HELLER

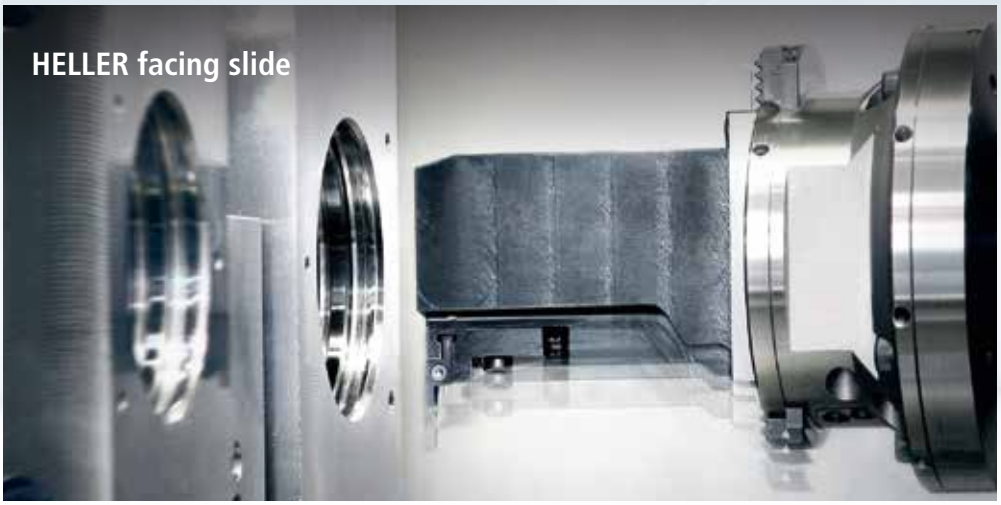
Machining centres

The H series

4-axis machining in top form

HELLER solutions:
Knowing how it's done.

HELLER solutions: Knowing how it's done.

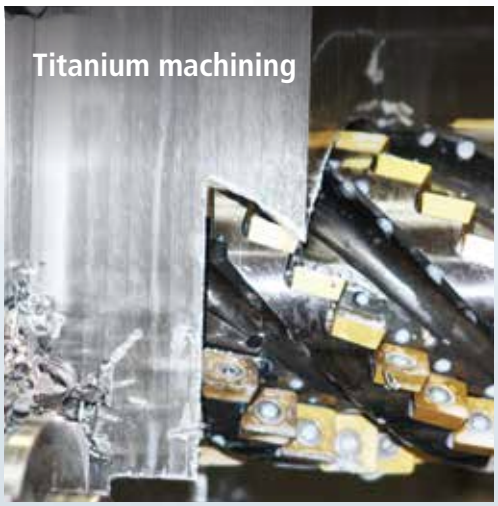

HELLER facing slide


Machining nickel-based alloy


Machining stator housing


Machining transmission case


High performance machining


Titanium machining

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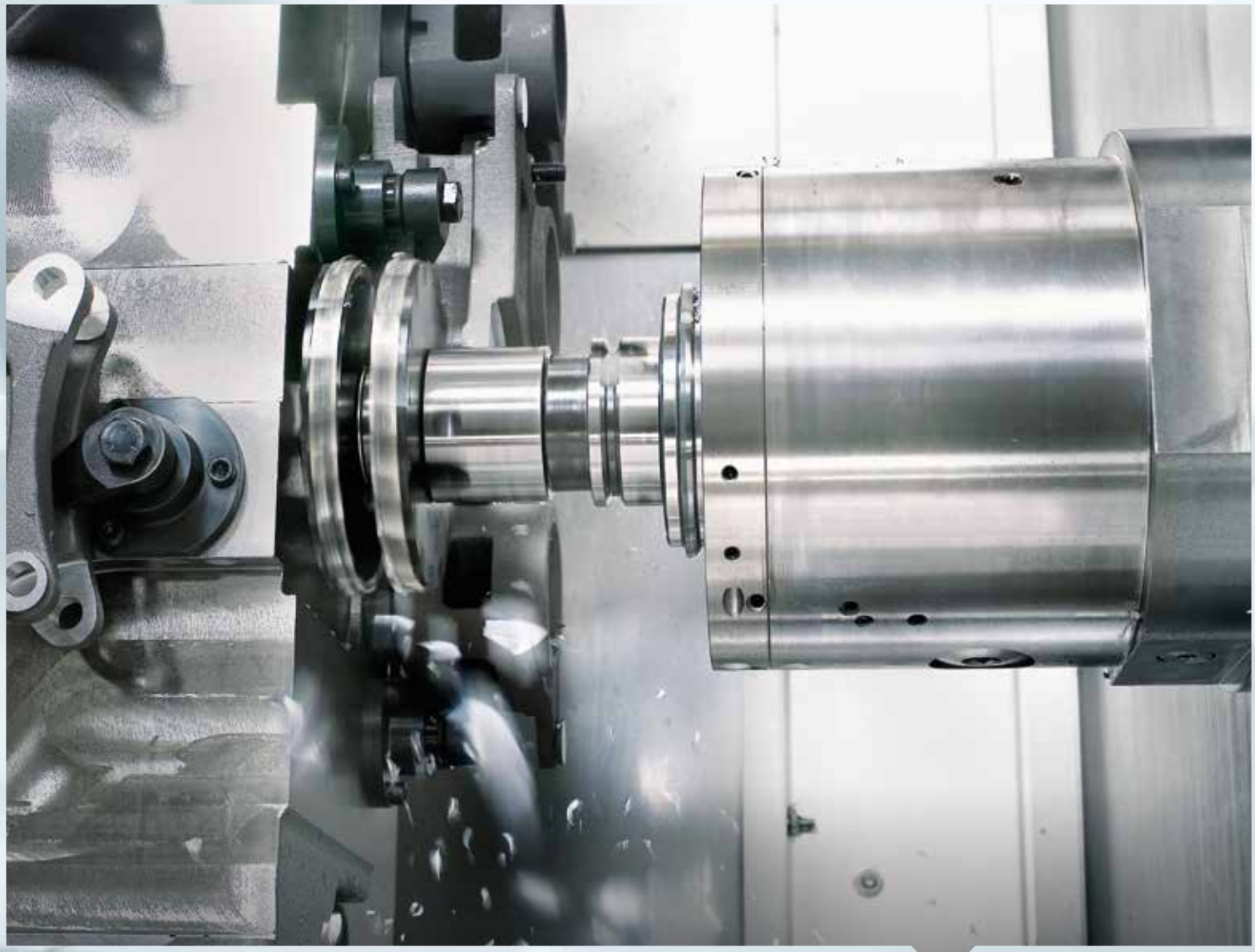


