

ZIMM Drive Technology for Ground Support Equipment

A Use Case for Aircraft Ground Equipment and Airport Logistics

ZIMM – Reliable Motion Functions for Lifting, Positioning and Driving

In ground support equipment (GSE), stairways and loading platforms must be lifted, lowered and positioned in a controlled manner, while containers and pallets must be moved reliably. Precise and reproducible movements, robust mechanics and drive technology tailored to the specific application are essential.

ZIMM provides a modular system for these tasks: Electromechanical actuators and screw jacks generate the required linear lifting and adjusting movements. ZK bevel gearboxes transmit torque and deflect rotary motion through 90° to drive roller segments. Combined with matching motors, connecting shafts, couplings and add-on parts, they form coordinated drive systems for passenger steps, loaders and transporters.

**ZIMM solutions for ground support equipment:
Electromechanical actuators, screw jacks
and ZK bevel gearboxes for lifting, positioning
and driving in passenger and cargo handling.**



Passenger Steps | Lifting and Positioning

Passenger steps provide access from the airport apron to the aircraft door. The height of the stairway must be adjusted to the respective door sill height. Two ZIMM electromechanical actuators generate the required linear lifting movements.

The actuators are arranged on both sides between the chassis and the stairway. A single motor drives both actuators via a connecting shaft, mechanically coupling them to ensure uniform lifting. The vehicle control system specifies the required stair height and monitors the position. Guidance, locking and safety functions are designed according to the requirements of the overall system.



Benefits

Height adjustment of the stairway at two defined linkage points

Mechanically coupled lifting of both actuators

Reproducible stair height for different aircraft types

No hydraulic fluid within the ZIMM lifting axes

Adaptable to stairway weight, stroke and linkage points

Operating principle

Two electromechanical actuators generate the linear lifting movements

One motor drives both actuators via a connecting shaft

The actuators raise or lower the pivoting stairway

The vehicle control system monitors the lifting movement up to the required door sill height

Guiding, locking and safety elements secure the stairway

Application scenarios

Self-propelled passenger steps

Passenger steps for different aircraft types

Passenger steps for wide-body aircraft

Height adjustment with mechanically coupled actuators

Replacement of technically suitable hydraulic lifting drives

Typical Movement Tasks in Ground Support Equipment

Loader | Lifting and Driving

Loaders handle containers and pallets during aircraft loading and unloading. The loading platform must be raised or lowered in a controlled manner to match the respective cargo door height. At the same time, driven roller segments enable unit loads to be positioned and conveyed on the platform.

Two ZIMM electromechanical actuators provide the lifting movement of the scissor mechanism. A single motor drives both actuators via a connecting shaft. In the turntable on the platform, ZK bevel gearboxes transmit rotary motion to the roller segments. This allows lifting and drive functions to be implemented using coordinated components from the ZIMM modular system.



Benefits

Controlled height adjustment of the loading platform

Mechanically coupled lifting of both actuators

Driving multiple roller segments via ZK bevel gearboxes

No hydraulic fluid within the ZIMM lifting axes

Adaptable to platform load, stroke and roller arrangement

Operating principle

Two electromechanical actuators generate the lifting movement

One motor drives both actuators via a connecting shaft

The actuators position the platform at cargo door height

ZK bevel gearboxes drive the roller segments of the turntable

The control system coordinates movement, while safety devices provide additional protection

