

Maximum Flexibility for Pallet Automation

PHS 1500 Allround



LIEBHERR

The Liebherr PHS Allround



Liebherr offers a wide range of automation systems which support modern high-efficiency production. They help to not only lower production costs, but also enable a fast and flexible response to changes in demand on the market. Efficiency, user-friendliness, quality and reliability, as well as high flexibility, are to the fore.

In the area of pallet handling systems Liebherr offers the rotation loading system RLS as well as the PHS Allround to complement the linear PHS PRO. With an approximately 20% lower installation space compared with the PHS PRO and greater flexibility compared with the RLS, the PHS Allround fits in perfectly in the existing product portfolio. The PHS 1500 Allround makes possible the introduction to highly efficient and fully automated production for users and is characterized by its high storage depth in relation to the footprint. The system is particularly suitable for multi-variant part batches with small to medium batch sizes.

Economy

The high spindle run-time of the machining center is a basic prerequisite for cost-effective production. Hand-loaded or semi-automatic machines only meet this requirement to a limited extent. Machine utilization rates of over 90 % can be achieved with the Liebherr pallet handling system PHS Allround. Personnel requirements are also reduced with the implementation of shifts comprising few or no workers, which allows the investment to pay for itself within a short time.

Flexibility

The PHS Allround from Liebherr can be combined as needed and extended at any time thanks to the modular concept. Numerous setup stations (e.g. turn/tilt/mobile) from the modular system are available. The storage capacity can be increased considerably with minimum floor space thanks to additional rotary towers. With a height of just under 3.8 m, the PHS Allround can also be used in existing halls with low ceiling heights.

User-Friendliness

Integrated order planning and unlimited extension are made possible with the tried-and-tested cell control with Industry 4.0 functions. In the basic version, NC program and tool management remain on the machine, while the cell control system manages the pallets. This allows operators to continue to work in a familiar machine environment. Short commissioning times, high acceptance, and fast production start-up are the result. The user-friendly cell control technology can be extended with useful additional functions such as productivity statistics, NC program, tool, material and device management, in addition to the simple pallet and order management. The software can be integrated in existing software systems such as ERP or CAM or tool management systems.

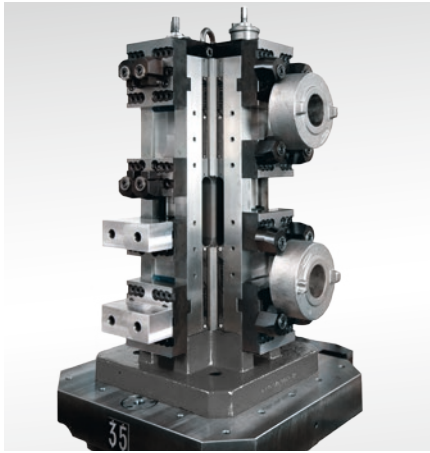
Quality and Reliability

Liebherr attaches huge importance to quality. Each production step is monitored in order to achieve optimal results every time and to guarantee the reliability and durability of the products.

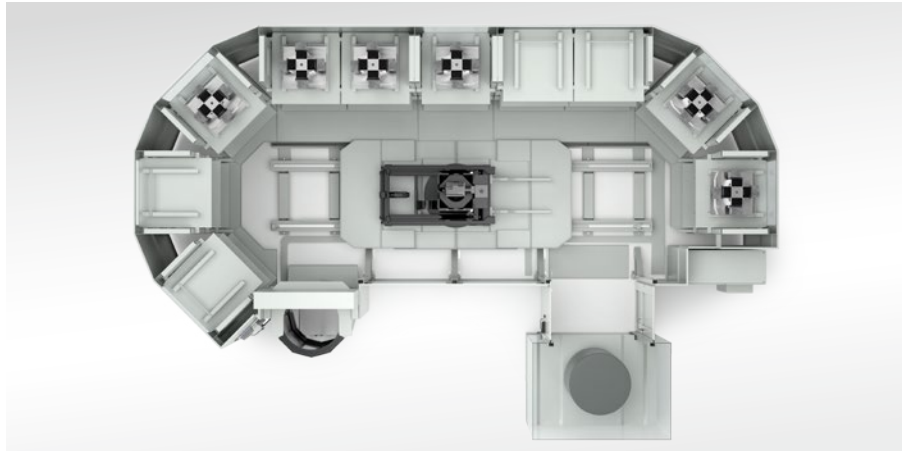
The quality management system of the overall manufacturing process of Liebherr-Verzahntechnik GmbH is certified according to DIN EN ISO 9001:2008. In addition, many years of experience and the latest technologies are also incorporated into the development of the products.