H series

Flexibly configurable
4-axis machining centres

Our quality pledge

MADE BY HELLER

F series

**5-axis production machines
with and without pallet changer**

C series

**5-axis milling/turning centres
for complete machining**

The foundation of quality and precision for every 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. When it comes to the daily availability of your HELLER machine, we put a strong emphasis on a high proportion of in-house manufacturing. Therefore, "Made by HELLER" stands for a quality seal you can rely on.

FOR HIGH OUTPUT

These compact and powerful machining centres are ideal for a large range of parts and materials. From individual parts through to large series production. From light alloy through to heavy-duty machining.

Designed for stable processes with adapted speeds, fully loadable even at the thresholds

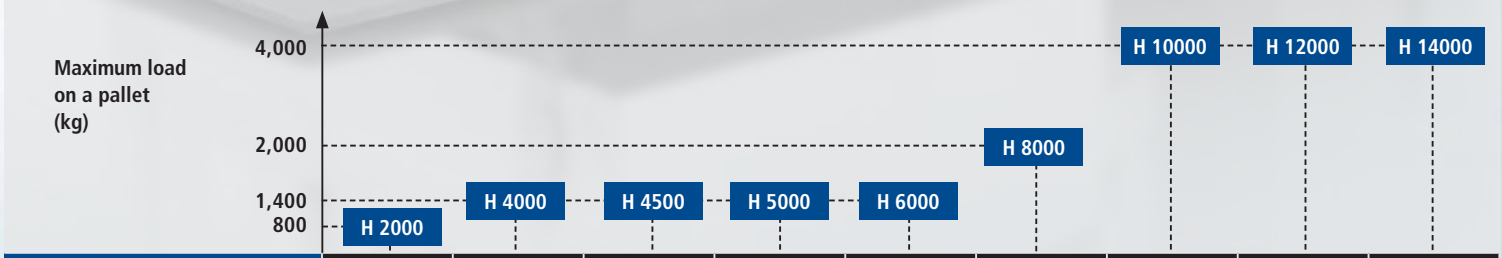
High-grade standardised series, which can be configured to individual requirements

Machine sizes from H 2000 to H 14000 with pallet sizes up to 1,000 x 1,000 mm and a maximum pallet load of 4,000 kg

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

Proven and perfected operation and cost-optimised maintainability

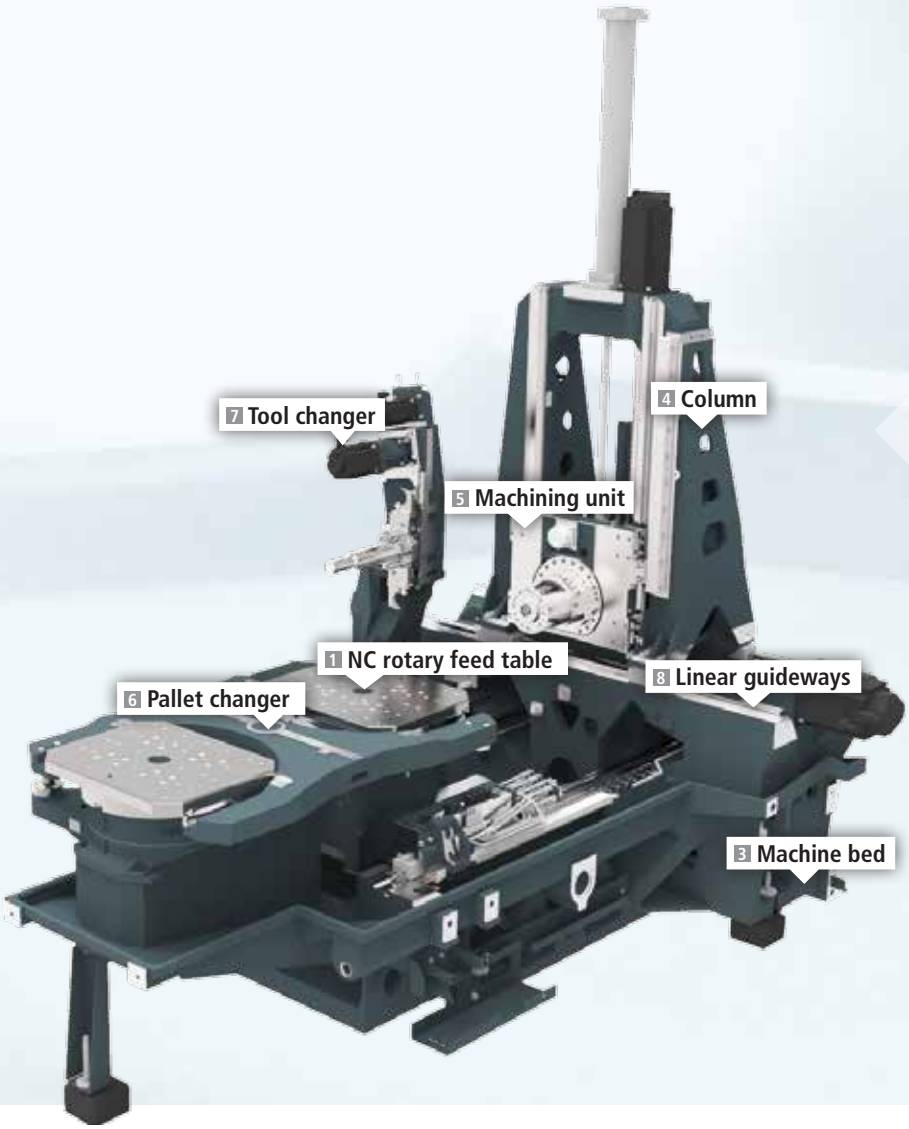
Technical added value included in the basic scope of machines



