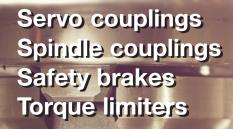


Machine Tool Components





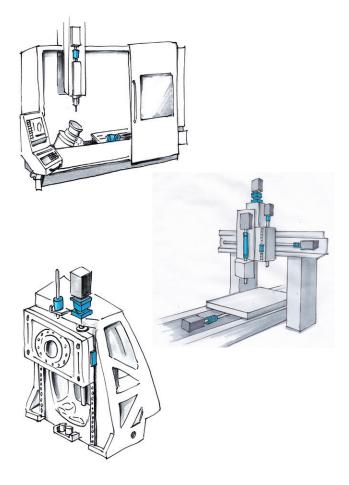
www.**May**P[®].com

IMG.002.V07.EN

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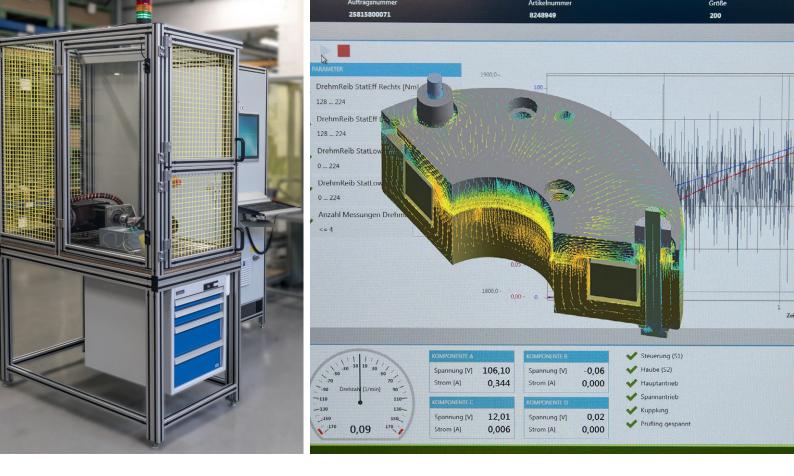
Smooth and trouble-free production

For more than 100 years, the company *mayr*[®] power transmission has stood for innovation and premium quality. The family-run company from the Allgäu region can rely on decades of experience in development, manufacture and application, and still has a major influence on power transmission today with its path-breaking products.

Precision, productivity, availability – machine tools must fulfil high expectations. Cycle rates and working speeds are increasing; tolerances are decreasing. Already the smallest programming and operating errors or malfunctions have a serious effect, even causing damage to the machine and downtimes in the overall production process. Therefore, every single component must work properly to ensure that the production runs smoothly and without problems.

Brakes and clutches by *mayr*[®] power transmission reliably protect machine tools and machining centres using complete solutions from a single source. A wide spectrum of backlashfree, high-performance servo couplings ensures a reliable connection between the shafts. Spindle couplings for the most diverse requirements ensure precise and reliable force transmission and very smooth running. A comprehensive portfolio of safety brakes ensures the reliable protection of machines and employees in every situation. These tried and tested torque limiters stand for permanently reliable overload protection – for maximum safety, process accuracy and machining performance.





Expert know-how in development and design

As the technological leader, *mayr*[®] power transmission focuses on continuous further development. Today, highly qualified engineers and technicians work on tomorrow's innovations using the most up-to-date tools. The many years of experience and countless tests in the Development and Testing Department at the Mauerstetten Headquarters form the basis of conscientious lifetime dimensioning.

The values upheld by our traditional, family-run company also include long-term stability, independence as well as a good reputation and satisfied customers.

Therefore, we place emphasis on:

- Tested product quality,
- Optimum customer service,
- Comprehensive know-how,
- Global presence,
- Successful innovations and
- Effective cost management

Tested quality and reliability

mayr[®] brakes and clutches/couplings are subject to meticulous quality inspections. These include quality assurance measures during the design process as well as a comprehensive final inspection. Only the best, tested quality leaves our factory. All products are rigorously tested on test stands, and adjusted precisely to the requested values. An electronic database in which the measurement values are archived together with the associated serial numbers guarantees 100 % traceability. On request, we confirm the product characteristics with a test protocol.

