

Flexible Automation Solutions for your production processes

hydraulic, mechanical / electrical

*Cost-effective automation
for all batch sizes*



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Products | for | productivity

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Automation of workpiece manufacturing

Conventional automation systems used in the manufacture of workpieces, such as pallet automation systems, are generally designed for workpiece machining in a single clamping operation. While pallet insertion and withdrawal, as well as machining, are for the most part optimally automated, the workpieces themselves usually have to be manually inserted and clamped in the clamping fixtures. For full machining of the workpiece, further clamping operations are needed which in turn require an adjustment or even a change of the clamping fixture.

These changeover procedures tend to be time-consuming, manual processes which have an even more negative effect on unit costs when small batch sizes are involved. Furthermore, it is often the case that workpieces with runtimes under 5 minutes cannot be produced cost-effectively in pallet automation systems.

ROEMHELD automation solutions

The basic idea behind ROEMHELD's automation solutions is to enable the universal automation of all production processes.

From loading of the workpiece through to the removal of the finished, machined part.

Particular emphasis is placed on the automation of all changeover operations:

- **Workpiece change**
- **Setting the clamping range**
- **Changing the clamping jaws**
- **Changing the fixture**

Flexible use even for small batch sizes

Thanks to the automation of these changeover operations, ROEMHELD automation solutions are not only suitable for large batch sizes. It is now possible to automatically change to other workpieces flexibly and cost-effectively.

Set-up costs are reduced which enables the cost-effective production of small batch sizes.

High quality through full machining

The automated changing or adjustment of the fixture enables full and automated machining of the workpieces from first to last clamping operation. Further working steps such as deburring, washing, etc. can be integrated in the overall system.

This ensures the complete benefits of full workpiece machining:

- **Stable, reproducible production processes**
- **Increased planning reliability for production**
- **Increase of workpiece quality**
- **Reduced scrap**

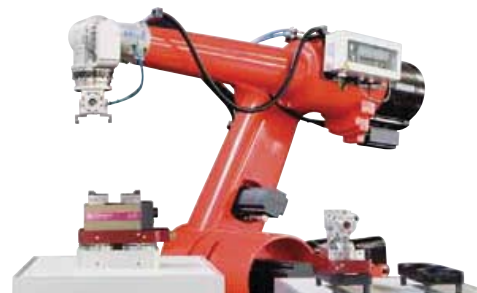
Increased productivity through automated processes

Universal automation leads ultimately to a reduction in production costs and thus an increase in the productivity of the production processes, while at the same time providing increased flexibility and quality.

- **The machine runtime is not restricted by the number of pallets**
- **Machine runtimes are increased**
- **The machine produces ready-for-sale workpieces**
- **The cost per workpiece is reduced**

The robot – handling of the workpiece and fixture

A robot from a given manufacturer is responsible for handling the workpieces, changing the clamping jaws and changing fixtures.



Hydraulic clamping systems

HILMA hydraulic clamping systems offer a wide range of application options. A selection of different sizes, clamping strokes and forces is available for your specific requirements.

Hydraulic stroke up to 160 mm in fixed jaw systems, or up to 2 x 40 mm in concentric systems. Clamping forces up to 32 kN.



Automated setting of new clamping ranges

Often it is not necessary to change the fixture or clamping jaws when the workpiece is changed.

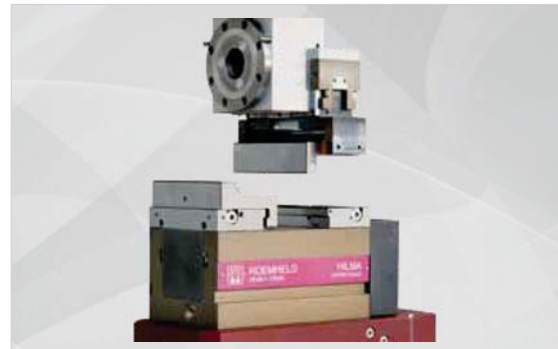
It suffices to set the clamping system to a new clamping range. To this end, HILMA clamping systems provide innovative solutions for a further automation benefit.

The adjustment is controlled by a volume measurement and can thus be fully automated, which means that manual set-up is omitted entirely.

Automated changing of clamping jaws

Clamping jaws can be changed automatically in HILMA clamping systems. Hydraulic and mechanical changing systems can be used for this purpose.

The process of automatically changing clamping jaws further reduces the machine idle time through the avoidance of manual operations and thus expands the application scope of the fixture.



Automated changing of fixtures

STARK zero point clamping systems are used to position and clamp the clamping fixtures on the machine table. Clamping and unclamping of the fixture are actuated hydraulically via a ROEMHELD clamping power unit whose control unit is connected to the robot controller.

Coupling of the media connections is implemented automatically directly in the zero point clamping system. Blowing and cleaning of the contact surfaces is also automated.

A STARK zero point clamping system can also be installed on the robot arm to accommodate and change clamping fixtures.



Mechanical clamping systems

A further innovation of the ROEMHELD Group is the automation of mechanical clamping systems.

Whether horizontal or vertical machining centre, concentric or clamped against the fixed jaw, the HILMA product range provides the perfect system selection.

