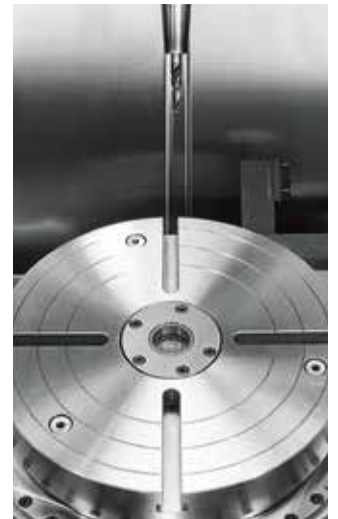
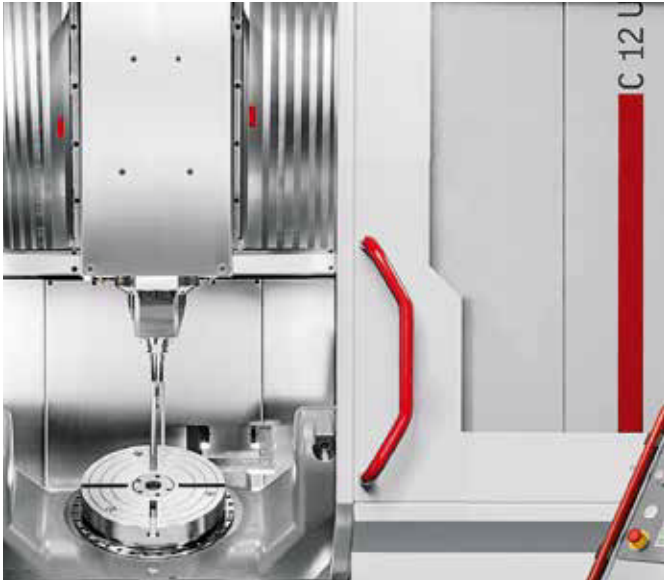


