4-axis machining in top form

THE H SERIES
HELLER solutions: Knowing how it’s done.

- Machining nickel/basic alloy
- Machining transmission cases
- Machining stator housing
- High performance machining
- Titanium machining
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Our quality pledge

MADE BY

HELLER

H series

Flexibly configurable 4-axis machining centres
The basis for quality and precision for each HELLER solution is a simple principle: HELLER machines produce HELLER machines.

Our machining centres evolve within a worldwide production network that manufactures to the high HELLER quality standards. We develop and produce ourselves all components that ensure the reliability, accuracy and quality of a HELLER machine. Especially when it comes to the daily availability of your HELLER, we consider the deepest vertical integration paramount. Therefore: Made by HELLER – a quality seal on which you can rely.

**F series**

5-axis production machines with and without pallet changer

**C series**

5-axis milling/turning centres for complete machining
The compact and powerful machining centres are ideal for a large range of parts and materials. From individual part through to large series production. From light alloy machining to heavy-duty cutting. Designed for stable processes with adapted speeds, fully loadable even at the thresholds.

High-grade standardised series, which can nonetheless be individually configured.

Machine sizes from H 2000 to H 16000 with pallet sizes up to 1,250 x 1,600 mm and a maximum pallet load of 8,000 kg.

Chip disposal for highly productive applications, configurable to customer requirements from a wide range of options.

Proven and perfected operation and cost-optimised maintainability.

Technical added value included in the basic scope of machines.
### Maximum loading on a pallet (kg)

| Pallets (mm x mm) | 400 x 500 | 500 x 630 | 500 x 630 | 630 x 630 | 630 x 630 | 800 x 800 | 1,000 x 1,000 | 1,000 x 1,000 | 1,250 x 1,600 |
|-------------------|-----------|-----------|-----------|-----------|-----------|-----------|              |              |              |
| X (mm)            | 630       | 800       | 800       | 800       | 1,000     | 1,000     | 1,250       | 1,600       | 2,400        |
| Y (mm)            | 630       | 800       | 800       | 800       | 1,000     | 1,000     | 1,200       | 1,400       | 1,600        |
| Z (mm)            | 630       | 800       | 800       | 800       | 1,000     | 1,000     | 1,100       | 1,300       | 1,600        |
| V (m³)            | 0.33      | 0.51      | 0.51      | 0.51      | 1.0       | 1.65      | 2.91        | 6.14        | 6.14         |
Every HELLER machine essentially comprises main components developed using FEM methodology. These include a machine bed optimised for stiffness and a mass-reduced column for high dynamics. At the same time, the vibration-optimised machine structure ensures the best surface quality during machining and long tool life.


Extremely rigid cast iron machine bed bears the X and Z axes

X-axis designed as a cast iron column

Powerful and precise machining units in the Y-axis – essentially with spindle growth compensation as standard

Pallet changer: Highly-accurate even under high load

Tool changer: Fast and precise even with high tool weights and moments of weight

Use of highly-accurate linear guides and absolute coded measuring system (glass measuring scales, rotary encoders)
Machining units

HIGHEST PRECISION

“Made by HELLER” machining units are among the core components of the machining centres that determine performance. This includes efficiency, accuracy, quality and precision.

- Spindle cooling always with precision cooling unit for maximum temperature stability
- Additional spindle growth compensation as standard
- Extraction of the IC coolant from the spindle for fast chip-to-chip times, clean work area and tools
- Established solution for the main spindle replacement thanks to the HELLER Zero Spindle system

Options

- Attachment head support (MSK) offers a larger support basis for supporting attachment heads and offers better rigidity
- HELLER facing slide as a full axis, integrated into the NC-controller, for contour and facing work
## MACHINING CENTRE

<table>
<thead>
<tr>
<th>H series</th>
<th>HSC 40/63 (High Speed Cutting)</th>
<th>SC 40/63 (Speed Cutting)</th>
<th>PC 40/63 (Power Cutting)</th>
</tr>
</thead>
<tbody>
<tr>
<td>H 2000</td>
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<td>H 4000</td>
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</table>