The certification of our quality management according to DIN EN ISO 9001:2008 confirms the quality-consciousness of our colleagues at every level of the company.





4

Specialists for power transmission for more than a century

mayr[®] power transmission is one of the most traditional and yet most innovative companies in the field of power transmission. From modest beginnings in the year 1897, the family enterprise has developed to become the world market leader. Worldwide, the company employs more than 1000 people.

Unsurpassed standard product range

mayr[®] power transmission offers an extensive variety of torque limiters, safety brakes, backlash-free shaft misalignment compensation couplings and high-quality DC drives. Numerous renowned machine manufacturers trust in solutions by *mayr*[®] power transmission.

Represented worldwide

With eight subsidiaries in Germany, sales offices in the USA, France, Great Britain, Italy, Singapore and Switzerland as well as 36 additional country representatives, *mayr*[®] is available in all important industrial areas, guaranteeing optimum customer service around the globe.

Never compromise on safety

We make no compromises where safety is concerned. Only top products of a perfect quality guarantee that no people are injured or machines damaged in case of malfunctions, collisions and other hazardous situations. The safety of your employees and machines is our motivation to always provide the best and most reliable clutches, couplings or brakes.

 $\textit{mayr}^{\circledast}$ power transmission holds numerous ground-breaking patents, and is the global market or technological leader for

- application-optimised safety brakes, for example for passenger elevators, stage technology and gravity loaded axes
- torque limiters to protect against expensive overload damage and production losses and
- backlash-free servo couplings.

Strongly positioned

mayr[®] sets standards in power transmission with economically viable solutions. For maximum competitiveness of your machines and systems, we always aim for the best possible cost efficiency, starting with the development of your clutch/coupling or brake, right up to delivery of the finished and inspected product. For cost-efficient production, our factories in Poland and China represent the perfect supplement to the headquarters in Germany.



mayr® headquarters in Mauerstetten



Subsidiary with production department - mayr® China



Subsidiary with production department - mayr® Poland



Servo couplings

Solutions for all drive constellations

For modern machine tools, production accuracy, feed speeds or service life are significantly dependent on the quality of the servo axes and their components. The shaft couplings in these axes have the basic function of transmitting the motor power with high precision from one shaft to another and of compensating for any shaft misalignment occurring. In servo technology, steel bellows, elastomer and disk pack couplings are generally used; these are amongst the most common and most attractive backlash-free shaft couplings. However, each drive has its own special features and places very different demands on the coupling. Therefore, *mayr*[®] power transmission provides an extremely wide and sophisticated product range for various drive constellations. Customers benefit from the competence of one of the leading companies worldwide in mechanical power transmission. You receive complete solutions from a single source, and therefore may be able to save on additional suppliers and costs. Servo couplings by *mayr*[®] power transmission convince not only through favourable prices and short lead times, but are also easy to handle and simple to select via the product configurator on the website, for example.





ROBA®-DS servo couplings

Wear and maintenance-free steel disk pack couplings Extremely compact construction series made of steel and high-strength aluminium alloys.

Torque range: 35 to 150 Nm

smartflex®

Modular and adaptable steel bellows couplings

smartflex[®] couplings convince customers with almost triple the misalignment compensation capability than in standard steel bellows couplings with radial shaft misalignment, and are therefore particularly reliable in operation.

Torque range: 16 to 700 Nm

primeflex®

Backlash-free, plug-in type steel bellows couplings

 $\mathsf{primeflex}^{\scriptscriptstyle(\!\!0\!\!)}$ couplings can be de-installed even after longer operating periods without damaging the steel bellows.