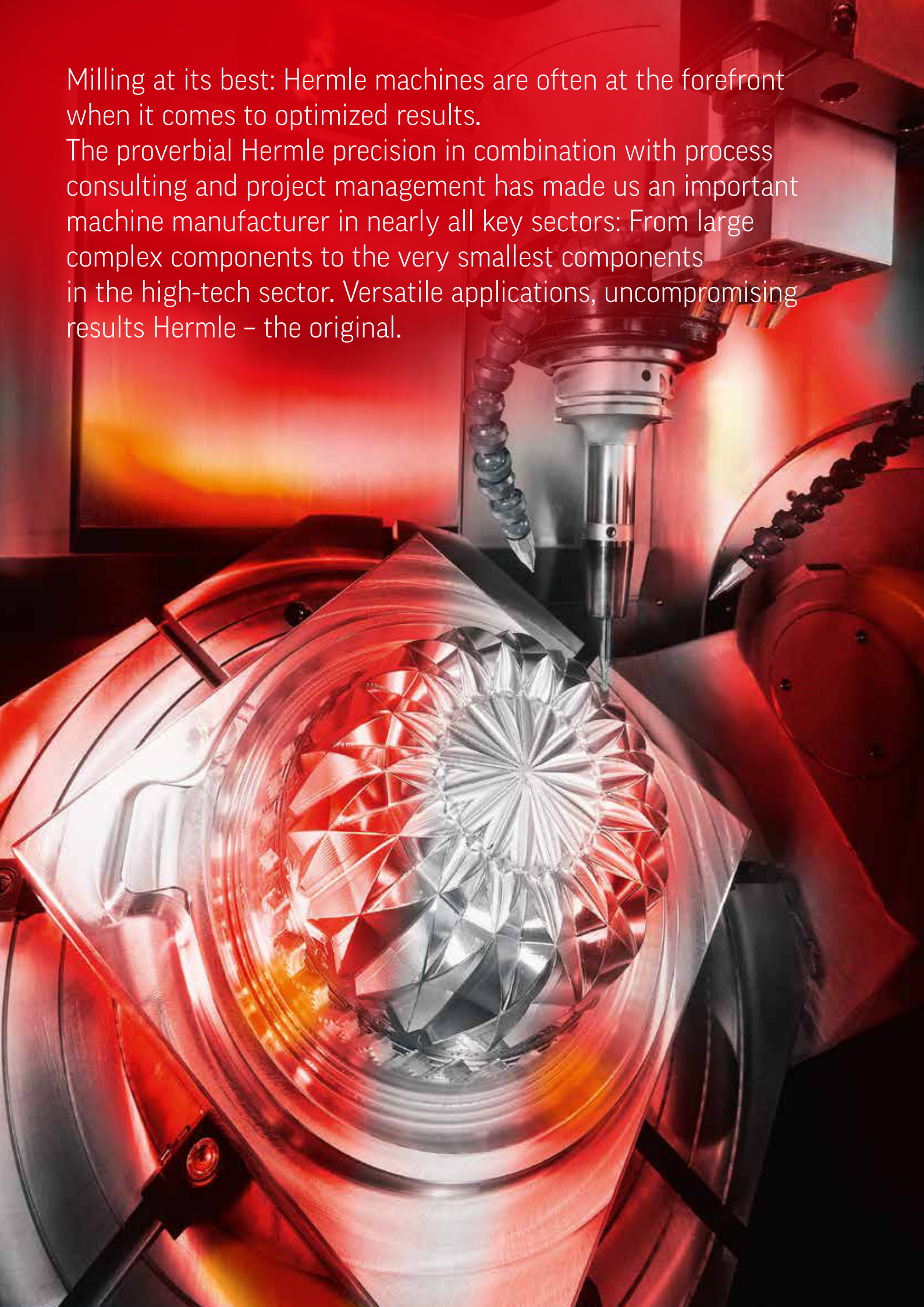
C 12

www.hermle.de



Milling at its best: Hermle machines are often at the forefront when it comes to optimized results.

The proverbial Hermle precision in combination with process consulting and project management has made us an important machine manufacturer in nearly all key sectors: From large complex components to the very smallest components in the high-tech sector. Versatile applications, uncompromising results Hermle – the original.



Contents.

| | |
|-------------------------|----|
| 01 Industry sectors | 4 |
| 02 The machine | 6 |
| 03 Technical data | 24 |
| 04 Automation | 30 |
| 05 Precision | 36 |
| 06 Energy efficiency | 38 |
| 07 Services | 39 |

01 Industry sectors

Hermle is at home in all sectors. For us, ensuring the highest precision and reliable machining is always paramount. Our machining centres are made for daily operation, whether as linked linear segments in production or as stand-alone workshop machinery.

Optical industry



Precision mechanics



Medical engineering



Tool technology



Aerospace industry



Machine construction



Tool and mould construction



Subcontractor industry



02

The machine

The C 12: a highly dynamic and compact machining centre designed consistently for 5-axis/5-side machining.

Features galore to ensure high-precision, economical parts production. Numerous automation solutions extend the application range many times over.

