

Kardex Shuttle

Vertical Lift Module

Product Guide

kardex

Kardex Shuttle

The Kardex Shuttle is a Vertical Lift Module (VLM) that maximizes storage capacity while reducing space requirements and improving picking efficiency through automated goods-to-person delivery.

It is designed to store trays in two vertical columns at the front and rear of the system. An extractor positioned in the center automatically retrieves and delivers trays to the access opening, which eliminates walking and manual searching. Smart technology measures the height of the stored goods on each tray and dynamically assigns them to the most efficient storage location, maximizing storage density and reducing unused space.

The operating concept increases productivity, simplifies workflows, and reduces training and familiarization time. Thanks to its flexible and modular design, the Kardex Shuttle adapts easily to changing product volumes and dimensions. It minimizes the required footprint while enabling space savings of up to 85% through dynamic storage allocation.

The system is ideally suited for storing goods of varying sizes and weights, especially in environments with frequently changing inventory mixes. Each Kardex Shuttle can operate as a stand-alone solution or as part of a fully net-worked system. It can even be installed externally to extend existing storage capacity.

Click here to learn more about the Kardex Shuttle

High **storage density**

Wide range of **stored goods**

Modular design



Application Range

Tool and spare parts storage
Using the Kardex Shuttle for tool and spare parts storage consolidates multiple storage locations and cabinets into a single solution. This significantly reduces walking distances and search times while ensuring full inventory transparency. The result is improved productivity and optimized use of floor space, combined with ergonomic working conditions.

Buffering for just-in-time supply
The Kardex Shuttle serves as a buffer system by temporarily storing semi-finished goods between production steps that require waiting or processing time. It ensures a consistent material flow by providing materials exactly when needed for the next step. This reduces bottlenecks, minimizes line stoppages, and improves overall production efficiency.

Accurate order picking and high throughput
With the Kardex Shuttle it is easy to manage orders from different distribution channels. It optimizes order fulfillment including picking, replenishment, and returns handling. It outperforms traditional shelving systems and enables accurate picking and high throughput rates, while also managing fluctuating demand. It can even become fully-automated by integrating robotics.

Main Benefits

Maximize your storage space
- Up to 85% space savings by utilizing the vertical height
- High storage density through dynamic tray height allocation
- Near-continuous storage with tray spacing of only 25 mm

Handle a wide range of goods
- Adaptable to a wide range of item sizes and weights, from small and lightweight to oversized and heavy goods
- Different tray types with varying load capacities
- Frequently used items can be stored close to the access opening

Increase access efficiency and throughput
- Fast access to stored goods with automated delivery of up to two trays in parallel
- Reduced waiting times during picking operations

Reduce labor effort and operating costs
- Less unproductive walking and searching thanks to the goods-to-person principle
- Lower personnel requirements and reduced personnel costs
- Faster operator onboarding, even for untrained staff

Ensure high accuracy and transparency
- Integrated visual picking aids, such as position displays, intuitive picking assistants and light pointers, support faster and more accurate picking
- Full inventory transparency and control through seamless to ERP and WMS

Improve ergonomics and operator comfort
- Goods delivered directly to the operator, reducing physical strain
- Provision of trays at an optimal and individually adjustable working height

Protect your goods and your people
- Controlled access to the machine and individual trays via user management
- Shutter door protects both goods and operators while reducing noise emissions
- Adjustable travel speeds based on load, e.g. slower handling for sensitive items

Scale with your business
- Modular design for flexible system expansion and long-term adaptability
- System height can be quickly and individually adjusted to space and building conditions
- Installation possible outside the building

Rely on proven and robust performance
- Reliable system performance in daily operations
- Designed for long-term use and high availability
- Proven solution with thousands of installations worldwide

Technical Data

Kardex Shuttle 250/500

Flexible solution for small parts and lightweight items

The Kardex Shuttle 250/500 is a flexible solution for the storage and retrieval of small parts and lightweight goods such as screws, small mechanical parts, and plastic components. With tray widths of up to 4,050 mm, a load capacity of up to 560 kg per tray is possible. The system height can be adjusted in 100 mm increments.

Its compact design enables efficient integration into existing building layouts while maximizing storage capacity within a minimal footprint.