Torque range: 24 to 120 Nm

ROBA®-ES

Backlash-free elastomer couplings

ROBA[®]-ES elastomer couplings transmit the torque backlash-free and damp critical vibrations. Torque range: 4 to 1,250 Nm



Product Catalogues

You can find an overview of our wide portfolio of servo couplings in the Catalogue $IMG.900.V__._$

A detailed product catalogue is available for each construction series, with all constructional designs, technical data and dimensions.

All the catalogues are available to download on our website **www.mayr.com**.

We are also happy to send you printed catalogues.

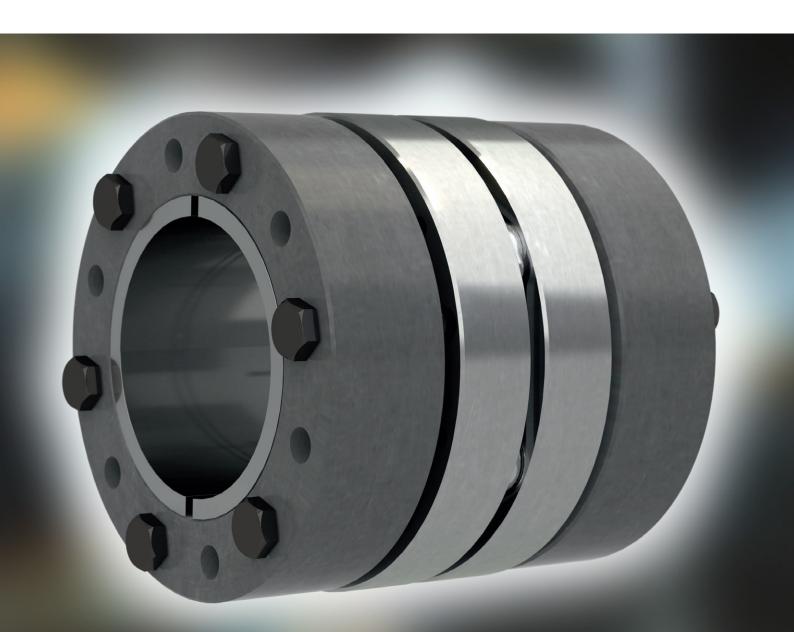


7

Spindle couplings

Smooth-running even at high speeds

Motor and tool spindles are subject to high loads and are extremely expensive components on a machine tool. In addition to the in part high torques, high speeds are involved. The installed drive elements must be designed so that the power is not only reliably transmitted, but also in a manner as smoothly as possible and free of wear. Spindle couplings by *mayr*[®] power transmission ensure a low mass moment of inertia with high performance density and compact designs, and are therefore optimally suited for high speeds. The disk pack couplings have an extremely high torsional rigidity, whereas the elastomer couplings have a vibration-damping effect thanks to their construction. In particular for large machining centres and gantries, special designs are necessary in order to span larger distances. Here, spindle couplings with an intermediate sleeve replace the conventional, complex design with multiple bearingsupported intermediate shafts. In addition to steel, carbon fibre-reinforced plastic can be used as a material for the sleeves. The advantages of the material really come into play here: The mass inertia is significantly reduced thanks to the up to 80% lower net weight in comparison to steel. The particularly advantageous weight to rigidity ratio permits high bend-critical speeds and therefore renders intermediate bearings unnecessary even with wide bearing spacing. A version with integrated cooling lubricant feedthrough is also available. The advantage: The cooling lubricant moves directly into the tool through the spindle. The service life, cutting speed and therefore also the machining performance significantly increase.





For high speeds and special requirements

ROBA®-DS

- Speeds: up to 20,000 rpm
- Torques from 35 to 110,000 Nm
- Backlash-free disk pack coupling
- Very high torsional rigidity
- Completely balanced to G 2.5
- Minimal ventilation noises

ROBA®-ES-P

- Speeds: up to 12,000 rpm
- Torques from 4 to 1,250 Nm
- Backlash-free elastomer coupling
- Easy plug-in installation
- Vibration-damping

Product Catalogue

The detailed Product Catalogue **IMG.900.V** ____ with all constructional designs, technical data and dimensions is available for download on our website **www.mayr.com**.

