

## SPECIAL APPLICATION

Clamping systems for pallets, devices,  
workpieces and machining aggregates





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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 m<sup>2</sup>. 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 ourselves 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

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The right clamping system  
for every application:



Tool clamping

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Special application

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Forming technology

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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** | Powerful, secure clamping is the defining characteristic of our clamping systems for pallets, devices, workpieces and machining aggregates. Our products meet the demand for high system rigidity combined with maximum safety as a prerequisite for optimum changing processes and 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 clamping systems

The increasingly stringent demands on modern production have also increased the demands on the clamping technology in use. Our clamping systems for pallets, devices, workpieces and machining aggregates are powerful products that are optimised to save space and contribute to stable changing processes with optimum repeat accuracy.

Ensuring and optimising productivity are essential challenges for any manufacturing company. On top of that, product service lives are becoming ever shorter, variety is increasing and with it, the demand for maximum production chain flexibility has also increased.

We have responded to these developments with thoroughly market- and customer-focused clamping technology. Novel machines and production processes usually demand customised solutions for the clamping challenge. Our expertise lies in designing precisely these kinds of products, which may well be unique in their technical layout.

## From standard to high-tech

We gained our international renown in the 1960s with our electromechanical clamping drives, which are still in use as retrofits.

Today we offer our customers an extensive range of products for direct clamping of pallets, devices and workpieces. These include clamping heads, zero point clamping systems and installation-ready clamping cartridges for tables and indexing units.

Moreover, we have developed specialised clamping systems for the tool technology used in machining centres. We offer a variety of clamping units for changing aggregates such as machining heads and auxiliary spindles.

## Years of expertise as the foundation for a successful future

Each new product idea is based on decades of industry expertise and consistent knowledge transfer from successful projects. Close dialogue with global leaders in component and machine production drives further development and innovation, such as in our clamping systems with a self-monitoring function.

### Clamping systems milestones:

2020	Mechanical clamping cartridge
2019	Mechanical zero point clamping system with condition monitoring
2017	Mechanical clamping head with condition monitoring
2008	Zero point clamping system for pneumatic release
2005	Hydromechanical clamping unit with pull studs
2004	Hydromechanical clamping cartridge
2004	Mechanical zero point clamping system and mechanical clamping head 2.0
2003	Hydromechanical clamping unit with adapter ring
1998	Mechanical clamping head
1995	Hydraulic clamping head
1967	Electromechanical actuator with rotary power take-off and automatic shifting mechanism
1966	Electromechanical actuator with rotary power take-off



High product diversity



100 % function check



Maintenance-free operation



Customised product adaptation

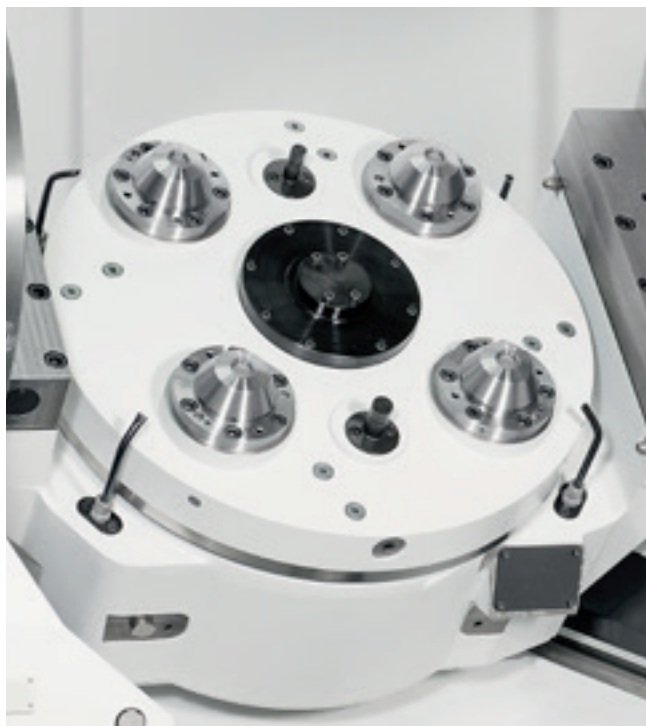
## Clamping systems for special applications

### Clamping heads

With a design that is perfectly adapted to the interface between the machine table and pallet, our clamping heads are suitable for all applications of pallet clamping. Thanks to their technical design and performance parameters, they are especially suitable for automated pallet changing with high safety and quality standards. The clamping heads with an analogue sensor offer the additional option of monitoring the clamping position in real time.

Our entire clamping head range is available for both machining and set-up stations. In addition, we offer a variety of housing designs and generally customised special solutions. Together with the matching accessories (taper ring and pull stud), our customers receive a high-performance complete solution all from a single source.

- + Universal solution for pallet clamping
- + Optimum repeat accuracy
- + Set-up parallel to production time



### Zero point clamping systems

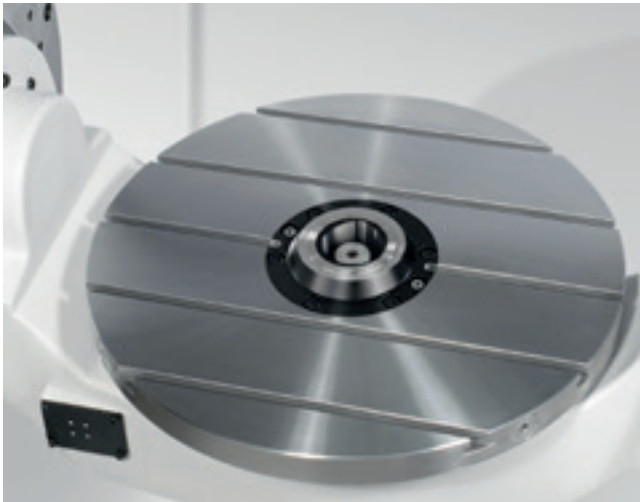


Our zero point clamping systems are maintenance-free products with a very low installation height. They are designed for clamping devices and workpieces. Depending on the machining process and ambient parameters in the machine, they are also frequently used for pallet clamping. The clamping process is executed using a spring mechanism. The releasing process is either hydraulic or pneumatic.

Our product range includes both machining systems and set-up station systems with reduced clamping force. In addition we offer application-specific housing versions and on request we will equip our systems with sensors, e. g. for monitoring the clamping position. As accessories, we have a variety of pull stud types with different arrangement options.

Our zero point clamping technology is the perfect choice for partially and fully automated handling and flexible production. The systems combine quick set-up with repeat accuracy in positioning and secure clamping. This allows them to play a major role in increasing economic efficiency of the production process.

- + Optimisation of machine times
- + High-precision positioning
- + Ideal for single workpiece or small batch production and for modernising machinery



## Clamping cartridges



For workpiece machining, we develop not just hydraulic and pneumatic clamping cartridges but also spring-actuated systems. What all clamping cartridges have in common is their application-specific design and compact, modular structure, which permits use in limited space and for a variety of different interfaces. Their technical properties also guarantee maximum reliability in the machining and changing process.

- + High clamping forces and secure workpiece changing
- + Application for different interfaces
- + Easy assembly thanks to installation-ready housing

## Electromechanical actuators

Our product series for the actuation of clamping devices consists of a variety of stationary electromechanical actuators with rotary power take-off. The VA series has an additional shifting mechanism that permits forward and backward moving, either automatically or actuated via hydraulic or pneumatic supply.

- + Large product selection with extensive accessories
- + Can be installed in any position
- + Energy-saving thanks to integrated detent clutch

## Clamping units

The products we call Hydrodocks are characterised by their suitability for a wide range of uses in automated production. They are designed for clamping changeable heads in machine tools, but have also proven to be the best clamping solution for many other machining processes – nowadays they are used for applications in forming technology as well.

The hydromechanical systems are among the first generation of Hydrodocks. Their force-amplifying wedge gear achieves maximum clamping forces in a compact space. The self-locking mechanism guarantees the required safety. Also the 1-channel design with spring stacks and a special gripper ensures consistently high clamping forces. All clamping units are maintenance-free and offered with an adapter ring or pull stud.

- + Absolutely safe clamping without constant pressure
- + Maximum clamping force performance in minimum installation space
- + Strong and long-lived



## Clamping heads and accessories

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Hydraulically actuated clamping head with special housing, e. g. for use on rotary tables with particularly space-limited assembly room (type SPH) [↑](#)



Very flat-designed clamping head with high clamping forces thanks to integrated force amplification, equipped with firmly installed IO link sensor for permanent condition monitoring (type SPM-HV-SC) [↑](#)



Space-optimised support head for set-up station [↑](#)



Closed housing with screw-on lock (type SPM-HV) [↑](#)



**left:** Taper ring with centring collar, **right:** Taper ring as assembly set with concentrically arranged pull stud [↑](#)



Different pull studs (from left to right): In standard design, with pre-centring for clamping head type SPM-HV and as special design for maximum clamping forces of up to 70 kN [↑](#)



Highly precise standard taper rings with different exterior geometries and screw connection options [↑](#)

## SPM-HV

### Mechanical clamping head

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**APPLICATION** Clamping heads of type SPM-HV are equipped with a mechanical clamping gear with force amplification and a locking mechanism ensuring the greatest possible fall prevention. This makes these systems particularly suitable for pallet clamping on highly dynamic turn and swivel tables with limited installation space. The large, load-bearing and precise surfaces between the clamping head and the taper ring ensure a maximum of repeat accuracy and rigidity. The lifting stroke is used to safely remove and position the pallets. In addition, it optimises the cleaning of the clamping cone surfaces via a separate blast air channel. This channel can also serve for contact monitoring.

**FUNCTION** For clamping, the pallet with taper rings and pull studs is placed on the clamping heads (in release position). Once the pressure is relieved from the release line, the gripper pulls in the pull stud in a form-closed manner. The clamping force builds up and the actuation force of the spring stacks is simultaneously amplified. During the unclamping process, the applied pressure compresses the spring stacks, thereby releasing the gripper. The variant SPM-HV-SC is equipped with an additional analogue sensor, which allows real-time monitoring of the clamping position and further monitoring functions.

**TECHNICAL FEATURES**

- Mechanically actuated, maintenance-free clamping system with high clamping and holding forces (1-channel, no continuous pressure required)
- Maximum repeat accuracy and rigidity of the interface
- Delivered in sets of the same height within a tolerance of  $\pm 0.0025$  mm
- With lifting stroke and separate blow-out air channel
- Various application-specific housing designs
- Lock for protecting the clamping gear during periods of non-operation

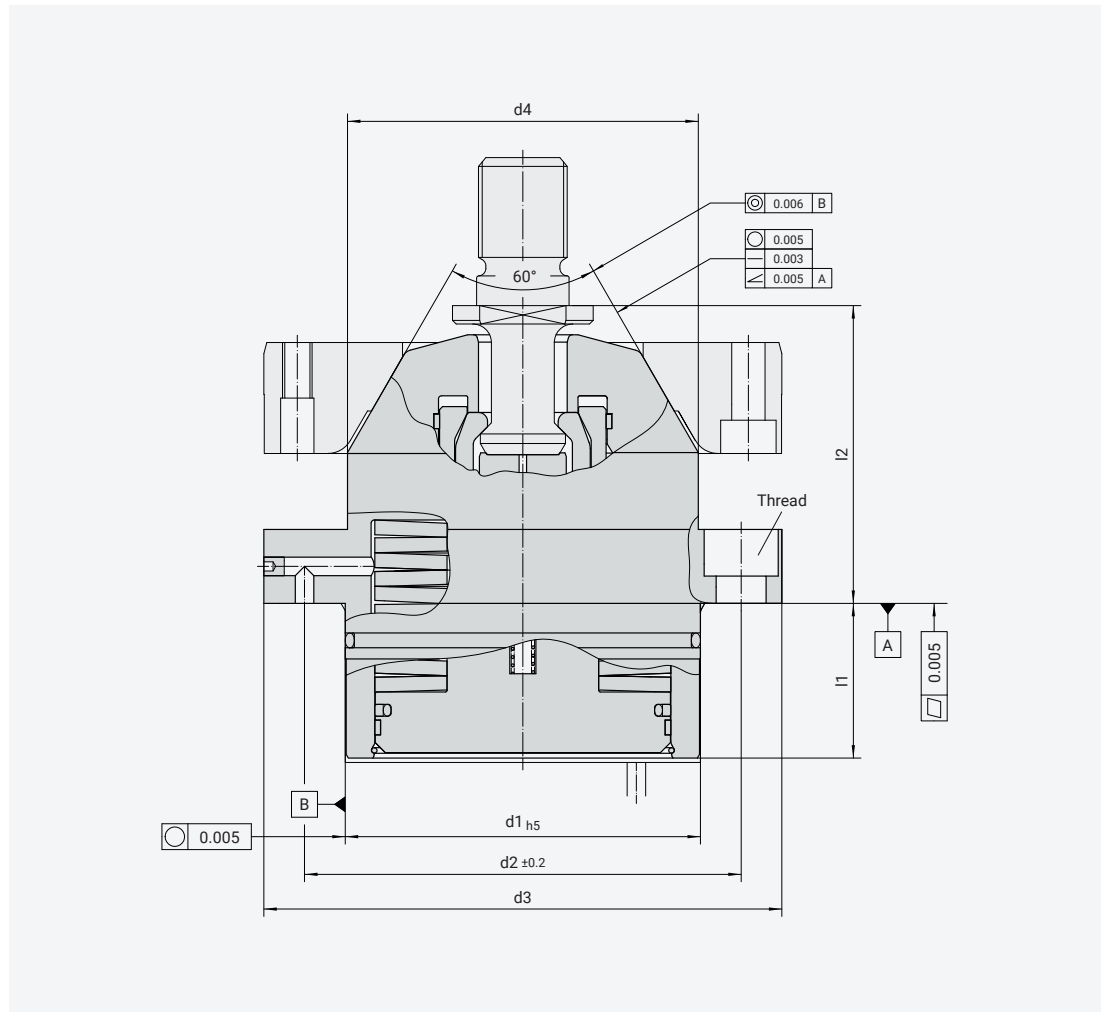
**VARIANTS**

- With medium supply above the machine table
- As force-reduced set-up station head without lifting stroke and blast air channel
- With firmly integrated analogue sensor, e. g. for clamping position monitoring (type SPM-HV-SC)

**ACCESSORIES**

- Taper rings, optionally as pre-assembled set with screwed-in pull studs
- Pull studs with and without pre-centring
- Protective ring for fixing bolts for ideal chip blow-off
- Clamping force measuring systems

## APPLICATION PROPOSAL



## TECHNICAL DATA

Type	d1	d2	d3	d4	Thread	l1	l2	F <sub>S</sub>	P <sub>L</sub>
SPM-HV 5	72	84.5	100	70	8 x M8	20	45	5	60
SPM-HV 10	72	84.5	100	70	8 x M8	18	45	10	60
SPM-HV 15	72	84.5	100	70	8 x M8	20	45	15	60
SPM-HV 20	85	105	125	85	6 x M8	40	56	20	80
SPM-HV 25	85	105	125	85	6 x M8	40	56	25	80
SPM-HV 30	95	114	130	97	10 x M8	20	48.5	30	80
SPM-HV 40	96	118	140	95	6 x M12	42	70	40	100
SPM-HV 50	140	163	185	140	10 x M12	54.5	87.6	50	120

**ABBREVIATIONS**    d Diameter (mm)    l Length (mm)    F<sub>S</sub> Clamping force (kN)    P<sub>L</sub> Release pressure (bar)

## COMMENT

SPM-HV clamping heads are also available with housings closed on the rear and an integrated release pressure channel.

