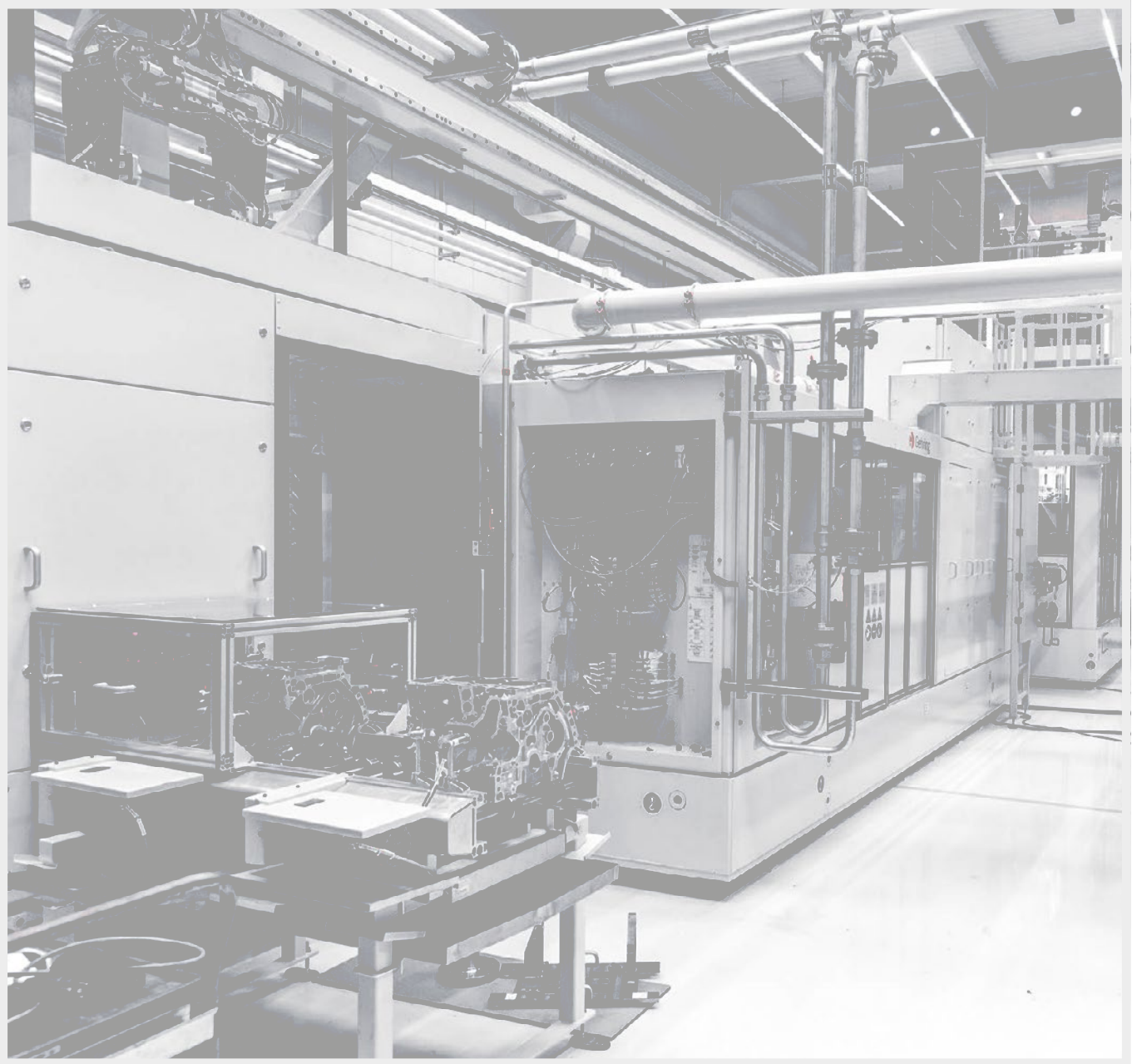


Powertrainhone

Precision honing systems

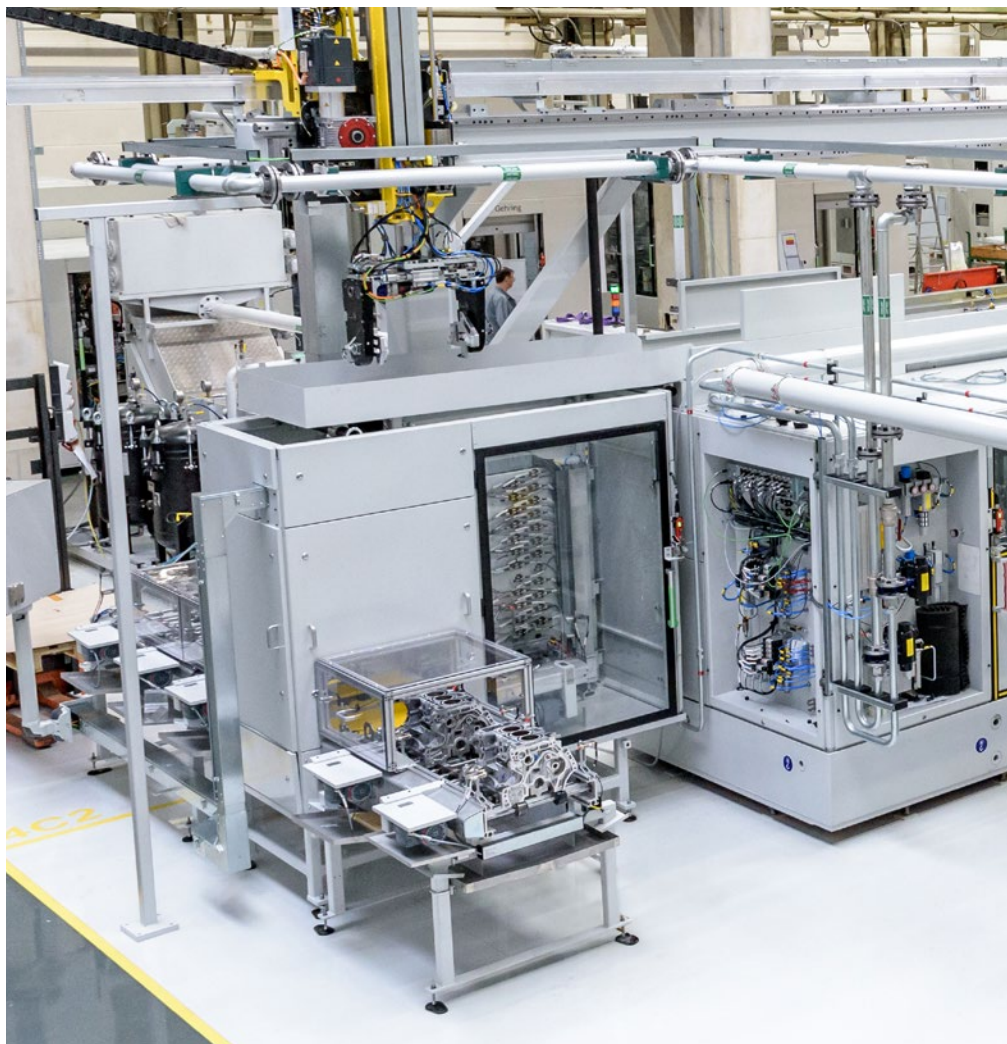


 **Gehring**

Excellence in motion.
Future in mind.

POWERTR

Powertrainhone



Performance at the highest level

The modern powertrainhone machine system can be used for all known honing processes. In addition to conventional honing, it can also be used for innovative processes such as form honing. The high traversing and cutting speeds as well as optimized processes significantly increase

TRAINHON



productivity. Whether as a stand-alone machine or interlinked production line - the modular concept offers maximum flexibility in the configuration of modern production solutions and is footprint optimized. Standard functional assemblies combined with

customer-specific solutions lead to an optimal result. The compact PT spindle unit with powerful stroke and spindle spindle drive combines efficiency and quality. It covers a wide range of applications in the diameter range from 68 to 105 mm.