We are also happy to send you a printed catalogue.



Spindle couplings with CFRP intermediate sleeves and integrated cooling lubricant feedthrough

ROBA®-DS spindle coupling

- Designed for large machining centres
- High performance density
- High torques und speeds
- A torsionally-rigid, lightweight intermediate sleeve, for example made from CFRP, replaces the multiple-bearing intermediate shaft
- Simple installation
- Increased running smoothness

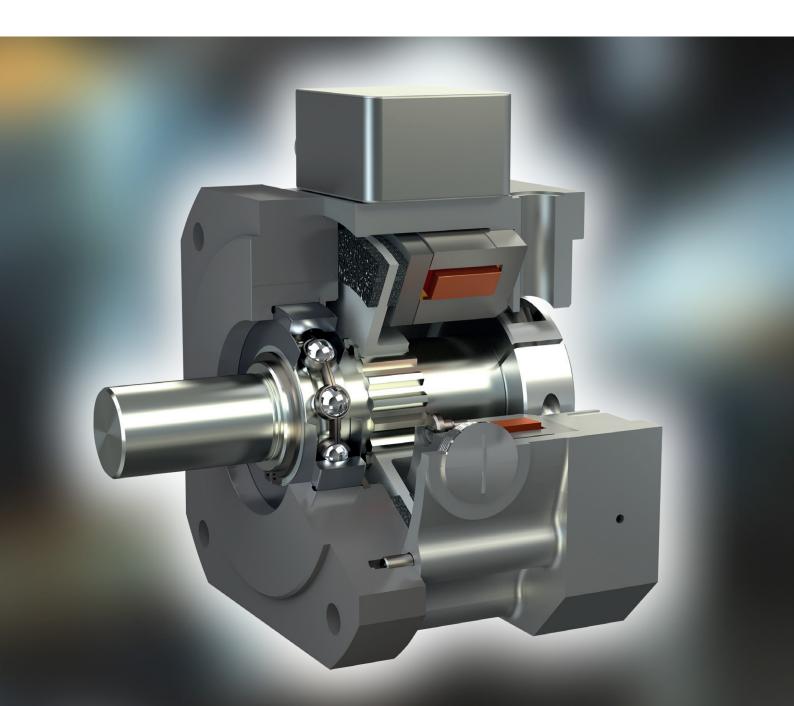


ROBA®-topstop® safety brakes

Modular braking systems for servo motor installation

ROBA®-topstop® brake systems by *mayr*® power transmission have proven themselves for decades as reliable vertical axis brakes. Thanks to the adapted flange dimensions, they can easily be integrated into existing constructions between the servo motor and the counterflange. As an independent module, they hold the vertical axis reliably in any position, even in case of a deinstalled servo motor, for example during machine maintenance or transportation. Additional measures for supporting the axis are not required in this case. This ensures significant time and cost savings,

for example, when changing the drive motor, and reduces downtimes during repairs. In critical situations, too, such as EMERGENCY STOPS or power failures, the braking systems quickly and reliably bring the loads to a standstill. *mayr®* power transmission has voluntarily subjected the ROBA®-topstop® safety brake to a type examination by the Deutsche Gesetzliche Unfallversicherung (DGUV) (German Statutory Accident Insurance). It confirms that this braking equipment can be considered a "tried and tested component" in terms of Category 1 according to DIN EN ISO 13849-1.





The top system on the market for rotary drives

The ROBA®-topstop® has quickly developed into the leading brake system on the market for vertical axes with rotary drives thanks to its design features and proven safety. They ensure:

- The axis is held safely in any position, even with a dismantled servomotor, e.g. during machine maintenance
- Safe braking on EMERGENCY STOP and power failure
- Long lifetime even after frequent EMERGENCY STOP brakings
- Maximum reliability due to decades of experience and a mayr[®] design which has been tried and tested millions of times
- Indication of the operating condition (opened/closed) via an integrated condition monitoring
- Short, compact design
- Low rotatory moments of inertia Low self-induced heat production even at 100 % duty cycle
- Design with Protection IP65 available
- Brake technology 4.0 upgrade now! The ROBA[®]-brake-checker allows the permanent brake monitoring of the switching condition, temperature and wear - sensorless, reliable and wear-free.