Flexibility





Application example
Pallet with clamping device



Top view

The Liebherr PHS 1500 Allround allows more users to enter the world of flexible production. The new modular concept for lift capacities up to 1.5 tonnes is very flexible and can be individually configured and extended. Users can thus introduce flexible production systems with manageable investment and expand them when necessary. The PHS 1500 Allround pallet handling system is available for delivery within four months. This helps you to boost your productivity, reduce your part costs, and increase your competitiveness.

Modular System

Thanks to the modular system, the automation device can be adapted in a very short time to current production needs. The modular system comprises the following components:

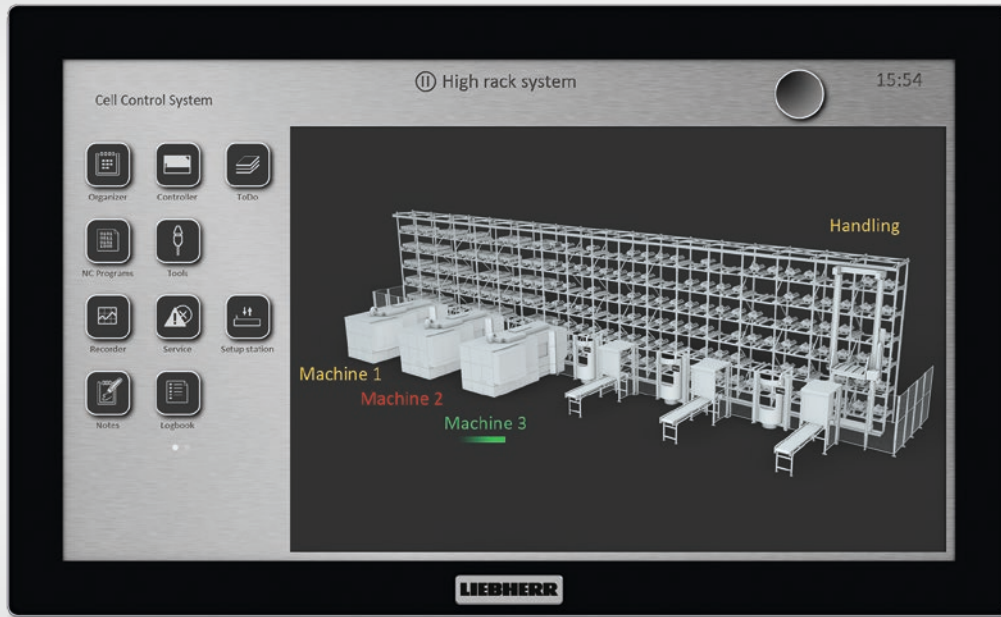
- Shelf module
- Setup module
- Lift module
- Rotary storage tower

The usability in existing halls with low ceiling heights, the compact design with optimal space utilization, as well as the front loading at both ends and the optional front access, set new standards in this segment. At the request of the customer, the system can be extended with the Liebherr tool storage systems.

Fit for the Future

If the task should change in the future, the PHS Allround is optimally prepared. The addition of rotary storage towers as an alternative to existing shelf modules offers the option of increasing the storage capacity in confined space conditions. The complete system can be extended flexibly in 1 meter steps up to 40 m. For example, additional machine and/or setup stations can be integrated in the system at any time. As an option the PHS Allround can also be extended with tool storage systems to increase the limited storage capacity of the tool magazines.