## SPH

### Hydraulic clamping head

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**APPLICATION** The main application of SPH clamping heads is horizontal pallet clamping on rotary tables in machining centres. Hydraulically actuated clamping heads are characterised by large, load-bearing, precisely manufactured surfaces that guarantee an extremely high repeat accuracy for the clamping position and a maximum of rigidity for the interface. The clamping heads are equipped with a lifting stroke, which ensures a secure pallet changing and an optimal blow-off of the clamping cone surfaces. The blast air channel is used for cleaning and also serves for monitoring the clamping status.

**FUNCTION** The system is clamped and released by applying pressure to the corresponding lines. For clamping, the pallet with taper rings and pull studs is placed on the clamping heads (in the release position). The gripper pulls in the pull stud in a form-closed manner and builds up clamping force proportionally to the applied pressure. Applying the release pressure counteracts the clamping force so that the pallet can be removed or changed.

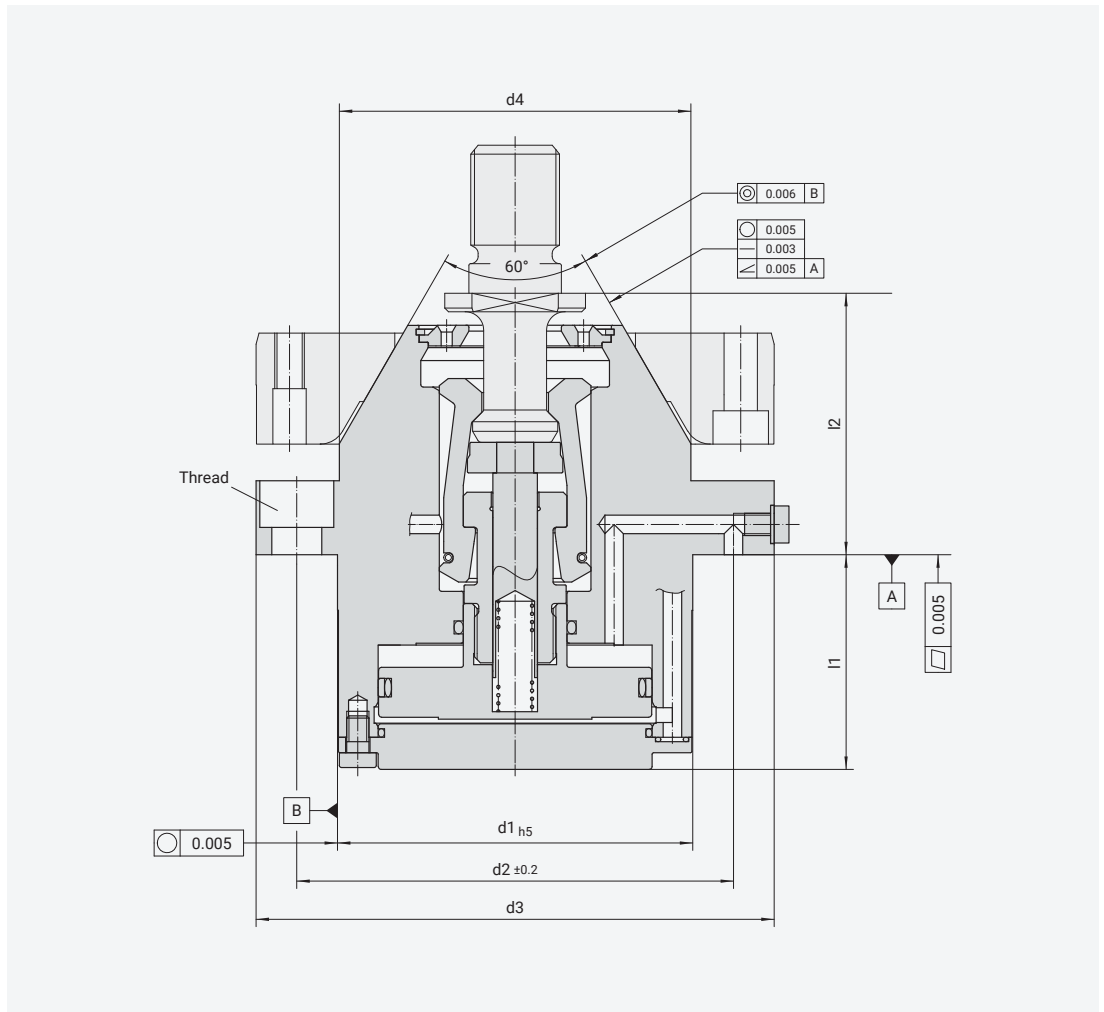
- TECHNICAL FEATURES**
- Hydraulically actuated, maintenance-free clamping system (2 channels with clamping and release line)
  - Maximum repeat accuracy and rigidity of the interface
  - Delivered in sets of the same height within a tolerance of  $\pm 0.0025$  mm
  - With lifting stroke and separate blow-out air channel
  - Various application-specific housing designs
  - Lock for protecting the clamping system from contamination during non-operation periods

- VARIANTS**
- With medium supply above the machine table
  - As set-up station head with reduced force without lifting stroke and blow-out air channel or designed as support heads

- ACCESSORIES**
- Taper rings, optionally as pre-assembled set with screwed-in pull studs
  - Pull studs
  - Protective ring for fixing bolts for ideal chip blow-off
  - Clamping force measuring systems



## APPLICATION PROPOSAL



## TECHNICAL DATA

Type	d1	d2	d3	d4	Thread	l1	l2	F <sub>S</sub>	P
SPH 10	63	80	98	63	6 x M6	31.9	48.8	10	80
SPH 20	85	105	125	85	6 x M8	54	56	20	80
SPH 28	96	118	140	95	6 x M12	58	71	28	80
SPH 35	100	118	140	95	8 x M10	58	70.7	35	100
SPH 40	96	118	140	95	6 x M12	54	70	40	100
SPH 50	144	175	200	140	10 x M12	100.5	92.6	50	60

**ABBREVIATIONS**    d Diameter (mm)    l Length (mm)    F<sub>S</sub> Clamping force (kN)    P Clamping pressure/Release pressure (bar)

## COMMENT

SPH clamping heads are also available with a housing that is open on the rear. In this case, the release pressure is applied from the bottom via the machine table.

## Taper rings and pull studs

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### APPLICATION

As a connecting element between the BERG clamping heads and the pallet being clamped, taper rings and pull studs make a significant contribution to a secure clamping process with high repeat accuracy. They are characterised by constant hardness and rigidity values as well as an excellent surface quality to withstand the strain of machining with absolute reliability. Taper rings and pull studs are intended for installation or integration into the pallet, so that the gripper in the clamping head can pull in the pull stud in a form-closed manner. The perfect interplay of the single components ensures a pallet clamping in the best possible way.

### TECHNICAL FEATURES

- Designed precisely for the geometries and clamping forces of the associated BERG clamping heads
- Maximum repeat accuracy and rigidity of the interface
- Surface quality, hardness and rigidity of the pull studs in accordance with tool standard
- Hardness and hardness depth of the taper ring surfaces resistant against any manner of contamination
- Taper rings delivered in sets of the same height within a tolerance of  $\pm 0.0025$

### VARIANTS

- Taper rings as pre-assembled set with screwed-in pull studs
- Pull studs with pre-centring for clamping head type SPM-HV to ensure optimum process stability
- Taper rings and pull studs in customised special sizes and shapes
- Special taper rings for master pallet
- Transport and setting dummies

### ACCESSORIES

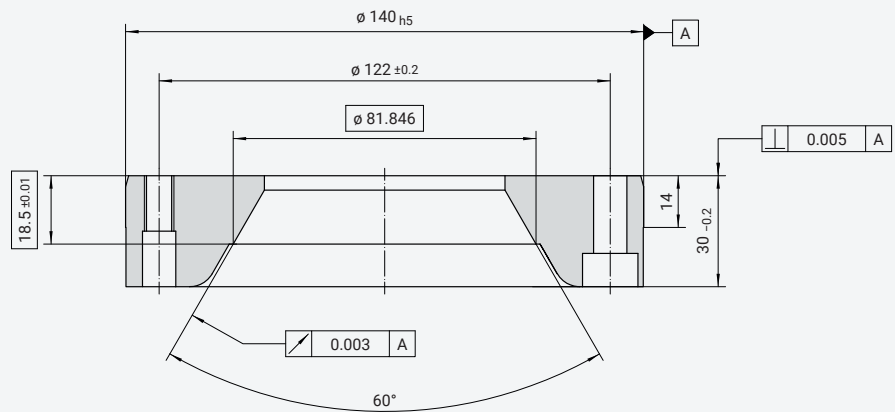
- Socket wrench for pull studs

### COMMENT

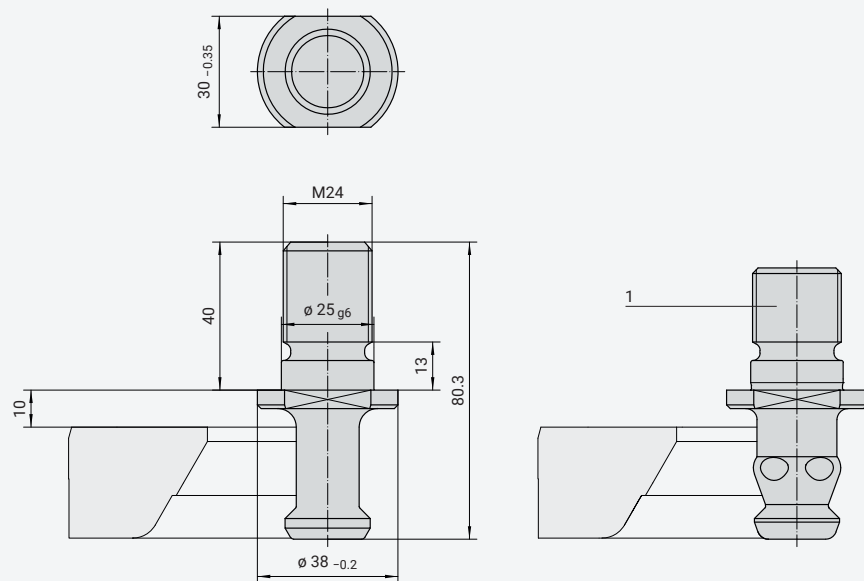
Taper rings and pull studs are available for all standard clamping heads as well as customised special designs. Due to the wide range of different variants, the product selection and offer is made on a project-specific basis.

APPLICATION  
PROPOSAL

Taper ring for clamping head type SPM-HV 40 and SPH 40



Pull stud for clamping head type SPM-HV 40 and SPH 40



## Zero point clamping systems and accessories

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Zero point clamping system with space-optimised housing (type NSM-HV) [↑](#)



Zero point clamping system for pallet clamping with protective ring for optimum chip blow-off, designed for minimised changing times (type NSM-PV) [↑](#)



Highly precise face plate for use in machining centres, incl. application-specific zero point clamping systems and traverse piston with large stroke [↑](#)



Bolt set with internal thread for rear installation, consisting of two solid bolts, one sword and one retaining bolt (from left to right) ←



Bolt set with external thread for front installation, consisting of two solid and two retaining bolts (from left to right) ←



Solid bolt set with external thread for front installation, same height within a tolerance down to  $\mu$  ←

## NSM-HV

Mechanical zero point clamping system, hydraulic release

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### APPLICATION

The zero point clamping systems of the series NSM-HV are designed for clamping workpieces and devices in cutting machine tools. The mechanical clamping gear with force amplification and a self-locking mechanism ensures absolute clamping reliability in the machining and changing process. For this reason, BERG zero point clamping systems in conjunction with suitable parameters are also used for pallet clamping in fully automated machining centres. The lifting stroke ensures a process-reliable changing of the pallets. Moreover, it optimises cleaning the taper and plane surface. The cleaning air is supplied via a separate channel, which also permits monitoring of the clamping status.

### FUNCTION

After the workpiece with built-in pull studs is positioned for clamping, it is pre-centred by the tapers of the studs. A release of pressure causes the gripper to pull in the pull stud in a form-closed manner with high repeat accuracy while it simultaneously amplifies the actuation force of the spring stacks. During unclamping, the applied pressure compresses the spring stacks. The workpiece is raised and can be removed. The variant NSM-HV-SC has an additional analogue sensor for position measurement and permits, for instance, real-time monitoring of the clamping position.