Kardex Shuttle 250

Unit height: Up to 30,050 mm (all models)

	Option 1	Option 2	Option 3
Unit width (Tray width)	Compact depth (Unit: 2,312 × Tray: 610)	Default depth (Unit: 2,921 × Tray: 813)	Extended depth (Unit: 3,074 × Tray: 864)
1,580 (1,250)	✓	✓	✓
1,980 (1,650)	✓	✓	✓
2,180 (1,850)	✓	✓	✓
2,380 (2,050)	✓	✓	✓
2,480 (2,150)	✓	✓	✓
2,780 (2,450)	✓	✓	✓
3,180 (2,850)	✓	✓	✓
3,380 (3,050)	✓	✓	✓
3,580 (3,250)	✓	✓	✓
3,980 (3,650)	✓	✓	✓
4,380 (4,050)	✓	✓	✓

All dimensions in mm



Kardex Shuttle 500

Unit height: 2,550 mm–30,050 mm (all models)

	Option 1	Option 2	Option 3
Unit width (Tray width)	Compact depth (Unit: 2,312 × Tray: 610)	Default depth (Unit: 2,921 × Tray: 813)	Extended depth (Unit: 3,074 × Tray: 864)
1,580 (1,250)	✓	✓	✓
1,980 (1,650)	✓	✓	✓
2,180 (1,850)	✓	✓	✓
2,380 (2,050)	✓	✓	✓
2,480 (2,150)	✓	✓	✓
2,780 (2,450)	✓	✓	✓
3,180 (2,850)	✓	✓	✓
3,380 (3,050)	✓	✓	✓
3,580 (3,250)	✓	✓	✓
3,980 (3,650)	✓	✓	✓
4,380 (4,050)	✓	✓	✓

All dimensions in mm

Kardex Shuttle 700

High-density storage for medium loads

The Kardex Shuttle 700 is designed for the storage and retrieval of medium-weight goods with trays supporting load capacities of up to 725 kg at a width of 4,050 mm. It is ideally suited for storing tools, components, and spare parts with higher weight requirements. The system height can be adjusted in 100 mm increments.



Kardex Shuttle 700

Unit height: 2,550 mm–20,050 mm (all models)

Unit width (Tray width)	Option 1 Compact depth (Unit: 2,312 × Tray: 610)	Option 2 Default depth (Unit: 2,921 × Tray: 813)	Option 3 Extended depth (Unit: 3,074 × Tray: 864)
1,580 (1,250)	✓	✓	✓
1,980 (1,650)	✓	✓	✓
2,180 (1,850)	✓	✓	✓
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2,780 (2,450)	✓	✓	✓
3,180 (2,850)	✓	✓	✓
3,380 (3,050)	✓	✓	✓
3,580 (3,250)	✓	✓	✓
3,980 (3,650)	✓	✓	✓
4,380 (4,050)	✓	✓	✓

All dimensions in mm

Kardex Shuttle 1000

Maximum load capacity for heavy and oversized goods

The Kardex Shuttle 1000 is designed for applications in the high load range, supporting loads of up to 1,000 kg. It enables efficient storage and retrieval of heavy and bulky goods across various applications.

- Heavy-duty trays support loads of up to 825 kg at a width of 4,050 mm, making them ideal for storing medium to heavy items with high load requirements.
- Special trays allow the storage of EURO pallets and wire mesh containers, which can be loaded into the system using forklifts or pallet jacks, saving floor space and enabling faster retrieval of goods.
- With a factory-installed crane, heavy goods can be handled easily, reducing manual effort while improving ergonomics and operational safety.

The system height can be adjusted in 100 mm increments.

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Kardex Shuttle 1000

Unit height: 2,550 mm–20,050 mm (all models)

	Option 1	Option 2	Option 3
Unit width (Tray width)	Compact depth (Unit: 2,312 × Tray: 610)	Default depth (Unit: 2,921 × Tray: 813)	Extended depth (Unit: 3,074 × Tray: 864)
1,580 (1,250)	✓	✓	✓
2,180 (1,850)	✓	✓	✓
2,780 (2,450)	✓	✓	✓
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3,380 (3,050)	✓	✓	✓
4,380 (4,050)	✓	✓	✓

All dimensions in mm



Main Components

Access opening
Access openings can be positioned at the front and rear of the system, with the option to install multiple openings across different floors.