Production with Innovative Operation



The user-friendly cell control technology can be extended with useful additional functions such as time-controlled order planning, productivity statistics, NC program, tool, material and device management, in addition to the simple pallet management. The software can be integrated into existing software systems such as ERP or CAM/tool management systems.

Route Guidance System

The route guidance system is the decisive link between operator, automation, and the connected machines and facilities. The intuitive workshop operation with function-oriented APPs on a touch display reduces the familiarization phase. Alternatively, the mouse-based control station operation is available for data processing.

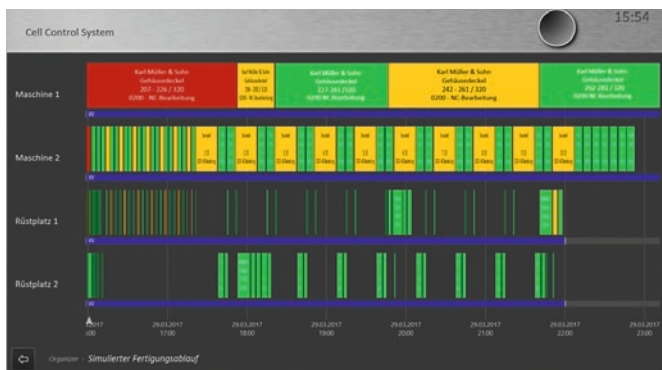
Basic System and Extensions

The basic system includes all necessary functions for a quick introduction to automated production operation. Building on this and depending on the operating requirements, there are different function-oriented modules available. The user can customize the standardized modules. The starting constellation is not binding, modules can also be activated or specific function add-ons integrated at a later time.



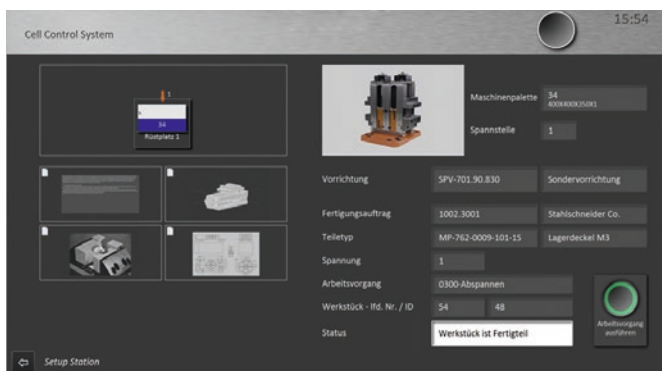
Cell Control System

- Pallet management and status displays
- Priority control for production orders
- Note and logbook functions
- Can be extended at any time