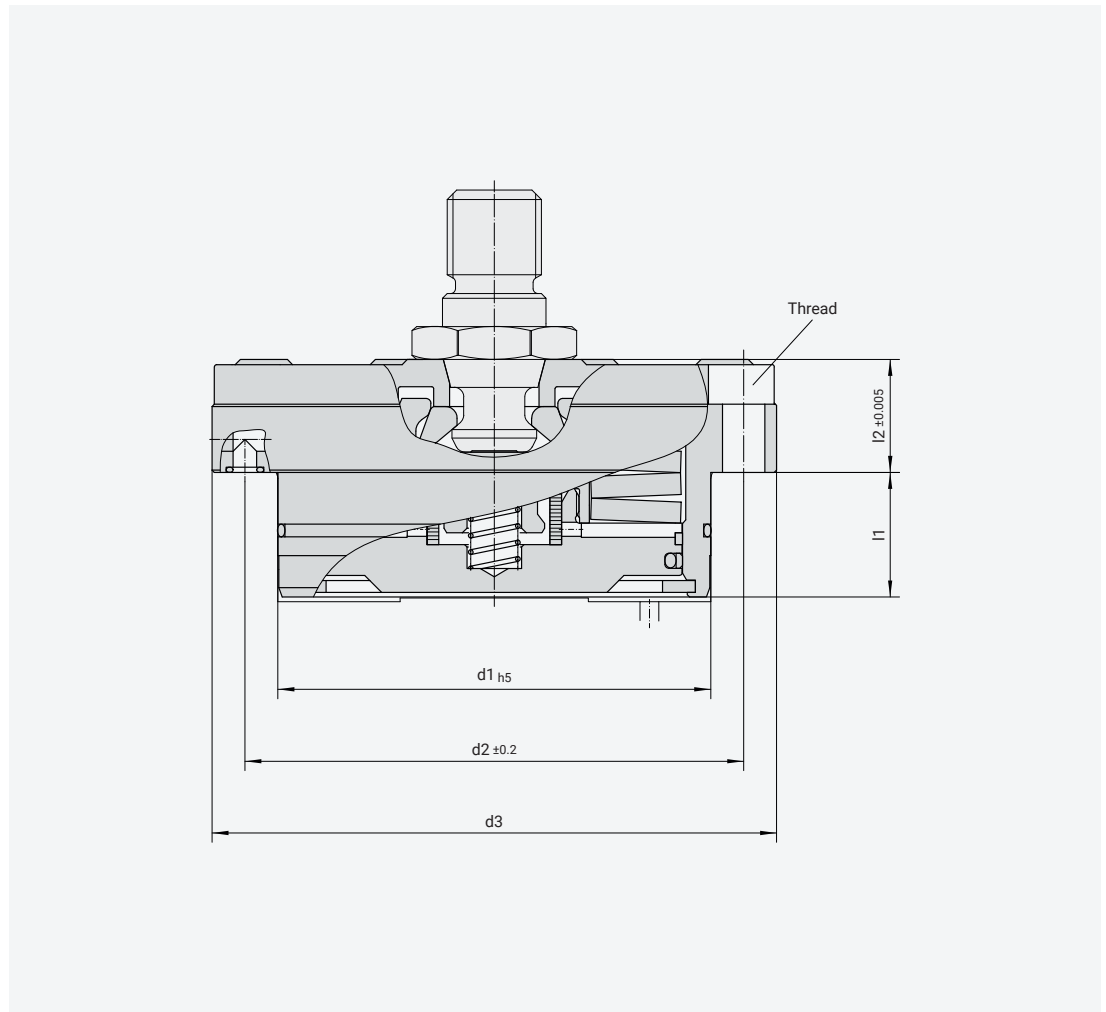
### TECHNICAL FEATURES

- Flat-designed, mechanical zero point clamping system (1 channel, release through hydraulic pressure)
- Dimensional and positional accuracy of the centring taper and contact surface for maximum repeat accuracy
- Extremely short force transmission from the pull stud into the machine table
- Delivered in sets of the same height within a tolerance of 0.005 mm
- With lifting stroke and separate blast air channel
- Various application-specific housing designs
- Integrated lock for protecting the clamping gear during periods of non-operation

### ACCESSORIES

- Solid, holding or sword bolts or solid bolt set of the same height
- Extension modules, e. g. single-station housing or face plate for multi-station applications
- Medium coupling, traverse piston, rotary union
- Protective ring for fixing bolts for ideal chip blow-off
- Clamping force measuring systems

## APPLICATION PROPOSAL



## TECHNICAL DATA

Type	d1	d2	d3	Thread	l1	l2	F <sub>S</sub>	P <sub>L</sub>
NSM-HV 20	92	106	120	8 x M8	26.5	24	20	60
NSM-HV 30	136	152	170	8 x M8	51.5	16.5	30	60

**ABBREVIATIONS** d Diameter (mm)    l Length (mm)    F<sub>S</sub> Clamping force (kN)    P<sub>L</sub> Release pressure (bar)

## COMMENT

NSM-HV zero point clamping systems are also available in a standard design with central face contact, e. g. for four-fold application.

## VARIANTS

- As set-up station system with reduced clamping force without lifting stroke and blow-out air channel
- With firmly integrated analogue sensor for position measurement (series NSM-HV-SC)

## NSM-PV

Mechanical zero point clamping system, pneumatic release

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**APPLICATION** The clamping systems of type NSM-PV are intended for zero point clamping of workpieces and devices. They are mainly used if no hydraulic pressure is available and relatively low clamping forces are sufficient, e. g. for light machining. With the right technical requirements and ambient parameters, zero point clamping systems are also suitable for clamping pallets in unmanned production. The systems are equipped with a lifting stroke that contributes to process reliability during automatic pallet changing. At the same time, it ensures optimal airflow when cleaning the clamps. The taper and plane surface are blown off via a separate channel, which is also provided for contact monitoring. The blast air can be used as additional actuation force in clamped condition.

**FUNCTION** For clamping, the workpiece with the built-in pull studs is positioned and pre-centred by the tapers of the pull studs. The gripper then pulls in the pull stud in a form-closed manner with high repeat accuracy. By building up the clamping force, the clamping gear amplifies the actuation force of the spring stacks. During the unclamping process, the applied pressure compresses the spring stacks, thereby lifting the workpiece. Type NSM-PV-SC includes an additional analogue position measuring sensor, which permits further monitoring.

**TECHNICAL FEATURES**

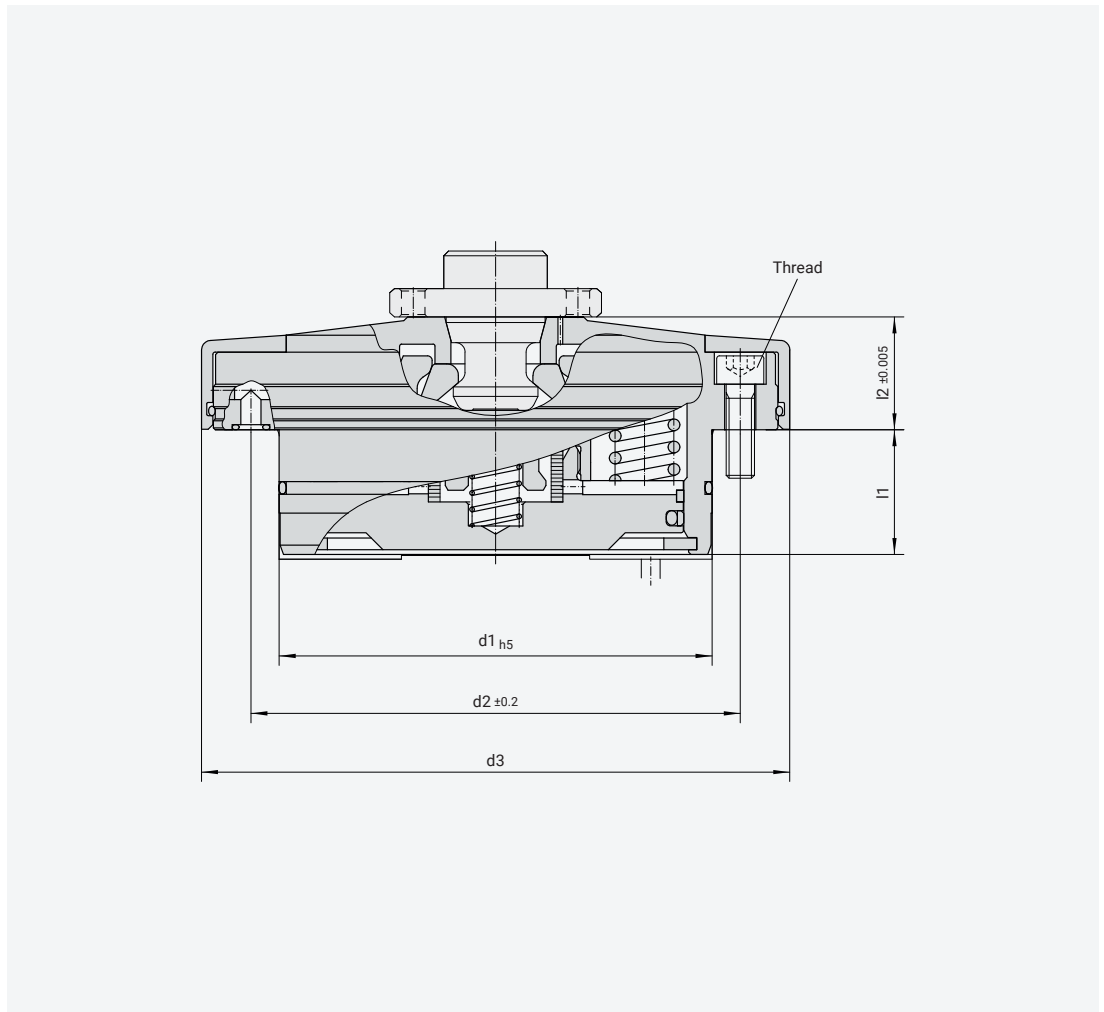
- Flat-designed, mechanical zero point clamping system (1 channel, release through pneumatic pressure)
- Increased actuation force by applying sealing air
- Dimensional and positional accuracy of the centring taper and contact surface for maximum repeat accuracy
- Extremely short force transmission from the pull stud into the machine table
- Delivered in sets of the same height within a tolerance of 0.005 mm
- With lifting stroke and separate blast air channel
- Various application-specific housing designs
- Integrated lock for protecting the clamping gear during periods of non-operation

**ACCESSORIES**

- Solid, holding or sword bolts or solid bolt set of the same height
- Extension modules, e. g. single-station housing or face plate for multi-station applications
- Medium coupling, traverse piston
- Clamping force measuring systems



## APPLICATION PROPOSAL



## TECHNICAL DATA

Type	d1	d2	d3	Thread	l1	l2	F <sub>S1</sub> <sup>1)</sup>	F <sub>S2</sub> <sup>2)</sup>	P <sub>L</sub>
NSM-PV 6	92	106	120	8 x M8	26.5	24	3.2	7	6

<sup>1)</sup> Clamping force with pure spring actuation

<sup>2)</sup> Clamping force when using blast air as additional actuation force

**ABBREVIATIONS**    d    Diameter (mm)    l    Length (mm)    F<sub>S</sub>    Clamping force (kN)    P<sub>L</sub>    Release pressure (bar)

## COMMENT

NSM-PV zero point clamping systems are also available in a standard design with additional contact surfaces, e. g. for dual application.

## VARIANTS

- As set-up station system with reduced clamping force without lifting stroke and blast air channel
- With firmly integrated analogue sensor for position measurement (series NSM-PV-SC)
- Customised special solutions for quicker pallet changing times

## NAB

### Pull studs

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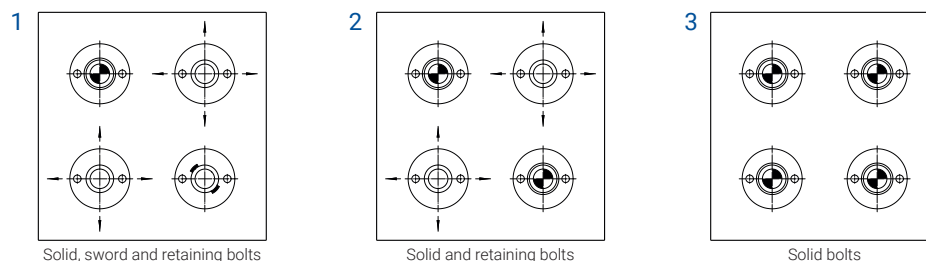


#### APPLICATION

Pull studs of type NAB form the interface between the BERG zero point clamping systems and the workpiece being clamped. They are used for workpiece, device and pallet clamping. NAB pull studs are available in various designs that differ in size, contact surface and installation method. Type and arrangement of the pull stud set is determined by the material of the clamped module or the available space.

#### TYPES AND ARRANGEMENT

Applications with four or more zero point clamping systems usually use solid bolts as the zero point, sword bolts to determine the angle position and retaining bolts for vertical draw-in and positioning [1]. These bolts have an internal thread and are assembled from the rear side. In addition to this common arrangement, it is possible to equip the clamped components with two solid and retaining bolts [2] or four solid bolts of the same height [3] in order to achieve maximum rigidity in a vertical and horizontal force direction. The NAB pull studs with an external thread are used for this purpose (also referred to as screw-in bolts for front installation). However, a prerequisite for this arrangement is the precise manufacture of the base plates, devices and pallets used.