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	1,000 x 1,000
X (mm)	630	800	800	800	1,000	1,250	1,600	2,000	2,400
Y (mm)	630	800	800	800	1,000	1,200	1,400	1,400	1,600
Z (mm)	630	800	800	800	1,000	1,100	1,300	1,300	1,600
V (m^3)	0.33	0.51	0.51	0.51	1.00	1.65	2.91	3.64	6.14

Machine concept

STRUCTURE AND



2

H 2000
H 4000[1)]
H 4500
H 5000
H 6000

Every HELLER machine comprises of 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.

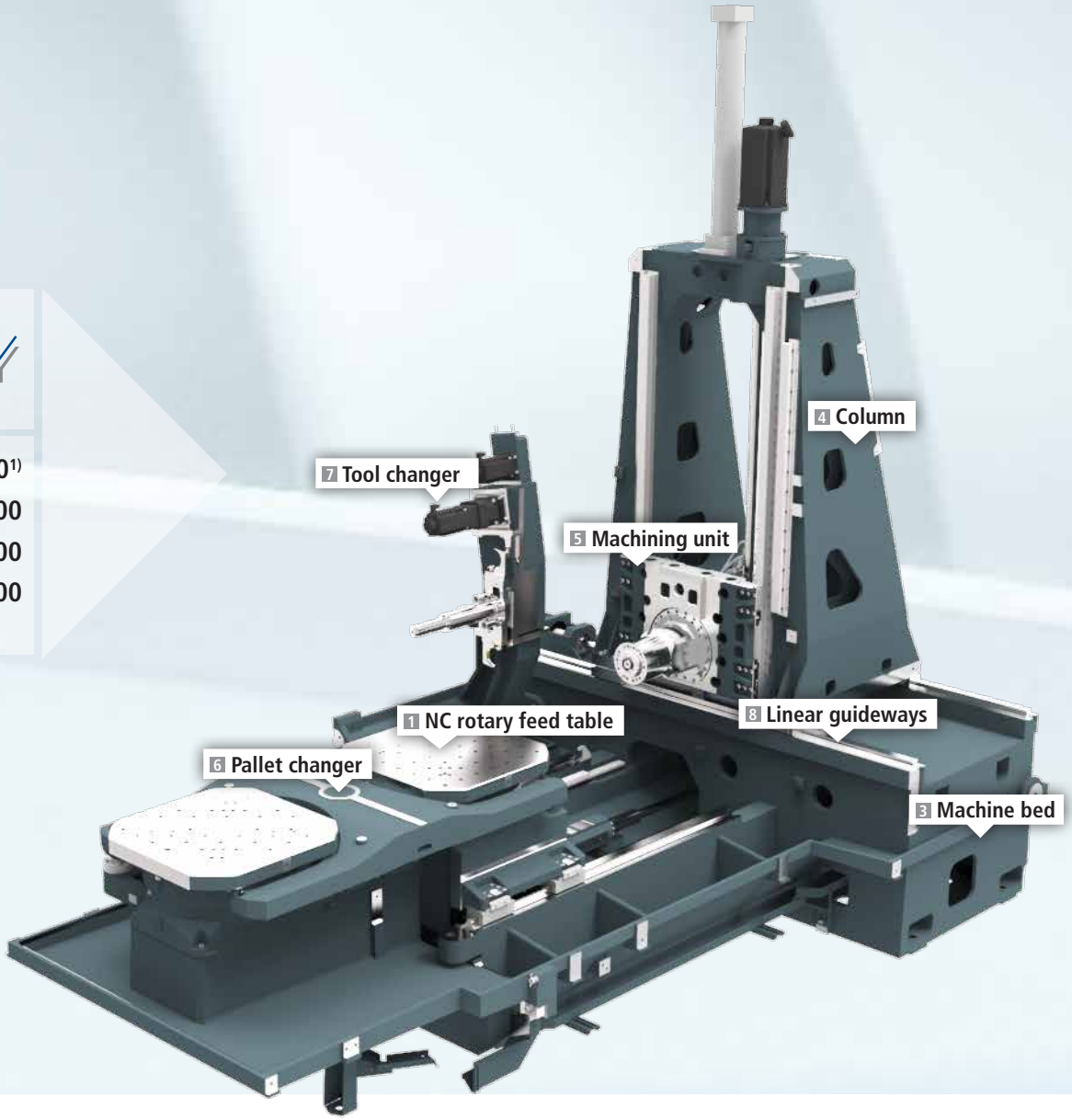
1 H 2000 – 6000: NC rotary feed table traverses in the Z-axis driven by two ball screws.
H 8000 – 14000: NC rotary feed table traverses in the Z-axis driven by a central ball screw.
For all machine sizes: Optimised force flow and thermo-symmetrical design