Type 200/899.012.22

A voluntary prototype inspection was carried out for the ROBA®topstop® single circuit brake Type 899.012.22, Size 200. The "DGUV Test Prüf- und Zertifizierungsstelle Maschinen und Fertigungsautomation" (translation: "DGUV Testing and Certification Body, Machines and Manufacturing Automation") confirms that this braking equipment can be considered a "tried and tested component" in terms of Category 1 acc. DIN EN ISO 13849-1.

Product Catalogue

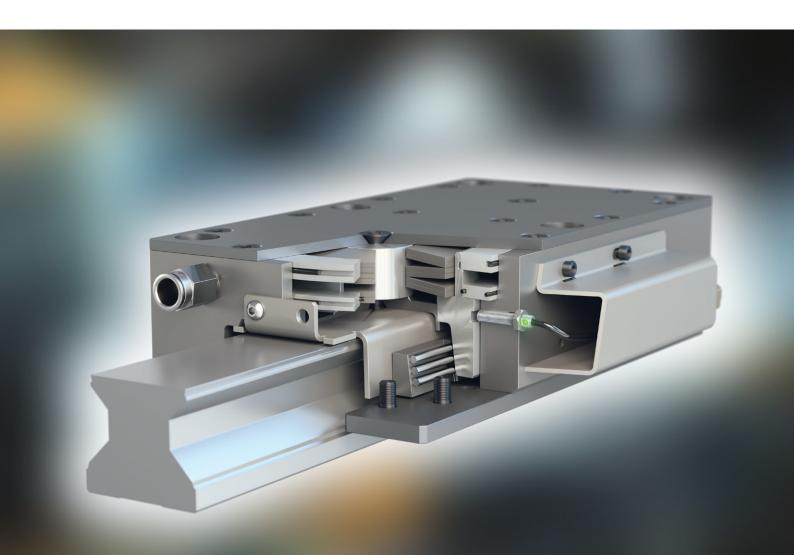
The detailed Product Catalogue **K.899.V**____ with all constructional designs, technical data and dimensions is available for download on our website **www.mayr.com**.



ROBA®-guidestop profiled rail brake

Decelerate reliably and safely – Clamp rigidly and backlash-free

The ROBA[®]-guidestop safety brakes act directly on the linear guide with extremely high rigidity. This means that they are attached directly to the masses which should be held. In particular in the case of gravity-loaded axes, this provides a decisive advantage if the hazard risk to people should be minimised: Drive elements between the motor and the moved mass, such as for example spindles, spindle nuts, shaft couplings or gears, can thus have no influence on safety. The backlash-free clamping by the ROBA[®]-guidestop directly on the profiled rail provides yet more advantages: The additional reinforcement of the NC axis increases process accuracy, increases the machining performance and can offer other technological advantages, for example during heavy machining. The processing is more vibrationresistant, and therefore the surface quality of the workpiece is positively influenced. In case of a stationary axis, the brake can take on the load during processing, for example. As a result, it is possible to switch the drive motor off during this phase and to disengage it from the control system. This eliminates the control movements and is thus gentle on the ball screw spindle. The closed brake absorbs the axial forces. The lifetimes and maintenance intervals for the drive components are therefore increased.

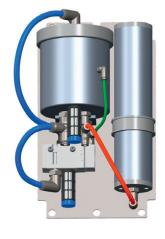




Real power packs

ROBA[®]-guidestop profiled rail brakes provide a suitable solution for every application: As a result, users can rely on hydraulically-released ROBA[®]-guidestop safety brakes for machines in which a hydraulic system already exists. However, in cases where a hydraulic system would first have to be installed in order to operate the brake with high holding forces, or if several brakes are necessary in order to achieve the corresponding forces, then the pneumatically-released ROBA[®]-guidestop safety brakes can be used. They clamp the profiled rail just as accurately and backlash-free, and achieve the same high holding forces as the hydraulic designs of this brake.

