

LPC Palletizing Cell



LIEBHERR

The LPC Palletizing Cell



Liebherr offers a wide range of automation systems that support modern high-efficiency production. The emphasis here is on economy, ease of use, quality and reliability in combination with a high degree of flexibility. The range of products comprises robotic palletisers, pallet handling systems, conveying systems, robots and emphasis on total System integration.

With the Liebherr palletising cell as a basic module, ultramodern production with a decoupled process sequence can be realised. Standardised transport containers with basket technology facilitate a uniform approach to logistics as well as flexible future-orientated production.

For the complete flow of material, the workpieces remain in a wire basket or workpiece carrier. This renders the interface between the machine and automation device uniform, providing a considerable potential for cost reduction.

Economy

The basic prerequisite for economical production is the optimum supply of workpieces to the processing machine. Hand-loaded or semi-automatic machines only meet this requirement to a limited extent. By automating the system with a Liebherr palletising cell, the capacity of the machine can be enhanced significantly.

The basket stacking arrangement means that workpieces are stockpiled in such a way that several machines can be operated with little effort. With the time saved in this way, qualified staff can concentrate on setting-up tasks, for example, or tool adjustments.

Flexibility

Thanks to the modular concept, palletising cells from Liebherr are particularly flexible. This means that the optimal solution can be found for any automation task. Depending on the production process, Liebherr offers a two, three or four unit version with respective additional functions.

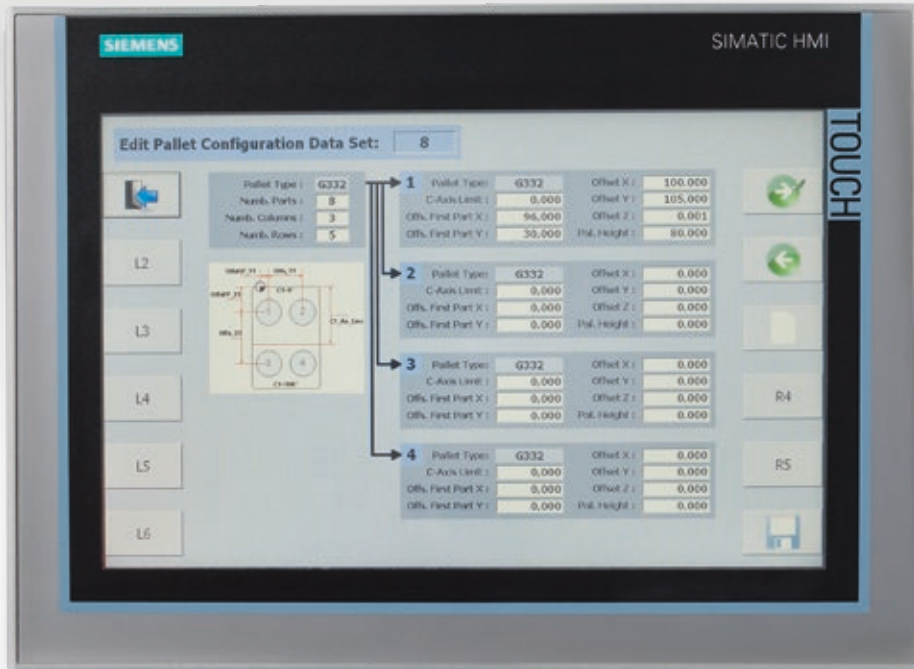
Ease of use

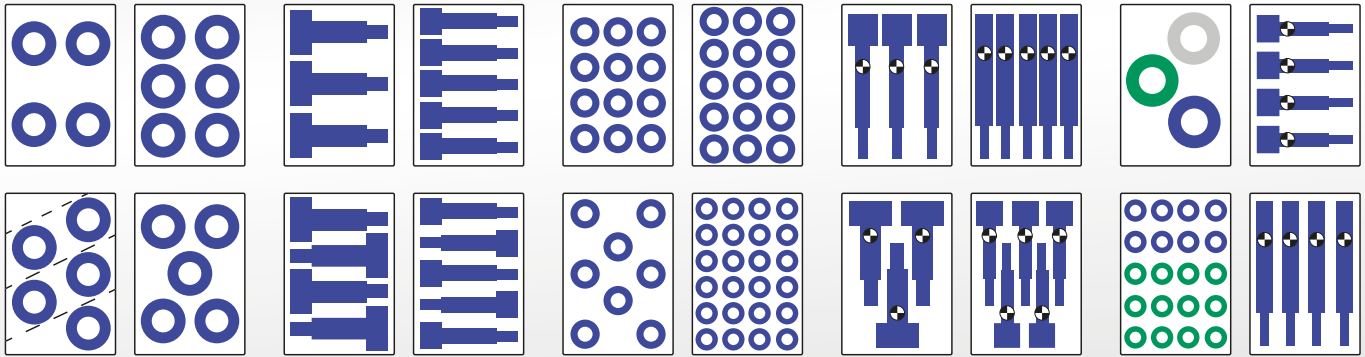
Thanks to the graphic-based display, operation of the Liebherr palletising cell is intuitive. The intelligent control system supports the user during retooling for a new workpiece and simplifies monitoring of the internal work processes. This results in short retooling times and quick production start-up.