2 H 2000 – 6000: Unrestricted chip evacuation below the tool spindle
H 8000 – 14000: Optimum chip removal by 3 spiral conveyors

BASIC LAYOUT

2

H 8000[1)]
H 10000
H 12000
H 14000



3 Extremely rigid cast iron machine bed bears the X- and Z-axis

4 X-axis designed as a cast iron column

5 Powerful and precise machining units in the Y-axis, equipped with spindle growth compensation as standard

6 Pallet changer: Highly accurate even at high load

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

8 Highly accurate linear guides and absolute coded measuring systems (glass measuring scales, rotary encoders)

[1)] pictured

HIGHEST PRECISION

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

High process stability through rigid guide slides from one cast

Robustly designed connection from the spindle neck to the guide slides

High precision from dynamically stiff, short machining unit design and sophisticated water-cooled spindle neck

Spindle cooling with precision cooling unit for maximum temperature stability as standard

Additional spindle growth compensation as standard

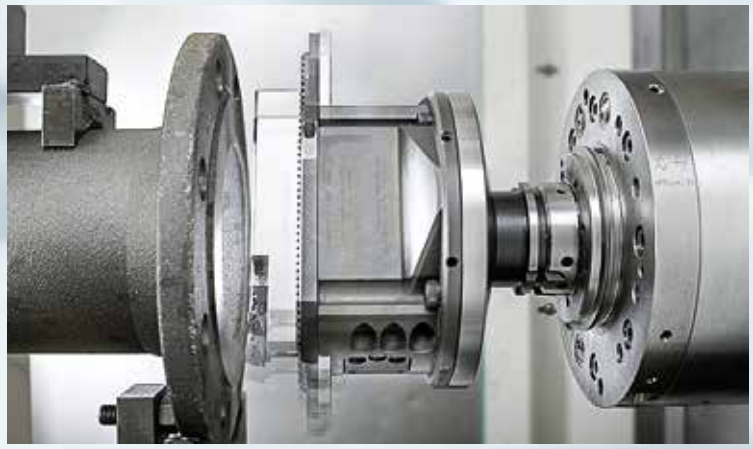
Extraction of the internal cooling lubricant from the spindle for fast chip-to-chip times, clean work area and tools

Established solution for the main spindle replacement thanks to the HELLER zero spindle system

Options

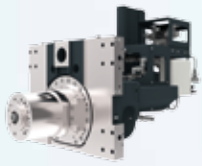
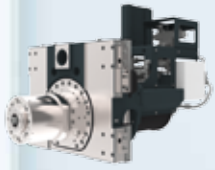
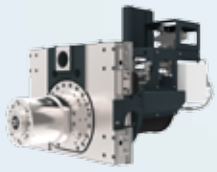
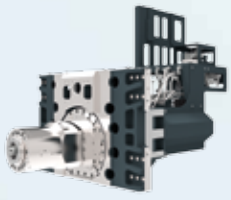
Attachment head support with and without additional clamping for selected machining units

HELLER facing slide unit as a fully integrated axis in the NC control used for contour and facing work



Machining units

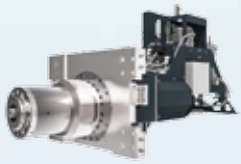
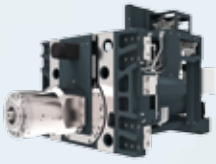
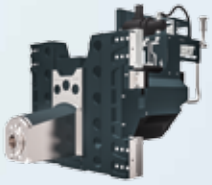
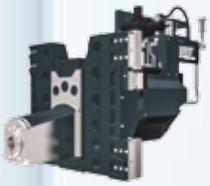
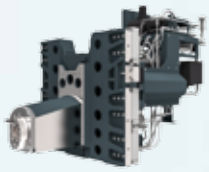
Ideally equipped for the most demanding tasks

Machining centre	HSC 40/63 (High Speed Cutting)	SC 40/63 (Speed Cutting)	PC 40/63 (Power Cutting)	SC 50/100 (Speed Cutting)
H 2000	□	■	□	–
H 4000	□	■	□	–
H 4500	–	–	–	□
H 5000	–	–	–	□
H 6000	–	–	–	□
H 8000	–	–	–	□
H 10000	–	–	–	□
H 12000	–	–	–	□
H 14000	–	–	–	□

Technical data					
Speed range	rpm	5 – 24,000	5 – 16,000	5 – 10,000	5 – 12,500
Torque[1)]	nm	40	95	242	166
Power[1)]	kW	25	40	38	52
Spindle taper	SK/HSK/BT	–/63/–	40/63/40	40/63/40	50/100/50
HELLER facing slide		–	–	□	□
HELLER multi-spindle head support (MSK support)		–	–	□	□
HELLER MSK support with additional clamping		–	–	–	–

