

# Holistic energy concepts.

Lithium-ion technology:  
delivering outstanding efficiency.



**LI-ION**  
technology

# Innovation from the market leader.

The future is electric – and it's here now: with lithium-ion technology from Jungheinrich.

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As a leading provider of innovative electrification solutions, we make it easy to switch to advanced lithium-ion technology. With holistic solutions, ground-breaking technology, fully integrated services and an extensive range of products, we help you to make your company more efficient and even more successful – so you don't have to compromise.



## Our perfectly coordinated overall system with lithium-ion power.

Lithium-ion technology can unfold its full potential only when the batteries, chargers and trucks communicate with one another in optimum fashion.

We are the only provider to have developed a fully networked and perfectly coordinated complete system, which not only ensures maximum performance but also delivers significant energy savings in comparison with conventional lead-acid batteries.

- ▶ Lower overall costs compared with a lead-acid alternative.
- ▶ No battery maintenance, servicing or infrastructure costs.
- ▶ Around 21 % lower CO<sub>2</sub> emissions than lead-acid batteries.
- ▶ Short charging times: 30 minutes booster charge to 50 %, 80 minute charge to 100 %.
- ▶ No special charging rooms with ventilation required.
- ▶ Reliably powerful performance even with low charge status.
- ▶ Possibility of rapid and booster charging during breaks or downtimes for maximum truck availability.
- ▶ Three times longer service life than conventional energy storage.
- ▶ High levels of safety during usage, charging and transport.



### TRUCKS



### BATTERIES



### CHARGERS



### CONSULTING



### AFTER SALES



**LITHION**  
technology





# A new era for lithium-ion trucks within intralogistics.

A holistic, high-performance system is only as good as its trucks. That's precisely why POWERLiNE-series sets an industry standard that is yet to be matched in terms of agility, safety, convenience and above all sustainability to provide a huge boost to the productivity of your company.

The integrated lithium-ion batteries make our POWERLiNE-trucks much more compact and agile, which means that they are ideal for use in narrow aisles and goods throughput applications. Up to 30 cm shorter, the impressive acceleration and lift speed of these trucks improve your productivity per unit area while setting new standards in terms of throughput.



## OUR SERVICES:

- ▶ Control systems developed in-house and integrated in our trucks to simplify the electrical functions (e.g. travelling, lifting, steering and battery charging).
- ▶ AC or DC control units to serve as optimum interface with the motors.
- ▶ POWERLiNE-trucks with integrated lithium-ion-batteries.
- ▶ Manufacture of POWERLiNE-trucks using energy from sustainable sources (e.g. own PV systems).
- ▶ Carbon-neutral footprint of POWERLiNE-series up to delivery to the customer.

## YOUR BENEFITS:

- ▶ Enhanced safety thanks to integrated fan cooling and short-circuit monitoring.
- ▶ Elimination of interface problems due to perfect interplay between control unit, battery and charger.
- ▶ Compact and powerful POWERLiNE-trucks with optimised construction.
- ▶ Improved residual capacities, optimised L2 dimension.
- ▶ Battery integrated in truck concept to deliver tangibly better ergonomics, safety and convenience.
- ▶ Conscious choice for perhaps the most sustainable trucks on the market.





## The heart of our trucks delivering power and long life.



As a pioneer of lithium-ion technology we have been developing high-performance lithium-ion batteries for over ten years, combining maximum efficiency, safety and convenience with minimal consumption and expenditure. Because we've known for a long time now: the future is electric.

That's why we also promise a lasting performance of up to eight years on our high-quality lithium-ion batteries with the Jungheinrich Lithium-Ion Guarantee Plus. So you can be certain of a lasting great performance and a long service life from your batteries.

### OUR SERVICES:



- ▶ In-house production and assembly of virtually all key components including software and hardware development.
- ▶ Use of the safest cell chemistry (lithium iron phosphate).
- ▶ Permanent, optimised monitoring of the lithium-ion cells by the electronic battery management system (BMS).
- ▶ Short, efficiency-enhancing booster charging: 50 % of nominal capacity in 30 minutes, fully charged in just 80 minutes.
- ▶ CE certification.

### YOUR BENEFITS:

- ▶ Unique, fully networked overall system from a single source.
- ▶ Ecologically sound usage and maximum safety in your warehouse.
- ▶ Longer battery service life due to prevention of deep discharge.
- ▶ Possibility of rapid and booster charging.
- ▶ Maintenance free.



# Charging experts to ensure maximum charging performance.



## OUR SERVICES:

- ▶ Very short charging times.
- ▶ Flexible application to suit all requirements: one, two or three-shift operation as well as light or heavy-duty usage profiles.
- ▶ SLH 300i high-frequency charger for all 24-, 48- or 80-V-applications.
- ▶ Active load management for peak shaving.

