



Stage Technology – Applications

**Safe brakes
for powerful emotions**





Reliable brake solutions for the stages of this world

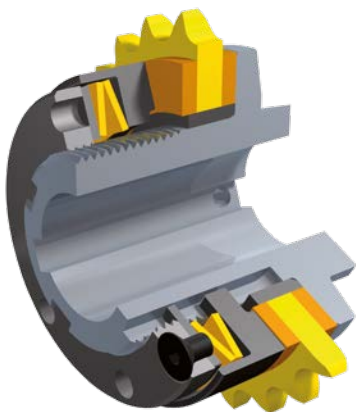
For more than 100 years, the company *mayr*[®] power transmission has stood for innovations and premium quality. Today, the family-run company from the Allgäu region is the world market leader in the field of stage brakes: Products manufactured in Mauerstetten make their appearance on the big theatre and opera stages of this world on a daily basis. But even in case of large-scale sporting events, such as at the Football World Championships or the opening ceremony of the Olympic Games, during large TV productions or on state of the art cruise ships — *mayr*[®] brakes, clutches and couplings are live on set and secure machine movements in front of and behind the scenery.

Stage brakes by *mayr*[®] power transmission are configurable for comprehensive brake monitoring. They can guarantee maximum operational and functional safety due to the permanent monitoring of the brake condition and the optimisation of the friction system. In addition, *mayr*[®] is the first manufacturer to equip its stage brakes with a unique contactless release monitoring system. This contributes substantially to providing maximum reliability. Never compromise on safety.



Olympic-standard performance

The 2012 Olympic Games in London began with an impressive opening ceremony. The audience was able to experience England's development as an industrialised nation 'live'. Among other things, six 36-metre high industrial chimneys with outer walls made of printed fabric rose from the ground. In order to stabilise the fabric housing as the chimneys rose, thus creating the impression of a massive wall, frictionally-locking torque limiters by *mayr*[®] power transmission were used. Whilst one winch pulled the upper frame of the chimney upwards, the drive of the second winch, which was located in the pedestal, moved against the pulling direction with relative speed and held the wire rope under tension. The differential speed between the two winches was compensated for through permanently slipping torque limiters in a special design. They were able to cope with the special requirements caused by the generated thermal load.



ROBA[®]-slip hubs

The load-holding, frictionally-locking torque limiters

- Load-holding slip clutch
- Robust and reliable
- Easy installation and handling
- Suitable for large friction work values and high torques



World class – *mayr*[®]-brakes at the World Cup Final

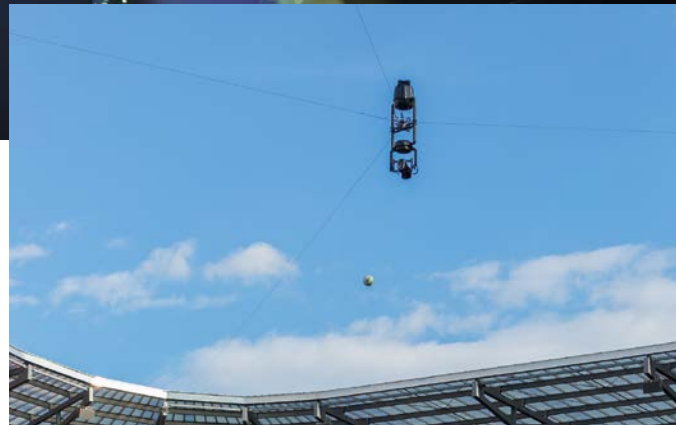
Germany won the Football World Cup in Brazil, and *mayr*[®] power transmission was represented live at the final in Rio de Janeiro, as ROBA-stop[®]-silenzio[®] brakes secured the flying camera above the football field in the stadium, guaranteeing maximum functional and operational safety.

This is particularly important when the camera is suspended above the audience and the players. The brakes hold the cameras safely in position, making sure that the camera stops and does not fall uncontrollably in case of malfunctions, for example in case of power failure.