Organizer – APP

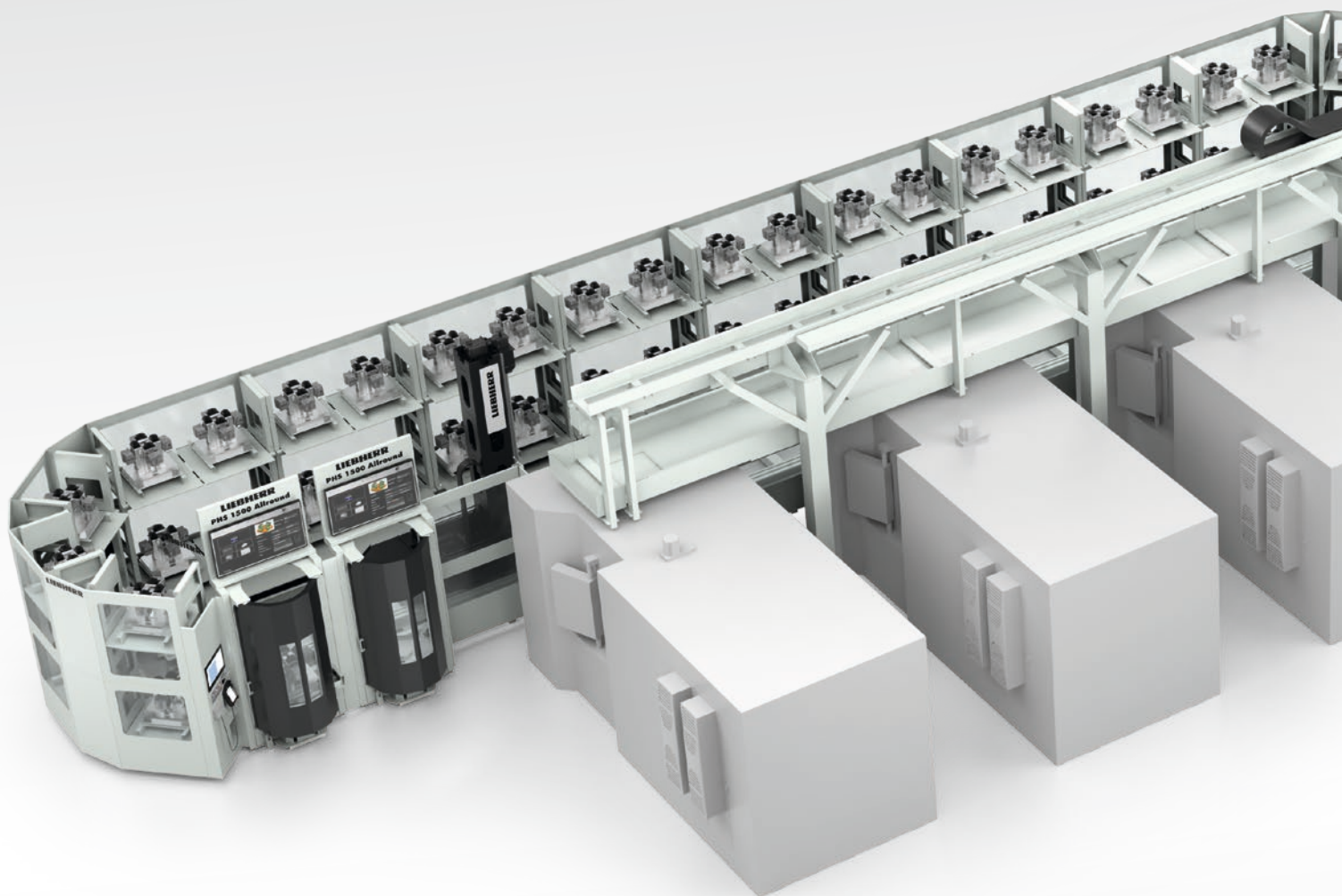
- Organization of production orders
- Create, block, and release production orders
- Define order sequence
- Detailed planning, create production preview
- Calculation of resource requirements

