

*powertrain*hone  
Precision Honing Systems



 Excellence in motion. Future in mind.

## Systems for honing operations

For today's production systems, the challenge is no longer to simply provide and optimize individual machines. On the contrary, the focus is placed on entire process chains, which must be implemented through the interplay between related, intelligently interlinked production elements. With our robust and highly productive processes, we see ourselves as a supplier of turnkey solutions. Our range of honing systems covers pre-control stations, honing machines, re-measuring machines and automation systems – all from a single source.

The powertrainhone series is used in the automotive industry in particular. Its typical areas of application include all types of cylinder crankcases in which the cylinder surfaces and the crankshaft bores need to be machined. The efficiency of modern combustion engines can be increased

by means of the design of cylinder surfaces and their geometry.

## Performance at the highest level

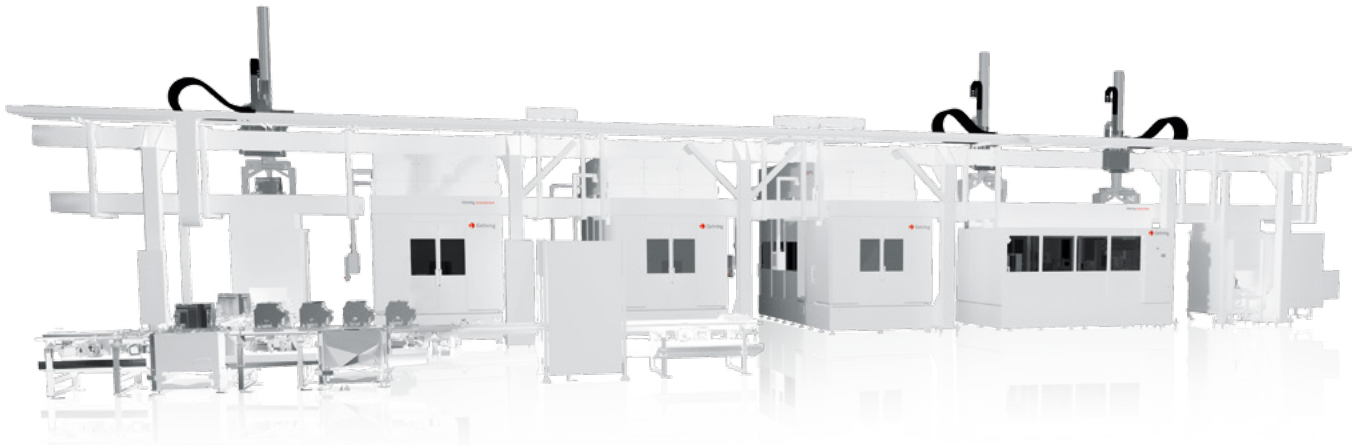
The modern powertrainhone machine system can be used for all established honing processes. In addition to conventional honing operations, innovative processes such as form-honing can also be used. The high movement and cutting speeds, together with optimized processes, significantly increase productivity. Whether as a stand-alone machine or an interlinked production line, the modular concept provides maximum flexibility in the configuration of modern manufacturing solutions and boasts an optimized footprint. Standard functional assemblies combined with customer-specific solutions produce optimal results. The compact PT spindle unit with a powerful stroke drive and spindle drive combines efficiency and quality. It covers a wide range of possible

applications in a diameter range from 68 to 105 mm.

## High-precision technology with modern control system

Features such as a modern operator panel and a large open viewing area provide an overview of the system and outstanding ease of operation. Our honing control system was specially developed for honing and has become established all over the world. The software we developed in-house enables us to meet the highest process requirements and allows the individual components to interact optimally, such as for the cylindromatic or in-process measurement.