■ standard
– unavailable
□ optional
[1)] at ED S6 – 40 %

EC 50/100 (Economic Cutting)	PSC 50/100 (Power Speed Cutting)	PC 50/100 (Power Cutting)	EPC 50/100 (Enforced Power Cutting)	HPC 50/100 (High Power Cutting)
–	–	–	–	–
–	–	–	–	–
■	□	–	–	–
–	□	■	□	□
–	□	■	□	□
–	□	■	□	□
–	□	■	□	□
–	□	■	□	□
–	□	■	□	□

5 – 10,000	5 – 12,500	5 – 8,000	5 – 8,000	5 – 6,000
242	500	822	1.146	2,292
38	52	43	60	60
50/100/50	50/100/50	50/100/50	50/100/50	50/100/50
□	–	□	□	□
□	□	□	□	□
–	–	□	□	□

Tool management

Comprehensive know-how for your tools


1


2


3

Chain-type magazine

1 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

2 Rack-type magazine with highly-dynamic loader for tool provisioning

Short loading times due 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

3 Tools are 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 operation for effective process reliability

Tooling parallel to machining with selected magazines

Tool shank cleaning time

Tool coding

Measuring probe with radio or infrared technology

Magazines	Chain-type magazines							Rack-type magazines		
	C 54	C 80	C 160	C 240	C 50	C 100	C 150	R 409	R 265	R 425
H 2000	■	□	□	□	–	–	–	□	–	–
H 4000	■	□	□	□	–	–	–	□	–	–
H 4500	–	–	–	–	■	□	□	–	□	□
H 5000	–	–	–	–	■	□	□	–	□	□
H 6000	–	–	–	–	■	□	□	–	□	□
H 8000	–	–	–	–	■	□	□	–	□	□
H 10000	–	–	–	–	■	□	□	–	□	□
H 12000	–	–	–	–	■	□	□	–	□	□
H 14000	–	–	–	–	■	□	□	–	□	□
Spindle taper (SK/HSK/BT)	40/63/40	40/63/40	40/63/40	40/63/40	50/100/50	50/100/50	50/100/50	–/63/–	50/100/–	50/100/–
Tool Ø[1] (mm)	160/72	160/72	160/72	160/72	280/112	280/112	280/112	188/72	280/112	280/112
Bridge mounted tool (mm)	Ø 260 x 160	Ø 260 x 160	Ø 260 x 160	Ø 260 x 160	Ø 460 x 280	Ø 460 x 280	Ø 460 x 280	Ø 300 x 188	H 5000/H 6000 Ø 485 x 280 H 8000-H 14000 Ø 550 x 280	
Length (mm)	450[4]	450[4]	450[4]	450[4]	600	600/(800)[5]	600	450[4]	600	600
Weight (kg)	12	12	12	12	25 (35)	25 (35)/35[5]	25 (35)	12	25 (35)	25 (35)
Moment of weight[2] (Nm)	10	10	10	10	30 (50)	30 (50)/50[5]	30 (50)	10	30 (50)	30 (50)
Loading HZP[3]	–	–	□	incl.	□[6]	□/incl.[5]	incl.	incl.	incl.	incl.

[1] adjacent places free/all places 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] for H 5000/H 6000

■ standard
□ optional
– unavailable
( ) optional values

High accuracy and process stability

Pallet changer

1 Optimised fork-type pallet change bridge for lifting and rotating of total loads up to 8t

2 Air nozzles on the swivel traverse for chip clearance

Optional cleaning of functional surfaces at rotary table and setting station including maintenance function

NC rotary feed table

3 For demanding 4-axis machining operations with worm gear drive for optimised damping, without compromising rigidity

Highly reliable tilting moments due 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

2 Air blast ensures cleanliness at pallet supports, pallet locks and coupling points for media transfer

Pallet alignment by means of diamond-type dowel pin and indexing pin for consistent clamping and alignment

Optionally available "Media interface" for hydraulic workpiece clamping to 60 bar, 200 bar or 200 bar with proportional valve technology