### Technical data

<table>
<thead>
<tr>
<th></th>
<th>Speed range rpm</th>
<th>Torque&lt;sup&gt;1)&lt;/sup&gt; Nm</th>
<th>Power&lt;sup&gt;1)&lt;/sup&gt; kW</th>
<th>Spindle taper SK/HSK-A/BT</th>
<th>HELLER Facing slide</th>
<th>HELLER attachment head support (MSK)</th>
<th>HELLER attachment head support (MSK) with additional clamping</th>
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<tbody>
<tr>
<td></td>
<td>5 – 24,000</td>
<td>40</td>
<td>25</td>
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<td>5 – 10,000</td>
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<sup>1</sup> S6 40%<br>
<sup>2</sup> S6 10%
### Technical Data

<table>
<thead>
<tr>
<th></th>
<th>SC 50/100 (Speed Cutting)</th>
<th>EEC 50/100 (Enforced Eco Cutting)</th>
<th>PC 50/100 (Power Cutting)</th>
<th>EPC 50/100 (Enforced Power Cutting)</th>
<th>HPC 50/100 (High Power Cutting)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed range (rpm)</td>
<td>5 – 24,000</td>
<td>5 – 16,000</td>
<td>5 – 10,000</td>
<td>5 – 12,500</td>
<td>5 – 8,000</td>
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<tr>
<td>Torque (Nm)</td>
<td>40</td>
<td>95</td>
<td>242</td>
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<tr>
<td>Power (kW)</td>
<td>25</td>
<td>40</td>
<td>38</td>
<td>52</td>
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<tr>
<td>Spindle taper</td>
<td>SK/63/–</td>
<td>40/63/40</td>
<td>40/63/40</td>
<td>50/100/50</td>
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</table>

1. Additional information for Enforced Power Cutting.
2. Additional information for High Power Cutting.
Tool management

Comprehensive know-how for your tools
Chain-type magazine

- Chain-type magazine with tool holders mounted on both sides in the double chain for optimised traversing dynamics
- Compact dimensions with high packing density for tools

Rack-type magazine

- Rack-type magazine with highly-dynamic loader for tool provisioning
- Short loading times thanks to optimised operating strategy

Tool changer

- Perfect interplay between tool changer and chain-type or rack-type magazine – for short chip-to-chip times and follow-on tool provisioning during machining
- Tools always precisely positioned for the tool change due to the traverse attachment acting as a link between the chain-type magazine and the tool changer; with the rack-type magazine, this function is performed by the loader

Options

- Tool break monitoring during machining for effective process reliability
- Setting during machining for selected magazines
- Tool shank cleaning
- Tool coding
- Measuring probe with radio or infrared technology

### Technical data

#### Tool holding fixture (SK/HSK-A/BT)

<table>
<thead>
<tr>
<th>Tool Ø1) (mm)</th>
<th>40/63/40</th>
<th>40/63/40</th>
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#### Bridge mounted tool Ø (mm)

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<tr>
<th>Length (mm)</th>
<th>4504)</th>
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<th>4504)</th>
<th>600 (8005))</th>
<th>600 (8005))</th>
<th>600 (8005))</th>
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<tbody>
<tr>
<td>Setting during machining3)</td>
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<td>incl.</td>
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#### Moment of weight2) (Nm)

| Weight6) (kg) | 12 | 12 | 12 | 12 | 25 (35) | 25 (35) | 25 (35) | 25 (35) |
| Moment of weight2) (Nm) | 10 | 10 | 10 | 10 | 30 (50) | 30 (50) | 30 (50) | 30 (50) |
| Setting during machining3) | – | – | – | – | incl. | incl. | incl. | incl. |

### Chain-type magazines

<table>
<thead>
<tr>
<th>Chain-type magazine</th>
<th>Chain-type magazine with tool holders mounted on both sides in the double chain for optimised traversing dynamics</th>
<th>Rack-type magazine with highly-dynamic loader for tool provisioning</th>
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#### Rack-type magazines

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<td>H 14000</td>
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<tr>
<td>H 16000</td>
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</tbody>
</table>

### Notes

1) Adjacent places free/all spaces occupied
2) Relative to the tool gripper groove
3) HZP= During machining
4) Observe limited tool length for H 2000
5) For machine sizes upwards of H 8000
6) Observe overall load capacity

- Standard
- Option
- unavailable
- optional values
High accuracy and process stability
Pallet changer

- Optimised power grip due to fork shape of the swivel traverse for total loads of up to 8 t
- Total load up to 16 t with slide/swivel pallet changer
- Air nozzles on the swivel traverse for chip clearance
- Optional cleaning of functional surfaces at rotary table and setting station with maintenance function