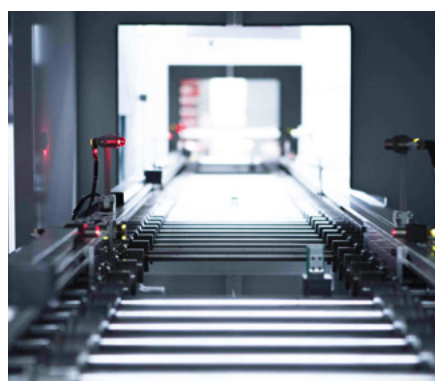
Gehring's honing control system makes it possible to control stroke speeds and switchover speeds. The modern, ergonomic operator panel with its large touchscreen



*Gehring system solution*



*Gehring gantry system*



*Gehring roller conveyor*



*Gehring pre-control station*

surface clearly and accurately displays the necessary process parameters and procedures. The multi-touch functionality makes operation as simple and self-explanatory as on a modern smartphone. When it comes to operating the machine, the customer is free to choose between the options that best meet their needs. We respond to your requirements, whether you need an additional measuring unit operator panel, a joint display on a Gehring Operator Panel or the combination of main and additional operator panel.

### The latest developments in digital technology

The Gehring Connection Module (GCM) – our solution for a high level of connectivity – is built into our machines as standard. The module provides secure and reliable access to your machine. Thanks to VPN and LTE/UMTS, our service team is able to provide remote support at any time. Our clients retain complete control of their data and the module can be switched on or off at any time.

### Intelligent tools for production

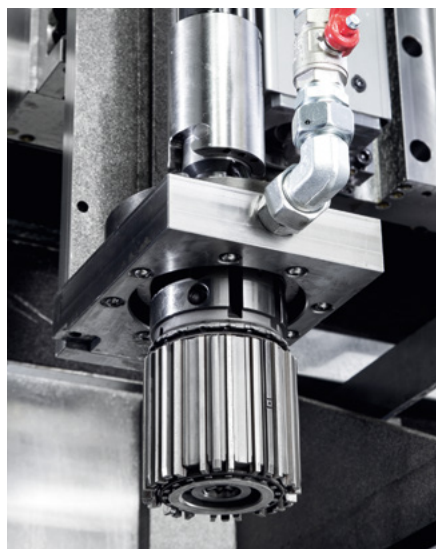
Gehring's new tool identification system guarantees a reliable process flow and simplifies the procurement

process for the wear parts required. The system automatically detects whether the right tool is being used for the process step in question, thereby guaranteeing that everything runs smoothly. The tool can be uniquely identified in the machine and all relevant data can be displayed on the large, modern multi-touch panel.

Thanks to continuous wear feedback, the procurement process is more efficient and easier to plan. This allows the Gehring honing tool with its stored history to be optimally prepared or the appropriate new tool to be provided.



Modern Gehring operator panel with multitouch functions



Gehring honing tool of the PT series



PT-module connected via Gehring conveyor

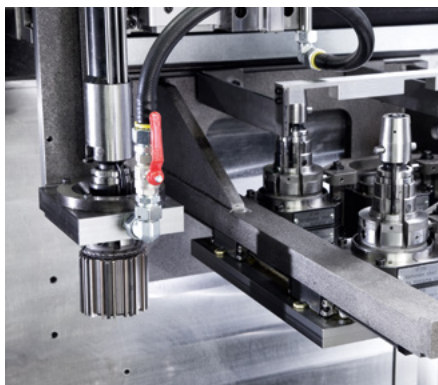
Technical data		PT 600	PT 600-X LR	Z 750-X LR	LSR 1750-1 LR
Stroke length	mm	600	600	750	1750
Diameter	mm	68 - 105	68 - 105	68 - 105	45 - 75
Spindle drive		Servo motor	Servo motor	Servo motor	Gear motor
RPM, max.	1/min	600	600	600	500
Stroke drive		Ball screw	Ball screw	Ball screw	Ball screw
Stroke speed, max	m/min	40	40	40	15
Spindle distance	mm	140	140	140	-

Subject to technical changes and variations in design and configuration.