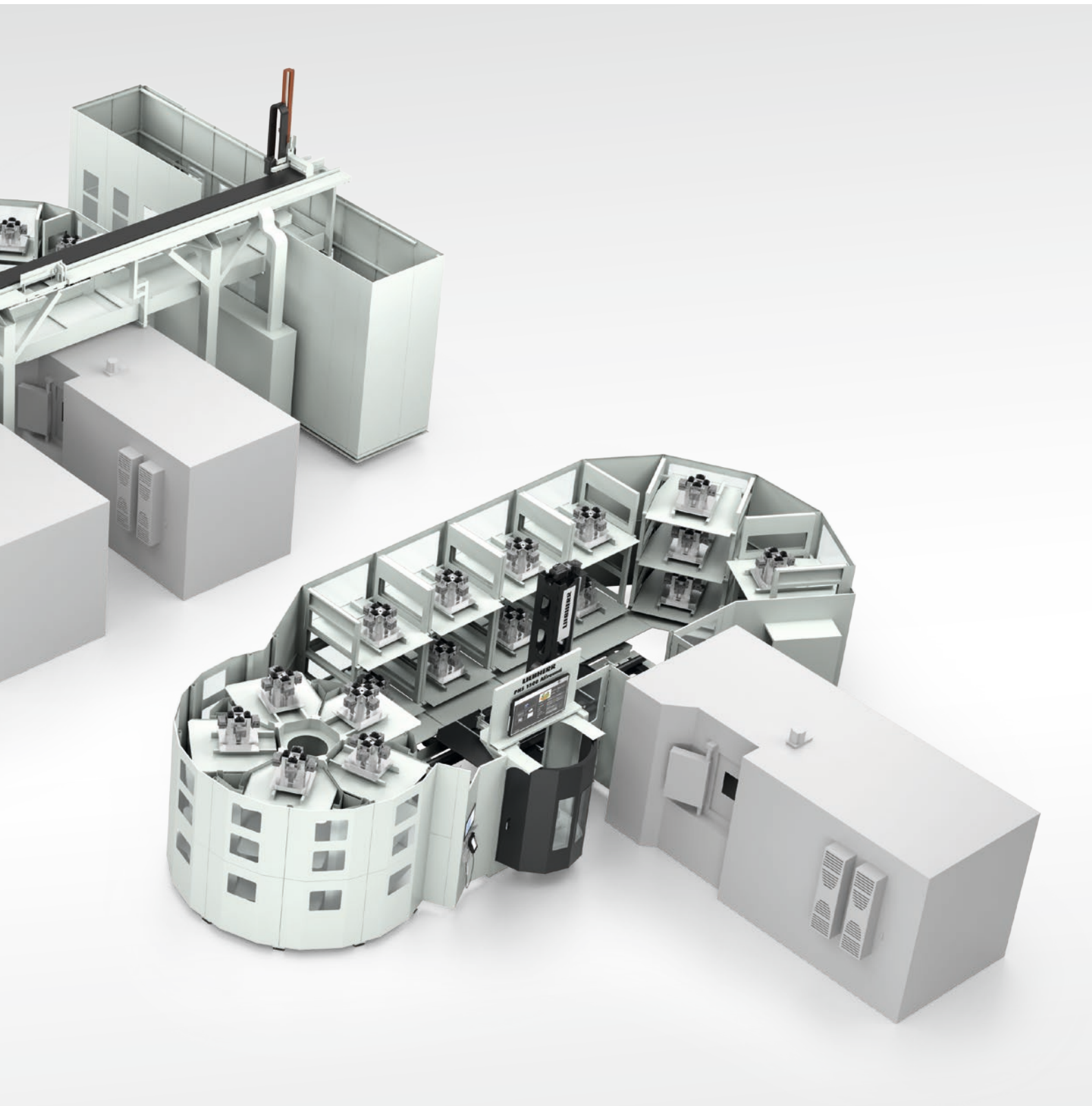


Setup Station – APP

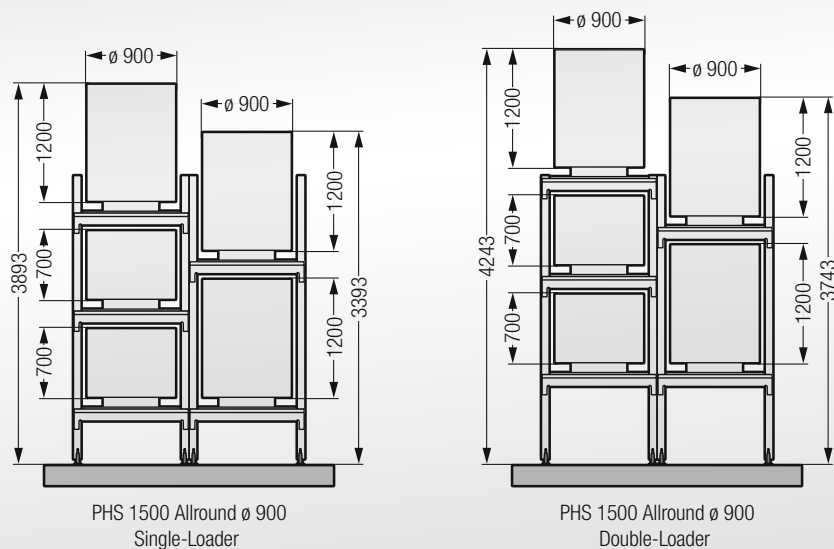
- Setup station operation
- Workpiece loading/unloading function
- Report workpiece status NOK/OK parts
- Clamping drawing, instructions, inspection characteristics, etc. appropriate to the respective status of the workpiece