NC rotary feed table

- For demanding 4-axis machining operations with worm gear drive for optimised damping, without compromising rigidity
- Highly reliable tilting moments thanks to compact design
- Rotary table clamping with oil-hydraulically actuated diaphragm brake
- High tangential and rotary milling torques
- Rotary table positioning through direct path measurement with absolute rotary encoder
- Air blast ensures cleanliness at pallet supports, pallet locks and coupling points for media transfer
- Pallet alignment via sword and full index for consistent clamping and alignment quality
- Optionally available "Media interface" for hydraulic workpiece clamping to 60 bar, 200 bar or 200 bar with proportional valve technology

Workpiece setting station

- Friction-locked 4 x 90° indexing at the setting station with foot release
- Optional automatically rotating NC setting station with automatically actuated setting station doors
- Optional pneumatic location check, unclamp or positioning check available
- Optionally available "Media interface" for hydraulic workpiece clamping at the workpiece setting station to 60 bar or 200 bar
Chip conveyor and coolant unit

Expandable with scraper conveyor or hinge band conveyor - depending on machining process requirements.

Coolant units in paper band filter or vacuum rotation filter technology.

- Cooling lubricant high pressure to 50 bar or 70 bar
- Internal coolant supply with up to 7 pressure stages programmable in the NC program
- High coolant unit tank volumes and high volumetric flows

Optionally additional coolant cooler for even higher process reliability through thermal stability.
Work area

H 2000 - H 6000: Unrestricted chip evacuation below the spindle and central conveyor for fast chip removal and increased production

H 8000 - H 16000: Optimised chip disposal from the work area by 3 spiral conveyors

Continuous self-cleaning effect of the moved concertina covers by stainless steel louvres

Extensive flushing nozzles during wet machining for keeping workpiece and work area clean as standard

Additional flushing of the machine bed

Easy to clean thanks to good access to the work area

Air and flushing gun as standard

Extraction of lubricants from the work area is optionally available
Operation

- Optimised availability thanks to more reliable and more convenient operation
- Optimally accessible operating stations
- Optionally with screen blow-off device on the main operating door

Workpiece setting station

- Short distance to the centre of the setting station for convenient handling
- Automatic setting/desetting sequence for increased process reliability and short idle times
- Control panel is ergonomically-integrated in the guard panels
- Easy-access doors to the setting station with linear guide

Tool setting

- Tool setting at the magazine when spindle is running
- Optionally-available: User-friendly operating panels
Sinumerik 840D solution line and Fanuc 31i-B

- Highly user-friendly
- Operating modes 2 and 3 included in standard scope of supply
- Integrated pallet and program management
- User-guided setup functions
- Automatic homing

Trust is good – Control is even better

- HELLER IPM (Integrated Process Monitoring) for process, collision and tool break monitoring
- Parallel tool break monitoring during machining
- RDS – Remote machine diagnostics, incl. coolant unit
- CDS – Condition Monitoring

Functions for practical use

- Convenient programming with HELLER technology cycles (boring, milling, measuring)
- Order management/management of multiple clamping
- Alternative strategy (program restart e.g. after tool break)
- Tool requirements planning
- "Milling" technology package
- Automated setting/desetting sequence
The concentration of supply units and maintenance points at just a few locations ensures quick and easy inspection and operation.

A quick response HELLER spare parts service equates to the shortest possible production interruptions in an emergency.

All function-relevant systems and components are quickly and easily accessible. Easily removable guards and positioning designed for maintenance purposes guarantees access by a single action.

The milling spindles can be quickly replaced thanks to HELLER’s tried and proven Zero Spindle system.
HELLER BLUE
Energy-efficient packages that guarantee you an energy saving of up to 30%

Regenerative drive systems, servomotors that make efficient use of the entire speed range and output-reduced valves have been standard at Heller for many years. Methods for optimising the topology of structural components (e.g. beds and columns) have also been consistently in use for a number of years.

Thus enabling rigidities to be increased and the mass of moved components to be optimised. The new HELLER BLUE energy-efficient packages allow — depending on the machining situation — further potentials to be systematically exploited. The more universal and versatile the machining tasks, the more important an adaptive (i.e. demand-regulated) current consumption of the periphery and main units, to be able to optimise various operating points.