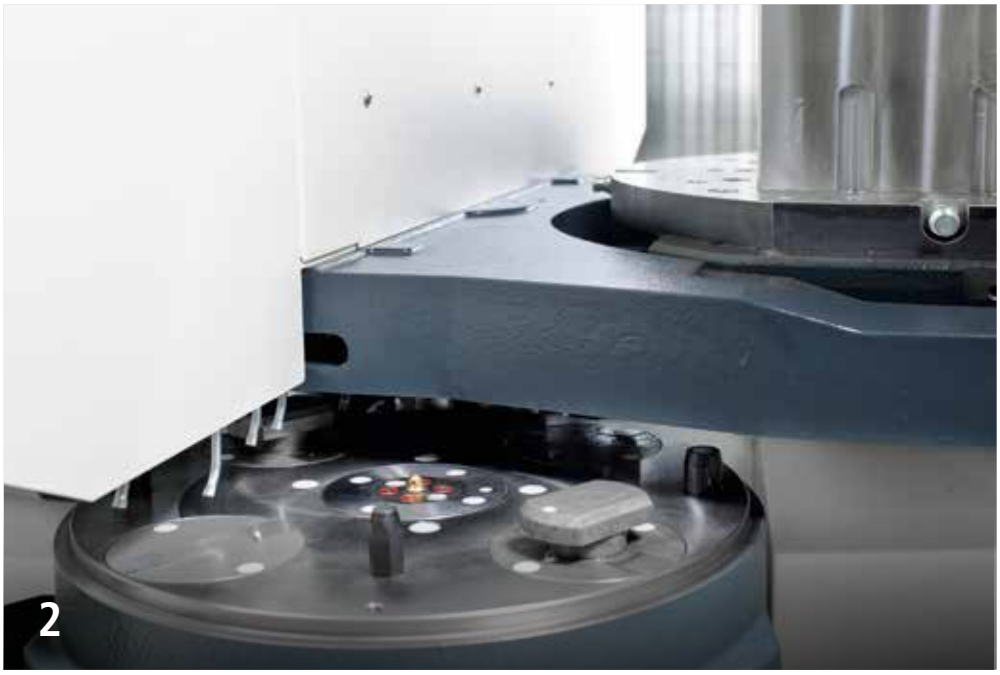
Workpiece setting station

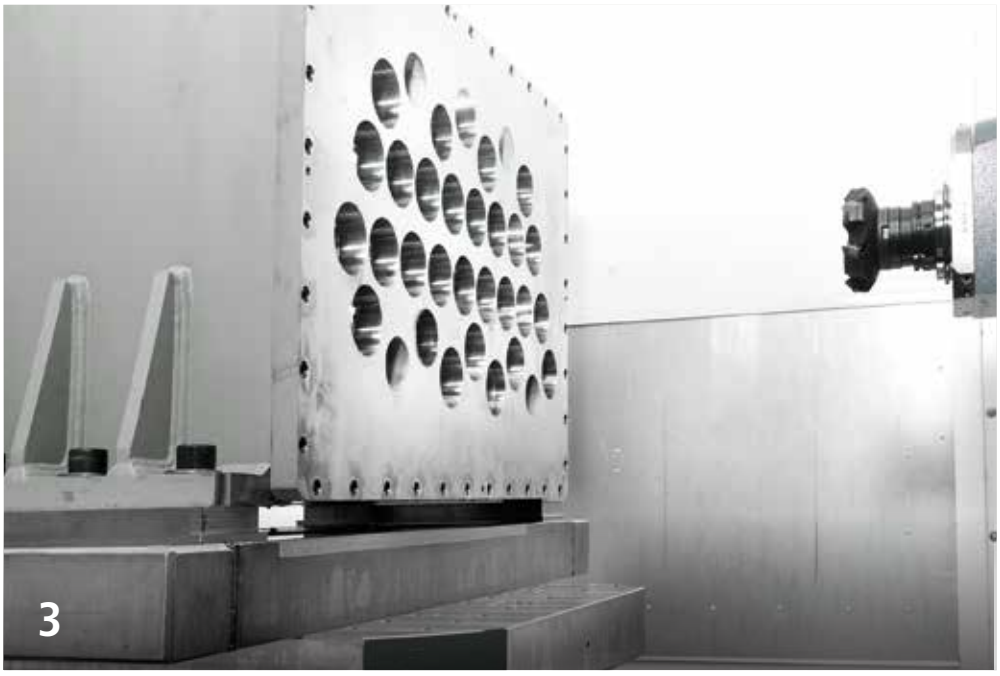
Friction-locked 4 x 90° indexing at the setting station with foot release

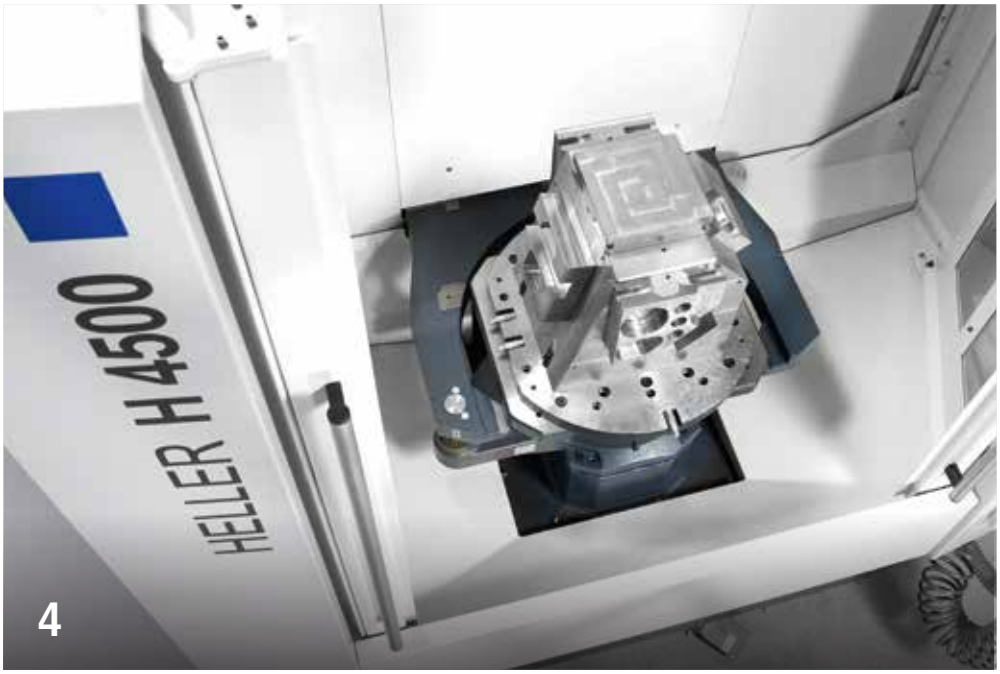
4 Optional automatically rotating NC setting station with automatically actuated setting station doors

