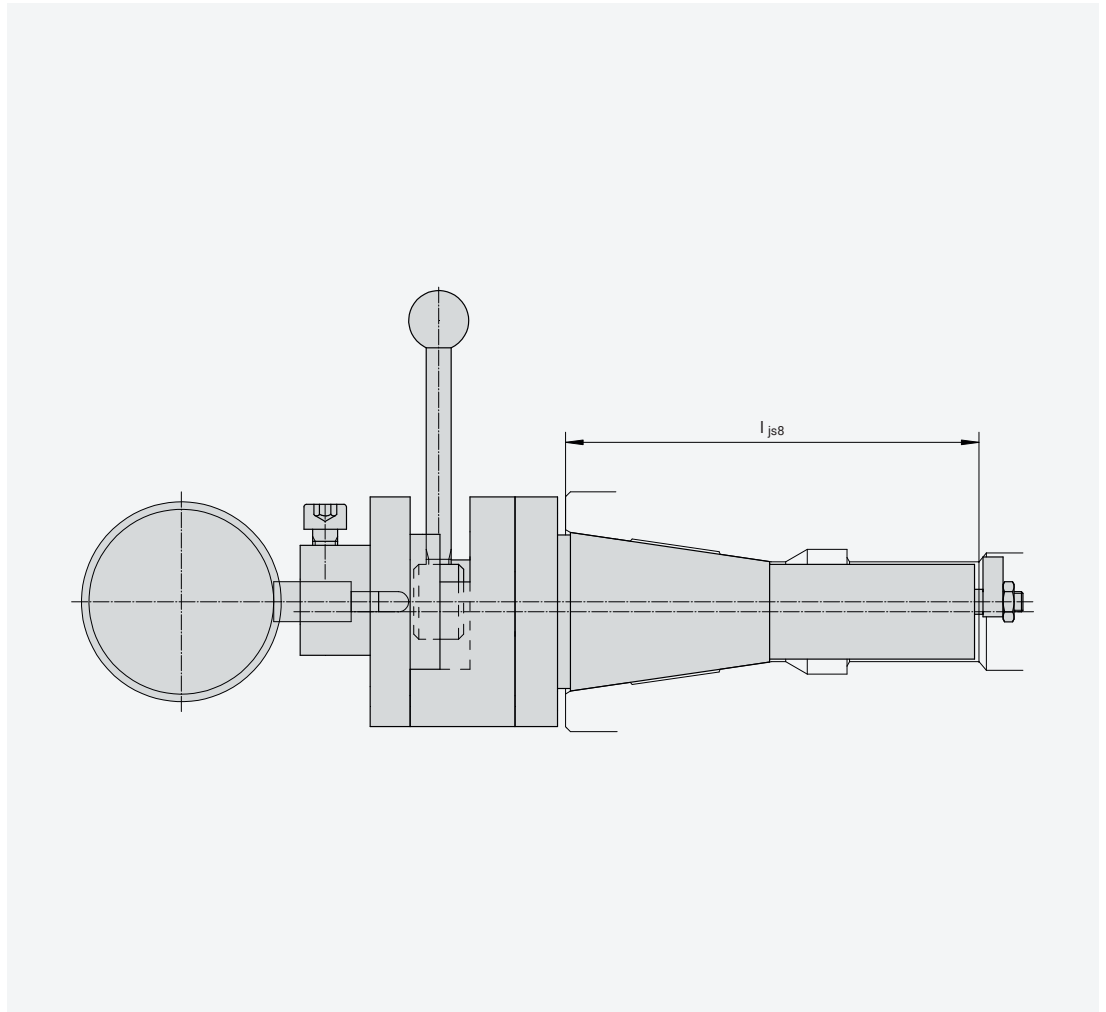
SSM-SK · SSM-Capto

Clamping shoulder measuring systems



APPLICATION	BERG's force-amplifying SK and PSC grippers require internal spindle contours with a precise spacing between the incline of the clamping shoulder and the taper zero line or face contact surface. The clamping shoulder measuring system SSM makes it possible to check this dimension, ensuring the correct clamping force and clamping stroke. The measurement is performed either directly in the machine during production of the spindle shaft or subsequently during the final inspection.
FUNCTION	The measuring system operates independently from software or energy supply. The setting sleeve is used to set the correct nominal dimension. The dial gauge shows any deviations in dimension.
TECHNICAL FEATURES	▪ High-precision measuring equipment ▪ Simple operation and handling for recording measuring values directly at the production machine ▪ Software- and energy-independent operation
VARIANTS	▪ Clamping shoulder measuring systems for special spacings
DELIVERY SCOPE	▪ Measuring unit incl. dial gauge ▪ Setting sleeve ▪ Handy transport case ▪ Operating manual ▪ Test certificate