## YOUR BENEFITS:

- ▶ Maximum availability of batteries and trucks.
- ▶ Energy savings compared with conventional chargers.
- ▶ Safe and battery-friendly charging.
- ▶ Reduced energy costs due to prevention of expensive load peaks.



Having the appropriate high-performance charging equipment is an important part of an integrated system. With Jungheinrich you will always find a charger suitable for your highly efficient lithium-ion batteries and perfectly tailored to your system. You can then get the most out of your battery in terms of service life and performance. Not to mention optimum availability for your trucks.



# Comprehensive advice for a complete system.

With a unique range of solutions, we can revolutionise energy usage in your warehouse.

Professional energy management in the warehouse is becoming increasingly important. As a full-service provider we are dedicated to sustainable intralogistics with a smart application of resources and will support you every step of the way.

Our specially trained energy-experts select the right option for your warehouse. They carry out an in-depth assessment of your energy infrastructure, suggest measures for optimisation if necessary and develop a tailor-made ecosystem from perfectly coordinated components. Such components include trucks, chargers and energy storage systems that reduce the demands on the power supply and guarantee full charging capacity even in periods of high utilisation. All fully harmonised with an active load management concept. The result is maximum efficiency at all times.

- ▶ Planning, project management, implementation and optimisation from a single source.
- ▶ Customised energy and charging concept as well as process consultancy from trained, experienced experts.
- ▶ A wide range of technology (e.g. battery types, charging concepts, power generation).
- ▶ A high degree of innovation through in-house research and development.
- ▶ Maximum availability, even with large fleets and three-shift operation.
- ▶ Falling energy costs thanks to needs-based models.
- ▶ Support for a sustainable energy supply, e.g. by reducing consumption, cutting CO<sub>2</sub> emissions and using renewable energy sources.
- ▶ Continuous adaptation of the solution according to your needs, even after implementation.



## SMART ENERGY!

The Jungheinrich consulting model.

### STEP 1

#### REQUIREMENT IDENTIFICATION

We look at the current situation and work with you to define the objectives of the energy solution while considering economic factors.

### STEP 2

#### ANALYSIS

We carry out detailed inventory and process mapping (current energy profile).

### STEP 3

#### CONCEPT

We evaluate the data, create a target energy profile, present a detailed cost and action plan and produce the appropriate energy concept (covering economic efficiency and CO<sub>2</sub> footprint).

### STEP 4

#### IMPLEMENTATION

Layout planning and commissioning of the solution or the complete ecosystem (batteries, trucks, battery chargers, load management, process adjustments and storage systems).

### STEP 5

#### OPTIMISATION

Energy is a key area for innovation. The requirements in your warehouse are also constantly changing. Therefore, we will continue to adapt your system on an ongoing basis.



Powerful performance, a long service life and high availability are key factors for an optimal energy efficiency in your warehouse. We support you with a comprehensive service package for batteries and battery chargers. When needed, we will promptly provide you with replacement batteries and carry out status checks.

- ▶ Investment security for trucks, batteries and chargers.
- ▶ Consistently high performance from your batteries.
- ▶ Maximum reliability for operators.
- ▶ Battery charger inspections in accordance with legal guidelines.

### CHARGER SERVICE.



We check the function and safety of chargers in accordance with all relevant legal regulations supply incl. an inspection sticker.

# Fully committed to keeping your fleet operational.

Our energy and battery service is always on hand.

### OUR SERVICES:

- ▶ Individual advice and assistance from our energy specialists for all your questions concerning lithium-ion technology.
- ▶ Benefit from our powerSCAN service:
  1. Visual inspection of the battery
  2. Free software updates
  3. Usage report
- ▶ Advantages of our service:
  1. Rapid response times from our local service units
  2. 24/7 availability via the Call4Service app
  3. Global support network
  4. Qualified engineers with specific lithium-ion training

### YOUR BENEFITS:



- ▶ Local contacts for all your questions regarding usage, application, etc.
- ▶ Shorter downtimes with our fast and straightforward on-site-repairs.
- ▶ Provision of a disposal concept even at the end of the device life cycle.



# Lithium-ion power for ORAFOL.

A modern rental concept with 100 new trucks and innovative lithium-ion technology provide ORAFOL with the key to optimal production processes and maximum efficiency.



## 100 % FUTURE-READY.

As part of a four-day inventory analysis at ORAFOL in Orienburg (Germany), the Jungheinrich team placed every single one of the company's 250 industrial trucks under the microscope. The result: many trucks were reaching the end of their shelf life and prone to faults that were bringing daily production to a halt.