Examples and Different Layouts





Technical Data



PHS 1500 Allround: Maximum shelf height

Technical data

Pallet size	mm	up to 800 x 800
Interference diameter	mm	up to Ø 1,400
Transport weights	kg	up to 1,500
Number of storage levels		2 or 3 levels can be selected
Number of machines		max. 4 machines
Number of setup stations		freely selectable
Max. travel path	M	40
Arrangement of machines, setup stations, and storage tower		front, face side, back
Min. hall ceiling height	M	4.0

From 2018 Liebherr will extend the PHS Allround product portfolio and add the PHS 800 Allround and PHS 3000 Allround, as well as a double-loader option.

Service and Locations

Training

We offer a comprehensive range of training courses both at the customer's premises and in our subsidiaries. The practical technical training courses are delivered by our experienced system technicians who are very familiar with the systems and applications owing to their many years of experience. These training courses enable you to help yourself and use systems safely in emergency situations, e.g. a power failure.

Customer Hotline and Remote Maintenance

Our experts on the 24/7 customer hotline provide professional initial assistance when needed. Many faults can be eliminated with the support of our experts via remote access.

Global Presence and Spare Parts Availability

With our headquarters in Kempten and global subsidiaries, as well as service outlets, we guarantee a fast response time in order to be able to deploy a service technician to the customer's premises if necessary. A rapid replacement parts service is guaranteed thanks to the consistent modular system of the products and the use of basic components from well-known, global manufacturers. Original spare parts are stocked in the subsidiaries and can be delivered to your production sites within a short period of time. Included in the services offered are the provision of spare parts, inspections, maintenance, or modifications to systems.

Service and Maintenance

Liebherr developed a system for optimizing repair and maintenance based on experiences with aerospace components within the Liebherr Group. As a result of this, maximum availability values and minimal total costs of ownership are achieved.

Most of the unexpected system failures can be avoided through preventive maintenance.

We also offer our customers optional "Wellness Checks" to minimize the risk of machine downtimes and secure the machine availability over the long term. Axles, gearboxes, cable drag, guides, carriages, as well as cables and hoses, are checked and replaced if necessary. The system data is saved as a backup during each service and maintenance call in order to restore the status of the last maintenance if needed and thus quickly guarantee the restart of production.



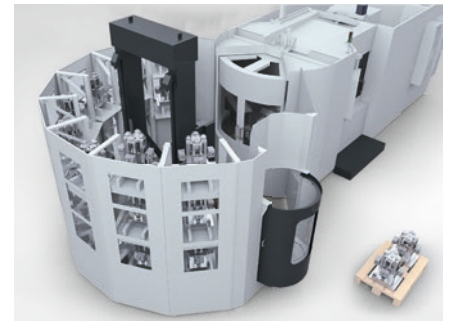
Locations of Liebherr-Verzahntechnik

- Liebherr-Verzahntechnik GmbH, Kempten, Germany
- Liebherr-Verzahntechnik GmbH, Ettlingen, Germany
- Liebherr-Utensili S.r.l., Collegno, Italy
- Liebherr-Verzahntechnik Paris, France
- Liebherr-Russland OOO, Moscow, Russia
- Liebherr-Gear Technology Inc. and Liebherr Automation Systems Co., Saline, USA
- Liebherr Brasil Guindastes e Máquinas Operatrizes Ltda., São Paulo, Brazil
- Liebherr-Machine Tools India Private Limited, Bangalore, India
- Liebherr Machinery Service (Shanghai) Co. Ltd., China
- Liebherr Japan, Tokyo, Japan
- Liebherr Machine Tools and Automation, Seoul, South Korea

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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