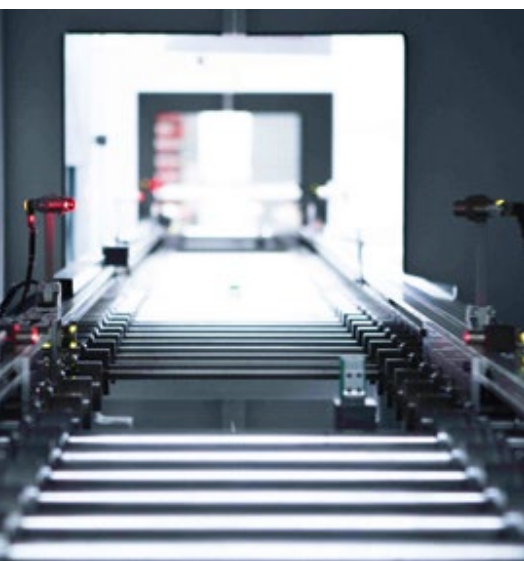
Precision honing systems



System installations for honing processes

In today's production systems, the challenge is no longer just to provide and optimize individual machines. Rather, the focus is on entire process chains that must be realized through the interaction of interconnected, intelligently networked production elements. We see ourselves as a supplier of ready-made complete solutions with robust and highly productive processes. Our offering for honing systems ranges from pre-inspection stations to honing and post-measuring machines to automated interlinking - all from a single source.

The powertrainhone series is used in particular in the automotive industry. Typical areas of application are all types of cylinder crankcases, where the cylinder tracks are machined as well as the main bearing bores. The efficiency of today's internal combustion engines can be increased via the surface and geometry design of cylinder tracks.



High-precision technology with modern control system

Features such as a modern control panel and a large open viewing area provide an overview and best operability. Our honing control was developed especially for honing and has proven itself worldwide. With our specially developed software, we meet the highest process requirements and enable optimal interaction of the individual components, such as cylindromatics or in-process measuring.

The Gehring honing control system enables controlled stroke speeds and changeover accuracies. The modern, ergonomic control panel with a large touch surface displays the necessary process parameters and sequences sharply and precisely. The multi-touch functionality makes operation as simple and intuitive as on a modern smartphone. With regard to the operation of the machine, the customer can flexibly choose between the options that suit his needs. Whether an additional control panel for the measuring computer, joint display on a GOP or the combination of main and secondary control panel, we cater to your needs.

ON SYSTEMS

Digitally up to date

Discover the Gehring Connection Module (GCM) - your solution for maximum connectivity! Integrated as standard in our machines, the module provides secure and reliable access to your machine.

Thanks to VPN and LTE/UMTS, we enable you to receive remote support from our service staff at any time. You always retain full data control, and the module can be flexibly switched on or off - according to your needs. Stay connected and benefit from modern technology for optimal machine performance.



Intelligent tools for production

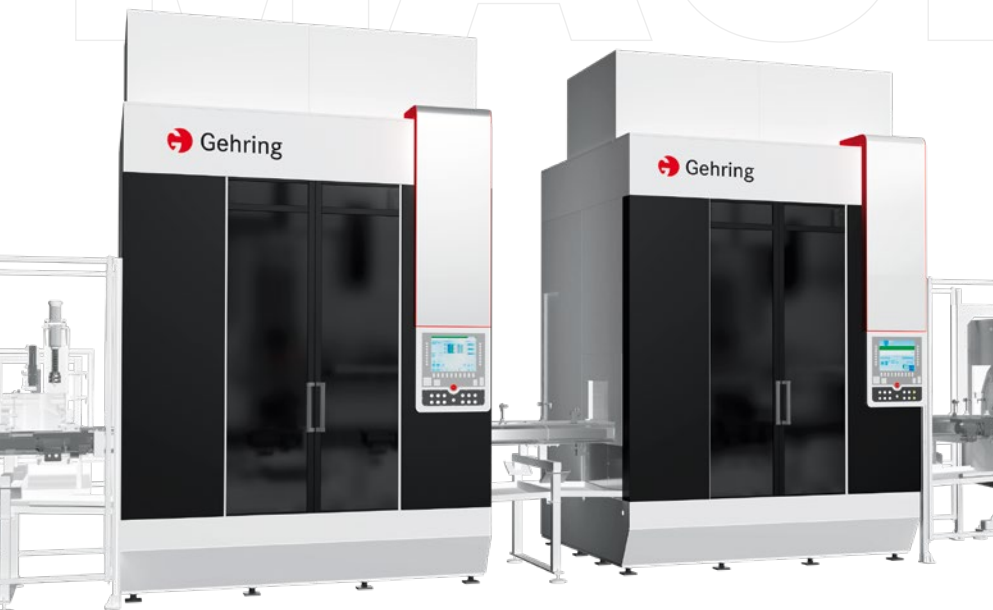
The new Gehring tool identification system guarantees a reliable process flow and simplifies the procurement process for necessary wear parts. The system independently detects whether the right tool is being used for the appropriate process step, thus guaranteeing a clean process flow. In the machine, the tool can be clearly identified and all relevant data displayed on the modern, large multi-touch panel.

