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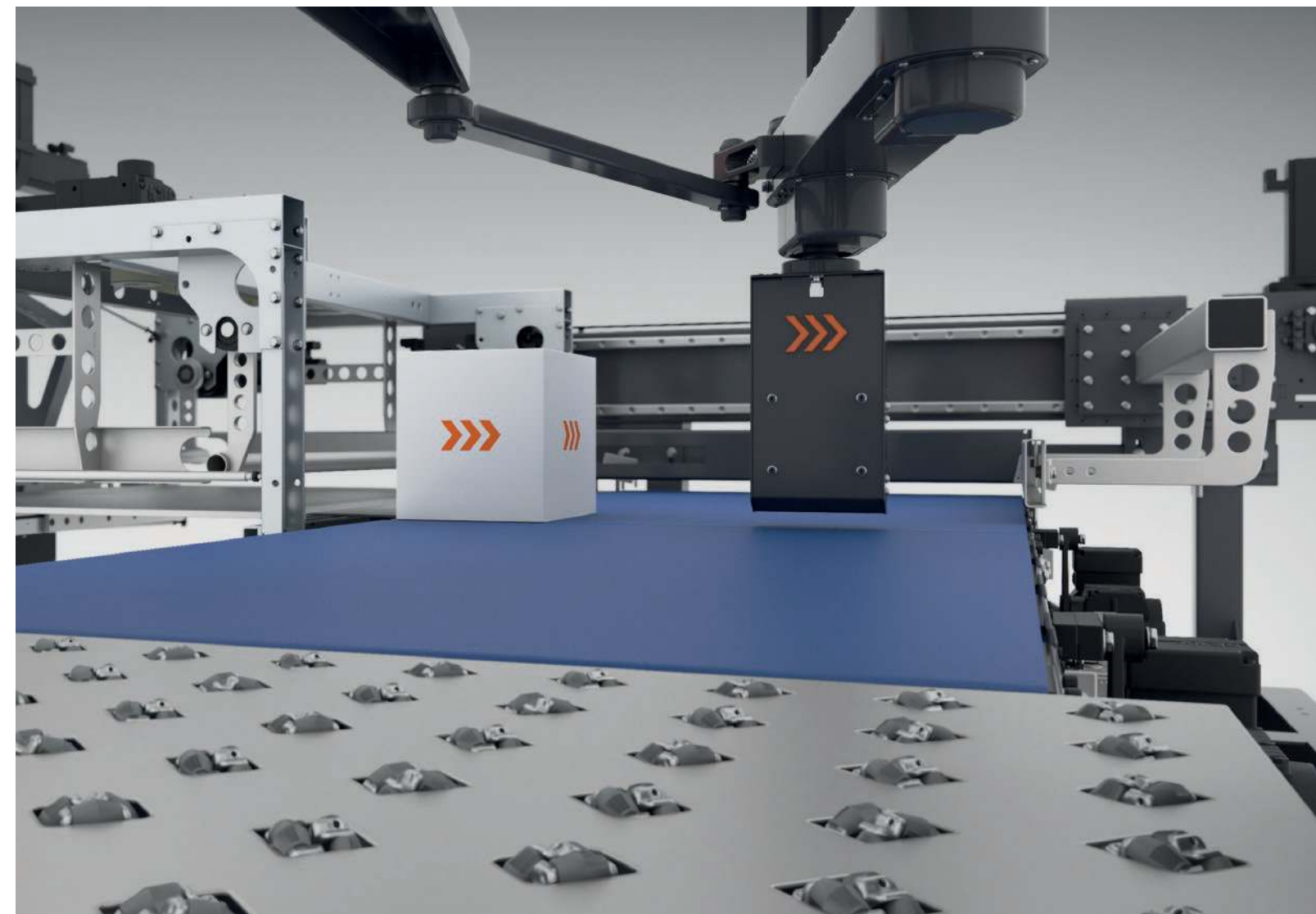
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ROBOT AND PALLETIZING SYSTEMS
OPTIMAL PALLETIZING SOLUTIONS
FOR YOUR PRODUCTS