- Enables flexible integration into existing building layouts and workflows
- Allows simultaneous access on multiple levels, increasing productivity

Trays
Trays store goods and bins and are automatically moved by the extractor to the access opening or to a free storage location.

- Provides fast and direct access to stored items
- Enables safe handling of sensitive or fragile goods through adjustable tray speeds

Personal protection light curtain
Integrated light curtains detect movement or obstructions in the access opening and immediately stop the system to prevent injuries.

- Ensures operator safety and protects stored goods, especially in environments with frequent staff changes or new operators
- Automatically resumes operation after brief interruptions, minimizing downtime

Optiflex technology
A sensor measures the height of stored goods on each tray and dynamically assigns the most efficient storage location within the system.

- Maximizes storage density by minimizing unused space, with trays positioned in a fine 25 mm grid, enabling near-continuous storage
- Ensures flexible and space-saving storage without manual intervention

Total Intelligence Control (TIC)
TIC combines a modern software architecture with an intuitive user interface to simplify operation and improve overall system performance.

- Reduces training time and operator errors through context-based guidance
- Speeds up order processing through optimized workflows, faster system responses, and intelligent tray prioritization

Machine Enhancements

The Kardex Shuttle can be equipped with a range of additional features and options to support picking processes, adapt to specific operating environments and building requirements, and improve overall warehouse performance.

Picking Support

Advanced picking support solutions increase accuracy and throughput as well as eliminate search time during picking and replenishment processes. By guiding operators and streamlining workflows, these systems ensure faster and more reliable order fulfillment.

Intuitive Picking Assistant for Kardex Shuttle
The Intuitive Picking Assistant (IPA) projects relevant picking information directly onto the access opening, guiding the operator step by step through the picking process. It highlights the exact picking position, displays item details on an ergonomic interaction surface, and detects hand movements to help prevent picking errors.

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Display LED-Navigator
The Display LED-Navigator is a visual picking assistant that guides operators through the picking process using LED signals in real time. It displays relevant information such as item description, quantity, and storage location exactly when needed, ensuring a smooth workflow. By indicating when the system is ready for picking, it prevents premature access and reduces unnecessary safety interruptions.

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Laser Pointer
This solution uses an LED or laser light mounted above the pick area. Software-driven, a slider shifts sideways to any position, swivels backward and forward in the storage tray, and illuminates the product to be picked.

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Kardex Color Pick System
The Kardex Color Pick System combines several orders into a batch that can be simultaneously processed. The unique concept integrates colored lights into the batch picking process, allowing multiple operators to pick from a single work zone and achieve up to 300 order lines per hour per operator, resulting in significantly higher throughput. It also enables you to scale your labor force to meet peaks in order picking demand. When demand is high, the Kardex Color Pick System allows multiple workers to pick from dynamic work zones using pick-to-light technology for higher throughput. When demand is lower, it can be operated with only one worker.

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Pick and Place Robotics
The Kardex Shuttle can be integrated with pick and place robotics to automate key intralogistics processes such as picking, palletizing, depalletizing, putaway, and replenishment. These systems handle a wide range of items, from single components to entire totes, with high precision and speed.

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Critical environments

Many industries require the storage and handling of sensitive goods under controlled conditions to prevent contamination and maintain product quality. The Kardex Shuttle can be configured for cleanroom, temperature-controlled, or low-humidity environments, and can be equipped with integrated fire protection, ensuring product integrity while reducing operational effort and costs.



Clean room
The Kardex Shuttle 500 and 700 support clean room environments by providing enclosed storage with controlled airflow to maintain stable conditions during storage and retrieval. Depending on the configuration, the system can achieve cleanroom classifications from ISO Class 6 to ISO Class 8 in accordance with ISO 14644-1.

To minimize particle generation, the Kardex Shuttle is equipped with roller-based trays that operate without creating dust. An optional air-conditioning solution further enhances cleanliness by using dual access doors to reduce exposure to airborne contaminants such as dust, particles, and germs. With multiple access openings, the system can also be configured for pass-through applications, enabling a clear separation between clean and non-clean areas and supporting strict zoning requirements.