Quality and reliability

Quality is the ultimate priority at Liebherr. Every production stage is consistently monitored in order to achieve optimum results at all times and to ensure the reliability and long life of the products. The quality management system of the overall production process at Liebherr-Verzahntechnik GmbH is certified in accordance with DIN EN ISO 9001:2008. Moreover, many years of experience and state-of-the-art technologies flow into product development.

Ease of use





Parts Array

A user-friendly concept aids handling of the palletising cell in production mode, which in turn heightens acceptance among users. Not only that, it also has a decisive influence on the reduction of secondary processing times. As well as the optimisation of processing operations, these are becoming more and more important in terms of global competition. Liebherr supports this process by means of simple time-optimised retooling and visualisation of the processes.

Simple and fast retooling

Intensive setting-up times are a thing of the past. Liebherr specifies interactive tooling processes for the palletising cell instead: The user selects a basket filling pattern, whereupon just the workpiece dimensions have to be entered. Calculation of the necessary axis positions is then performed automatically by the Liebherr software. So-called teach processes are reduced to a minimum in this way and retooling is simple and fast.

Processes in the palletising cell are visualised

The user interface displays the processes within the palletising cell. Each of the current statuses is shown by means of graphics. Examples of these are the number and position of the unprocessed and finished parts, the measured parts ejected via the SPC station and also the status of the workpieces in the optional special stations, such as the centrifuge.

Flexibility



Modular System

The basis of the modular system is formed by the Liebherr three unit cell. With the aid of a two or four unit cell, which are available as an option, additional demands can be met to supplement this, which in turn increase the flexibility of the palletising cell.

The Liebherr palletising cell is designed for handling wire mesh baskets, pallets or plastic boxes in standard dimensions. Based on the range of parts, baskets of max. 120 mm can be used with a stack height of 1,000 mm. The mechanical operator guard makes it possible for the stack of finished parts to be changed at the same time as main operation. The integrated switch cabinet reduces the surface area require-

ment and can be setup and brought into operation easily, which makes a reduction in the costs of installing the palletising cell possible.

The optional intermediate storage feature for a three or four unit cell guarantees homogeneous loading and unloading. This prevents unprocessed and finished parts from being mixed up. Through parallelisation of the stacking processes, faster cycle times are also achieved.

The additional functions that encompass Part/part drying, measured / master part handling, marking / reading, turning device and orientation station can be integrated from the Liebherr standard programme.



SPC Station



Floor Roller



Basket



In Process Storage



Pick and Place unit (PP10)



Robot System



Gantry

Loading systems with versatile deployment

The Liebherr palletising cell makes it possible for machines to be incorporated from a wide range of different manufacturers. Loading systems suitable for this purpose, such as assemblers, loading robotic palletisers, robot systems and the associated gripping units are configured from the comprehensive standard modules. Workpiece logistics and loading systems from one source simplify commissioning, maintenance and production start-up.