APPLICATION PROPOSAL



TECHNICAL DATA

Interface	Size	Type	For gripper type	l (Check gauge)
SK	30	SSM-SK 30-81.8	SSKV 30	81.8
SK	40	SSM-SK 40-115	SSKV 40	115
SK	50	SSM-SK 50-152	SSKV 50	152
SK	50	SSM-SK 50-165	SSKV 50	165
SK	50	SSM-SK 50-176.75	SSKV 50	176.75
PSC	63	SSM-Capto C6-53	CV(R) 6	53
PSC	80	SSM-Capto C8-70.3	CV(R) 8	70.3

ABBREVIATIONS l Length (mm)

Services

We do it! With our wide range of services, we support our customers on their way to successful production. Our modular service package consisting of basic, comfort and premium services covers our entire product range as well as the complete product life cycle. We always focus on economic efficiency, safety and quality that only we as the manufacturer can offer professionally.



From professionals for professionals | Our clamping systems perform precision work every day – often for millions of clamping cycles, depending on their configuration and application. To maintain this performance, we offer our customers various services for their BERG products, e. g. expert clamping force measurements or a general overhaul of the clamping system in use, which includes full guarantee on the entire overhauled product. If a product requires service, we do everything we can to reduce downtimes to a minimum: with a repair service that guarantees smooth processing, high transparency and fair billing.

Our services for productivity and quality assurance

Gauge rental • Calibration of measuring equipment • Clamping force measurements at site • Repairs • General overhaul



Learning by doing | Well-founded knowledge of products and their practical application is essential to ensure that production processes remain stable and efficient in the long term. Our training courses introduce to our exciting product range. We demonstrate what our clamping systems can do and how to use them best – with a focus on practical application and adapted precisely to our customer's requirements. In addition to knowledge about the function and performance range of our clamping equipment, participants will learn how to handle the equipment and how to use the full potential offered by our products.

First-hand product know-how and practical expertise

Product training • Product training with practical part • In-house product training with practical workshop

We do it!



International sales and service network

We manufacture our products exclusively at our central location in Bielefeld. However, we are available for our customers worldwide. Thanks to our sales and service partners in the most important markets of the cutting machining industry, we can offer optimum service around the globe.



BERG Spanntechnik worldwide | With representatives in over 20 countries, we are always right where our customers need us. Our sales and service partners in Europe, Asia and America form the interface between our international customers and our administration, development and production site in Germany. This global network ensures that expert contact partners will be available to provide our business partners comprehensive and timely information in their own language.

Our delivery and after-sales services for customers all over the world

- + Optimum support
- + Expert product consultation
- + Short lines of communication
- + Simple order processing
- + Products tailored to special market requirements
- + Global availability of spare parts

Working for our customers worldwide:





Intelligent clamping systems

The ever-faster development of technology and the demand for digital product solutions has posed new challenges for our company. We are ready to accept the challenge and regard the digitalisation of our industry as an opportunity for consistent further development of our existing range of products and services.

Our goal is to develop intelligent mechatronic clamping systems in close cooperation with our customers: Smart products of clamping technology, using integrated microcontrollers to monitor processes, collect and analyse data, communicate with other machine components and act automatically based on the programmed logarithm.

We turn products into intelligent systems

The advantage of our products is their exposed position near the tool and workpiece. This explains their great potential for generating process-relevant data. The foundation for this is integrated condition monitoring, adapted to the specific application to permanently record parameters such as the clamping force, clamping stroke, wear, tool or workpiece qualities, temperature, leakage, etc. Based on this, we have researched decentralised, low-resource data processing (edge computing) and the interface connection between the machine and connected peripherals.

First prototypes prove successful

In a first step, we equipped selected products with sensor systems and launched our tool clamp PSP 4.0 "Tool Assist" and our intelligent clamping heads SPM-HV-FC and SPM-HV-SC with the associated energy and data couplings.

Certainly not simple, but far from unsolvable

With regard to product development, we now focus on the optimisation of existing processes by using new technologies. We regard the use of intelligent, space-adapted sensor technology combined with suitable evaluation units as a key to success in the development of IoT solutions in clamping technology.

Intelligent clamping systems for modern machine concepts:

 Requirements	• Monitoring operating and status data • Data recording and analysis in real time • Transmission of relevant data via standardised interfaces, potentially automatic control based on pre-defined rules • User-friendly installation
 Technologies	• Sensor systems, foil conductor, semi-conductor strain gauges • Contact-free energy and data transmission, e. g. through inductive couplers • Microcontrollers for signal processing • Edge computing for low-resource data processing
 Benefits	• Ensuring consistent workpiece quality • Reliable process monitoring • Optimised scheduling of service/maintenance work • High process stability, prevention of downtimes • Reduction of rejects and minimisation of secondary damage

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