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Climate control
The Kardex Shuttle 500 and 700 can be equipped with integrated climate control solutions to help protect sensitive materials from temperature fluctuations and environmental influences. Depending on the configuration, the system supports temperature ranges from –20°C to +55°C (or -4°F to +131°F) with high consistency.

To ensure reliable performance, the Kardex Shuttle includes features such as temperature mapping, heated and insulated control cabinets, and advanced humidity control.

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Fire protection
Kardex Shuttle systems can be equipped with advanced fire protection solutions to safeguard stored goods and the system itself. Detection systems continuously monitor the air inside the unit and identify early signs of combustion, even before visible smoke occurs.

In the event of a fire, an inert gas suppression system is activated to reduce oxygen levels within the enclosed system to a concentration where combustion is no longer sustainable, while remaining safe for personnel. This approach avoids water damage associated with traditional sprinkler systems and helps protect high-value goods and sensitive components.

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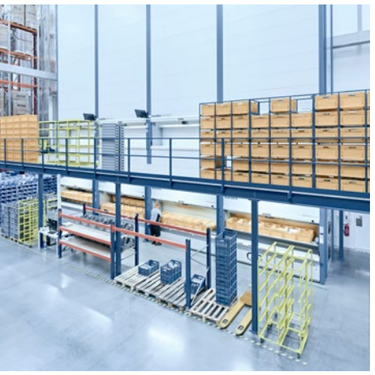


Dry storage
Kardex Shuttle systems can be integrated into dry room environments to maintain controlled humidity levels for moisture-sensitive goods, maintaining relative humidity levels as low as 5%.
To ensure stable conditions, the solution features a sealed design with airlock access openings and dedicated dehumidification systems. Humidity control can be achieved through nitrogen purging (down to approx. 10% r.h.) or adsorption drying (down to 5% r.h.), depending on application requirements. ESD-compliant designs are available to protect sensitive electronic components.

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Adaptation to site conditions

The Kardex Shuttle can be flexibly adapted to existing building structures and site conditions, enabling efficient use of available space while increasing storage capacity and operational efficiency.



Multi-floor installation
The system can extend across multiple floors and be equipped with several access openings on the front and rear of the system. This allows simultaneous storage and retrieval operations on different levels, improving workflow efficiency and reducing internal transport routes.

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Outdoor installation
To increase existing storage capacity, the Kardex Shuttle can also be installed outside the building. In this case, access to stored goods is provided through a dedicated opening in the building structure, enabling seamless integration into existing processes without requiring additional indoor space.

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Other enhancements

A range of additional features further enhance your operational efficiency by reducing waiting times, improving material flow, and supporting ergonomic handling of goods.

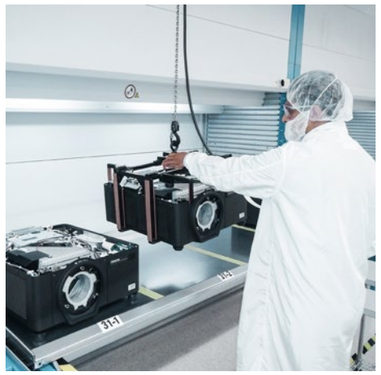


Conveyor connection
Integrating conveyor technology enables a continuous material flow between the Kardex Shuttle and adjacent workstations or picking zones. This supports faster order processing and efficient consolidation of goods while reducing manual transport effort.

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Dual-tray delivery
Dual-tray delivery minimizes idle times by preparing the next tray while the operator is still picking from the current one. This parallel process reduces waiting times and ensures consistent picking performance throughout the shift.



Full tray extraction and lifting devices
Full tray extraction provides complete access to the tray outside the system, enabling safe and ergonomic handling of heavy or bulky items such as pallets or large components. In combination with lifting devices such as cranes or manipulators, it allows heavy goods to be handled directly at the access opening. This reduces physical strain on operators, improves accessibility, and increases safety during loading, unloading, and picking processes.



Kardex VLM Box
The Kardex VLM Box, available in 800 and 850 mm depths, provides a flexible and structured storage solution for small parts. Its modular design is based on a combination of base elements, frames, and dividers, allowing the height and layout of each box to be easily adjusted to specific storage requirements. By improving visibility, accessibility, and organization within the tray, the system supports faster picking processes, reduces search times, and increases overall picking efficiency.