TRAPO | EFFICIENT PALLETIZING AND DEPALLETIZING



TRAPO >>>
Automated Intralogistics

CONTENT

- 4 > **Complete system competence**
Our automated solutions for every industry and every product
- 5 > **Palletizing software**
TRAPO Pack; optimal use of space in trucks
- 6 > **Infeed area**
Feeding for optimal layer and stack formation
- 7 > **Robot gripper**
The perfect interplay: robot and gripper
- 8 > **Precise robot systems – articulated arm robots**
Extensive and flexible: high-speed robot systems (HRS Series)
- 9 > **Precise robot systems – portals**
Take the direct route: high-speed portal systems (HPS Series)
- 10 – 11 > **High-speed layer palletizers HLP 6000 (HLP Series)**
Palletize flexible: high-speed layer palletizers with three basic modules
Palletizers: three basic modules
- 12 > **Depalletizing**
Robotic depalletizer: safe transfer of palletized goods
- 13 > **Customized add-on modules**
Equipment options and transport safety
- 14 > **Automation and system control**
All under control: TRAPO automation technology
- 15 > **TIM**
TRAPO Intelligent Managementsystem

INNOVATIVE SOLUTIONS
FOR AUTOMATED (DE)PALLETIZING

As a source of inspiration and ideas in the automotive supply industry, TRAPO took the first steps in automation together with customers. Today, customers from all manufacturing industries benefit from this expertise which has grown over many years.

TRAPO offers maximum flexibility when it intelligently automates intralogistics tasks – in the perfect interplay of palletizing and depalletizing systems and customized robot grippers.

TRAPO focuses on the automated palletizing and depalletizing of goods. Mechanics and controls are optimally adapted to the production conditions.

Depending on your product, TRAPO offers layer palletizers, articulated arm robots or gantries.

Proven technologies and groundbreaking further developments: With the HLP series and the high-performance layer palletizer HLP 6000, TRAPO presents a modular system that acts flexibly in terms of product and application.

Depalletizers are an integral part of fully-automated process chains. They carefully remove palletized goods and place them on conveyors for further processing.

Customers benefit from the accumulated knowledge of the specialist teams for machine lifelong: they have only one central contact. This reduces time, sources of error and costs – including service effort.

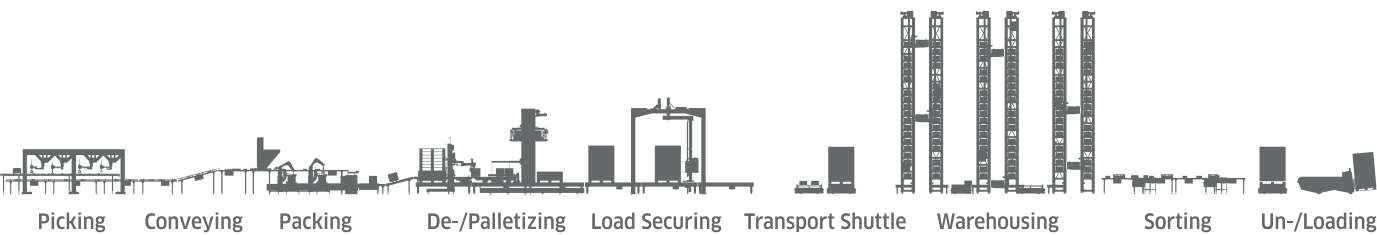
Discover the TRAPO world now!



OUR AUTOMATED SOLUTIONS FOR EVERY INDUSTRY AND EVERY PRODUCT

Customer satisfaction is crucial for us. We put together concrete packages of measures to support our customers where they benefit most from TRAPO’s total system expertise – with a strong sales and service team at your side.

Our systems impress with their flexibility, top performance and cost-effectiveness.



FLEXIBLE AND PRODUCT-INDEPENDENT SOLUTIONS FOR ALL REQUIREMENTS

TRAPO solutions optimize work performance in production and intralogistics. As a system provider, we have customized individual solutions, partial and complete systems for every industry and oriented to the respective product. With special know-how in the field of hygiene design for care areas.

BAGS

CARTONS/TRAYS

BALES/STONES

SMALL-LOAD CARRIERS (KLT)/CRATES

BUCKETS

BOTTLES/CANISTERS

BARRELS

FLOWPACKS/CANS/TUBES

PLASTIC PANELS

BLISTER PACKS

INJECTION MOULDING PARTS

MUCH MORE

TRAPO PACK: OPTIMAL USE OF SPACE IN TRUCKS

The perfect combination: power, endurance and brain – high-performance palletizer plus TRAPO Pack software.

TRAPO software configures the optimum layer pattern from the dimensions of the package and the pallet – for perfect stacking as the basis for stable shipping units.