HELLER BLUE basic
Basic supply for all H, F and C series
Use of IE2 motors with up to 5% less current consumption
Individual switch-off of individual consumers after a programmable specified time

HELLER BLUE supply
Needs-driven compressed air shut-off
Constant media and filter monitoring supported in uninterrupted machine operation

HELLER BLUE coolants
A frequency converter ideally adapts the volume flow of the high pressure coolant pump and hence also the energy consumption to your machining requirements

HELLER BLUE chill
Flexible control instead of ON/OFF circuit
Just like the coolant pump, the central cooler can also be controlled via a frequency converter in line with machining requirements
The current consumption is significantly reduced by a new compression technology

HELLER BLUE hydraulics
High pressure on demand
Booster technology in accordance with the pressure amplification principle ensures low-noise, energy saving high-pressure provisioning while simultaneously minimising heat admission into the hydraulic system
Options

TYPICAL "EXTRA" QUALITY FROM HELLER
Tool break monitoring during machining

Air nozzles on the swivel traverse, pallet support, pallet lock and coupling points for media transfer ensure optimised process reliability

Tool cleaning for chain-type magazine and rack-type magazine – chain-type magazine incl. cartridge flushing, rack-type magazine with brush and flushing options

Measuring probe for radio or infrared technology

HELLER attachment milling head support (MSK), also with additional clamping for critical operations or tools

HELLER facing slide for turning operations at a machining centre

HELLER Zero Spindle principle for fast main spindle replacement

Spindle growth compensation as standard for guaranteed machining accuracy
H series machines are productivity centres: They work highly accurately and effectively, remain extremely reliable even under constant load, and can be flexibly adapted to new tasks.

The same is true for our automation solutions. They have been designed to optimise your production process and maximise added value. The results are maximised effective machining time, optimised throughput and increased production output.

We offer automation solutions that perfectly match your requirements and that are constantly being refined. The corresponding cost and safety benefits of these concepts are passed directly on to you.

The offer ranges from simple pallet magazines to pallet rack systems through to flexible robotic cells for complete workpiece handling.

- Overhead gantry loader
- Fully automatic loading via mobile robot
- Pallet rack system
- Pallet and tool automation system
- Rotary pallet magazine
- Semi-automated loading with balancer
Especially when it comes to global competition, maximum productivity is now considered to be the key success factor in machining. Achieving maximum productivity hinges on the interplay between several aspects: besides optimising production, especially the reduction of unplanned downtimes and increasing machine availability. That’s why HELLER machines and HELLER Services simply belong together. HELLER Services guarantees optimised machine availability for many years through its worldwide presence, fast reaction times and qualified support. You benefit from a comprehensive range of services.
HELLER Optimisation Packages

To increase the performance and productivity of HELLER machines in your facility, HELLER is offering you an extensive range of standardised optimisation packages. Through these packages, HELLER always provides the right answer to your optimisation requirement, i.e. in adapting to new production tasks. In the following areas:

- Machining unit
- Media supply
- Measuring probe
- Process optimisation
- Guard panels/machine frame
- Software/control
- Workpiece management
- Tool management
- Increased energy efficiency

HELLER Retrofit – new productivity

To making the resources available fit again for production life, we look at all relevant aspects of retrofitting:

- Status check and disassembly
- Overhaul of the basic machine
- Overhaul of the assemblies
- Conversion of the controller
- Overhaul of the control cabinet and new cabling
- Replace covers and guards
- Acceptance at factory prior to delivery

The result is always a (almost) new machine with higher productivity and safety. The benefit to you: A retrofit machine is covered by the same guarantees and rules of warranty or service availability as a new machine.

HELLER Training

A multitude of practical training sessions that qualify your employees to work on a HELLER machine - offered by the “HELLER Academy”. We also offer basic and advanced courses in the following areas:

- Operation
- Programming
- Maintenance

Upon request, HELLER Services can also provide customised, individual training on your own premises. In this case, the contents of this premium training programme will be adapted specifically to the needs of your company, and cover all HELLER specialist areas (technology, control technology and machine technology).

HELLER TPS – the modular service package

To provide you with optimal support as you maximise your productivity, HELLER has developed the TPS (Total Productive Services) modular service package. It comprises various service packages, which integrate seamlessly into your production system – always allowing for your maintenance strategy. You decide which of the three packages is the best solution for you:

- **Performance Package:** Annual manufacturer inspection
- **Maintenance Package:** Annual manufacturer maintenance
- **Full Service Package:** All Inclusive
HELLER product range