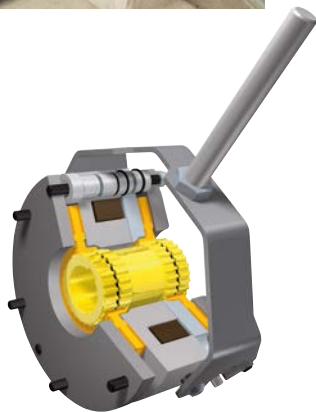
ROBA-stop[®]-silenzio[®]-brakes

The quietest safety brakes on the market

- Dual-circuit brake as redundant brake system
- Extremely short construction length
- Easy installation
- High availability
- Fast switching time
- 100% quality control



From the World Cup to the Olympic Games



Taking the lift up to the ski jump

The famous venue for the Vierschanzentournee (Four Hills Tournament) and the World Cup is the ski jumping area close to Oberstdorf with its Schattenbergschanze. Here, an inclined ski lift transports both the ski jumpers and the visitors from the end of the jump to the foot of the jumping tower. The speed-regulated drive at the lift's top station is equipped with a ROBA-stop®-Z safety brake. In normal operation, it works solely as a holding brake. In case of emergency stop or power failure, it stops the cabin safely – independently of whether the cabin is in a steep or flat section and independent of the load.

ROBA-stop®-Z

The cost-effective dual-circuit safety brake

- Dual-circuit brake in compact design
- Low-noise operation
- Unique double rotor design
- Easy installation and maintenance



Safe stage technology for the “Bird’s Nest” in Beijing

ROBA-stop®-silenzio® brakes were also used at the opening and closing ceremonies of the 2008 Olympic Games at the famous national stadium in Beijing. They safeguard the rope hoists, which are used to move, for example, the headlights, the decoration, but also the actors. The suspended loads must not only be moved and braked, but must also be held in a certain position accurate to the millimetre. More than one billion people worldwide watched the opening ceremony by Director-in-Chief Zhang Yimou.

ROBA-stop®-silenzio®-brakes

The quietest safety brakes on the market

- Dual-circuit brake as redundant brake system
- Extremely short construction length
- Easy installation
- Consistently low noise level
- Carefully selected and tested friction lining pairings



From the World Cup to the Olympic Games





The Cultural Centre on the coast of Norway

The Stavanger Cultural Centre in Norway is situated adjacent to the sea. In 2012, the new concert hall, which consists of two complementary concert halls, was opened there. This is where classic, rock, pop and jazz meet. The state-of-the-art stage technology featured in both halls is able to meet all the different specifications, requirements and demands. In the stage drives, the low-noise ROBA-stop®-silenzio® safety brakes guarantee safe and smooth operation.

ROBA-stop®-silenzio®-brakes

The quietest safety brakes on the market

- Dual-circuit brake as redundant brake system
- Extremely short construction length
- Easy installation
- Consistently low noise level
- Reliable braking torque transmission

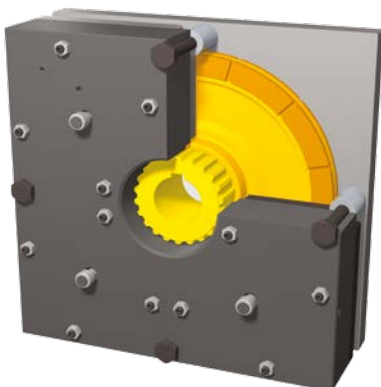


On the stages of this world



Technology for the stronghold of Russian ballet

The Bolshoi Theatre in Moscow is one of the largest and most important venues for opera and ballet in Russia, representing Russian culture like no other theatre. Today the theatre, the origins of which can be traced back to 1776, employs approximately 900 staff members and provides space for approximately 1,800 guests. Several hundred scenery hoists and stage light hoists, which can lift and lower loads of up to one ton, work in its overhead machinery. In the drives, ROBA®-quattrostop safety brakes are used. These systems feature several individually switchable and testable brake circuits. They are redundant and gentle on components, functioning without braking torque doubling in case of emergency stop braking actions.



ROBA®-quattrostop

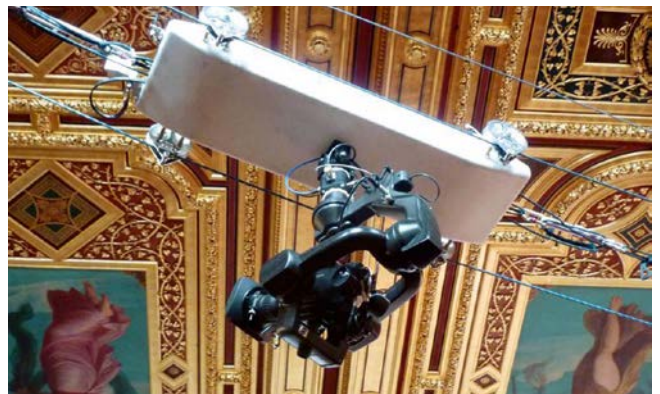
The extremely compact multi-circuit brake

- Several individually switchable and testable brake circuits
- Redundant without braking torque doubling
- Gentle braking which ensures long service life of components
- Lightweight connection construction
- Adapted product design



New Year's Concert in Vienna

The New Year's Concert of the Vienna Philharmonic Orchestra is perhaps the best-known New Year's Concert worldwide. The concert, which takes place every year in the famous Great Hall of the Viennese Music Association, is broadcast live in more than 70 countries, reaching almost 50 million viewers and listeners. For the broadcast, flying cameras are used amongst other things; these cameras are secured by ROBA-stop®-silenzio® brakes. Firstly, it is very important that the cameras are held safely in position and do not sink uncontrollably whilst moving over audience and musicians. Secondly, it is crucial that the brakes work particularly quietly in case of sensitive recordings, such as a classic concert.