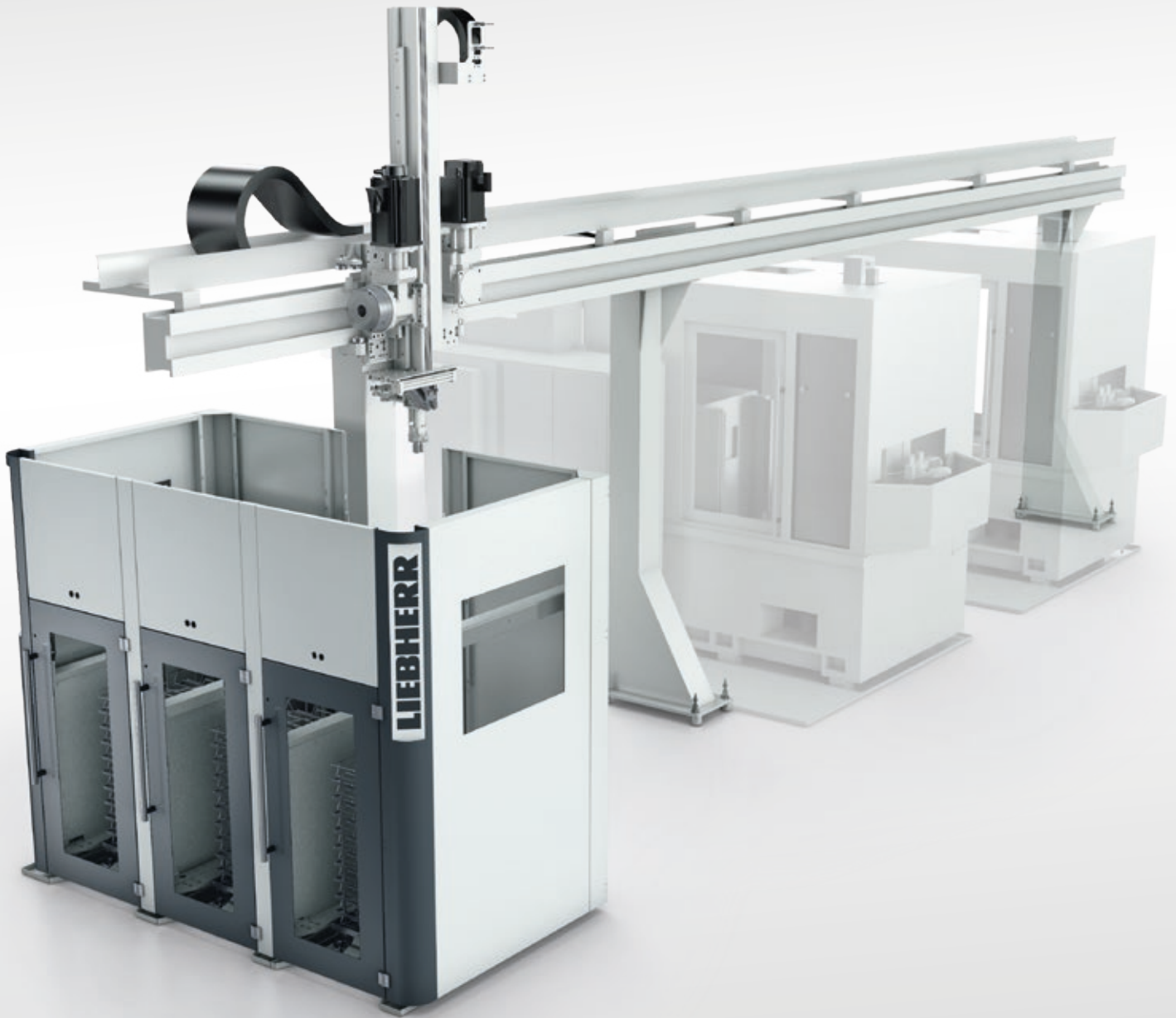


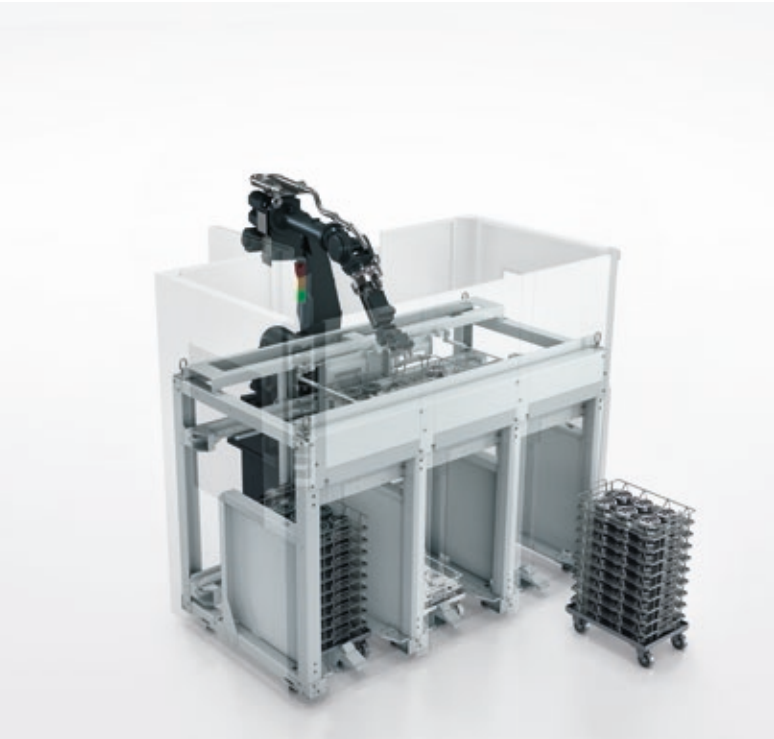
Spinning unit



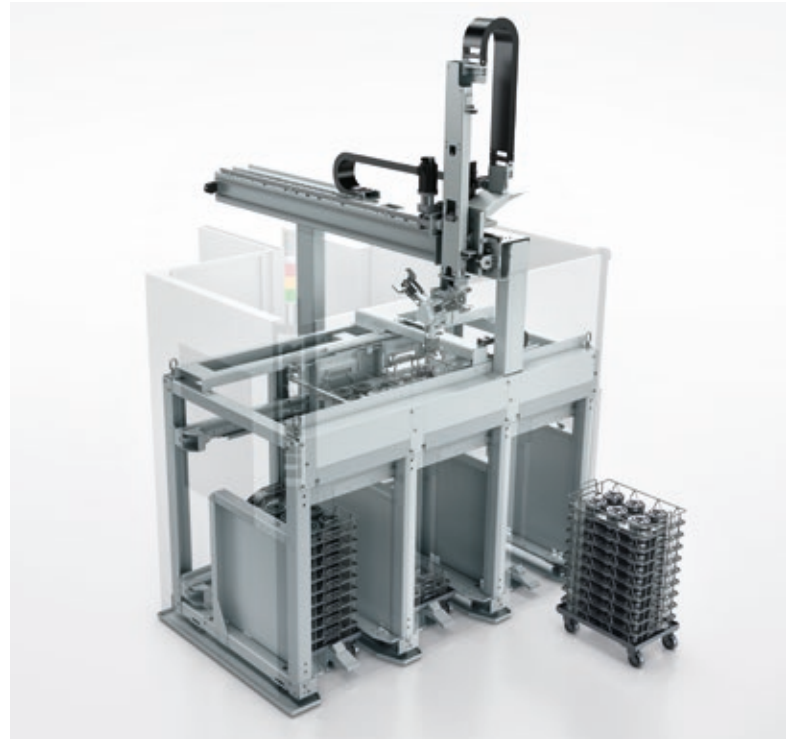
Gripper unit

Layout Examples





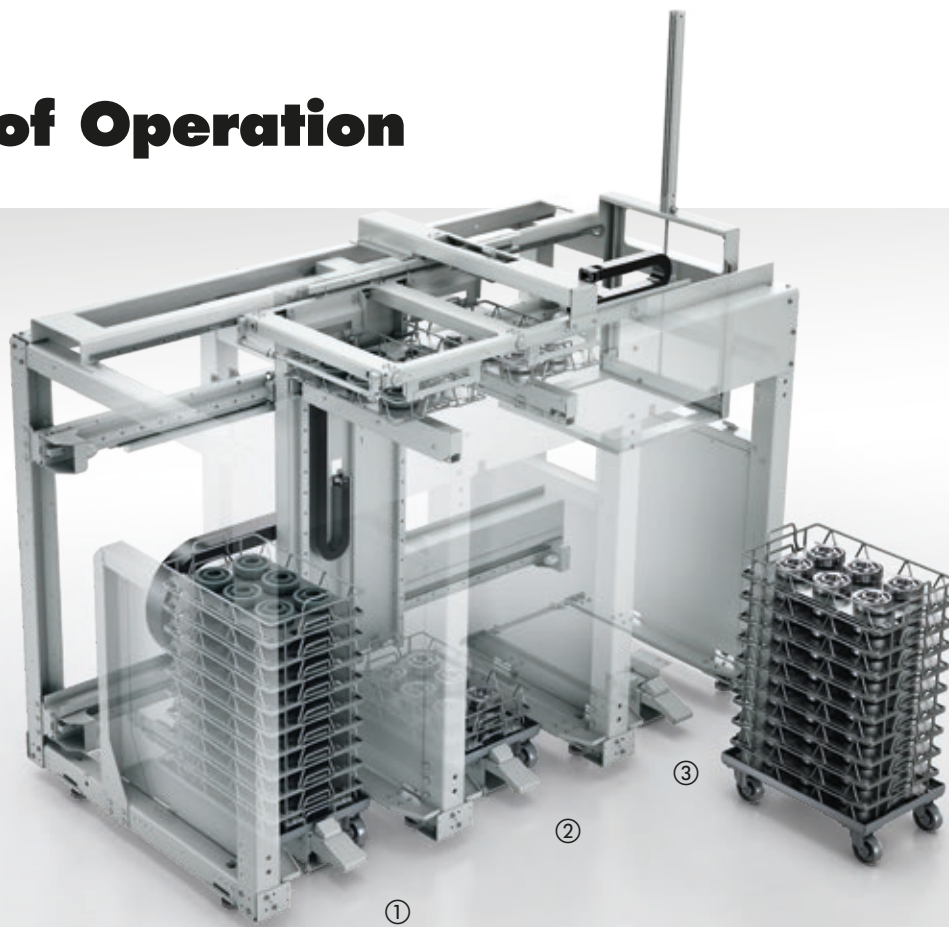
Robot System



Pick and Place unit (PP)

A very wide range of different production concepts can be realised using a palletising cell from Liebherr. With a uniform basic system in a modern factory, it is possible to automatise production stations with individual machine loading, cell systems with unprocessed and finished part buffers and decoupling modules in linear systems.