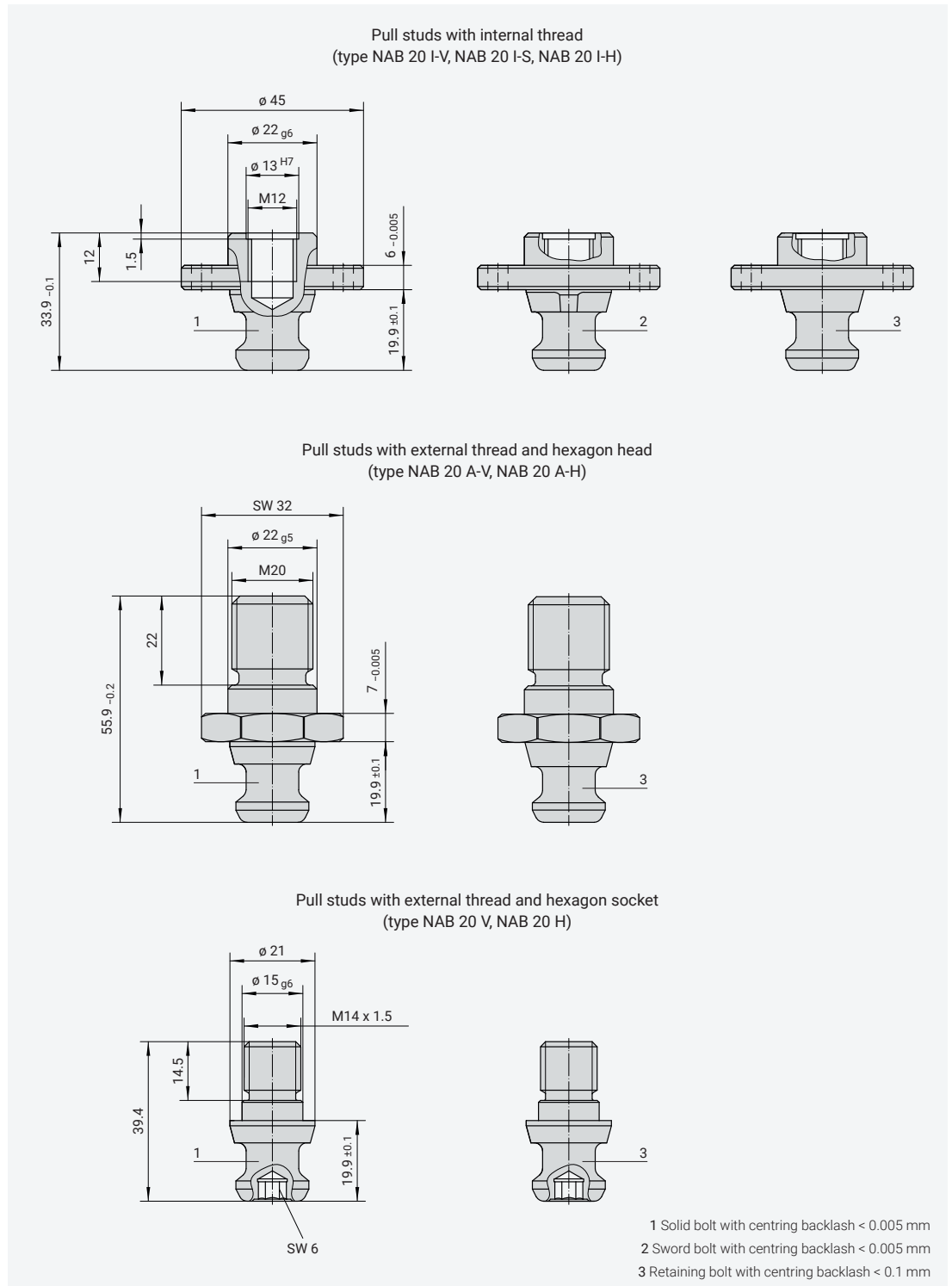
#### TECHNICAL FEATURES

- Designed precisely for the geometries and clamping forces of associated BERG zero point clamps
- Optimum surface quality with excellent hardness and rigidity values
- High clamping force transmission and maximum positioning accuracy
- Form-closed contact with screw-in bolts for maximum rigidity in all spatial axes

#### VARIANTS

- Transport and setting dummies
- Customised special sizes and shapes

APPLICATION  
PROPOSAL



ABBREVIATIONS SW Width across flats (mm)

## Clamping cartridges for workpiece clamping

Hydromechanical and spring-actuated clamping systems

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Spring-actuated clamping cartridge incl. gripper with holding function for secure workpiece changing, designed for interface HSK-T 100 [↑](#)



Self-locking hydromechanical clamping cartridge (without housing) with special flange for interface PSC 63 [↑](#)



Hydromechanical clamping cartridges of different sizes (without housings) with application-specific flanges for clamping workpieces with standardised HSK and PSC interfaces [↑](#)



**APPLICATION** BERG clamping cartridges are modular clamping systems with long service lives. Thanks to their integrated force amplification, they guarantee maximum clamping force performance even in limited installation space. They are used for workpiece clamping on B and C axes in milling, grinding or eroding machines. Installed directly in the machine table or the (C)NC indexing unit, they are usually used for machining carbide metal cutting tools with standardised SK, HSK or PSC shafts. The clamping units are available as a self-locking, hydromechanical 2-channel system and as a mechanically actuated 1-channel system.

**TECHNICAL FEATURES**

**Hydromechanical clamping cartridge (type HS)**

- Hydraulically actuated clamping system (2 channels with clamping and release line)
- Force-amplifying wedge gear with very high energy density in smallest installation space
- Well-proven gripper with holding function and direct force transmission
- Absolute self-locking ability for maximum mechanical rigidity and safety (no constant pressure required after clamping process)
- Compact design, strong and maintenance-free

**Mechanical clamping cartridge (type MS)**

- Mechanical clamping principle with long-lived spring stacks (1-channel, no constant pressure required)
- Force-amplifying gripper with holding function
- Self-holding for high mechanical rigidity
- Particularly flat design
- Strong and maintenance-free

**VARIANTS**

- Stainless steel version
- Without housing and/or flange
- With additional channel for blast or sealing air
- Designed for pneumatic actuation
- With tool flanges for special interfaces

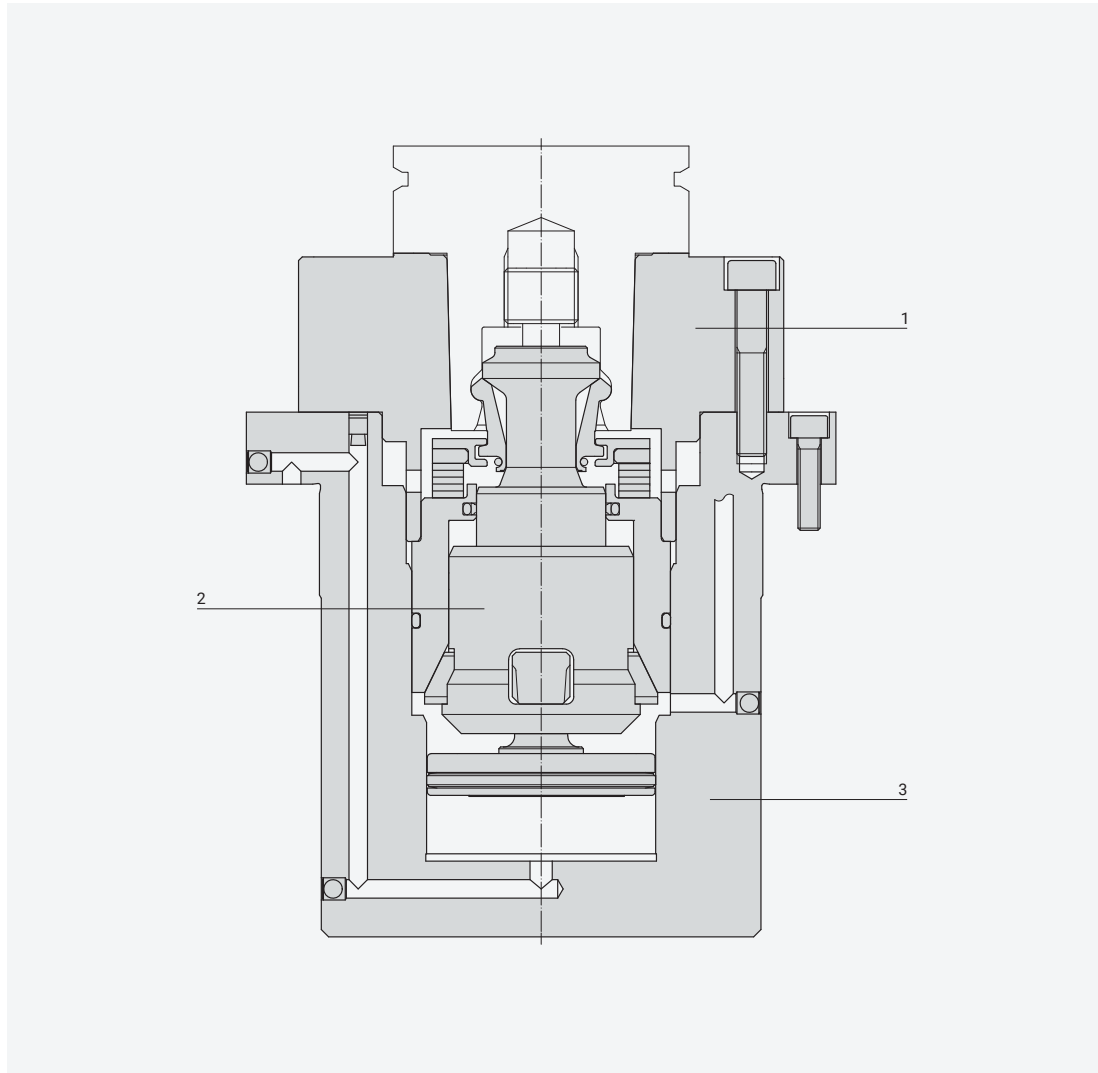
**ACCESSORIES**

- Clamping force measuring systems

## HS-SH-C 10R

### Hydromechanical clamping cartridge

#### APPLICATION PROPOSAL



- COMPONENTS**
- 1 Highly precise tool flange in special design for PSC interface according to ISO 26623
  - 2 Self-locking, maintenance-free clamping unit with PSC gripper incl. holding function and force-amplifying wedge gear for maximum clamping forces and secure workpiece changing
  - 3 Completely sealed, installation-ready housing

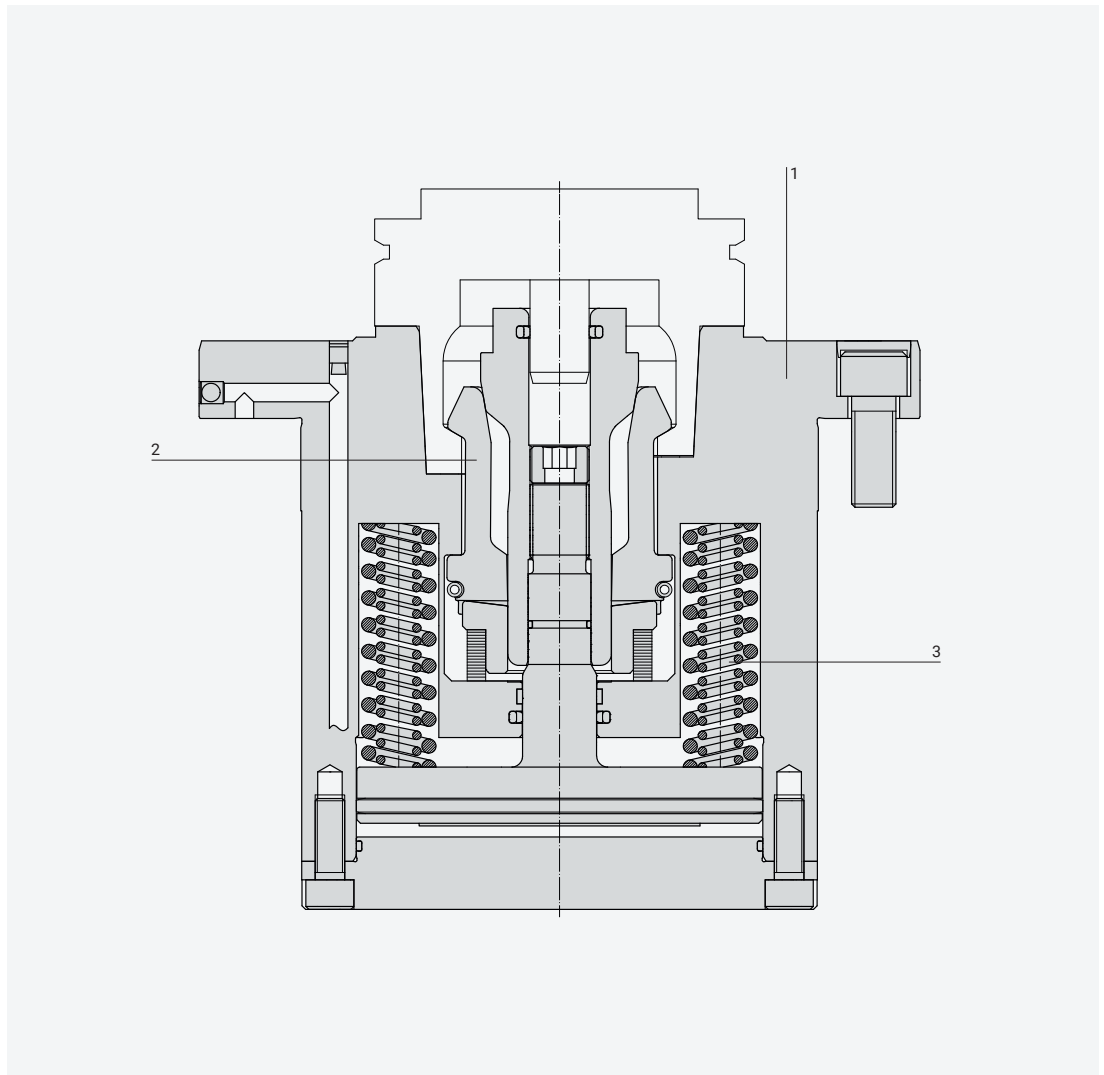
**FUNCTION**

When pressure is applied to the clamping line, a double-acting piston actuates the wedge gear. The segments move outward into the gripper groove of the holder (with HSK or PSC shafts) or push themselves behind the clamping shoulder of the pull stud (with SK shafts). The workpiece is pulled in. When face or taper contact is achieved, the gear builds up the required clamping force. During the unclamping process, the applied pressure pushes the piston forward. The self-locking function and clamping function are released. During this process, a holding mechanism in the gripper prevents the workpiece from falling out in an uncontrolled manner.