The new generation of mechanical clamping systems with clamping strokes up to 100 mm and clamping forces up to 35 kN can be automated.



Automated setting of new clamping ranges

Automated changing of clamping jaws

Automated changing of fixtures

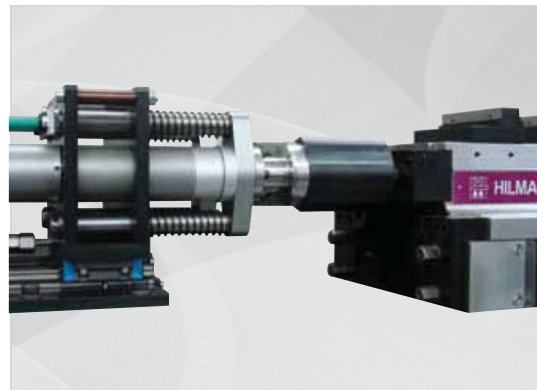
An mechanical automation solution can be used for the automated changing of jaws, setting of clamping ranges and changing of fixtures. The fact that the clamping systems do not require any energy supply is an additional benefit. Standard clamping systems from the HILMA range can be used on the tool machine or in the pallet storage. And it is also possible to use all clamping systems manually, without any automation.

A single screw system to actuate the clamping areas is installed in the vicinity of the machining centre. The linear stroke of the screw system is actuated by a pneumatic cylinder. All positions are monitored via limit switches. The screw system automatically finds its position on the spindle of the clamping system.

The control unit can be integrated in a superordinate control system using all conventional interfaces.

The programs are configured and triggered in sequence via the control unit:

- **Set-up:** Move the clamping system to a given measurement
- **Clamping:** Rotate the spindle until a defined torque is reached
- **Unclamping:** Open the clamping system by a given measurement
- **Basic position:** Pallets can be moved freely





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Further ROEMHELD components for automation – tried and tested and perfectly adapted to each other

In addition to its large selection of clamping systems, ROEMHELD also offers the matching, tried and tested components for controlling automation processes.

The provision of all main components from a single source ensures that the components are perfectly adapted to each other. This guarantees an optimum production result at modest investment costs.



Clamping power units

Our clamping power units are designed on the basis of standard components in accordance with the respective system requirements. They control the clamping and unclamping of the clamping fixtures, as well the change of clamping jaws and fixture.

They are particularly energy-efficient in intermittent operation and only supply hydraulic pressure when it is actually required.



Screw systems

In combination with the robot controller, the electrical screw systems ensure the smooth running of the automation processes.

A wide range of clamping forces can be set by means of the torque sensor.

A rotation angle monitor enables specific clamping ranges and positions to be set.



Control units

In combination with the robot controller, our electrical control units ensure the smooth running of the automation processes.

They control the clamping power unit and process the signals of the stroke measuring system on the HILMA clamping system AS 125 H sensor.



Media couplings

Our media couplings in the STARK zero point clamping systems ensure that energy is provided where it is required. They automatically connect the hydraulic, pneumatic and electrical supply lines to the fixtures.

ROEMHELD automation solutions – workpiece-specific and customized solutions can be implemented thanks to modular design

ROEMHELD automation solutions can be easily adapted to customer-specific requirements.

The modular design and the vast number of available components enable the entire system to be adapted individually to the workpieces to be machined and to the required level of automation.

Existing systems can be converted for new requirements and tasks with minimal effort.

**Please contact us.
We are glad
to advise you!**



Clamping technology. And more!
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Zero point clamping systems • Hydraulic cylinders • Hydraulic components • Clamping and industrial power units
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Assembly and drive technology • System solutions

Field-test comparison of automation solutions: ROEMHELD Pallet systems

The level of automation and the non-productive times of both systems are compared using an example from the field.

The comparison is based on the following data:

Pallet system with 32 pallets, 2-fold clamping of each workpiece, 15-minute machining time per workpiece.

The second table shows further differences between the systems which have a direct influence on workpiece cost and quality.

Working steps	Degree of automation		Non-productive times		Further system differences		
	ROEMHELD	Pallet system	ROEMHELD	Pallet system	ROEMHELD	Pallet system	
Workpiece loading	●	○	5 s	15 s	Switch to another clamping system	●	○
Clamping	●		5 s	10 s	Runtime / < 5 min.	Yes	No
Pallet insertion	●	●	–	30 s	Continued usability of components	Yes	No
Pallet withdrawal	●	●	–	30 s	Machine runtime	unlimited	480 min.
Opening of clamping system	●	○	5 s	10 s	Full machining of workpiece	Yes	No
Workpiece unloading	●	○	5 s	10 s	Monitoring functions	Yes	No
Cleaning	●	○	10 s	10 s	Weight restriction	No	Yes
2nd clamping	●	○	30 s	115 s			
Workpiece loading (different size)	●	○	–	120 s			
Change of clamping jaw	●	○	10 s	30 s			
Setting new clamping range	●	○	5 s	15 s			
Cleaning	●	○	10 s	10 s			
			Total:	85 s			405 s

● Automated process
○ Manual process

Thanks to the higher degree of automation, a total of 320 seconds or around 80% of non-productive time can be saved with the **ROEMHELD** automation solution.

System benefits of the **ROEMHELD** automation solution which will save you time and money.