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OPTIMIZED ELEVATOR BRAKES

ROBA® TWINSTOP®: ADVANTAGES THANKS TO NEW, PATENTED DAMPING SYSTEM

quiet – constantly safe – intelligent

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Summary

Wherever people are transported by elevators, passenger safety is the top priority. Safety-relevant components such as elevator brakes must therefore meet the highest quality requirements. In addition to safety, the focus is always on the noise level. As the market leader, *mayr*® power transmission therefore offers various noise damping concepts for its diverse portfolio of elevator brakes.

A novel damping system not only makes the brakes quiet as a whisper, but also has a decisive side effect: it ensures more stability and under certain circumstances more safety over the entire service lifetime and enables reliable, intelligent brake monitoring – without any additional sensors. This monitoring not only helps to reduce or even completely avoid errors and downtimes, but also supports the customer in demand-based maintenance of the elevators in line with the workload and automated remote maintenance.

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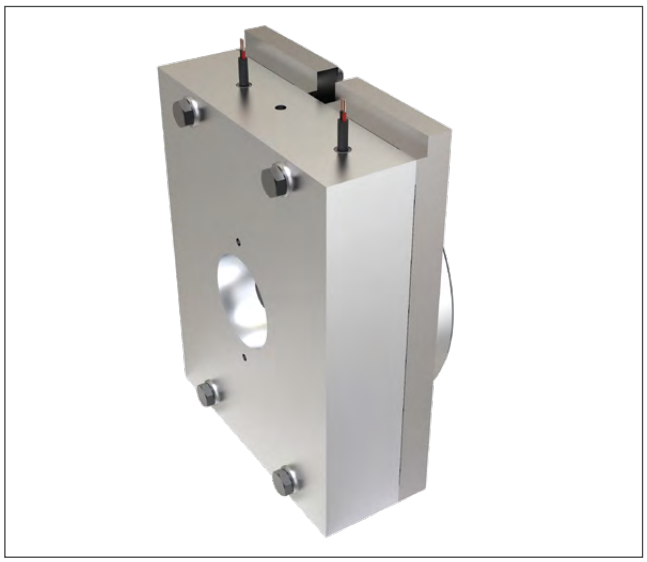
1. Introduction

Passenger elevators are still one of the safest means of transportation today. The low number of accidents involving persons in accident and malfunction statistics confirms that high-quality technical products are used here that are reliably tested in advance. This is particularly true for the safety brakes used in elevators.

This is why *mayr*® power transmission takes great care to ensure that its safety brakes meet the highest quality requirements: For this purpose the company carries out a 100% final inspection before delivery, during which all important technical properties are recorded, documented and permanently assigned to the serial number. The delivery status of each individual brake can therefore be traced back and documented at any time. These data ensure that the traceability of the high quality standard is maintained throughout the series, as safety does not allow for any compromises. In addition the safety brakes are prototype-inspected by the TÜV Süd (German Technical Inspectorate, Southern Germany).



ROBA® twinstop®: Advantages thanks to new, patented damping system

2. Quiet and consistently safe over the entire service lifetime – noise emissions well below 65 dB(A) up to 5 million switching cycles

In addition to safety, the noise level of elevator brakes also plays an important role in ensuring that the drives are user-friendly when installed in the elevator shaft.

For this reason *mayr*® power transmission is constantly further developing the damping system of its brakes and offers new, technologically advanced solutions. After all, it is important that elevator brakes reliably provide safety in every operating state and that switching noises are practically non-existent – and not just when the brakes are in new condition, but over their entire service lifetime. Long-term tests confirm that *mayr*® brakes still operate at a low noise level (below 65 dB(A)) even after several (up to 5) million switching actions and that the required consistency of the safety system is not affected.

This is made possible, among other things, by a new, patented damping system based on the special geometry of the armature disk. This is a new selection option in addition to the existing patented adjustable elastomer damping and provides additional benefits.

3. Metal-damped safety brakes provide temperature stability compared to elastomer materials – for a longer service lifetime and improved safety

Many damping systems in elevator brakes based on elastomer materials are prone to ageing due to the effects of temperature and heat. This can lead to a deterioration in noise development over time.

Against the background of the new EN ISO 8100-1/2, the standards committees are currently discussing daily brake force measurements, which are intended to contribute to greater safety.

Concerning the existing European standards EN 81-20/50:2020, which will also be replaced by new EN ISO 8100-1/2, must be taken into account, that daily braking force monitoring can ensure quality levels and point out deficits in braking force.

mayr® has opened up new possibilities here with the new integrated metallic damping system in its elevator brakes. The new system is particularly durable and insensitive to low and high temperature, as it is metallic/mechanical. While changes occur in elastomers/plastics due to extremes temperatures, the modulus of elasticity of the metallic damping system is always the same (between 0° and 80°C). Mechanical adjustment is not required.