ROBA-stop®-silenzio®-brakes

The quietest safety brakes on the market

- Dual-circuit brake as redundant brake system
- Extremely short construction length
- Easy installation
- Consistently low noise level
- Application-optimised



On the stages of this world





Great talents behind the scenes

It is the centre of attraction for opera fans from all over the world – the Bavarian State Opera. Offering approximately 2,100 seats, the classical style building is the largest opera house in Germany and is considered one of the most beautiful in Europe. Each year, approximately 600,000 guests visit around 450 performances – apart from opera, also concerts and ballet shows. Behind the scenes, in scenery hoists and skylight hoists, ROBA-stop®-silenzio® stage brakes with reliable, contactless release monitoring guarantee maximum functional and operational safety – as stage drives must work reliably during a performance. With their contactless release monitoring, *mayr*® power transmission is the first manufacturer to offer a contactless system with an inductive proximity sensor. It registers the operating condition of the brake and authorises the motor to start up only after release.

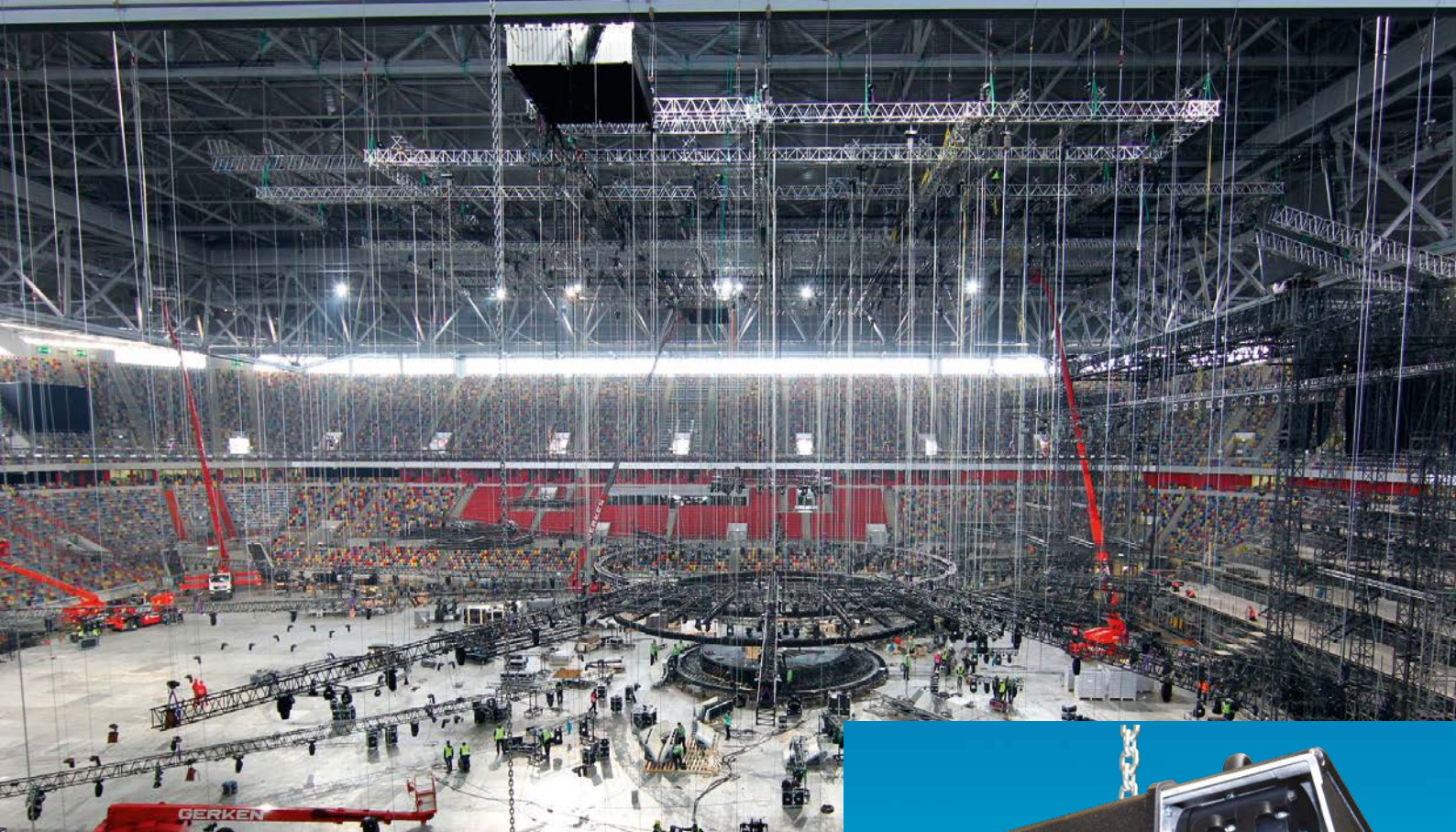


Unique: Contactless release monitoring for ROBA-stop® safety brakes

- Wear-free
- Resistant
- Magnetic field-resistant
- Reliable

On the stages of this world





A perfect performance

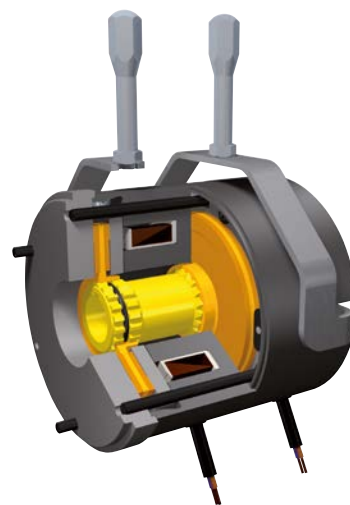
The technical complexity proved immense when it came to turning the Dusseldorf Arena into a gigantic television studio for the Eurovision Song Contest 2011. Stage elements weighing several tonnes had to be moved above the heads of the audience and the artists during the complex scenery changes. In the chain hoists used for this purpose, stage brakes by *mayr*® power transmission, such as the ROBA®-secustop, guaranteed uncompromising safety.



ROBA®-secustop

Double brake for chain hoists and hoisting devices

- Easy installation without adjustment work
- Maintenance-free due to wear-free and durable brake linings