# MS-HKR 75

## Spring-actuated clamping cartridge

### APPLICATION PROPOSAL



- COMPONENTS**
- 1 Single-section, installation-ready housing with low installation height incl. high-precision tool flange for HSK interface according to ISO 12164
  - 2 Force-amplifying, maintenance-free HSK gripper with holding function for a secure, optimised workpiece change
  - 3 Durable spring stack with integrated release cylinder

**FUNCTION**

The clamping process is executed using a spring mechanism. The unclamping process is either hydraulic or pneumatic. During the clamping process, the clamping segments move outward into the gripper groove of the workpiece holder (with HSK or PSC shafts) or push themselves behind the clamping shoulder of the pull stud (with SK shafts). The workpiece is pulled in. The required clamping force builds up when the face or taper contact is achieved. By applying pressure to the release line, the spring stacks are compressed. The segments open and the clamping connection is released. The holding function integrated in the gripper prevents the workpiece from falling out in an uncontrolled manner during ejection.

## Clamping units for changing aggregates

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Hydromechanical clamping units in standard and special designs with adapter rings and pull stud [↑](#)



Space-adapted hydromechanical clamping unit for application in turning and milling machines (type Hydrodock-SSKF) [↑](#)



Adapter ring with spring-loaded lock to protect from foreign particles for standard Hydrodocks [↑](#)



# Hydrodock

## Hydromechanical clamping unit with adapter ring

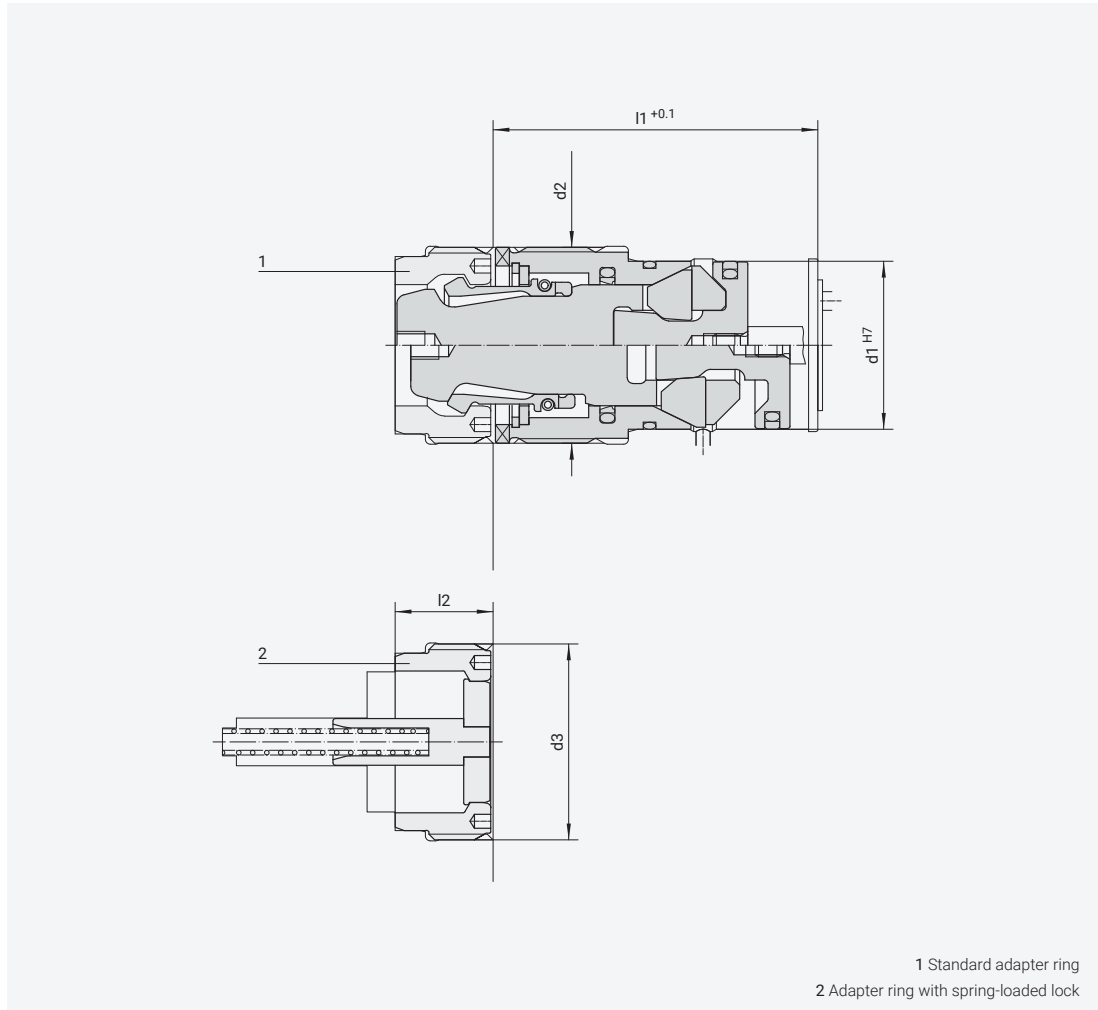


- APPLICATION** Hydrodock clamping units with adapter rings are versatile connection elements characterised by maximum clamping force even in extremely small installation spaces. Due to their absolute self-locking ability, they fulfil the stringent safety and quality requirements of automated production processes. Hydrodocks of this type are primarily designed for the interface of machine tools with changeable machining units. For this reason, they are usually used for clamping milling heads or auxiliary spindles, but can also be used for clamping e. g. boring bars in turning centres.
- FUNCTION** A double-acting piston is used for clamping and release by applying pressure to the corresponding line. During the clamping process, the piston actuates the integrated wedge gear and the segments move outward behind the clamping shoulder of the adapter rings (installed in the machining aggregate). The aggregate is pulled in. When axial contact is achieved, the wedge gear builds up the required clamping force. During the unclamping process, the applied pressure pushes the piston forward. The self-locking function and clamping function are released, the machining aggregate can be removed.
- TECHNICAL FEATURES**
- Force-amplifying wedge gear with very high energy density in smallest installation space
  - Absolute self-locking ability for high mechanical rigidity and fall prevention (no permanent pressure required after clamping process)
  - Highly compact design, strong and maintenance-free
- VARIANTS**
- With switch rod for monitoring the clamping stroke
  - In special sizes for application-specific installation spaces
  - As housing version with fixed Hydrodock clamping unit, optionally in standard version, with separate blast air channel, integrated centring or switch rod for monitoring the clamping stroke
- ACCESSORIES**
- Adapter ring, optionally with spring-loaded lock to protect from foreign particles
  - Assembly tool
  - Clamping force measuring systems
- COMMENT** During periods of non-operation, a locking plate with adapter rings is required to protect the clamping units from contamination.

# Hydrodock

## Hydromechanical clamping unit with adapter ring, thread version

### APPLICATION PROPOSAL



### TECHNICAL DATA

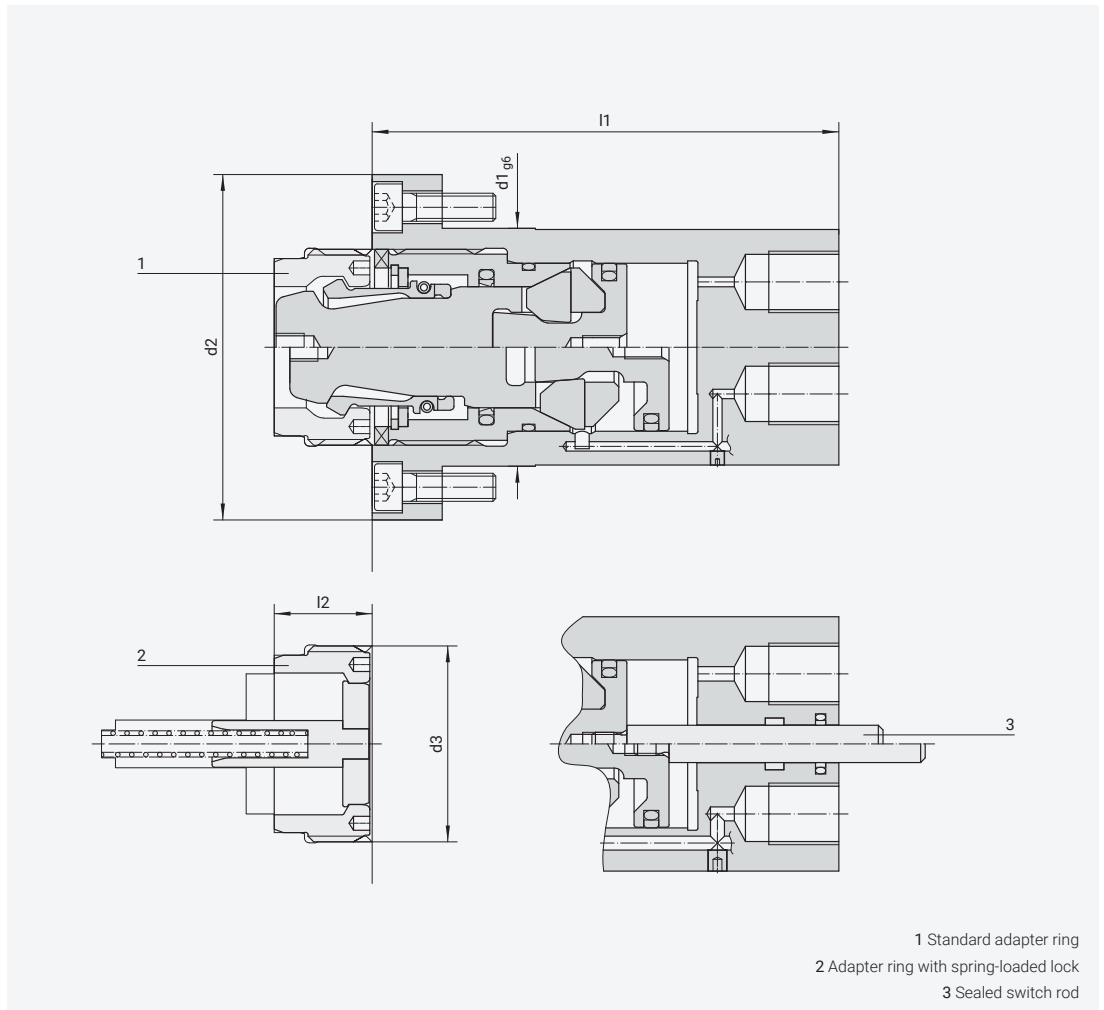
Type	d1	d2	d3	l1	l2	F <sub>S</sub>	P
Hydrodock 20 – Thread version	28	M36 x 1.5	M36 x 1.5	65	21	20	100
Hydrodock 30 – Thread version	36	M42 x 1.5	M42 x 1.5	69.6	21	30	100
Hydrodock 40 – Thread version	45	M52 x 1.5	M52 x 1.5	81	31	40	90
Hydrodock 50 – Thread version	55	M62 x 1.5	M62 x 1.5	101	35.5	50	80
Hydrodock 85 – Thread version	65	M74 x 1.5	M72 x 1.5	106.3	43	85	100
Hydrodock 120 – Thread version	80	M100 x 1.5	M72 x 1.5	135	43	120	90

ABBREVIATIONS    d Diameter (mm)    l Length (mm)    F<sub>S</sub> Clamping force (kN)    P Clamping pressure/Release pressure (bar)

# Hydrodock

## Hydromechanical clamping unit with adapter ring, housing version

### APPLICATION PROPOSAL



### TECHNICAL DATA

Type	d1	d2	d3	l1	l2	F <sub>S</sub>	P
Hydrodock GR. 20 – Housing version	45	69	M36 x 1.5	95.5	21	20	100
Hydrodock GR. 30 – Housing version	51	74	M42 x 1.5	100	21	30	100
Hydrodock GR. 40 – Housing version	60	84	M52 x 1.5	110	31	40	90
Hydrodock GR. 50 – Housing version	85	116	M62 x 1.5	115	35.5	50	80
Hydrodock GR. 85 – Housing version	100	155	M72 x 1.5	139	47.5	85	100

ABBREVIATIONS    d Diameter (mm)    l Length (mm)    F<sub>S</sub> Clamping force (kN)    P Clamping pressure/Release pressure (bar)

## Hydrodock-SSKF

### Hydromechanical clamping unit with pull stud

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**APPLICATION** The hydromechanical clamping units Hydrodock-SSKF are designed for clamping changing aggregates with pull studs. The integrated force-amplifying and self-locking wedge gear achieves high clamping forces in relatively small spaces. It ensures the required clamping security even in the event of a pressure loss. Hydrodocks of the type SSKF are suitable e. g. for clamping milling or facing heads, in particular if a machining area without interfering contours is required or there is no space for a cover ring or protective ring for the clamping unit during non-operation.

**FUNCTION** When pressure is applied to the clamping line, a double-acting piston actuates the wedge gear and the clamping segments move inward behind the clamping shoulder of the pull studs (installed in the machining aggregate). The aggregate is pulled in. The defined clamping force is built up when the axial contact is achieved. When release pressure is applied, the clamping/release piston is pushed forward and releases the self-locking function and clamping mechanism. The machining aggregate can be changed. The integrated lock automatically protects the Hydrodock clamping unit as soon as the aggregate with the pull stud is removed.