PRODUCTIVITY OVER THE FULL SPECTRUM

The H series: 4-axis horizontal machining

**H 2000**
X/Y/Z: 630 x 630 x 630 mm  
Pallet: 400 x 500 mm  
Pallet load: up to 800 kg

**H 4000**
X/Y/Z: 800 x 800 x 800 mm  
Pallet: 500 x 630 mm  
Pallet load: up to 1,400 kg

**H 4500**
X/Y/Z: 800 x 800 x 800 mm  
Pallet: 500 x 630 mm  
Pallet load: up to 1,400 kg

**H 5000**
X/Y/Z: 800 x 800 x 800 mm  
Pallet: 630 x 630 mm  
Pallet load: up to 1,400 kg

**H 6000**
X/Y/Z: 1,000 x 1,000 x 1,000 mm  
Pallet: 630 x 630 mm  
Pallet load: up to 1,400 kg

**H 8000**
X/Y/Z: 1,250 x 1,200 x 1,100 mm  
Pallet: 800 x 800 mm  
Pallet load: up to 2,000 kg

**H 10000**
X/Y/Z: 1,600 x 1,400 x 1,300 mm  
Pallet: 1,000 x 1,000 mm  
Pallet load: up to 4,000 kg

**H 14000**
X/Y/Z: 2,400 x 1,600 x 1,600 mm  
Pallet: 1,000 x 1,000 mm  
Pallet load: up to 4,000 kg

**H 16000**
X/Y/Z: 2,400 x 1,600 x 1,600 mm  
Pallet: 1,250 x 1,600 mm  
Pallet load: up to 8,000 kg

The HF series: Productivity in 5 axes

**HF 3500**
X/Y/Z: 710 x 750 x 710 mm  
Pallet: 400 x 500 mm  
Pallet load: up to 550 kg

**HF 5500**
X/Y/Z: 900 x 950 x 900 mm  
Pallet: 500 x 630 mm  
Pallet load: up to 750 kg
The F/C series: 5-axis complete machining

**FP 4000**
- X/Y/Z: 800 x 800 x 1,045mm
- Pallet: 500 x 630mm
- Pallet load: up to 1,400kg

**CP 4000**
- X/Y/Z: 800 x 800 x 1,045mm
- Pallet: 500 x 630mm
- Pallet load: up to 1,400kg

**FP/FT 6000**
- X/Y/Z: 1,000 x 1,000 x 1,300mm
- Pallet: 630 x 630mm / Ø 1,000mm
- Pallet/table load: up to 1,400kg

**CP/CT 6000**
- X/Y/Z: 1,000 x 1,000 x 1,300mm
- Pallet: 630 x 630mm / Ø 1,000mm
- Pallet/table load: up to 1,400kg

**FP/FT 8000**
- X/Y/Z: 1,250 x 1,200 x 1,400mm
- Pallet/table: 800 x 800mm / Ø 1,100mm
- Pallet/table load: up to 2,000kg

**CP/CT 8000**
- X/Y/Z: 1,250 x 1,200 x 1,400mm
- Pallet/table: 800 x 800mm / Ø 1,100mm
- Pallet/table load: up to 2,000kg

**FP 10000**
- X/Y/Z: 1,600 x 1,400 x 1,600mm
- Pallet: 1,000 x 1,000mm
- Pallet load: up to 4,000kg

**CP 10000**
- X/Y/Z: 1,600 x 1,400 x 1,600mm
- Pallet: 1,000 x 1,000mm
- Pallet load: up to 4,000kg

**FP 14000**
- X/Y/Z: 2,400 x 1,600 x 1,600mm
- Pallet: 1,000 x 1,000mm
- Pallet load: up to 4,000kg

**FP 16000**
- X/Y/Z: 2,400 x 1,600 x 1,600mm
- Pallet: 1,250 x 1,600mm
- Pallet load: up to 8,000kg

**The MC series: Highly productive series production**

**MC 20**
- X/Y/Z: 800 x 750 x 800mm
- Table: Ø 520mm
- Table load: 500 / 800kg

**The RFK / DRZ / RFN series: Crankshaft and camshaft manufacturing**

**RFK**
- External and internal milling of crankshafts

**DRZ**
- Turn-chasing of crankshafts

**RFN**
- External milling of camshafts

**Process modules and special solutions: Productivity across the full range**

**CBC**
- Coating of cylinder bores of automobile engines

**MPC 400**
- Head Changer System for multispindle manufacturing processes

**TRS 4000**
- Stand-alone machine for transferlines, designed for high volumes

**VKM (Wenzler)**
- Vertical-chamber machine with 5 axes for the manufacturing of structural parts