Learn more about the Kardex VLM Box 800

Learn more about the Kardex VLM Box 850



Software Solutions

Kardex software solutions enable customers to fully integrate automated storage systems into existing warehouse and business environments, improving workflow efficiency, inventory transparency, and process control.

Kardex offers a comprehensive portfolio of software solutions covering:

- Warehouse Execution Systems
  (e.g., Kardex Power Pick System and Kardex Power Pick Cloud)
- Machine monitoring (e.g., Kardex Connect)
- Performance insights (e.g., Kardex Analytics)
- Integrations (e.g., Kardex Drive and Kardex JMIF)
- Secure remote access
- and much more

All Kardex systems and warehouse processes are powered by the KardexOne Software Platform, enabling seamless communication between automation, material flow, and business systems across all levels of automation.

Benefits at a glance

Intuitive interfaces and guided workflows simplify daily operations

Easily adapt workflows, rules, and screens without disrupting daily business

Expand users, sites, and functionality seamlessly as your business grows

Protect operations with encrypted data transmission, access control, and regular security updates

Success Stories

Across various industries, companies use the Kardex Shuttle in combination with tailored solutions to address specific operational challenges. The following customer success stories illustrate how different configurations and enhancements are applied in practice to improve efficiency, optimize storage, and support individual requirements.

IKEA Components

Based in Slovakia, IKEA Components supplies spare parts and replacement fittings to IKEA customers worldwide. Facing low picking efficiency and inefficient use of time and labor resources, the company implemented an automated solution to optimize its operations. As a result, picking processes became significantly faster and more accurate, enabling a team of eight operators to handle up to 15,000 items per day while managing an inventory of around 6,000 items.

Solution

- 4 Kardex Shuttle with dual-tray delivery
- 6 Kardex Megamat
- Kardex Power Pick System
- Kardex Color Pick System

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HOERBIGER

HOERBIGER is a globally leading technology company with a diverse portfolio of industrial solutions. To support future growth, the company aimed to automate its small parts storage, create additional production space, reduce throughput time, and reduce physical strain on employees.

Together with Kardex, HOERBIGER found a solution that helped overcome prevalent space constraints within the facility by adding an extension to the building. The project was implemented alongside ongoing day-to-day operations without-disrupting production.

By implementing the tailored solution with Kardex Shuttles, HOERBIGER gained a total of 200 m² of additional production space, creating the foundation of the company's vision of a fully automated production environment by 2030. At the same time, employees benefit from a 71% reduction in walking distances, saving approximately 20 km per person per day and improving overall operational efficiency. This results in a significant improvement in material availability, enabling products to reach customers two to three days faster.

Solution

- 16 Kardex Shuttles in total
- 4 Kardex Shuttles installed in an extension to the main building
- Display LED-Navigator
- Laser pointer position indicator
- Kardex Drive for real-time data integration in SAP

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Maschinenfabrik Mönninghoff

Maschinenfabrik Mönninghoff supplies critical components to industries such as medical robotics, aerospace, and packaging. As part of its expansion into a new facility, the company aimed to increase storage capacity and accelerate order processing while maintaining high standards for accuracy and safety.

By implementing a tailored intralogistics solution, storage capacity was increased by 60% while significantly improving picking performance. Automated processes reduced order picking times and enabled a more efficient and ergonomic workflow. At the same time, logistics costs were reduced by 30%, contributing to an overall more efficient and future-ready operation.

Solution

- 9 Kardex Shuttle // One unit with dual access openings for simultaneous access from tool dispensing and storage areas
- Display LED-Navigator
- Kardex JMIF for seamless integration with the inventory management system

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Merck

As a global science and technology company, Merck develops and supplies specialized products for the healthcare sector. In a newly constructed research facility, the company required a solution to store and manage pharmaceutical substances under controlled conditions across multiple temperature zones while enabling direct access from a room temperature environment and ensuring reliable climate control.

Kardex implemented a customized solution with cooled and deep-freeze storage areas, improving accessibility and ergonomics for laboratory staff. It ensures safe handling of sensitive substances, stable environmental conditions, and significantly reduces required floor space..

