



**RACO WILL GET YOU SAFELY TO YOUR DESTINATION
LOCAL TRANSPORT ENGINEERING**



RACO Schwelm

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CONCEPTS FOR TRACK-BOUND LOCAL TRANSPORT SYSTEMS

Mass mobility is both a pre-requisite for and result of globalisation. For this reason, the future belongs to means of transport which are safe, fast, reliable, economical and environmentally friendly.

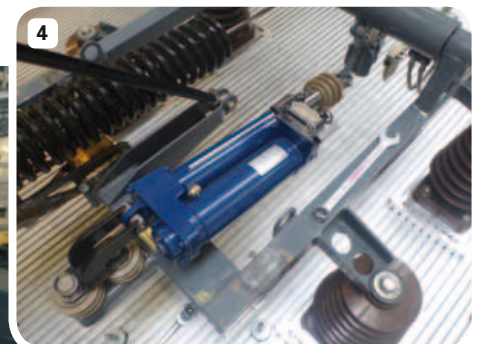
Modern track-bound transport systems fulfil these requirements. They can concentrate traffic flows, transport large masses fast and safely even over long distances, have a good energy balance and considerable capacity reserves.

On the basis of a detailed understanding of the applications and requirements of its customers, RACO has been developing customised technologies and solutions for the transport markets of both the present and the future for more than 35 years.

The RACO products used in local transport systems include:

- Electric cylinders for operating mechanical and electric couplings.
- Electric cylinders for operating pantograph lowering mechanisms.
- Spring-operated safety brake equipment and controls for trams.
- Electric cylinders and linear drives for operating points and monorail tracks.
- Electric cylinders for automated door operation and locking of suspended monorail tracks.

[1]-[2] Coupling with decoupling drive
[3]-[4] Pantograph lowering mechanism



CONCEPTS FOR TRACK-BOUND LOCAL TRANSPORT SYSTEMS

Together with customers, RACO has developed several electric actuator types for use in track-bound vehicles used for local transport.

The requirements for the use of track-bound vehicles are met for the following aspects:

- IP rating and measures to protect against mechanical damage & excess voltage.
- Function during local fast (up to 3K/s) and intense (up to 40K) changes in air temperature with exceedance of the dewpoint of humid air and corresponding condensation ("tunnel effect").
- Resistance to sinus-wave oscillation in accordance with EN 60721-3-7 Class 7M2.
- Low-maintenance version and high availability.

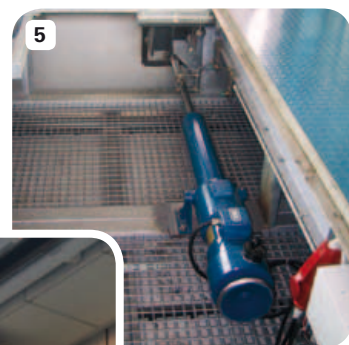
As far as operating conditions are concerned, special attention is paid to the aspects of ambient temperature, component IP rating and vibration or impact resistance, all of which are described in rail standards. RACO has had proofs of suitability confirmed by independent testing institutes.

On the suspended monorail system at Dortmund University, RACO electric cylinders are used to lock the vehicle carriage in place at the stops.

These position the carriage exactly at the stop, thus preventing any rocking motion and allowing passengers to enter and exit the carriages safely.



[1]-[3] Electric cylinders in the points of the monorail train in Las Vegas
[4]-[5] Electric cylinders at the stop. Suspended monorail system, Dortmund university



RACO ELECTRIC CYLINDERS FOR YOUR WORKSHOP EQUIPMENT

There is a large range of system equipment available for the cost-efficient servicing and care of the public track-bound transport system vehicles in the depot workshop.

RACO electric cylinders are used as drawer drives on working platforms at rooftop height for safe work on the roof-mounted equipment of trams. The moving part of the working platform is moved towards the vehicle carriage by means of remotely controlled electric cylinders.