4. Intelligent brake monitoring without additional sensors/reducing costs with 'talking' brakes

Thanks to the new, innovative metallic damping system, reliable intelligent brake monitoring is now also possible without additional sensors. Particularly in elastomer damped brakes, continuous monitoring is only possible to a limited extent. Temperature and aging effects of the elastomers lead to varying current and voltage curves and contribute to the occurrence of unjustified error messages.

The monitoring takes place in combination with the metallic dampers with the retrofittable ROBA® brake-checker® module, which is clamped into the voltage supply of the brake. The module detects the movement of the armature disk through extended analysis of current and voltage, and knows what condition the brake is in. In addition to monitoring the switching condition and critical coil temperature, the ROBA® brake-checker® also performs preventative function monitoring for wear, functional reserve and malfunctions. In an extended version, the module is equipped with an additional PCB with a customer-specific interface (e.g. Ethernet based). Via this interface, data concerning the switching time, current, voltage, resistance, performance and functional reserve can be provided. This means that processes can now also be evaluated, anomalies in the process can be detected quickly and conclusions can be drawn from complex interrelationships; and also the integration into remote maintenance systems is possible.

This means maintenance becomes plannable – the elevator operator or manufacturer is able to undertake maintenance in a targeted and aligned manner. This creates savings potential, not by using low-cost components, but by saving on time-consuming and cost-intensive services. The module itself is now able to provide detailed information on the condition of the brake. In some countries, the regular maintenance procedures have to be carried out by Service personnel, and the results are documented manually. If such visits and service work are no longer necessary, customers are able to save a lot of money. To achieve this, however, procurement costs and service costs must be combined. Brakes with the new damping system can now be retrofitted with the module.

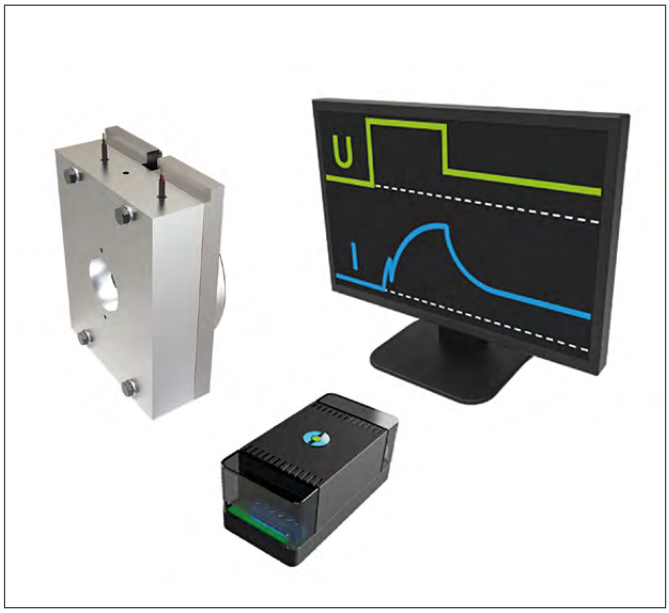
5. Technology as an integration option in the control systems

Users are able to integrate the module easily and quickly into machines and systems without having to intervene in the ‚converter' or ‚control' components. However, as a special option it is possible to integrate the existing ROBA® brake-checker® software (instead of the hardware module) into the clients control system, which can be considered especially for large quantities. This can be done in the context of co-operations, for example. The brake supplier can draw on decades of experience in the field of brake monitoring and can contribute the necessary technology for integration directly into the clients control system if required.

6. Condition monitoring without switches/reliable monitoring independent of the location of use

As the ROBA® brake-checker® works without sensors, i.e. no microswitch or proximity switch has to be attached to the outside of the brake for switching condition/ release monitoring, safety brakes simplified in design, this means without additional preparation for sensors can be used and smaller airgaps can be considered on such brake designs. Switches and the corresponding cabling can be omitted, which reduces the cost of the brake.

In contrast to the solution with micro switches, which are exposed to impacts and vibrations due to their installation situation on the brake, monitoring with the external ROBA® brake-checker® is carried out from the control cabinet, i.e. in a protected environment. Failures due to special ambient conditions and error signals because of dirt, such as for example friction dust, are thus excluded. The system also operates wear-free over its service life.



The intelligent ROBA® brake-checker® module can monitor safety brakes without sensors and supply them with energy.

Company profile

In 2022, *mayr*® power transmission, the renowned family business from the Allgäu region in Germany, celebrated its 125th company anniversary. A glance at the company history reveals that stability is a central component of the corporate philosophy. After all, the values of safety and reliability are not just an advertising slogan for the products.

The company, which was founded in 1897, is today a leading manufacturer of safety brakes, torque limiters and shaft couplings. These products are primarily designed for application in electrically driven machines and systems. They can be found, amongst other things, in filling plants, machine tools, packaging and printing machines as well as in elevators, wind power plants and in the stage technology. The company is active in over 60 branches worldwide. Currently, approximately 750 employees work at the headquarters in Mauerstetten, in the Allgäu region. Worldwide, *mayr*® power transmission has more than 1350 employees.