The procurement process becomes more efficient and easier to plan thanks to continuous wear feedback. In this way, the Gehring honing tool can be optimally prepared with the stored history or the appropriate new tool can be provided.



Efficient machine configuration

A look at our various honing systems



Technical Data

Stroke length (mm)

Honing diameter (mm)

Spindle drive

Speed, max. (1/min)

Stroke drive

Stroke speed max (m/min)

Spindle distance (mm)

Space requirement (w x d x h) (mm)

Weight, net (t)

Noise emission

Honing control

Your benefits

- Honing spindles can be moved independently
- Rigid spindle bearings
- Automatic tool change systems for up to 12 tools
- Short machining times due to high cutting speeds
- Use of standard function groups
- Machining of thermally coated functional surfaces
- High stock removal rate
- High cut-off accuracy
- Optional internal tool cooling
- Spindle drive via servo motors
- Latest honing control technology with simple, user-friendly user interface
- Direct force-controlled electro-mechanical infeed systems (EMZ-F)
- Direct in-process measuring system for dimensional and form control

TRAIN

FUNCTIONAL

PT 600	PT 600-X LR	Z 750-X LR	LSR 1750-1 LR
600	600	750	1750
68 - 105	68 - 105	68 - 105	45 - 75
Servo motor	Servo motor	Servo motor	Gear motor
600	600	600	500
Ball screw	Ball screw	Ball screw	Ball screw
40	40	40	15
140	140	140	-
2400 x 2200 x 3900	2400 x 6000 x 3900	2600 x 3750 x 5660	3800 x 6250 x 3250
Approx. 10	Approx. 22	Approx. 21	Approx. 15
78 dB(A)	78 dB(A)	78 dB(A)	78 dB(A)
Gehring Control Unit (GCU 3.0)			

Subject to technical changes and deviations in design and equipment

Simplest configuration

- Transfer system solution or modular linked single modules
- with flexible number of spindles
- for in-line and V-motors
- with automatic tool change system
- can be combined with various Gehring loading and unloading systems for example roller conveyors, gantry loaders, robots and so on



Gehring Control Unit (GCU 3.0)

- Proven „look and feel in operation
- Fast start-up after rebuild without start-up problems or training requirements for your operators
- Higher processing speeds and significantly higher processor performance
- New GCU 3.0 with state-of-the-art technology and better functional stability thanks to EtherCat

PT 600-X



removal rates and shut-off accuracy characterize the PT spindle units and result in short machining times. The integrated in-process measurement in the Gehring tools is used for dimensional cut-off.

The electromechanical clamping device ensures deformation-free clamping of the workpieces. Optionally, a support control and support flushing of the fixture can be selected. This guarantees clean positioning and alignment of the workpiece.

Depending on the customer's requirements, the workpiece can be transported via gantry, roller conveyor or manually. Thanks to Gehring's own automation and measuring solutions, you receive the complete system from a single source. The digital Gehring measuring technology is used for quality assurance and the different loading and unloading systems ensure short cycle times.

Technical Data

Space requirement (w x d x h) (mm) 2400 x 2200 x 3900

Weight, net (t) Approx. 10

Workpiece example Cylinder crankcase

Subject to technical changes and deviations in design and equipment

The compact design and the attached control cabinet are typical for the small PT module. Optionally equipped with a rotary table, roller conveyor or long table, the compact machine offers space for up to two spindle units and two tool changers. Thanks to the electromechanical infeed unit

EMZ, the greatest possible dimensional accuracy and shape improvements can be achieved via various infeed programs. The power-operated variants single EMZ-F and double EMZ-F are available. In both variants, honing is performed with „constant infeed force F" on the infeed pin. High stock

PT 600-X LR



The large PT module is designed for machining row blocks and offers space for up to four spindle units. The modular design ensures the appropriate scalability depending on production capacities, and thanks to the plugged-in control cabinet, the machine can be set up quickly and without errors. Plug-in connections are used instead of the usual wiring. The standard assemblies used are easily accessible and the machine is designed to be maintenance-friendly.