- Maximum safety due to fail-safe principle
- Hydraulically opening (with 70 90 bar)
- Pneumatically opening (with 4 8 bar or 20 30 bar/ pressure booster)
- Five construction sizes from 1 to 34 kN
- Type 3840, 3850/3852, power pack with two brake circuits for double holding force or a redundant design
- Type 3841, 3851/3853, cost-efficient solution for limited installation space
- High degree of rigidity up to the full nominal holding force
- Extremely high holding forces
- Designed for standard linear guides
- With switching condition monitoring



The pneumatic ROBA®guidestop (Type 3852/ 3853) opens using compressed air at 20 to 30 bar. In order to achieve the necessary operating pressure, a compact pressure booster is used together with the brake, which increases the normal system pressure of 4 to 6 bar in the pneumatic network purely mechanically, without external energy. This innovative concept enables a positionselective pressure increase directly in front of the brake, and therefore short high pressure lines suffice.

Product Catalogue

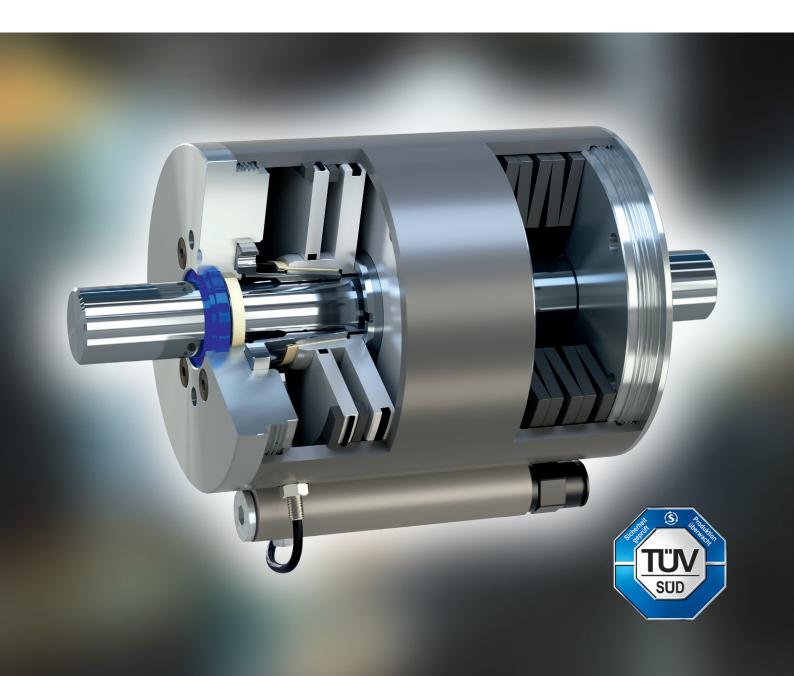
The detailed Product Catalogue **P.380000.V**____ with all constructional designs, technical data and dimensions is available for download on our website **www.mayr.com**.