The company runs two additional production plants in Poland and China and is currently setting up a branch office in India. With subsidiaries in the USA, in France, Great Britain, Italy, Singapore, Japan, Spain and in Switzerland as well as around 40 additional country representatives, *mayr*® power transmission has a global presence.

Autors

Alexander Hutler, Key Account Manager Lift brakes
Simone Dauer, Head of Marketing and Communications

Contact

mayr®

Chr. Mayr GmbH + Co. KG
Eichenstraße 1
D-87665 Mauerstetten

+49 (0)8341 804-0

sales.mayr@mayr.de

www.mayr.com

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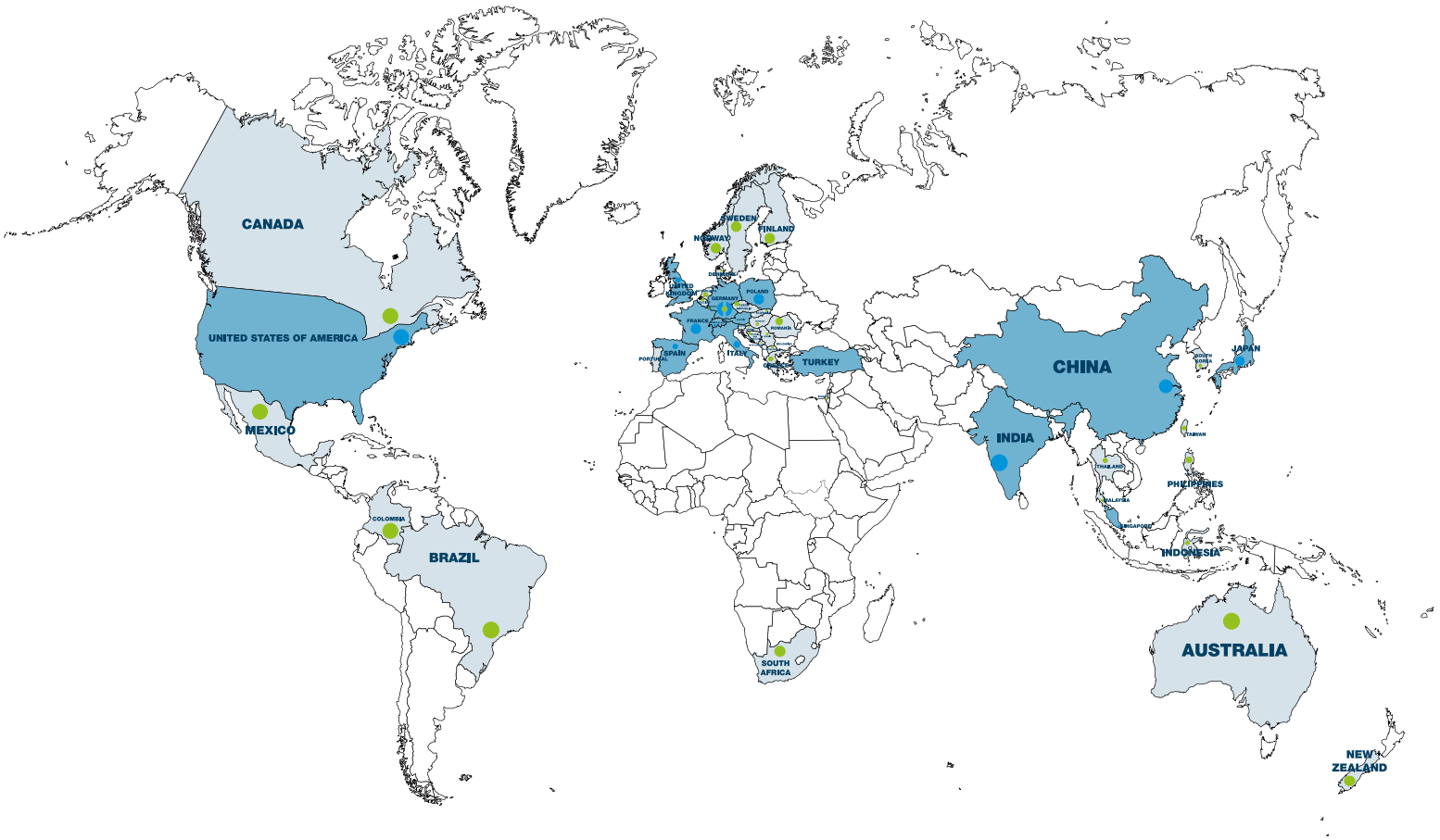

Headquarter Branch office Representatives

mayr® Antriebstechnik
Eichenstraße 1
87665 Mauerstetten

Phone: +49 (0)8341 804-0
public.mayr@mayr.de
www.mayr.com

LEARN MORE

Everything you need to know about the ROBA® twinstop®, including downloads and configuration options—just scan the QR code!

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