## PT 600-X

The compact design and the attached control cabinet are typical of the small PT module. Equipped with either a rotary table, roller conveyor or long table, the compact machine provides space for up to two spindle units and two tool changers. The



*Tool changing system*

electromechanical feeding unit (EMZ) enables various feeding programs to be used to achieve the greatest possible dimensional accuracy and improvements to the shape. You can choose between the powered electromechanical feeding unit with force monitoring (EMZ-F) in single or double versions. On both versions, the honing operation is performed with „constant feeding force F“ at the feeding pin. The PT spindle units are characterized by their high material removal capacity and shutdown accuracy, resulting in short machining times. The in-process measurement integrated into Gehring’s tools is used to switch the tool off after reaching the required dimensions.

The electromechanical clamping device ensures that the workpieces are clamped without putting strain on them. A workpiece check and workpiece rinsing for the device can optionally be chosen. This guarantees that the workpiece is positioned and aligned properly.

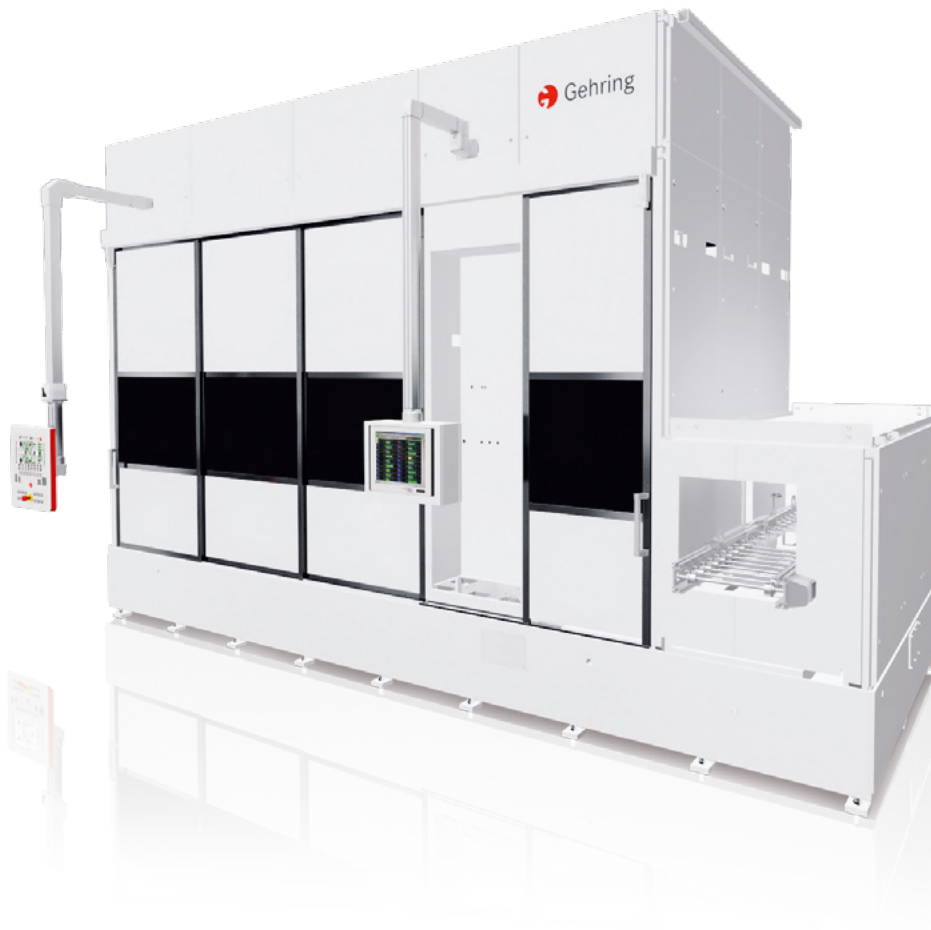
The workpiece can be transported by a gantry, roller conveyor or manually, depending on customer requirements. Thanks to Gehring’s own automation and measurement solutions, the customer can obtain the whole system from a single source. Gehring’s digital measurement technology is used for quality assurance purposes, while the various loading and unloading systems ensure short cycle times.