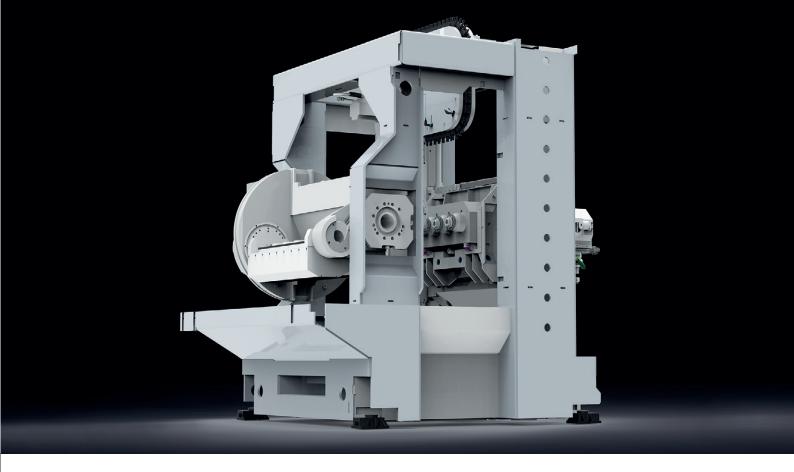


ROBA®-linearstop

The perfect safety brake for linearly moved axes

With the ROBA[®]-linearstop, *mayr*[®] power transmission provides a further safety brake to decelerate and hold linearly-moved masses. It acts on the piston rod independently of the drive unit. The ROBA[®]-linearstop also works according to the fail-safe principle and generates the braking force via thrust springs. Depending on the design, it is hydraulically, pneumatically or electromagnetically released, and is available as a complete brake for dynamic braking or as a clamping unit. The pneumatic version of the ROBA[®]-linearstop safety brake (type 381.1_) is tested and acknowledged by TÜV Süd as a complete dynamic braking device. It easily fulfils the testing principle for emergency braking with a holding function for linear movements (GS-MF-28) of the Berufsgenossenschaftlichen Instituts für Arbeitsschutz (BIA) (German Institute for Occupational Safety). This testing principle defines 1 million switching operations, both with and without load assumption, and an additional 1000 dynamic brakings. The pneumatic clamping unit is also certified by TÜV Süd (Technical Inspectorate South): In addition to the required test criteria for holding brakes, 100 dynamic brakings were executed during the test — the brake also fulfilled these requirements without any problems.

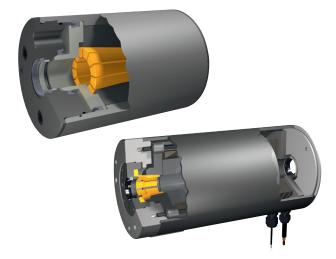




Versatile — as a safety brake or a clamping unit

ROBA[®]-linearstop safety brakes are more than just clamping units. They are designed so that they hold the load reliably, and furthermore are suitable for emergency braking procedures. Prior to a brake leaving the premises of *mayr*[®] power transmission in Mauerstetten, the required force is set with the appropriate safety. This value is checked and documented, and therefore every serial number is traceably assigned.

- Safety brake system according to the fail-safe principle
- Hydraulically, pneumatically or electromagnetically opening
- Backlash-free force transmission having an effect on both sides
- No self-reinforcement during clamping
- Clearing the clamping device is not necessary
- Maximum performance density
- Suitable for EMERGENCY STOP braking actions
- Suitable for dynamic braking actions
- Minimum reaction times
- Integrated switching condition monitoring possible
- Long service lifetime
- Can easily be integrated into existing constructions



The ROBA®-linearstop is available in a hydraulic, pneumatic or electromagnetic design.

Product Catalogue

The detailed Product Catalogue **K.381.V**_ _._ with all constructional designs, technical data and dimensions is available for download on our website **www.mayr.com**.



ROBA-stop®-M

The robust, cost-effective safety brake

ROBA-stop[®]-M safety brakes are designed for installation at the free shaft end. They ensure reliable holding and can decelerate moving masses or loads in motion. In case of power failure, a fault or malfunction of the servo brake in the drive motor, ROBA-stop[®]-M brakes hold the axis in any position and therefore prevent an uncontrolled fall or crash. This not only protects the employees against injury, but also the drive, tools and the workpieces to be processed against damage.

- Simple installation
- Completely enclosed brake housing acc. Protection IP54 or IP65
- Maintenance-free over the entire service lifetime of the rotor
- Class of insulation F
- Can be used for 100 % duty cycle
- Short switching times





Product Catalogue

The detailed Product Catalogue **K.891.V**____ with all constructional designs, technical data and dimensions is available for download on our website **www.mayr.com**.