- Low-noise
- Installation space-optimised



On the stages of this world





Ocean liners – top-class entertainment

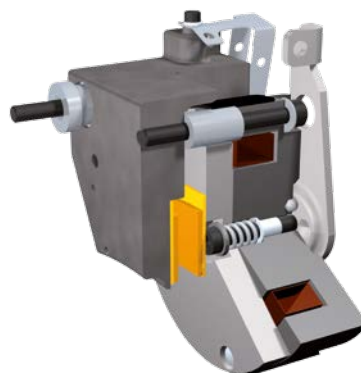
With a length of 360 metres and construction costs of approximately EUR 800 million, the Oasis of the Seas is one of the largest and most expensive cruise ships ever built. The ship, which belongs to the Royal Caribbean International shipping company, offers holidaymakers on board top-class entertainment, for example the “Rising Tide Bar”, a bar for approximately 50 guests, which moves up and down between Deck 5 and Deck 8 in the heart of the ship. *mayr*® power transmission produced a tailor-made complete solution for the bar’s lift drive; it consists of a ROBA®-diskstop® safety brake, a backlash-free ROBA®-DS shaft coupling and a reliable EAS®-Compact® overload clutch.



ROBA®-diskstop®

Safety brakes for brake disks

- Attractive solution for large braking torques
- Low noise operation
- Mechanic and electrical release
- High energy absorption capability



On the stages of this world



Flying artistes

Whether it is Tarzan swinging on lianas through the jungle on the musical stage, Spiderman darting through New York's skyscraper canyons in a film, Peter Pan flying to Never Never Land or Celine Dion "taking off" in a spectacular stage performance – during flight scenes in theatres, films and TV productions, the safety of the artists and stuntmen always comes first. With its ROBA-stop®-silenzio® brakes, *mayr*® power transmission provides the ideal solution for airframes: The redundant safety brakes comply with the strict requirements of BGV C1 and EN 81 and reliably provide maximum functional and operational safety wherever people have to be held and moved.

ROBA-stop®-silenzio®-brakes

The quietest safety brakes on the market

- Dual-circuit brake as redundant brake system
- Extremely short construction length
- Easy installation
- Consistently low noise level
- Application-optimised



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