TRAPO Pack requires less energy input and reduces material consumption. TRAPO’s own software is the basis for efficient palletizing at high speed.

The generated layer patterns are optimized on the monitor. Layer patterns and pallet loads can be configured by the user and memorized for subsequent palletizing operations.

The software monitors the process, minimizing downtime during layer formation and palletizing.

Clear advantage: This saves enormous setup times - and thus costs!

TRAPO ensures optimum securing of the load - with minimal use of film.

Your advantages

- Simple & user-friendly
- Definition of packing pattern & pallet format
- Efficient placement of packages on pallets
- Maximum system availability
- Absolutely automated – enormously flexible



FEEDING FOR OPTIMAL LAYER AND STACK FORMATION

Each product with its specific characteristics prescribes the requirements to a palletizing plant. Solutions for this need are created by TRAPO with combinations which make the perfect overall system.

Several combination options are available:

Feeding

- Maximum flexibility: Several feeds possible, also feed from above and below
- Any pallet size can be moved, e.g. Euro, Industry, Düsseldorf-type and others
- Slip-sheet handling of most varied types

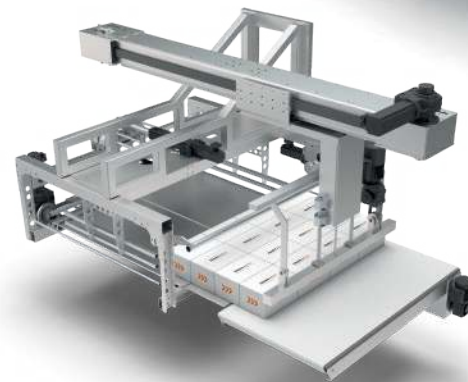
In the infeed area reliable layer formation through:

- **Conventional methods**
Turntable, turnstile, hub, turning tappet, contraflow conveyor
- The **parallel kinematics (HKS Series)**
programed for high-speed

In the guide area

Independent of capacity and product, as desired, the following are employed:

- A simple slide plate with x-axis
- A dual slide plate with x-axis and additional z-axis
- A dual slide plate with x-axis and additional intermediate slide plate



THE PERFECT INTERPLAY: ROBOT AND GRIPPER

Tailor-made gripper technology perfects utilization options, function and performance of a robot system. Employment of the perfect gripper is decisive when it comes to sustainably raising performance and quality.



Combination gripper

Combination grippers combine the function of several grippers - they can be adapted to different packages. This eliminates the need for time-consuming and costly gripper changes. In addition, they grip workpiece carriers, intermediate layers or lids.



Mechanical gripper

Mechanical grippers prove themselves when sacks or other products such as barrels, canisters or cartons need handling and palletizing.



Fork gripper

Retractable fork grippers handle open containers or larger containers.



Vacuum gripper

Goods are securely picked and forwarded with vacuum grippers. Handling weights are increased by the number of suckers and matched vacuum creation.



Magnetic gripper

Magnetic grippers for ferro-magnetic materials gain their holding strength from permanent- or electromagnets. In practice, for example during handling of perforated plates, or to support suction of heavy plates.



- In the TRAPO technical center, components for gripper systems are developed, realized in the 3D printer and tested under real conditions.

EXTENSIVE AND FLEXIBLE HIGH-SPEED ROBOT SYSTEMS (HRS SERIES)

4- or 6-axes articulated-arm robots of various well-known brands function highly-flexibly. The high-speed systems palletize, sort, pick and place individual pieces, rows, part or complete layers both swiftly and highly-precisely.

Our knowledge – your benefit:

- › Small footprint
- › On request: suitable for clean-rooms
- › Flexibly employable for various applications
- › Modular construction: Maximum adaptability to product characteristics
- › Product- and sector-independent: Mature gripper technologies transport most varied goods.
- › Suitable for different pack units and load carriers
- › Gentle product handling
- › Freely selectable layer patterns
- › Placed on rails, the articulated-arm robot stops at different palletizing stations
- › Application-oriented, flexible combination of optimally-complemented high-capacity palletizer- and robot technical characteristics



TAKE THE DIRECT ROUTE HIGH-SPEED PORTAL SYSTEMS (HPS SERIES)

Our high-performance portal robots act gently on two or three linear axes in cubic space. We design and manufacture the portal robots in our in-house production facilities in Gescher-Hochmoor. They move particularly heavy products even over long distances.