The arrangement of the individual stations and the lift/turn table ensure short non-productive times in the process sequence. The automatic tool changer is designed for a maximum of six tools per spindle. The temperature control of the zero ring packs ensures the corresponding accuracy and the workpiece can also be optionally temperature controlled. Depending on the process and customer requirements, a choice is made between single EMZ-F and double



Technical Data

Space requirement (w x d x h) (mm) 2400 x 6000 x 3900

Weight, net (t) Approx. 22

Workpiece example Cylinder crankcase

Subject to technical changes and deviations in design and equipment

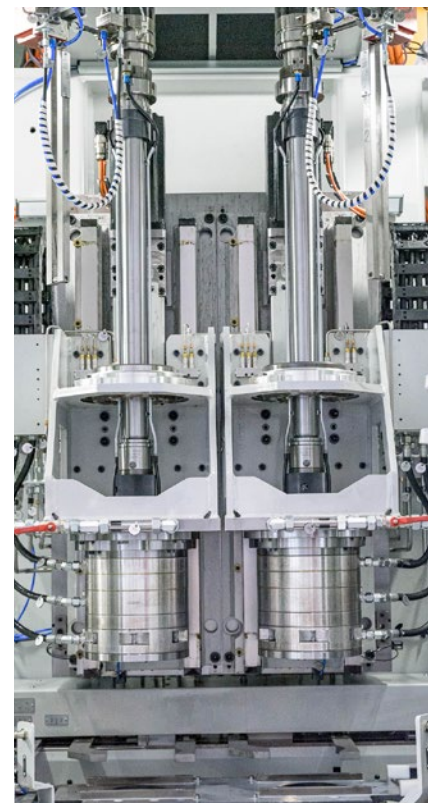
EMZ-F. The integrated in-process measurement in the Gehring tools is used for dimensional cut-off, and the high stock removal rate and cut-off accuracy of the PT spindle units result in short machining times. The workpieces are clamped deformation-free with the electromechanical clamping device. The optionally

available support control and support flushing of the fixture also ensure clean positioning and alignment of the workpiece. Thanks to our own automation and measuring systems, the customer receives the entire interior system with four spindle units from a single source.

Z 750-X LR



The Z 750 module enables complete honing machining in one machine. Thanks to the three machining stations with a maximum of two honing spindles each and the lifting rotary table, short non-productive and cycle times are ensured. The spindles are accessible via a direct maintenance area for easy servicing.



Tool changes are carried out reliably with the integrated tool change system. The pneumatic measuring system, consisting of the air-measuring tool and the Gehring digital transducer, operates with high accuracies. In addition, a re-measuring device for cylinder bores can be integrated as an option.

Depending on the process and customer requirements, a choice is made between the infeed options single EMZ-F, double EMZ-F and hydraulic automatic infeed HAZ. The electromechanical clamping device meters the infeed force and guarantees deformation-free clamping of the workpieces. To ensure clean positioning and alignment of the workpiece, a support control and support flushing of the device can be selected as an option.

Depending on customer requirements, the workpiece transport can be carried out via Gehring's own gantry systems or roller conveyors.



Technical Data

Space requirement (w x d x h) (mm)	2600 x 3750 x 5660
Weight, net (t)	Approx. 21
Workpiece example	Cylinder crankcase