It was high time for a turnaround, in the form of a sustainable, future-ready rental solution involving 100 trucks. With efficient charging through short charging cycles at decentralised charging points in all 12 production halls and minimal downtime, it is now possible to ensure maximum productivity during challenging three-to-four-shift operation. ORAFOL's profitability and customers are better served under this approach.

## SUSTAINABLE YET FLEXIBLE.



ORAFOL opted for a customised long-term rental solution using modern lithium-ion trucks. This not only provides a wide choice of industrial trucks and a full service agreement including a workshop on site, but also a high degree of financial planning and the potential to achieve maximum efficiency and profitability.

## COMPREHENSIVE ANALYSES, DETAILED EVALUATIONS.

The Jungheinrich FMS fleet management system serves as a higher-level control centre providing a constant overview of truck utilisation and all the relevant data. Employees are always optimally informed about current operating costs, service reports and maintenance tasks that are due. Access control ensures that only employees with a forklift licence can access the trucks, successfully keeping damage and accidents to a minimum.

## "THAT'S A BOOST TO MOTIVATION".


The numerous charging points in all 12 production halls alone represents a huge step forward, as all employees can now easily access the trucks at all times. As well as the boost to motivation, safety is awarded paramount importance: "The batteries are much easier to maintain and handle; the employees don't even have to top up the water any more", enthuses Manuel Reinfandt, Technical Purchasing Team Leader at ORAFOL. "That puts us at a whole new level in terms of safety and maintenance."

## CUSTOMER PROFILE.

 **Production**  
Industry

 **1.100**  
Employees

 **250**  
Industrial trucks

 **250.000 m<sup>2</sup>**  
Area



# A leader in intralogistics. There for you across the globe.



Our own direct sales companies in 41 countries.

Partner companies in more than 70 other countries.

Over 19,000 employees.

More than 5700 service engineers in technical customer support across the globe.

Founded in 1953, Jungheinrich is one of the world's leading providers of intralogistics solutions. With a comprehensive portfolio of industrial trucks, automated systems and warehouse equipment and services, we offer tailor-made solutions that allow you to devote your full attention to your core business. With our unique direct sales and service network, you can call upon a reliable partner who is at your side at all times, wherever you may be in the world.



## AUTOMATED SYSTEMS

Based on our comprehensive process knowledge and extensive experience in a wide range of industries, we can provide you with tailor-made automated systems, ranging from semi to fully automated solutions. We will thus work together to raise your efficiency and productivity to a whole new level.



## NEW TRUCKS

Lifting, stacking, transporting, order picking – electrically, by combustion engine or by hand? Our product portfolio contains the perfect trucks for your needs.



## WAREHOUSE EQUIPMENT

From pallet racking to automated small parts warehouses, we have the right solution for every item and warehouses of all sizes. Combined with Jungheinrich industrial trucks and IT solutions, the result is a future-proof, integrated intralogistics concept of unique quality.



## RENTAL

Forklift truck rental is not just an ideal solution for addressing short-term or seasonal requirements. Jungheinrich offers "power on demand" for all companies, regardless of their size or industry. There are rental solutions available to suit all requirements, with trucks available instantly in a wide number of variants across the globe.



## USED TRUCKS

JUNGSTARS are used trucks from Jungheinrich, which are among the best on the market. With high-end reconditioning according to our 5-star principle, every truck is returned to an outstanding technical and visual condition to satisfy the highest safety and sustainability standards.



## DIGITAL SOLUTIONS

With intelligent software and sophisticated hardware components, we ensure complete digital networking within your warehouse. All processes can be monitored centrally and controlled with utmost efficiency. Systems from different manufacturers can also be integrated with ease.



## CONSULTING

Products and services must meet your exact requirements. That is why our consulting service combines a high level of technical ability with process knowledge and in-depth industry expertise. We can thus work together to identify the perfect complete solution.



## FINANCING

Jungheinrich Financial Services is your reliable partner throughout the entire life cycle of your Jungheinrich product. We offer individual solutions for trucks, racking, warehousing and system solutions, while taking your budget and the special requirements of your business into account.




## AFTER SALES

The trouble-free operation of your intralogistics solution is our top priority. That is why we offer reliable, global support for your trucks and systems with more than 5,700 qualified service engineers in technical customer support. This allows us to be on-site within a very short time frame to restore the availability of your trucks and systems.



**ISO 9001** The German production plants  
**ISO 14001** in Norderstedt, Moosburg and  
Landsberg have been certified.

 Jungheinrich industrial  
trucks meet European  
safety requirements.

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