We are also a specialist in portal robots made of stainless steel for special applications in sectors which have special hygiene and corrosion protection requirements.

HPS Series:

- › **HPS 100** moves workpieces up to 100kg
- › **HPS 250** moves workpieces up to 250kg
- › **HPS 500** moves workpieces up to 500kg

Our knowledge – your benefit:

- › Modular construction
- › Suitable for various packs and load carriers
- › Gentle product handling
- › On request: suitable for clean-rooms
- › Higher weights are implementable as a special construction on request
- › Portals are flexible in length, height and width



PALLETIZE FLEXIBLE: HIGH-SPEED LAYER PALLETIZERS

Palletizers of the High-Speed Layer Palletizer Series function with high and low infeed. The product family of high-speed palletizers is optionally equipped with y-axis, rotary module or even with a traversing axis – so one or several palletizing stations can be served as required.

THE HLP 6000: HIGH-SPEED PALLETIZING

HLP 6000 >
High-Speed Layer Palletizer

The HLP 6000 high-speed palletizer from the HLP Series offers high performance on a compact footprint – and serves a virtually unlimited range of products: Highly flexible, as it can be adjusted to any product. Perfect, clean layers and stacks can be formed at maximum speed with the customer employing a high degree of product diversity and different formats.

With this considerable advantage the HLP 6000 plays its unique selling point, its absolute flexibility: For, until now, a great deal of change was necessary in order to implement complex layer patterns. The HLP 6000 places perfectly thus realizing any layer patterns of different formats.

Our knowledge – your benefit:

- > Small footprint
- > Extremely compact
- > Modular system
- > Several infeeds
- > Infeed below/above
- > Most varied slip-sheet versions
- > High speeds
- > Option of palletizing on several palletizing stations
- > Palletizing capacity of up to 10 layers/min.

Characteristics:

- > Layer weight up to 200kg
- > Low-friction recirculating ball bearings
- > Integrated drop guard
- > Different pallet formats possible with a layer gripper – without mechanical retrofitting, special pallets on request
- > Clean pallet optics through centering of the products in the gripper

PALLETIZERS: THREE BASIC MODULES

In the palletizing area

Basic modules of the HLP 6000 are the lifting column, layer gripper and feed track.

> Basic variant

HLP 6000 with guide area above and palletizing position below.



> Variant with y-axis

The HLP 6000 serves two palletizing stations and can operate with both high and low infeed. The advantage: In a small space, the infeed is from two levels to achieve the desired high output.



> Variant with rotary module and traversing axis or a combination of both

The traversing high-speed professional travels on a prescribed stretch. The rotatable variant functions in a radius of 180°.



ROBOTIC DEPALLETIZER: SAFE TRANSFER OF PALLETIZED GOODS

The high-performance layer depalletizer (HLDP series) from TRAPO offers several innovations at once: The space-saving arrangement of the modules enables operation at ground level. The performance with up to 90,000 empty cans per hour is impressive. Thanks to its modular design, the HLDP can also handle jars and bottles in the same way.

Any employee who has had to climb up to 35 steps on the platform several times under time pressure to rectify a fault knows that this is not only a time-consuming, but also dangerous climb. With the HLDP, there is no need for the second operating level by means of a platform – an absolute safety advantage in this performance class!

This innovative solution impresses through the use of a lifting column in combination with a magnetic or vacuum gripper and thus enables the efficient depalletizing of empty food cans (tinplate/aluminum) or empty jars – with an output of up to six layers per minute. This corresponds to around 1500 empty cans per minute.

Minimizing sources of error – relieving employees

Up to now, depalletizing tasks have often still been carried out manually. A depalletizer as an integral part of an automated line enables stable, reliable processes and offers consistently efficient and traceable production sequences.

Automated depalletizing solutions pick up products piece by piece, as single or complete layers. Depending on weight and condition, gantry or jointed-arm robots plus grippers are used.



- More safety and impressively high speed: high-performance, ground-level depalletizing of up to 1500 empty cans per minute.

EQUIPMENT OPTIONS AND TRANSPORT SAFETY

Profit from our numerous equipment options and customer-specific additional modules:

- Automatic feed and removal of pallets or other load carriers such as pallet cages, trays, etc.
- Layer recognition through image processing or sensor technology

All TRAPO systems impress with the additional integration of:

- Sack equalization
- Empty-pallet magazine with individual sorting and empty-pallet feed
- Positioning of slip-sheet
- Securing with hot- or cold glue
- Control functions: weighers/ metal detectors
- Product printing/ Labeling



- Stretch hooders are universally employable for secure wrapping of pallets.