### Technical data

Required space (WxDxH)	mm	2400 x 2100 x 3600
Weight, net	t	appr. 10
Workpiece examples		Engine block

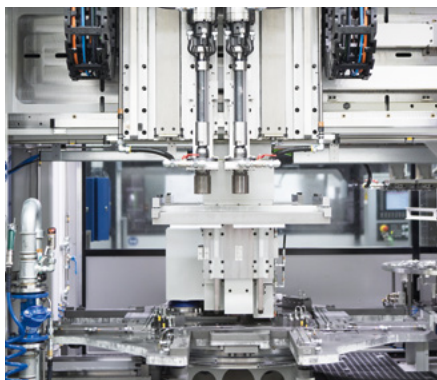
*Subject to technical changes and variations in design and configuration.*





## PT 600-X LR

The large PT module is designed for machining series blocks and provides space for up to four spindle units. The modular design allows for the corresponding scalability depending on production capacity, while the attached control cabinet means that



Machine interior with four honing units

the machine can be set up quickly and correctly. Plug connections are used instead of the conventional wiring. The standard assemblies used are easily accessible and the machine is designed to be simple to maintain.

The arrangement of the individual stations and the lifting/rotary table ensure short auxiliary process times in the procedure. The automatic tool changer is designed for up to six tools per spindle. The temperature control for the zero ring packages ensures the corresponding accuracy and the workpiece temperature can also be controlled as an option. Depending on the process and customer requirements, it is possible to choose between single EMZ-F and double

EMZ-F. The in-process measurement integrated into Gehring's tools is used to switch the tool off after reaching the required dimensions, while the high material removal capacity and shutdown accuracy of the PT spindle units result in short machining times.

The workpieces are clamped using the electromechanical clamping device without putting strain on them. The workpiece check, available as an option, and the workpiece rinsing for the device also guarantee that the workpiece is positioned and aligned properly. Thanks to Gehring's own automation and measuring systems, the customer can obtain the entire system from a single source.

### Technical data

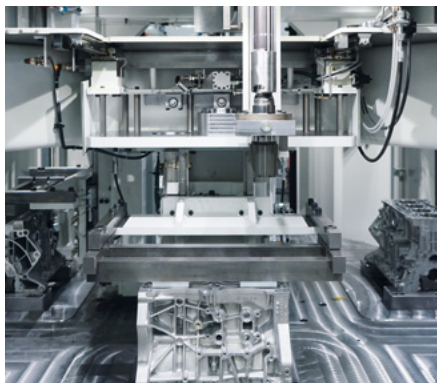
Required space (WxDxH)	mm	2400 x 6200 x 3895
Weight, net	t	appr. 26
Workpiece examples		Engine block

Subject to technical changes and variations in design and configuration.



## Z 750-X LR

The Z 750 modules enable the entire honing operation to be performed on a single machine. Thanks to its three machining stations with up to two honing spindles each and the rotary table, short auxiliary process and cycle times are guaranteed.



Machine interior with three honing stations

A direct maintenance area provides easy access to the spindles for servicing purposes.

Tools can be changed reliably with the built-in tool changing system. The pneumatic gauging system, consisting of the air-gauging tool and the Gehring digital transducer, operates with a high level of accuracy. A re-measuring station for cylinder bores can also be integrated as an option.

Depending on the process and customer requirements, it is possible to choose between the single EMZ-F, double EMZ-F and hydraulic automatic feed (HAZ) as available feed options. The electromechanical clamping

device controls the feeding power and guarantees that the workpieces are clamped without putting strain on them. In order to ensure that the workpiece is positioned and aligned properly, a workpiece check and workpiece rinsing for the device can also be chosen as an option.

The workpiece can be transported by Gehring's own gantry systems or roller conveyors, depending on customer requirements.

### Technical data

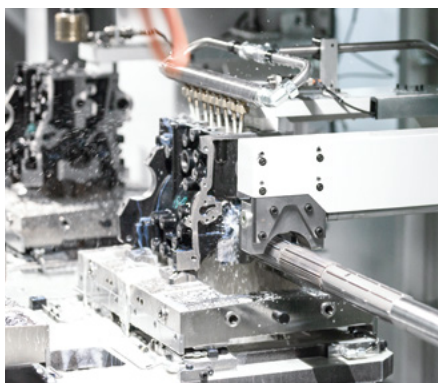
Required space (WxDxH)	mm	2600 x 3550 x 5660
Weight, net	t	appr. 21
Workpiece examples		Engine block

Subject to technical changes and variations in design and configuration.