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 disposal

Perfect answers
to your needs

Chip conveyor and coolant unit

With scraper conveyor or hinge band conveyor - depending on machining process requirements

Coolant units with either 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 delivering high volumetric flows

Optionally additional coolant refrigeration for high process reliability through thermal stability

Work area

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

H 8000 - H 14000: Optimised chip disposal from the work area by 3 spiral conveyors

Self cleaning stainless steel louvered concertina guarding

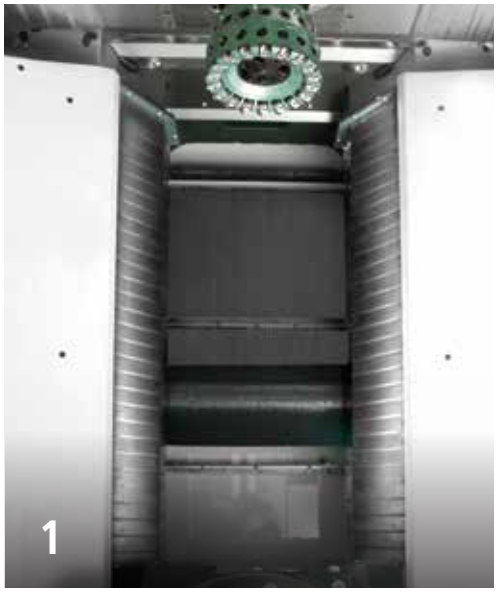
Various flushing nozzles during wet machining for keeping workpiece and work area clean as standard

Additional flushing of the machine bed

Easy to clean due to good access to the work area

Air and flushing gun as standard

Extraction of lubricants from the work area is an available option



Proven and perfected


1


2


3

Operation

1 Optimised availability due to a reliable and convenient operation

Optimally accessible operating stations

Optional with screen blow-off device on the main operating door

Workpiece setting station

2 Short reach to the centre of the setting station for convenient handling

Automatic loading/unloading 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

3 Tool setting at the magazine when spindle is running

Optional: User-friendly operating panels

Control unit

Programming in the familiar system environment

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

Operator-guided setup functions

Automatic return to home position

Trust is good – control is even better

HELLER IPM (Integrated Process Monitoring) for process, collision and tool break monitoring

Tool break monitoring during machining operation

RDS – Remote machine diagnostics, incl. coolant unit

CDS – Condition Monitoring Service

Functions for practical use

Convenient programming with HELLER technology cycles (boring, milling, measuring)

Order management/management of multiple clamping

Alternative strategy (program continuation, e.g. after tool break)

Tool requirements planning

"Milling" technology package

Automated loading/unloading sequence

Maintenance

Optimised life cycle costs in an instant


1


2


3

4

1 The concentration of supply units and maintenance points at just a few locations ensures quick and easy inspection and operation

2 HELLER's quick response with spare parts and service means less interruption to production

3 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

4 The milling spindles can be quickly replaced due to HELLER's tried and proven zero spindle system

Maximum savings with package bundles

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.

These methods help to increase stiffness and optimise the mass of moved components. 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 smartsupply

Flexible switch off/on of all consumers

In addition to HELLER BLUE supply, switch off or sleep mode for further function units such as coolers, pumps, lights, chip conveyors, drives, seal air and other options

HELLER BLUE coolant

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

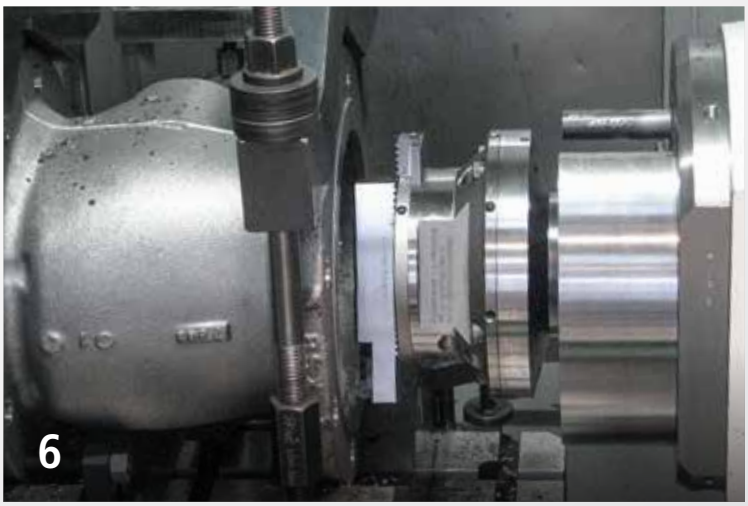
The current consumption is significantly reduced by a new compression technology

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

TYPICAL "EXTRA" QUALITY FROM HELLER



1 Tool break monitoring during machining operation

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

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

4 Measuring probe for radio or infrared technology

5 HELLER attachment head support, also with additional clamping for critical operations or tools

6 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 optimised machining accuracy

SOLUTIONS FOR HIGHER EFFICIENCY

H-series machines are productivity centres: They work highly accurately and effectively, remain extremely reliable even under constant load, and can be easily 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.