Application scenarios

Loaders for lower-deck cargo holds

Loaders for main-deck cargo holds

Loaders with powered turntables

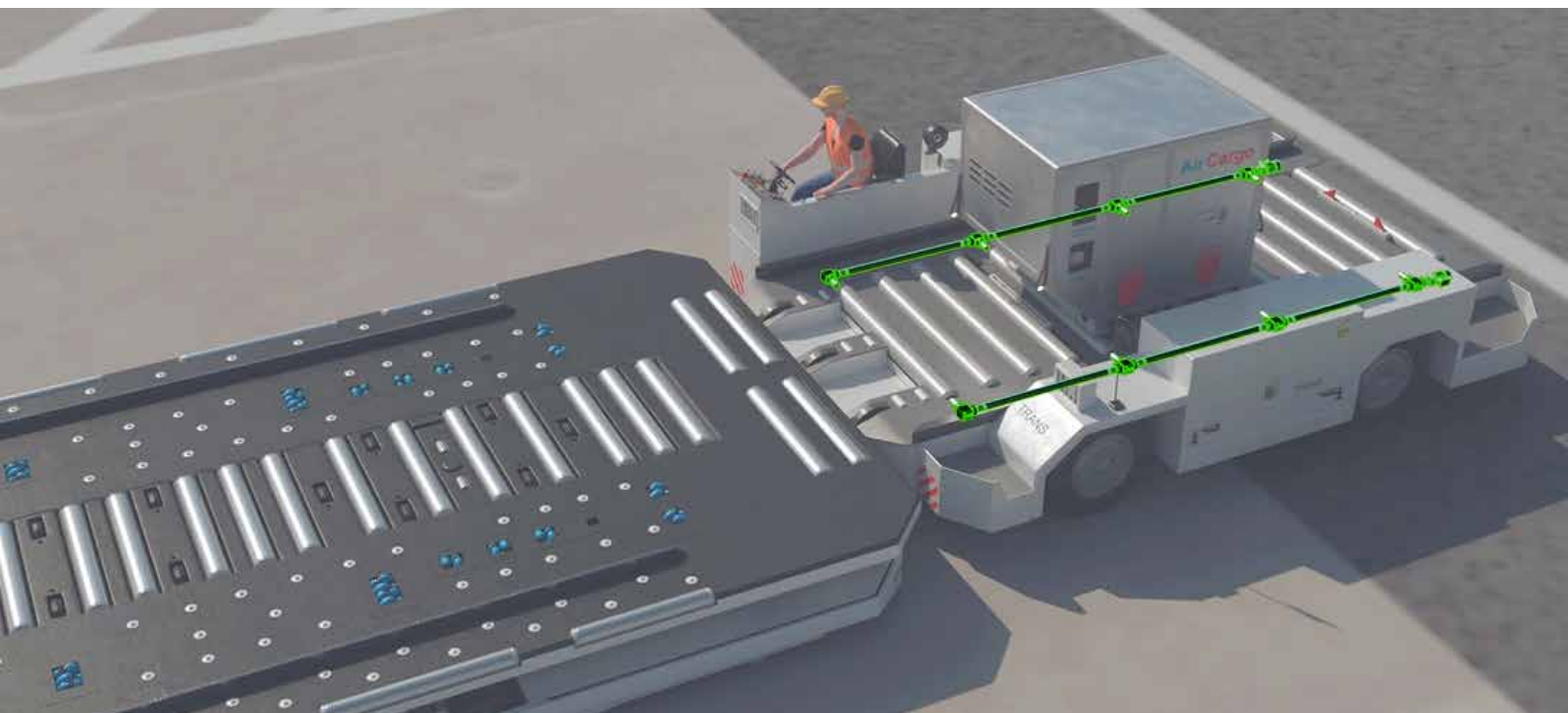
Loading platforms for different cargo door heights

Replacement of suitable hydraulic lifting systems with electromechanical drives

Transporter | Driving the Roller Segments

Transporters receive containers and pallets from loaders and move them within the airport logistics system. Powered roller segments are used to transfer and position the loads. On roller decks with turntables, multiple roller segments must be driven together in a controlled manner.

ZIMM ZK bevel gearboxes transmit torque and redirect rotary motion through 90°. In the configuration shown, two motors each drive four roller segments through mechanically linked drive trains. Connecting shafts and couplings from the ZIMM modular system ensure coordinated rotation within each drive train.



Benefits

Torque transmission with 90° direction change

Multiple roller segments driven by a single motor

Mechanical coupling of roller segments within each drive train

Compact integration into roller decks and turntables

Adaptable to roller arrangement, torque and rotational speed

Operating principle

Each motor drives four ZK bevel gearboxes in one drive train

VWZ connecting shafts link the gearboxes

The bevel gearboxes redirect rotary motion through 90°

KUZ couplings transmit torque to the roller segments

The control system coordinates movement, while safety devices provide additional protection

Application scenarios

Self-propelled container and pallet transporters

Roller decks with powered roller segments

Transporters with turntables

Transfer of unit loads from loaders

Mechanically coupled roller drives in airport logistics

Submit an inquiry for your application now

Are you planning a lifting, positioning or drive function for ground support equipment?

Send us details of your application and the key technical requirements, such as load, stroke, torque, speed and installation conditions. You can also attach a drawing or sketch.

ZIMM supports you in selecting and sizing the right drive technology.



ZE-Series | Screw jacks

ZIMM screw jacks convert rotary motion into linear lifting and positioning movements, with lifting capacities ranging from 2.5 to 1,000 kN per gearbox. Mechanically coupled systems enable coordinated lifting, supporting and levelling movements.



ZK-Series | Bevel Gearboxes

ZIMM ZK bevel gearboxes transmit torque and redirect rotary motion through 90°. With gear ratios of 1:1, 2:1 and 3:1, they enable mechanically coupled drive trains, for example to drive roller segments in loaders and transporters.

ZA-Series | Actuators

ZIMM actuators provide precise linear movements for lifting, lowering and positioning, with lifting capacities ranging from 25 to 200 kN. In ground support equipment, they are used for applications such as height adjustment of passenger steps and loading platforms.



For more information on ground support equipment applications, products and technical design, visit:
zimm.com/ground-support-equipment

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