The TRAPO Stretch Wrapper

- For warehouse and intermodal transport
- Pallet securing with wrapper
- Fully automatic securing for cartons, bags or buckets
- The entire pallet is wrapped with film at high speed - this is how manufacturers ensure the required transport security



- We reliably code products of all kinds and enable seamless tracing of loads.



- Strong hold – low film consumption: The TRAPO Stretch Wrapper (TSW series) enables fully automatic securing of pallet loads.

ALL UNDER CONTROL

TRAPO AUTOMATION TECHNOLOGY

When production plants communicate in order to grip or to palletize/depalletize products, the TRAPO competence team is on site in order to shape the optimal, efficient interplay of conveying technology and handling systems.

Individual safety precautions

In optimized production processes intelligent systems communicate with each other and with the products. This planning and interlinking requires, apart from programming, special protection and individual safety precautions. TRAPO competence creates trust there and offers a decisive safety benefit: with in-house developed solutions and proven systems.

As the main contact, we coordinate control technology and the hardware for conveying and robot systems as well as for palletizing systems and load security – and create impressive solutions.

Multi-talent image processing

Image processing supports efficient and smooth material flow. Cameras recognize products, identify parts and act independently within the programmed assignment. These precise, application-specific solutions are individually matched to demands.



- When automating complex systems we rely on detailed visualization, a high level of operator-friendliness and a low maintenance requirement.

Automation and system control

The TRAPO control- and monitoring software unites the control of all systems on a clear centralized or decentralized terminal.

- High system availability
- Reliable system-diagnosis
- Clear visualizations for each system component
- Fully-automatic display of maintenance intervals

TIM

TRAPO INTELLIGENT MANagementsystem

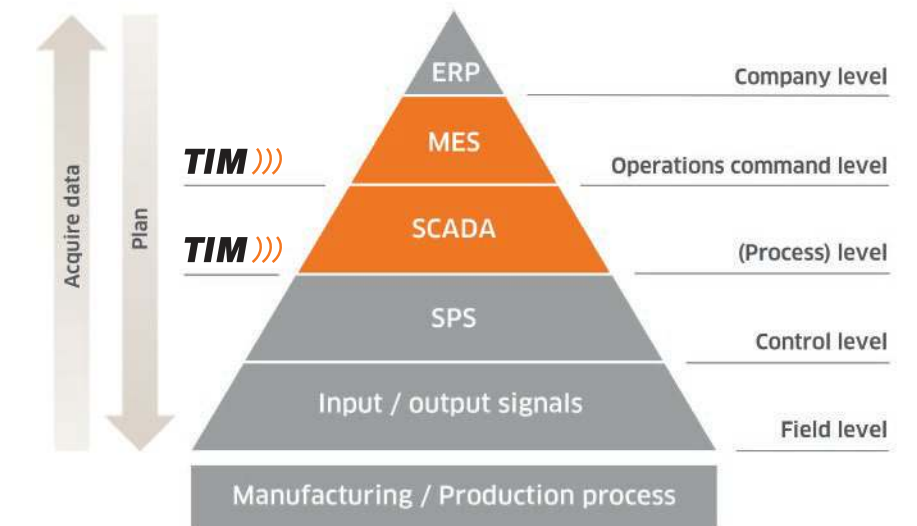


TIM was already introduced in 2018 in the TRAPO technical center for the needs of plant and mechanical engineering as an ME system (Manufacturing Execution System). TIM is industry-independent, can be configured by the customer, connects production systems and also includes third-party systems.

Plant monitoring

TIM monitors processes in production and intralogistics based on specified OEE performance.

With TIM, customers have an overview of their company key figures in real time. TIM can be integrated into the customer's ERP systems.



Plant operation

TIM offers a web-based, user-friendly HMI (Human Machine Interface) user interface.

Plant optimization

Continuous monitoring and the data collected from it enable targeted optimization of the monitored plants. In addition, TIM specifies the optimal time for predictive maintenance – and simplifies ordering processes by providing a digital shopping cart.

Control of autonomous systems

At the process level (SCADA), TIM acts as a data highway for the fully-automatic route calculation and control of shuttle fleets of the TTS series.

The vehicles move freely along predefined traffic routes meaning that even changes in the driving route can be implemented with little effort.