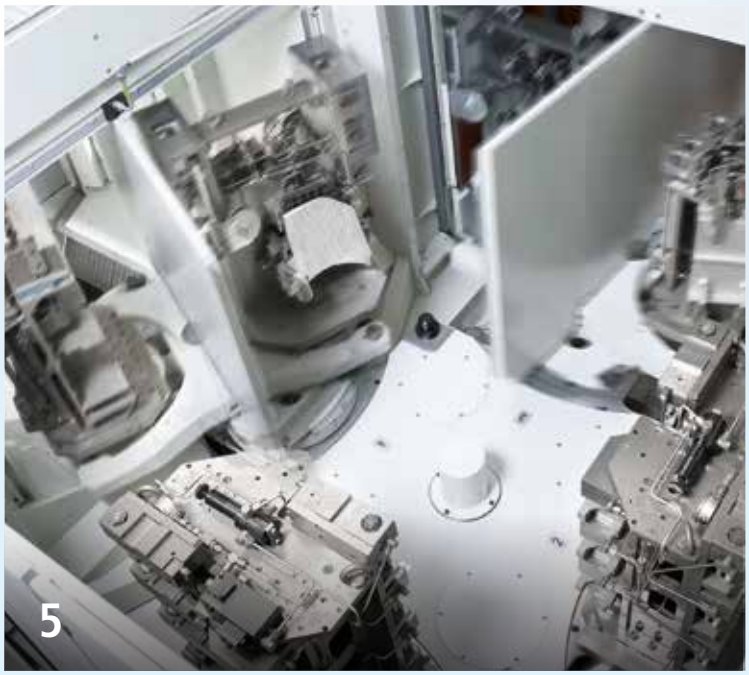
1. Overhead gantry loader
2. Fully automatic loading via mobile robot
3. Pallet rack system
4. Pallet and tool automation system
5. Rotary pallet magazine
6. Semi-automated loading with balancer


1


2


3


4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6

HELLER Services

ENSURING MAXIMUM PRODUCTIVITY

When it comes to global competition, maximum productivity is nowadays considered to be the key success factor in machining. Achieving maximum productivity hinges on the interplay between several aspects: optimising production, especially the reduction of unplanned downtimes and increased 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 Tune-up packages

To increase the performance and productivity of HELLER machines in your facility, HELLER is offering you an extensive range of standardised tune-up 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 an (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 HELLER machines - offered by the the "HELLER TrainingsCenter". 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. 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

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 loading: to 800 kg

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

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

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

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

H 8000
X/Y/Z: 1,250 x 1,200 x 1,100 mm
Pallet: 800 x 800 mm
Pallet loading: 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 loading: to 4,000 kg

H 12000
X/Y/Z: 2,000 x 1,400 x 1,300 mm
Pallet: 1,000 x 1,000 mm
Pallet loading: 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 loading: to 4,000 kg

The F/C series: 5-axis complete machining

FP 2000
X/Y/Z: 800 x 630 x 875 mm
Pallet: 400 x 500 mm
Pallet loading: to 800 kg

CP 2000
X/Y/Z: 800 x 630 x 875 mm
Pallet: 400 x 500 mm
Pallet loading: to 800 kg

FP 4000
X/Y/Z: 800 x 800 x 1,045 mm
Pallet: 500 x 630 mm
Pallet loading: to 1,400 kg

CP 4000
X/Y/Z: 800 x 800 x 1,045 mm
Pallet: 500 x 630 mm
Pallet loading: to 1,400 kg

FP/FT 6000
X/Y/Z: 1,000 x 1,000 x 1,300 mm
Pallet/Table: 630 x 630 mm / Ø 1,000 mm
Pallet/Table loading: to 1,400 kg

CP/CT 6000
X/Y/Z: 1,000 x 1,000 x 1,300 mm
Pallet/Table: 630 x 630 mm / Ø 1,000 mm
Pallet/Table loading: to 1,400 kg

FP/FT 8000
X/Y/Z: 1,250 x 1,200 x 1,400 mm
Pallet/Table: 800 x 800 mm / Ø 1,100 mm
Pallet/Table loading: to 2,000 kg

CP/CT 8000
X/Y/Z: 1,250 x 1,200 x 1,400 mm
Pallet/Table: 800 x 800 mm / Ø 1,100 mm
Pallet/Table loading: to 2,000 kg

FP 10000
X/Y/Z: 1,600 x 1,400 x 1,600 mm
Pallet: 1,000 x 1,000 mm
Pallet loading: to 4,000 kg

CP 10000
X/Y/Z: 1,600 x 1,400 x 1,600 mm
Pallet: 1,000 x 1,000 mm
Pallet loading: to 4,000 kg

FP 14000
X/Y/Z: 2,400 x 1,600 x 1,600 mm
Pallet: 1,000 x 1,000 mm
Pallet loading: to 4,000 kg

The MC series

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

Crankshafts and camshafts

RFK
External and internal milling of crankshafts

DRZ
Crankshaft chasing

RFN
External milling for camshafts

Special solutions

CBC
Coating of cylinder bores in passenger car engines

MPC 400
Head Changer System
for multi-spindle machining processes

TRS 4000
Stand-alone machine for transfer lines, rated for high volumes

VCM (Wenzler)
Vertical chamber machine with 5 axes for machining structural components

SWEDEN
Värnamo

SLOVAKIA
Vráble

FRANCE
Paris

USA
Troy, MI

SWITZERLAND
Niederbüren

ITALY
Verona

SPAIN
Barcelona, Santander

RUSSIA
Jekaterinburg

CHINA
Beijing, Changchun, Changzhou, Chongqing, Nanning, Shanghai

MEXICO
Queretaro

ENGLAND
Redditch

GERMANY
Goslar, Hattingen, Kirchheim, Nuremberg, Nürtingen, Saarbrücken, Salem

BRAZIL
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