**TECHNICAL FEATURES**

- Force-amplifying wedge gear with high energy density even in small installation space
- Absolute self-locking ability for high mechanical rigidity and fall prevention (no permanent pressure required after clamping process)
- Compact design, strong and maintenance-free

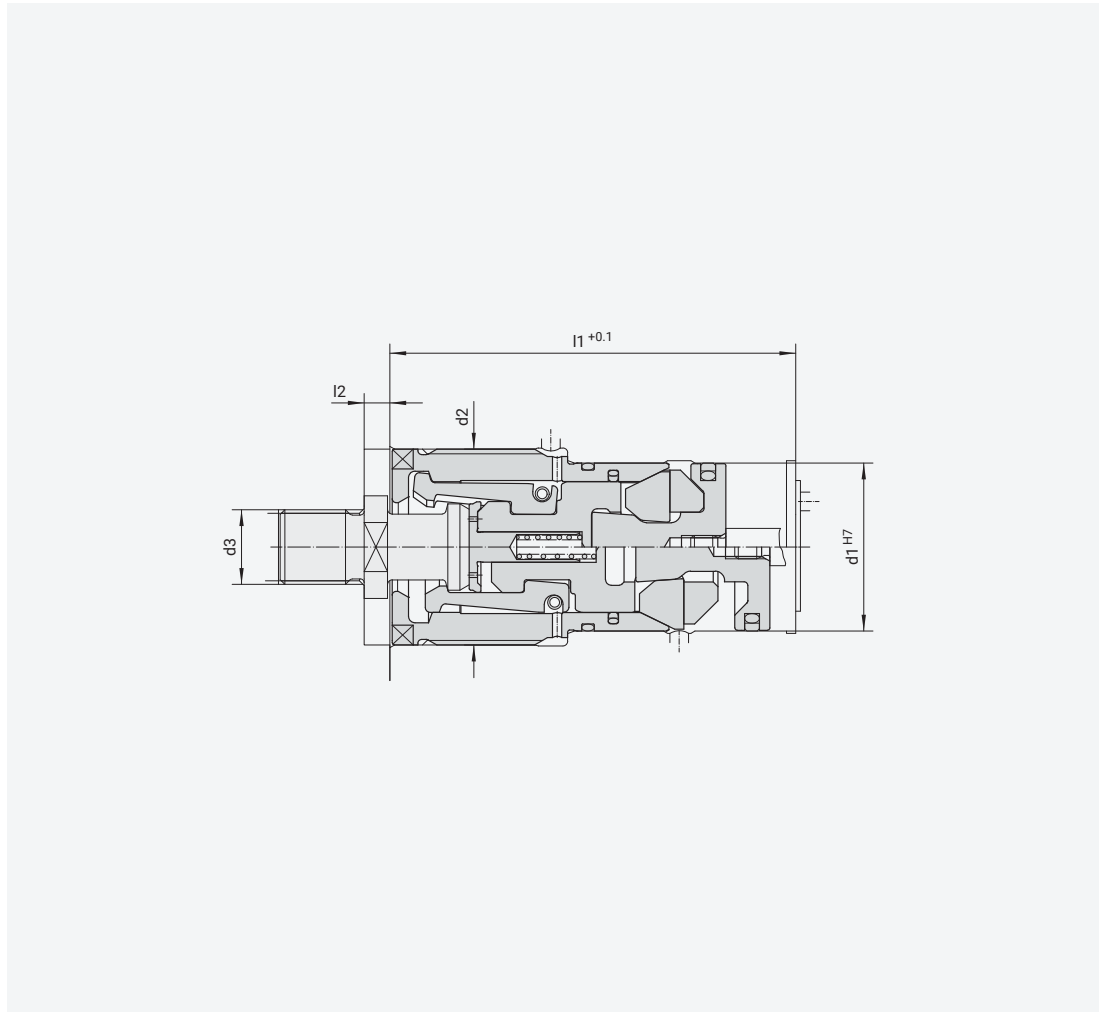
**VARIANTS**

- With switch rod for monitoring the clamping stroke
- With clamping segments for special pull studs
- As housing version with fixed Hydrodock clamping unit, optionally in standard version, with blast or sealing air channel or switch rod for monitoring the clamping stroke

**ACCESSORIES**

- Pull studs, optionally with or without ejection stroke
- Assembly tool
- Clamping force measuring systems

## APPLICATION PROPOSAL



## TECHNICAL DATA

Type	d1	d2	d3	l1	l2	F <sub>S</sub>	P
Hydrodock-SSKF 10	26	M36 x 1.5	M12	75.5	6.2	10	80
Hydrodock-SSKF 20	36	M42 x 1.5	M16	87	5.5	20	80
Hydrodock-SSKF 40	50	M55 x 1.5	M24	112	8	40	60
Hydrodock-SSKF 60	65	M80 x 1.5	M30	164.6	0.5	60	80

**ABBREVIATIONS**    d Diameter (mm)    l Length (mm)    F<sub>S</sub> Clamping force (kN)    P Clamping pressure/Release pressure (bar)

## Hydrodock-1K

Spring-actuated clamping unit with pull stud

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**APPLICATION** The force-amplifying clamping units Hydrodock-1K are designed for clamping changing aggregates with pull studs. Characteristic features are their spring actuation, meaning only one hydraulic line is required, and their installation-friendly design as a completely sealed housing version. The clamping system consisting of spring stack and special gripper stands for high clamping force consistency and a long service life. Hydrodocks of this type are used in automated production processes, e. g. on travelling mandrel spindles for clamping milling heads.

**FUNCTION** The clamping process is executed using a spring mechanism. The releasing process is hydraulic. During the clamping process, the segments move behind the clamping shoulder of the pull studs (installed in the machining aggregate). The aggregate is pulled in. The required clamping force is built up when the axial contact is achieved. The Hydrodock clamping unit is self-holding but not self-locking. The holding force corresponds to approximately double the clamping force. During unclamping, the applied hydraulic pressure compresses the spring stack. The segments open and the clamping connection is released. The machining aggregate can be removed or changed.

**TECHNICAL FEATURES**

- Housing version for easy installation
- With durable, long-lived spring stack and special gripper for consistently high clamping forces
- Compact design thanks to high force amplification factor
- 1 channel
- Self-holding
- Strong and maintenance-free

**VARIANTS**

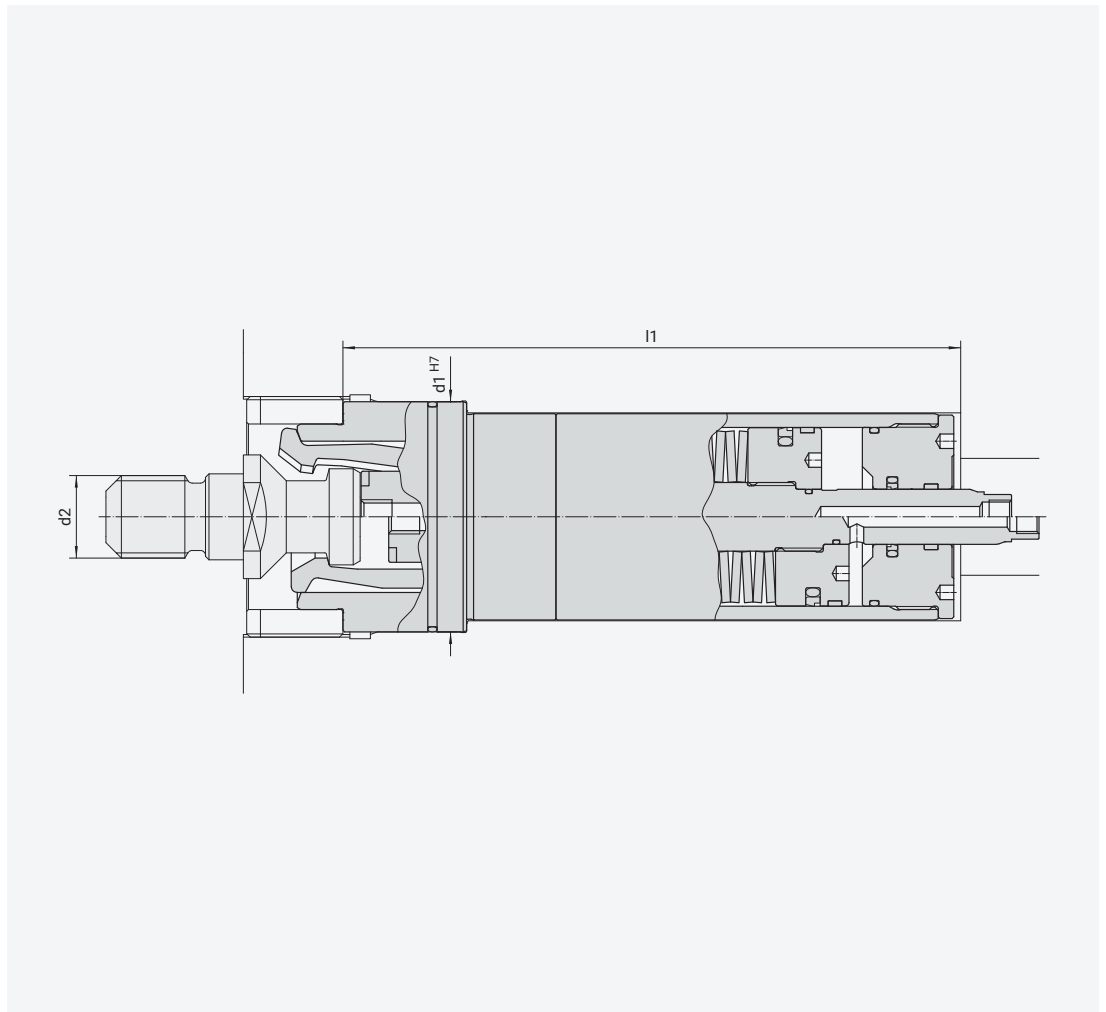
- With customer-specific geometries for special pull studs
- With sealed switch rod for monitoring the clamping stroke

**ACCESSORIES**

- Pull studs
- Clamping force measuring systems

**COMMENT** During periods of non-operation, a locking plate with pull studs is required to protect the clamping units from contamination.

## APPLICATION PROPOSAL



## TECHNICAL DATA

Type	d1	d2	l1	F <sub>S</sub>	P <sub>L</sub>
Hydrodock-1K 35	67	M24	302	35	120
Hydrodock-1K 45	72	M30	427	45	120

**ABBREVIATIONS**    d Diameter (mm)    l Length (mm)    F<sub>S</sub> Clamping force (kN)    P<sub>L</sub> Release pressure (bar)

## ESP

Stationary electromechanical actuator with rotary power take-off

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Classic products from the electromechanical actuator range: On the left with automatic shifting mechanism for automatic entering and retracting (type ESP 150 VA) and on the right with angled power take-off (type ESP 120 STW 40-1) [↑](#)





#### APPLICATION

With their mechanically settable power take-off torque, the electromechanical actuators of the ESP series are particularly suitable for actuating clamping devices in machine tools. They are also used as actuating drives, gear motors with mechanical overload protection and auxiliary drives in mechanical and process engineering. The design including the automatic shifting mechanism or shifting device is primarily used for circular transfer machines or transfer lines. The torque can be adjusted within predetermined ranges using a cam ring. Depending on the model, these units can be controlled automatically using the optionally available torque, end position and linear control.

#### FUNCTION

Depending on the application, the clamping devices either are connected directly with the clamped device or engage with the clamping device for the duration of actuation via an auxiliary device. The electromechanical actuators consist of a three-phase brake motor with a sliding rotor, planetary gearing with an adjustable detent clutch and a power take-off shaft. The power take-off wheel is driven by a motor via the planetary gearing and is connected in a torque-proof manner to a shaft or bush. When the set torque is reached, the spring-loaded clutch engages audibly. Electromechanical actuators of type VA and VAW have an additional automatic shifting mechanism that permits automatic entering into and retracting from the device clutch. In the ESP ... VAL, this function is performed by a shifting device that is controlled and actuated separately using pneumatic or hydraulic pressure.

#### TECHNICAL FEATURES

- Maintenance-free, sturdy clamping system
- Designed for operating voltage 220 or 380 VAC / 50 Hz (deviating operating voltage on request) and in insulation class F
- Energy-saving thanks to integrated detent clutch
- Can be installed in any position

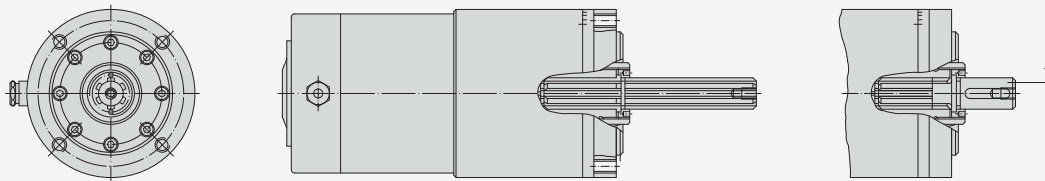
#### ACCESSORIES

- Power take-off shafts and spline bushes
- Terminal box
- Torque control, end position control, linear control
- Clutch mounting elements, coupling claws, claw clutches
- Contact rods

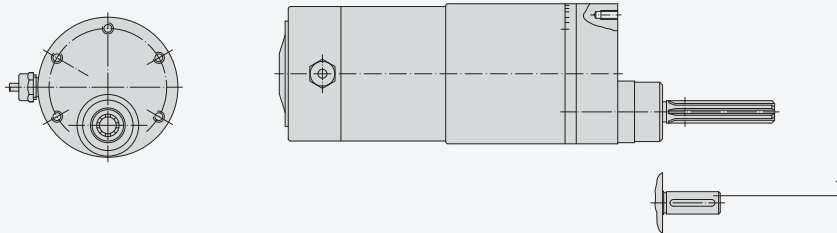
# ESP

## Type overview

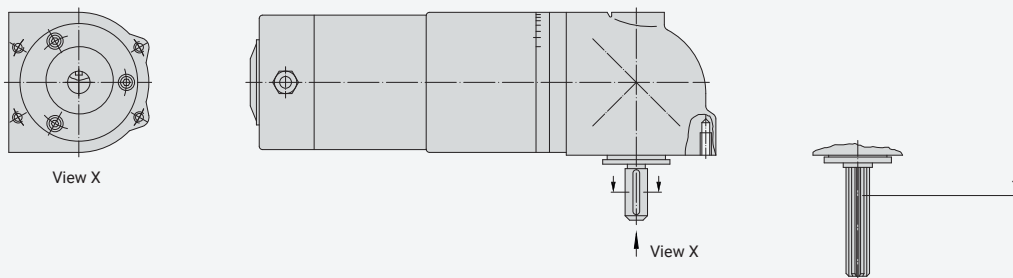
Clamping actuator with concentrically arranged power take-off shaft (type ESP 150 ST 40)



Clamping actuator with eccentrically arranged power take-off shaft (type ESP 120 STEX 40)