Solution

- 3 Kardex Shuttle with thermally decoupled automatic tray extension
- Integrated cooling system
- Drying technology
- Laser pointer position indicator
- Kardex Power Pick System

Click here to read the success story



DHL

As a global logistics leader, DHL Supply Chain handles complex spare parts distribution for major international clients. In a high-volume 3PL facility in France, the company needed an automated solution to store and rapidly manage 35'000 SKUs ranging from tiny seals to heavy equipment, handle 40% urgent order volumes, meet strict fire protection standards, and go live within a tight 6-month timeframe.

Kardex implemented a high-density system consolidating the SKUs into just 400 m², and streamling order fulfillment across locations. The Kardex system also maximizes throughput with minimal staffing: just two operators needed to handle 1,500 daily picking lines at 100–110 lines per hour per operator.

Solution

- 6 Kardex Miniload-in-a-Box systems (20 m long × 12 m high; 15,000 VBM boxes)
- 3 Kardex Shuttle systems (1,100+ locations for medium-sized items)
- Kardex Power Pick System Software (WCS PPS)
- Put-and-Pick-to-Light modules with color-coded guidance
- Wi-Fi-connected Pikeos technology for replenishment

Click here to read the success story



Life Cycle Services

Long-term performance of automated solutions requires continuous support. Kardex Life Cycle Service supports your system throughout its life cycle, maintaining performance, protecting your investment, and preparing your operations for the future.

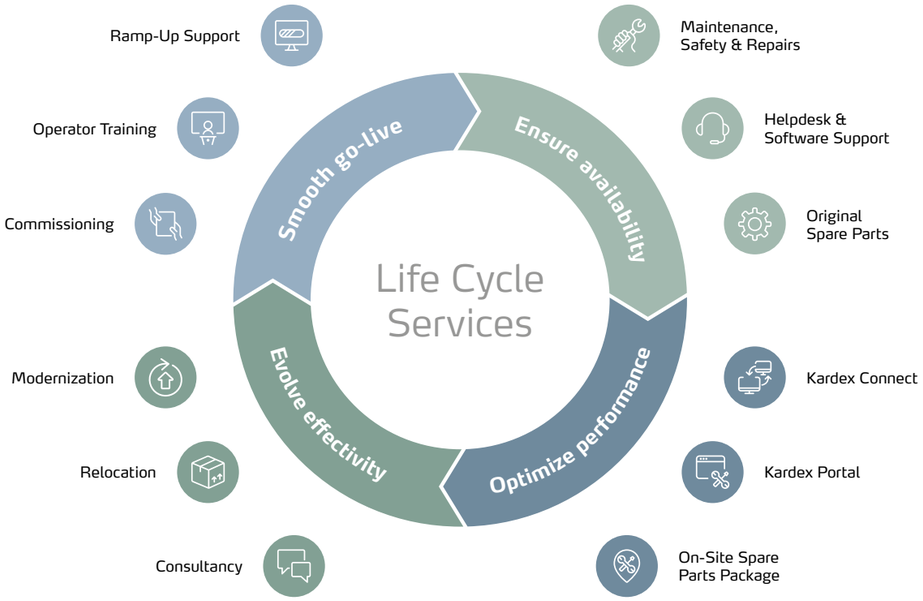
Our service approach follows a continuous cycle

Smooth go-live
Professional commissioning, operator training, and ramp-up support ensure a seamless start and stable system performance from day one.

Ensure availability
Preventive maintenance, original spare parts, safety services, and responsive helpdesk support safeguard maximum uptime and operational reliability.

Optimize performance
Digital data-based services such as Kardex Connect with remote support and Kardex Analytics enhance transparency, improve performance, and reduce unplanned downtime.

Evolve effectiveness
Modernization, relocation, and consultancy services adapt your system to new requirements and ensure long-term investment security







Global expertise with local presence

Kardex is your global partner for smart intralogistics solutions delivering semi and fully automated systems worldwide. With a strong international footprint and a broad network of local specialists, Kardex supports you from initial concept and system design to implementation and long-term operational support.

By combining global expertise, unified software solutions, and Life Cycle Service, Kardex supports sustainable warehouse performance for customers from various industries worldwide.

Take your intralogistics to the next level and contact a local team member for a complimentary, on-site consultation.

Get in touch

kardex.com

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