RACO electric cylinders are also used in underfloor lifting equipment which can be retracted to below floor level and variably positioned according to different vehicle lengths.

EXTREMELY COMPACT PRECISION

The RACO-COMPACT is the electric cylinder version that combines extremely small dimensions with high actuating forces. As with the electric cylinders of the "heavy duty" type, the cylinders have a purely electro-mechanical working principle. Design details such as integrated torsion protection for the thrust tube and option for adaptation of the RACO path sensors are standard features.

The RACO-COMPACT stands out as a versatile actuator for thrust-pull movements thanks to:

- High performance.
- Sturdy, industrial-standard design and execution.
- Suitable for applications with high switching frequencies.
- Brilliantly straightforward compact design.
- Maintenance-free over a long service life.
- High reliability even under extreme operating conditions.



[1]-[4] Electric cylinders on service platforms

RACO MEANS SAFETY

RACO has been a partner to vehicle manufacturers for more than 35 years and has been one of the key players in the development of purely electro-magnetic brakes for numerous track-bound local transport systems.

RACO spring-operated brakes of the type GBM make jerk-free and safe braking possible with a short reaction time of $t < 500$ ms, thus perceptively increasing passenger ride comfort.

RACO GBMs ideally fulfil functions as holding, parking, rapid emergency, forced, hazard and exception brake. They can also be used as a service brake in combination with electronic control/regulation.

The braking force can optionally be reduced or increased in fine stages by means of a sensor integrated in the force flow, and thus compensates braking pad wear (anti-blocking system).

In the event of a power failure, the emergency braking of the vehicle is guaranteed by the spring-operated brake. There is no danger of the system freezing since no auxiliary fluids are required.

RACO offers its tram-operating customers a repair service and/or the complete overhaul of the GBM including the following services:

- Check and functional test of all components on delivery.
- Repair and replacement of defective components.
- Optimization through alternative parts and upgrade to the current status.
- Test certificate for the repaired GBM and warranty for the service work.

Your benefits:

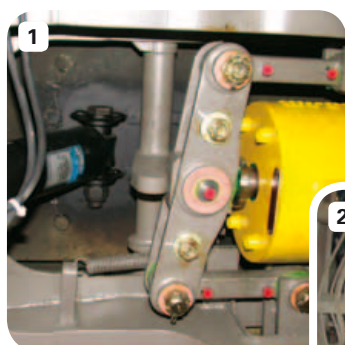
- Only components which are function-related and necessary are renewed.
- Repairs are carried out quickly by our experienced fitters.
- Compatibility of the components is guaranteed for systems manufactured before 2000.

GBM 6

GBM 3



[1]-[2] GBM as brake lever linkage
[3]-[4] GBM for actuating the brake calliper on the Wuppertal suspended railway



OUR KNOW-HOW IS YOUR CUSTOMER BENEFIT

Our products for track-bound local transport systems help you to meet the challenges of a constantly increasing demand for faster mobility in a future-proof way. More efficiency through greater effectiveness, convenient operation and high reliability.

Customer-related solutions are at the focus of cooperative product development and are tailor-made exactly to requirements. Adaptation to the installation space available and weight reduction coupled with observance of all safety-related aspects as well as component testing are core competencies at RACO.

We guarantee maximum tool lives, longer service intervals and minimum maintenance requirements to reduce the "life cycle" costs. As a manufacturer, we offer you after-sales service performed by trained specialists and thus accompany the products throughout their service life.

RACO product overview. Please request your catalogue!

- RACO – Electric cylinders for coupling devices
- RACO – Electric cylinders for pantographs
- RACO – Spring loaded safety brakes



Would you like to receive a quotation without obligation and free of charge?

Please call us directly or use our contact form! Please send this contact form by fax to the number +49 (0) 2336 40 09 10 or by email to raco@raco.de. We will contact you immediately.



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