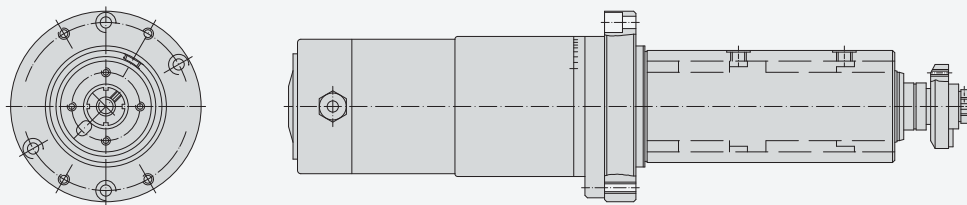
Clamping actuator with angled power take-off (type ESP 120 STW 40)



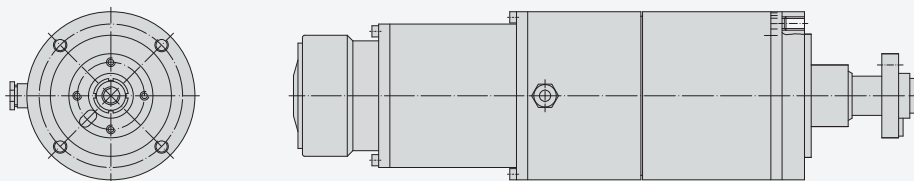
1 Variant power take-off shaft

BERG electro-mechanical actuator	Linkage with device	Power take-off	Accessories for automatic mode	Axial stroke
ESP ... ST	Constant via power take-off shaft	Concentric	Torque control	Without
ESP ... STEX	Constant via power take-off shaft	Eccentric	Torque control	Without
ESP ... STW	Constant via power take-off shaft	Right-angled	Torque control	Without

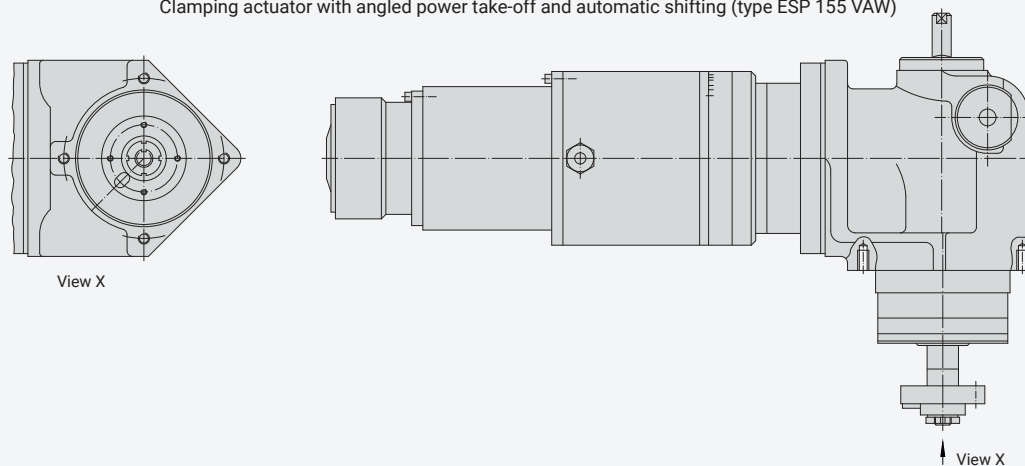
Clamping actuator with hydraulic or pneumatic shifting unit (type ESP 150 VAL)



Clamping actuator with automatic shifting (type ESP 150 VA)



Clamping actuator with angled power take-off and automatic shifting (type ESP 155 VAW)



BERG electro-mechanical actuator	Linkage with device	Power take-off	Accessories for automatic mode	Axial stroke
ESP ... VAL	Disconnectable by shifting unit with clutch mount	Concentric	Torque and linear control	63 or 125 mm
ESP ... VA	Disconnectable by automatic shifting with clutch mount	Eccentric	Torque and end position control	18 mm
ESP ... VAW	Disconnectable by automatic shifting with clutch mount	Right-angled	Torque control and contact rod	18 mm



## Expertise in medium transfer

A secure medium supply to rotary machine components is a decisive factor for stable machining processes, high product quality and, last but not least, the service life of the machine. With our rotary unions, we provide our customers with compact, application-specific system components for reliable medium transfer to machine tools and rotary machines.

As experts in clamping technology in mechanical engineering, we stand for long-lived and production-focused product solutions. We take the entire machining process and the ambient conditions in the machine into consideration in order to provide our customers with the best clamping solution for their needs. For us, this full-process product development also includes the transfer of machining-relevant medium types.

### Expertise and success through perseverance and meticulous work

BERG began to develop medium distributors and rotary unions in the 1950s. Even today, this development is still characterised by continuous adaptation of products to the constant development of machines and production processes.

Our milestones include our central distributors for rotary indexing tables and automatic indexing machines as well as rotary unions in our clamping/releasing cylinders for power chucks or machining spindles. Today's best-sellers are the bearing-mounted rotary unions for coolant lubricant used for high-performance spindles and the multi-channel rotary unions that can be used for machining at maximum speeds.

Each stage of technical development expands our experience regarding the interface of the rotating machine com-

ponent and the stationary supply line. When configuring our rotary unions, we take into account all operating requirements such as the temperature, pressure, rotation speed, torque, the medium composition and the available installation space.

### BERG rotary unions for medium transfer:

Application	Medium supply	Benefits
<ul style="list-style-type: none"> <li>Clamping/ Releasing</li> <li>Temperature control</li> <li>Cooling lubrication</li> <li>Cleaning</li> <li>Contact monitoring</li> </ul>	<ul style="list-style-type: none"> <li>Hydraulic oil</li> <li>Pneumatic</li> <li>Vacuum</li> <li>Coolant lubricant</li> <li>Cooling water</li> </ul>	<ul style="list-style-type: none"> <li>High machine availability</li> <li>Consistent workpiece quality</li> <li>Increased flexibility due to modular design</li> </ul>

Bearing-mounted rotary unions (single- and multi-channel) and rotary transmission lead-through with a special flange for air transfer for use in rotary machines



## DDF

Single- and multi-channel rotary unions

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Rotary union with six medium channels for hydraulic oil and air plus additional cooling channels, designed for flange connection [↑](#)



Rotary union with seven medium channels for hydraulic oil, air and coolant lubricant, designed for hose connection [↑](#)



#### APPLICATION

BERG's bearing-mounted rotary unions are 100 % tested precision components that ensure process-reliable medium transfer from stationary pipes and hoses to different points of use in rotating machine axes. They are primarily used in cutting machine tools, e. g. in torque tables for actuating clamping devices, for cleaning, cooling lubrication or contact monitoring. In addition to this main application, they are also suitable for actuation and temperature control of expanding shafts and rollers in rotary machines.

A crucial feature of BERG rotary unions is their modular design with a consistent installation diameter. It permits use of rotary unions with a variable number and assignment of channels for just one table structure with a defined interface on the machine side.

#### TECHNICAL FEATURES

- Application-specific configuration for transmission of all common medium types (hydraulic oil, air, coolant lubricant, vacuum)
- Optionally available with additional return channel for cooling water for machine table cooling
- Compact design with precision components perfectly adapted to each other
- Modular design principle for simplified, economic table model series and increased production flexibility
- Low-wear seals and sealing elements for strict medium separation
- Twist- and temperature-optimised design for longer service lives
- Designed for high speeds with simultaneously high medium volumes and pressures

#### VARIANTS

- Stainless steel version
- Adaptation of collector rings for measuring and control signals or for supplying electrical signals

#### ACCESSORIES

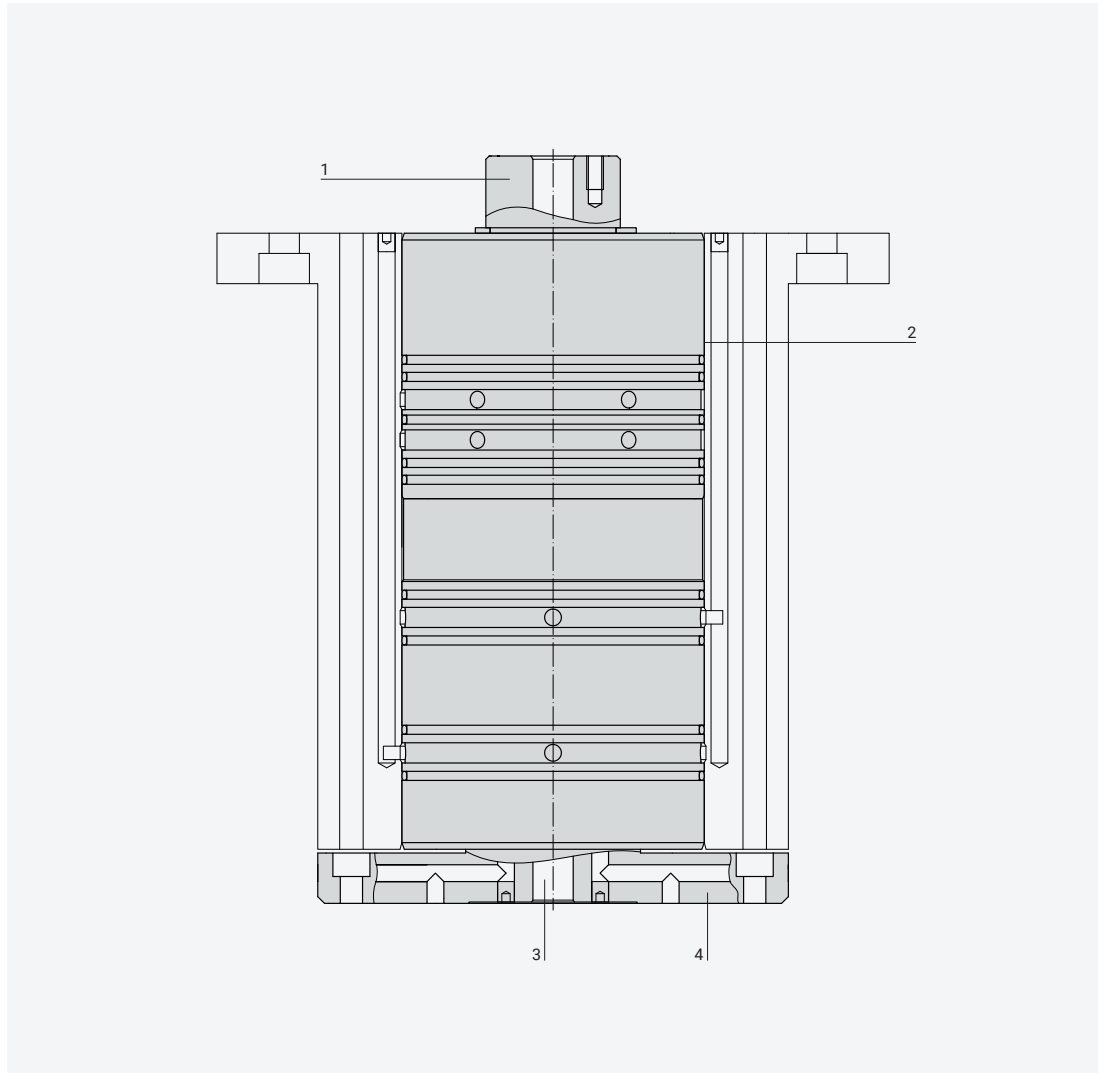
- Contact-free energy and data couplers for data transmission (in conjunction with clamping heads and zero point clamping systems of the SC series)

## DDF

### Multi-channel rotary union with flange connection

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#### APPLICATION PROPOSAL



#### SYSTEM

- Bearing-mounted, temperature-optimised rotary union
- For use in customer-supplied plug-in sleeve
- Designed for highly dynamic rotary indexing tables with torque drive for rotational speeds up to 1,200 rpm
- Channel assignment: Hydraulic oil, air, cooling (1 time each)

#### DESIGN FEATURES

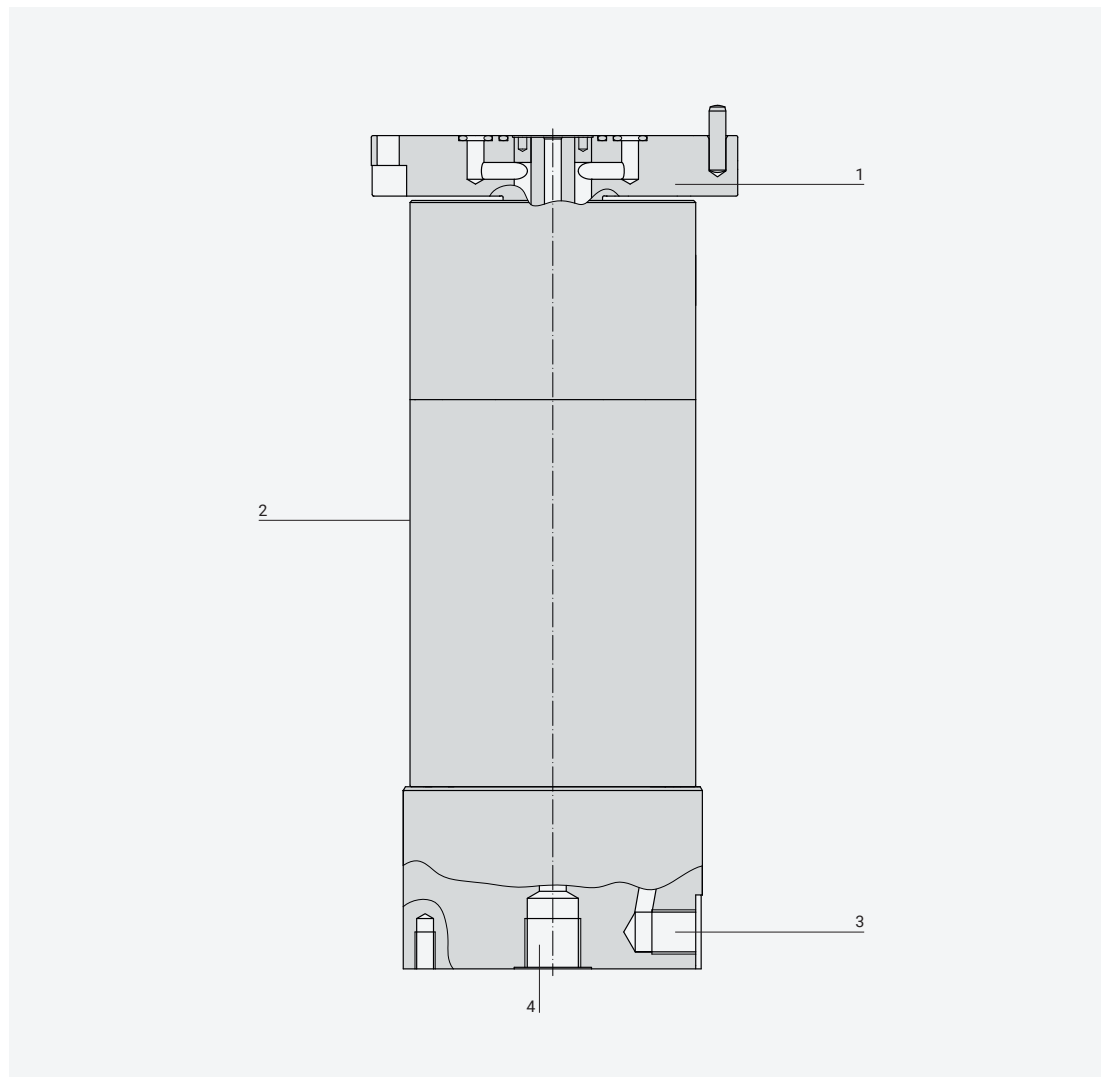
- 1 Stationary rotary union bolt with connecting flange for rotary encoder
- 2 Housing connection joined force-free in plug-in sleeve
- 3 Large central passage for rotary encoder cable
- 4 Medium supply via flange