Mode of Operation



The basic version of the palletising cell from Liebherr features three stacking areas that are fed in different ways. The first and third area are fed with unprocessed part baskets. The second area is fed with finished part baskets. The mode of operation can be described as follows:

The pallet grabber withdraws a pallet with unprocessed parts from stacking area 1 and positions this at the transfer point for the loading device. Here, the machine is loaded with unprocessed parts while the finished parts are taken and placed back on the pallet. As soon as the pallet is filled with finished parts, it is moved to stacking area 2.

Once all of the pallets from stacking area 1 have been processed, the cell draws parts from stacking area 3 where unprocessed parts are likewise stored. The stack of finished parts from stacking area 2 is removed and exchanged for a new stack of unprocessed parts during normal operation.

Strategies with specific additional functions that have been developed with the users can be realised, for example, with an intermediate or empty pallet storage area as an option. Among these are pure pallet operation, relocation of empty slots to the uppermost level of the stack and run until empty.

Service and maintenance



The Liebherr Automation Service has its headquarters in Kempten (Germany), and has a network of Liebherr service centres around the world. The experts who man the customer hotline provide professional first-aid should help be needed. Included in the services offered are the provision of spare parts, inspections, maintenance or modifications to systems. Since the products have a universal modular design, rapid provision of spare parts is assured, which means that periods out of use are kept to a minimum.

The Liebherr palletising cell was designed to be maintenance-friendly throughout. All of the necessary lubrication points are supplied from a central lubrication pump. As with all pneumatic components and bus modules, this is located on a maintenance unit that can be accessed easily from outside. Every palletising cell is supplied with a detailed operating manual and service handbook that specifies the service intervals and describes the work that needs to be performed.

As an option, Liebherr also offers the means of remote maintenance. In this case, Liebherr experts perform a fault diagnosis and rectify malfunctions online.

Thanks to the use of commercially-available components, such as drive and control systems, Liebherr guarantees a high level of availability for the whole system.

		Two, three and four unit cell	
		Basket size 400 mm	Basket size 600 mm
Max. size of palletising cell		Depends on size of transport pallet	
Size of transport pallet	mm	600 x 400	800 x 600
Transport container		Baskets, workpiece carrier, plastic pallets	
Max. stack height inc. dolly	mm	1,000	1,200
Drive systems		NC	NC
Switch cabinet		integrated	integrated

Machine Tools and Automation Systems from Liebherr

Liebherr employs roughly 1200 staff in the area of machine tools and automation technology and has production facilities in Kempten and Ettlingen (Germany), Collegno (Italy), Saline (Michigan, USA) and Bangalore (India). They are supported by expert and reliable marketing and service specialists at a large number of locations worldwide.

With over sixty years of industrial experience, Liebherr is one of the world's leading manufacturers of CNC gear cutting machines, gear cutting tools and automation systems. The company's innovative products are the result of pioneering ideas, highly qualified staff and state-of-the-art manufacturing systems at each of their locations. They are characterised by economy, ease of use, quality and reliability in combination with a high degree of flexibility.



System Solutions in the Area of Machine Tools

Included in the production programme are gear hobbing machines, gear shaping machines and generating- and profile grinding-machines, all noted for their high degree of stability and availability. Particular importance is attached to the energy efficiency of the machines.

Gear cutting machines from Liebherr are supplied to renowned manufacturers of gears and gearboxes and large-scale slewing rings worldwide. They are in demand primarily from the automotive and construction machinery industries and also increasingly from the wind power industry for the manufacture of gears for wind turbines.

High Quality Gear Cutting Tools

Liebherr manufactures high quality, precision tools for the soft and hard machining of gears and all Liebherr gear cutting machines are fitted with Liebherr tools. The range also includes Lorenz shaping tools and products customised for specific customer applications.

Automation Systems for a Broad Range of Applications

Liebherr has a wide range of products for linear robots, pallet-handling systems, conveying systems and robot integration for projects in all areas of production and can provide above-average availability of systems.

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