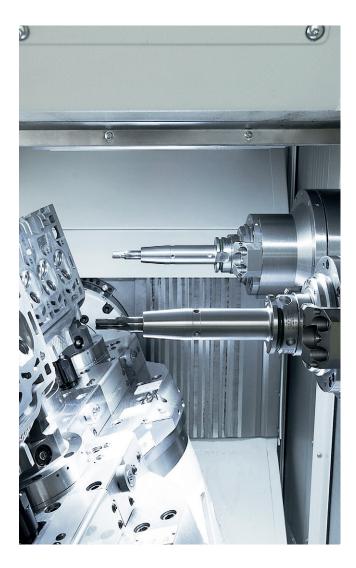
ROBA®-pinionstop

The safe rack and pinion brake

The ROBA[®]-pinionstop offers an additional braking system for axes with a rack and pinion drive. A pinion shaft is integrated into this brake. It directly locks into the toothed rack at any required position and therefore operates independently of the drive motor.

- Safe holding of the axis via ready-to-install brake module with pinion shaft
- Independent, electromagnetically releasing spring applied brake system

- Integrated release monitoring
- Sealed brake housing
- Individual dimensioning and design possibilities of the brake configuration
- Simple installation
- Simple realisation of a redundant, flexible braking system through the installation of a second ROBA®-pinionstop brake or through the use of an additional brake at the servo motor





Product Catalogue

The basis for the ROBA®-pinionstop is mainly the construction series ROBA-stop®-M (catalogue **K.891.V**__.__). Depending on the installation situation, the toothed rack profile and the technical requirements, we create the appropriate brake for you with an integrated pinion shaft.



Torque limiters

The airbag for your machine

Damage and production failures due to collision are expensive and harmful for a company's image – so it is better if these can be prevented thanks to the torque limiters by *mayr*[®] power transmission. As the global market leader, the company possesses the widest product range, and provides tailored solutions for very different applications.

During the development of intelligent drives, electronic strategies have emerged in parallel to mechanical solutions for the prevention of overloads. The mechanical overload clutch remains indispensable. The operating principle of a mechanical safeguard is based on the separation of the input and output and the fragmentation of the energy in the drive line. As a result, the loads acting at the collision position can be significantly reduced.

Furthermore, the overload clutches – in contrast to electronic controls – can realise any desired short reaction times, because a passive element is incorporated into the design which adjusts to the conditions in the drive line. Simulations and tests on special test stands prove that an effective overload protection is only possible with torque limiters. Clutches by *mayr*[®] power transmission ensure the smooth operation of machine tools and therefore an interruption-free production process. They stand for safety and absolute reliability.





Load disconnecting torque limiters

EAS[®]-smartic[®]

The installation space-optimised torque limiting clutch

- Limit torques from 2.7 to 500 Nm
- Easy torque adjustment using a graduation scale; the torque can be read off directly

EAS®-Compact®

Perfect overload protection in a wide range of product variants

- Limit torques from 0.65 to 1,500 Nm
- Load holding design for inclined and vertical axes available on demand

Product Catalogues

You can find an overview of our wide portfolio of torque limiters in the Catalogue $IMG.402.V___$

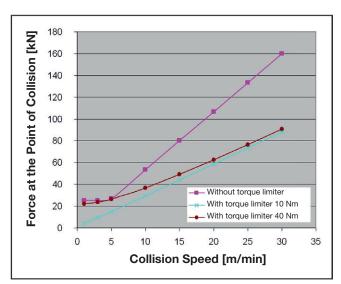
A detailed product catalogue is available for each construction series, with all constructional designs, technical data and dimensions.

All the catalogues are available to download on our website **www.mayr.com**.

We are also happy to send you printed catalogues.

Load holding torque limiters ROBA[®]-slip hubs

- Torque range: 2 to 50,000 Nm
- Suitable for large friction work values and high torques



The collision force is dependent on the speed and the torque setting of the torque limiter



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You can find the complete address for the representative responsible for your area under www.mayr.com in the internet. 3