# DDF

## Multi-channel rotary union with hose connection

### APPLICATION PROPOSAL



### SYSTEM

- Bearing-mounted, temperature-optimised rotary union with small external diameter
- Designed for rotational speeds up to 1,200 rpm in highly dynamic rotary and swivel tables with direct drive
- Channel assignment: Hydraulic oil (5 times), air (3 times), coolant lubricant (1 time)

### DESIGN FEATURES

- 1 Rotating rotary union bolt
- 2 Non-forced twist-secured housing, separated from table bearing
- 3 Rear hose connections for direct medium supply
- 4 Large central through hole for coolant lubricant



# Clamping force measurement

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 force measuring equipment is practice-approved, highly precise equipment for testing and ensuring the clamping forces on a variety of interfaces in machine tools.

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 match the specification can lead to inaccurate machining results and are a safety risk in the production process. The worst-case scenario is machine failure. For this reason, a regular clamping force check is crucial for detecting changes early and responding quickly, if action is required.

## Developed for ourselves, available to everyone

As a manufacturer of clamping systems, we focus particularly on precise evaluation of the clamping force. In accordance with our quality philosophy, all clamps are tested 100 %. For this purpose, we developed our own range of measuring systems. This equipment ensures quick and uncomplicated clamping force measurement and is highly cost-effective thanks to the modular design featuring freely exchangeable measuring adapters for different

interfaces. 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.

Measuring equipment milestones:	
2019	Trade show debut of measuring system series SKM-Visio with WLAN data transmission
2013	Hand-held display unit showing the recorded clamping force measurement curve on a new touch display
2012	Measuring cartridges with an adapter ring for Hydrodock clamping units
2011	Clamping force measuring system for mechanically actuated zero point clamping systems
2009	Expansion of the measuring equipment series with measuring cartridges for mechanical clamping heads (comfort and basic version)
2007	First clamping force measuring system for hydraulic clamping heads (comfort version)



Precise measurement results



Simple handling



Developed for our own requirements



Professional calibration service

## SKM-Visio

Wireless clamping force measuring system with display and WLAN data transmission

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**APPLICATION** Measuring systems of the series SKM-Visio permit wireless clamping force measurement and data transmission for all BERG clamping heads and zero point clamping systems. They can be operated easily and intuitively via touch display or connected end devices. The operation and wireless technology simplify regular clamping force checks to identify possible deviations at an early stage and to ensure a production process of consistent high workpiece quality.

**FUNCTION** The clamping force is measured by a firmly installed, factory-calibrated force sensor system in the associated measuring adapter, which is freely exchangeable based on the interface. The adapter is pulled in by the clamping system to be tested via the firmly installed measuring pull stud. The measured actual clamping force is displayed directly on the display unit. Moreover, the WLAN module transmits the results as numerical values and diagrams to smart devices and PCs with Windows or OS operating systems. In addition, the supplied software for Windows PCs permits data export for further processing.

**TECHNICAL FEATURES**

- Universal display unit for all measuring adapters
- Integrated WLAN module for wireless data transfer
- Laid out for high loads
- Energy supply via powerful lithium-ion accumulator
- Handy, robust structure with high rigidity for highly precise measurements

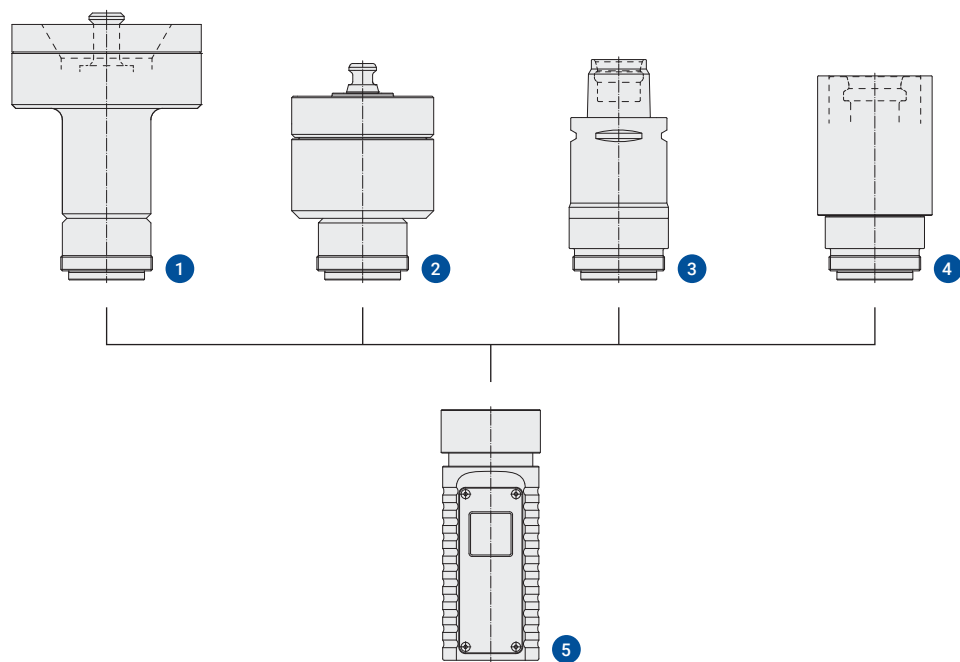
**DELIVERY SCOPE**

- Waterproof display unit incl. lithium-ion accumulator, micro USB connector, WLAN interface, data memory and OLED touch display
- Interface-specific measuring adapter with installed precision measuring pull stud
- Operating manual, PC software and test certificate
- Practical transport case

**COMMENT** BERG clamping force measuring systems for products from the programme range special application are always configured to the specific needs and considering the clamping systems to be tested.

## VARIANTS

The universal display unit makes it possible to use SKM-Visio for a variety of interfaces. In addition to measuring adapters for clamping heads and zero point clamping systems, adapters are available for measuring clamping forces at standardized tool interfaces and at the interface between machine tool and exchangeable units.



- 1 Measuring adapter for clamping heads (type M-Visio SPM-HV, M-Visio SPH)
- 2 Measuring adapter for zero point clamping systems (type M-Visio NSM-HV, M-Visio NSM-PV)
- 3 Measuring adapter for clamping cartridges or tool clamping systems in machining spindles (type M-Visio Capto, also available for standard interfaces HSK und SK)
- 4 Measuring adapter for Hydrodock clamping units (type M-Visio Hydrodock)
- 5 Universal display unit

## SKM(B)

### Clamping force measuring system with transmission cable

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**APPLICATION** The measuring system is suitable for clamping force measurement on all BERG clamping heads and BERG zero point clamping systems. It guarantees precise detection of clamping force deviations and thereby ensures consistent workpiece quality.

**FUNCTION** The clamping force measuring system is ready for operation by connecting measuring cartridge and display unit with the transmission cable. The clamping system to be tested pulls in the measuring cartridge via the firmly integrated pull stud. 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
- Simple operation and immediately ready for use
- Handy, robust structure with high rigidity for highly precise measurements
- Expandable by universal display unit

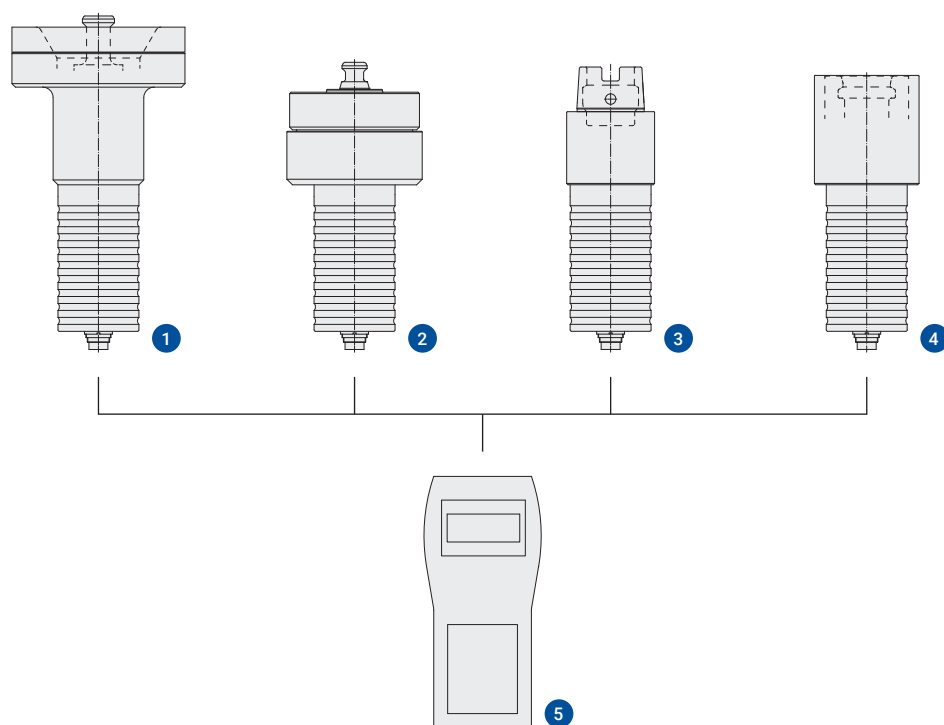
**DELIVERY SCOPE**

- Practical transport case
- Display unit, measuring cartridge with installed precision measuring pull stud, 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

**COMMENT** BERG clamping force measuring systems for products from the programme range special application are always configured to the specific needs and considering the clamping systems to be tested.

## VARIANTS

The clamping force measuring system of the series SKM(B) with a universal display unit can be used for a variety of interfaces. Measuring cartridges for clamping heads, zero point clamping systems, workpiece or tool clamping systems and hydromechanical clamping units are available. Moreover, universal measuring cartridges with exchangeable pull studs for SPH clamping heads of different sizes are offered.



- 1 Measuring cartridge for clamping heads (type M-SPM-HV, M-SPH)
- 2 Measuring cartridge for zero point clamping systems (type M-NSM-HV, M-NSM-PV)
- 3 Measuring cartridge for clamping cartridges or tool clamping systems in machining spindles (type M-HSK, also available for standard interfaces PSC und SK)
- 4 Measuring cartridge for Hydrodock clamping units (type M-Hydrodock)
- 5 Universal display unit with PC interface (comfort version)



# IN STANDSETZUNG - Freigabe

Kunde  
Kunden-Nr.  
Angebot  
Projekt  
Bestellung  
Freigabe  
Versandart  
Versandanschrift  
Abiadrstelle

130239.01  
002-4590049120-2019 vom 15.04.2019

Bedingungen  
80002\_00010\_vsd00

Vertreter  
092

Info Kunde

Rechnungszusatz  
artexgrob

W.V.R.N.  
10.00

Relevanzgrade

Position	Menge	Einheit	Ident-Nr / Bezeichnung	W.V.R.N.	Relevanzgrade	Einbringung	Vermerk
010	4.00	Stück	Instandsetzung von Ident-Nr. - 800-00002-004-0				

**EXPRESS**

Demontieren, prüfen, diverse Ersatz-  
...ieren und Funktionskontrolle.



## Services

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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:**

- Rental and calibration of measuring systems
- Clampforce measurements at site
- Repairs and 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

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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



Worldwide sales and service

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Advice and service in local language

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Fast supply of spare parts

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Market-specific products

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 algorithm.

## 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:

 <p><b>Requirements</b></p>	<ul style="list-style-type: none"> <li>Monitoring operating and status data</li> <li>Data recording and analysis in real time</li> <li>Transmission of relevant data via standardised interfaces, potentially automatic control based on pre-defined rules</li> <li>User-friendly installation</li> </ul>
 <p><b>Technologies</b></p>	<ul style="list-style-type: none"> <li>Sensor systems, foil conductor, semi-conductor strain gauges</li> <li>Contact-free energy and data transmission, e. g. through inductive couplers</li> <li>Microcontrollers for signal processing</li> <li>Edge computing for low-resource data processing</li> </ul>
 <p><b>Benefits</b></p>	<ul style="list-style-type: none"> <li>Ensuring consistent workpiece quality</li> <li>Reliable process monitoring</li> <li>Optimised scheduling of service/maintenance work</li> <li>High process stability, prevention of downtimes</li> <li>Reduction of rejects and minimisation of secondary damage</li> </ul>

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