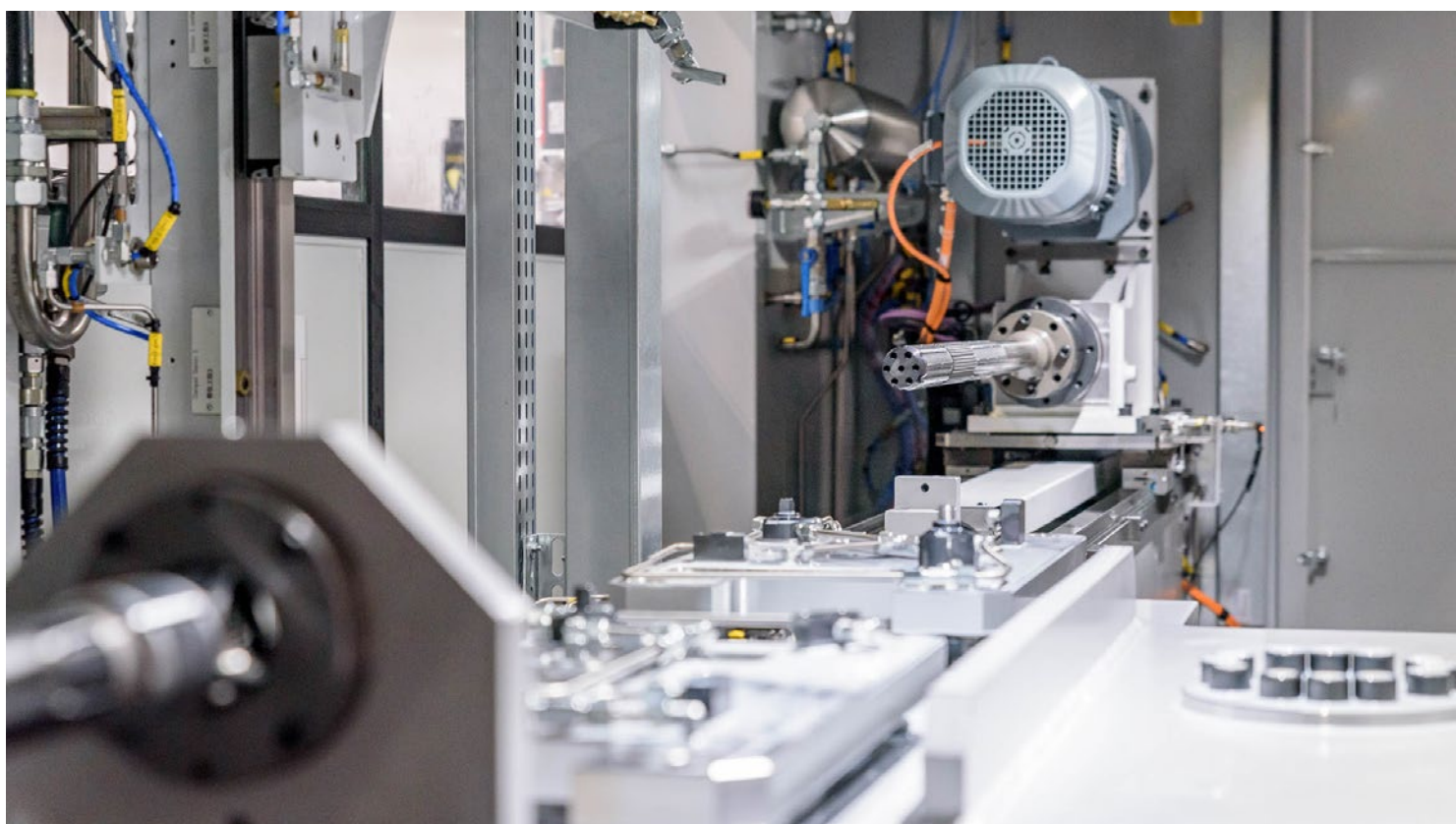
Subject to technical changes and deviations in design and equipment

LSR 1750-1 LR



The compact design and the hinged control cabinet are typical of the new LSR module. This is designed for horizontal honing of the crankshaft bores of cylinder crankcases in the diameter range from 48 to 70 mm. If these are in-line blocks, the integrated re-measuring device can measure both crankshaft and cylinder bores.

After loading the machine, the workpiece is cycled through the machine by a rotary table. The first step is honing of the crankshaft bore. While the re-measuring station measures the crankshaft and cylinder bores of the finished workpiece, the honing station is already machining the next workpiece. The friction honing process used serves to improve the accuracy of shape and position. Driven by a geared motor and equipped with an electromechanical infeed device, optimum machining results are achieved.



The HSK 100 tool connection and the practical tool rest for up to four tools ensure short changeover times and user-friendly handling. For simplified setup of the honing process, the honing unit can be moved in all three axes. In addition to the honing process, other special processes such as brushing can be integrated.

Technical Data

Space requirement (w x d x h) (mm)	3800 x 6250 x 3250
Weight, net (t)	Approx. 15
Workpiece example	Cylinder crankcase

Subject to technical changes and deviations in design and equipment

SERVICE

Service



We know that your machines and tools are the key to your success and therefore it is important to us that they must always be in top condition. We offer you complete support in all service matters.

Our team of experienced technicians performs regular inspections to ensure that your machines and tools are working properly, and your production is running smoothly. We also offer other services to ensure that your machines and tools always remain in top condition:

- Hotline
- Retrofit
- Spare parts
- Training courses

GLOBAL Global presence PRESENCE



With a presence on three continents and a total of 14 branches, we are very well positioned and ideally equipped for the increasing globalization of the world economy.

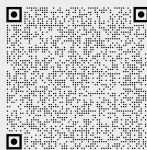
In addition, our representatives around the world provide competent support and are your direct contacts in the market.

Gehring locations

- Ostfildern (Germany)
- Naumburg (Germany)
- Paris (France)
- Farmington Hills (USA)
- Silao (Mexico)
- Shanghai (China)
- Bangalore (India)



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