## LSR 1750-1 LR

The compact design and the attached control cabinet are typical of the new LSR module. This is designed for horizontal honing of crankshaft bores in cylinder crankcases with diameters ranging from 48 to 70 mm. If these are series blocks, the



*Honing of the crankshaft*

built-in re-measuring station can measure both crankshaft bores and cylinder bores.

After the machine is loaded, the workpiece is cycled through the machine with a rotary table. The first step that follows is the honing of the crankshaft bore. While the re-measuring station measures the crankshaft bores and cylinder bores on the finished workpiece, the honing station has already moved on to machine the next workpiece. The friction honing process used is designed to improve geometrical and positioning accuracy. Powered by a drive motor and equipped with an electromechanical feeding unit, ideal machining results are achieved.

The HSK 100 tool adapter and the practical tool storage for up to four tools ensure short changeover times and user-friendly handling. To make the honing process simpler to set up, the honing unit can be moved along all three axes. In addition to the honing process, other special processes, such as brushing, can be integrated.

### Technical data

Required space (WxDxH)	mm	2980 x 6200 x 3250
Weight, net	t	appr. 22
Workpiece examples		Engine block

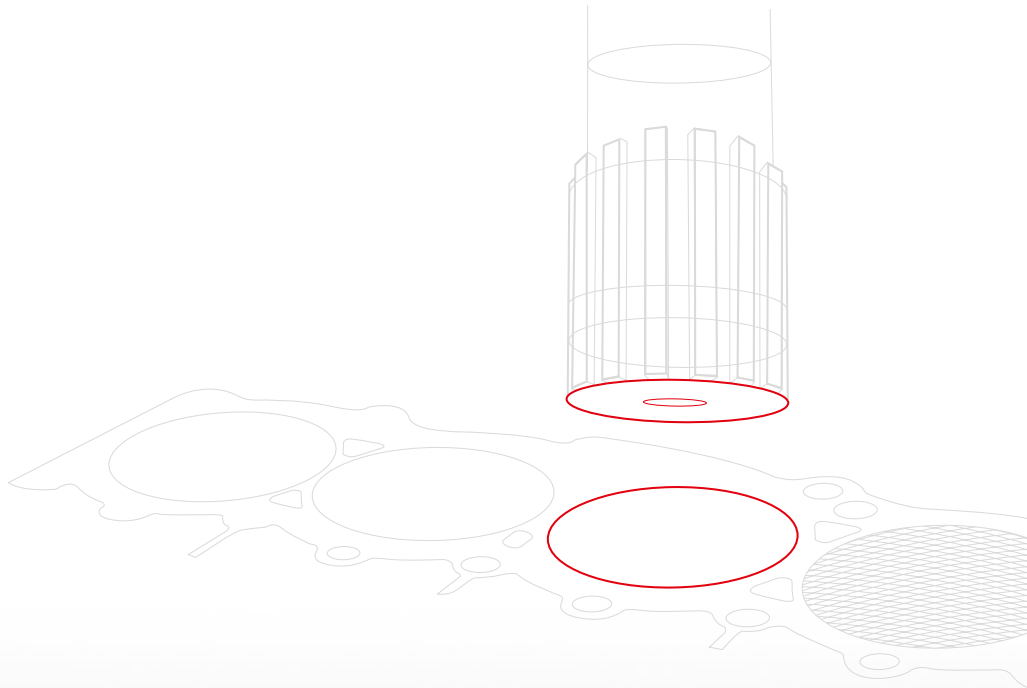
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## Global presence

With our presence on three continents and a total of 14 subsidiaries, we are very well-positioned and primed for the increasing globalization of the world economy.

Our representatives are at work worldwide and can also provide you with expert support as your direct contact in the market.

We are there wherever you need us and we can provide you with the ideal solution when it comes to honing and laser technologies for additional areas of application, too.



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