TECHNICAL DATA

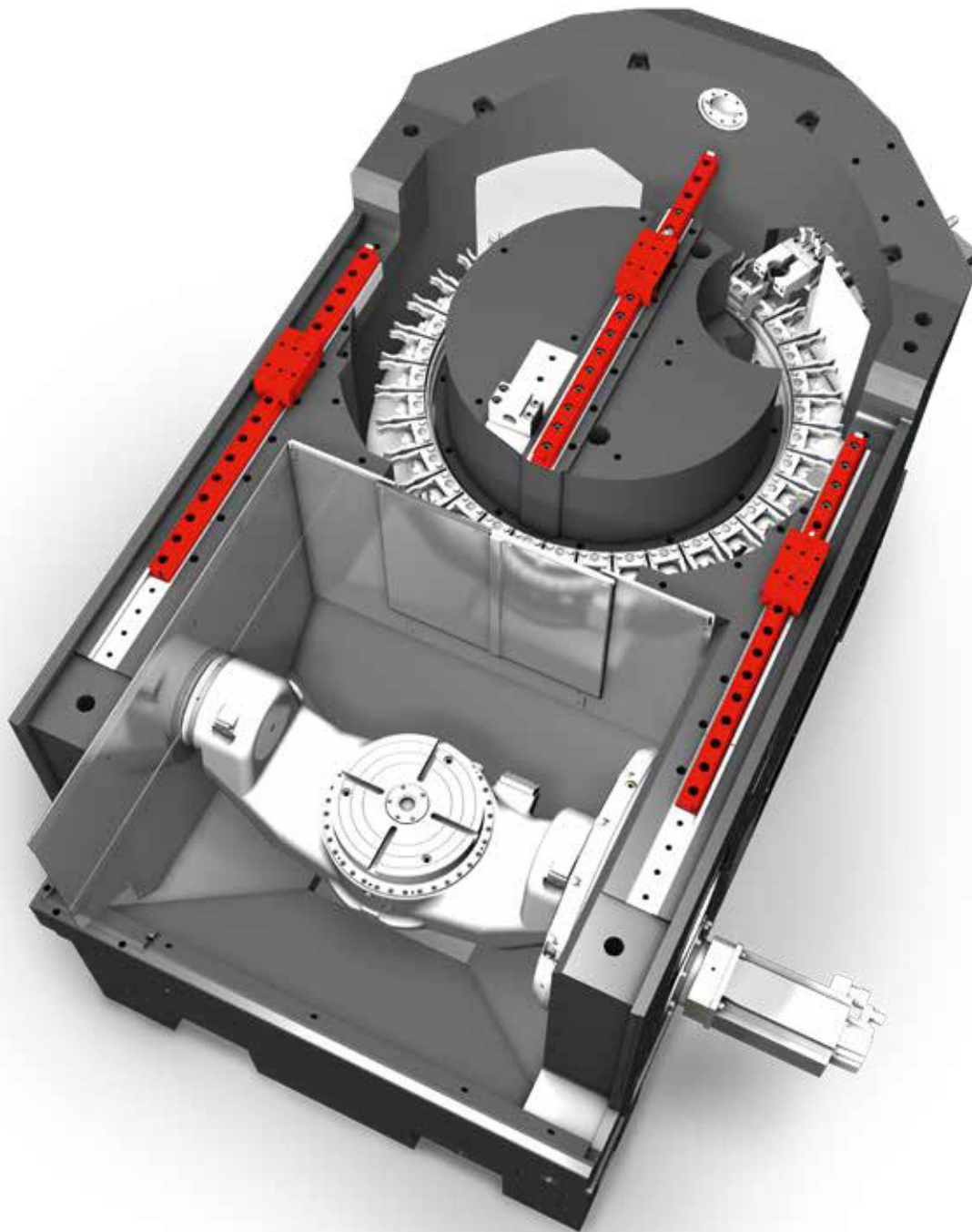
| | |
|---|--|
| <i>Traverse X-Y-Z:</i> | 350 - 440 - 330 mm |
| <i>Speed:</i> | 12000 / 15000 / 18000 / 25000 / 30000 / 42000 rpm |
| <i>Rapid linear traverse X-Y-Z (dynamic):</i> | 30 (50) m/min |
| <i>Linear acceleration X-Y-Z (dynamic):</i> | 4 (8) m/s ² |
| <i>Control:</i> | TNC 640 |
| <i>Swivelling rotary tables:</i> | |
| <i>Machining table with torque:</i> | Ø 320 mm |
| <i>Swivelling range:</i> | +/- 115° |
| <i>A-axis speed (dynamic):</i> | 25 (55) rpm |
| <i>C-axis speed (dynamic):</i> | 40 (80) rpm |
| <i>Max. table load:</i> | 100 kg |





02.1

A new dimension of dynamics



3 axes in a tool dynamics independent from workpiece

Pick-up tool magazine with space-saving integration into base body

Stainless steel lining of entire working area

Swivelling range of swivelling rotary table +/- 115°

Optimised chip ejection in working area during dry machining

Large working area relative to the installation area

Accessibility, excellent ergonomics

Force characteristics: 3 guideways with one guide shoe for ideal force balance

Linear axes above the working area

Torque motor (C-axis) for high dynamics

One-sided drive (A-axis): Torsion avoidance and high level of accuracy

Modified gantry design with optimum main axis support

Mineral casting design with excellent vibration damping properties

02.2

The workpiece

Many important points must be observed in order to guarantee that every workpiece is machined perfectly. For this reason, Hermle has been working on perfecting and optimising the machining process for many years. This is the reason that the C 12 is now equipped with:

- The largest working area relative to the installation area.
- The largest swivelling range of workpieces in the working area.
- Utilisation of the entire traverse range.
- A large collision circle between the table flanges.

THE WORKPIECE DIMENSION

- *Unlimited crane top loading to above the table centre*
- *During crane loading, the tool spindle moves into the tool magazine, leaving a completely clear and accessible working area*
- *Extensive automation solutions for optimum workpiece handling*



5-axes

Ø 320 x 265 mm

max. 100 kg

Collision circle: Ø 610 mm

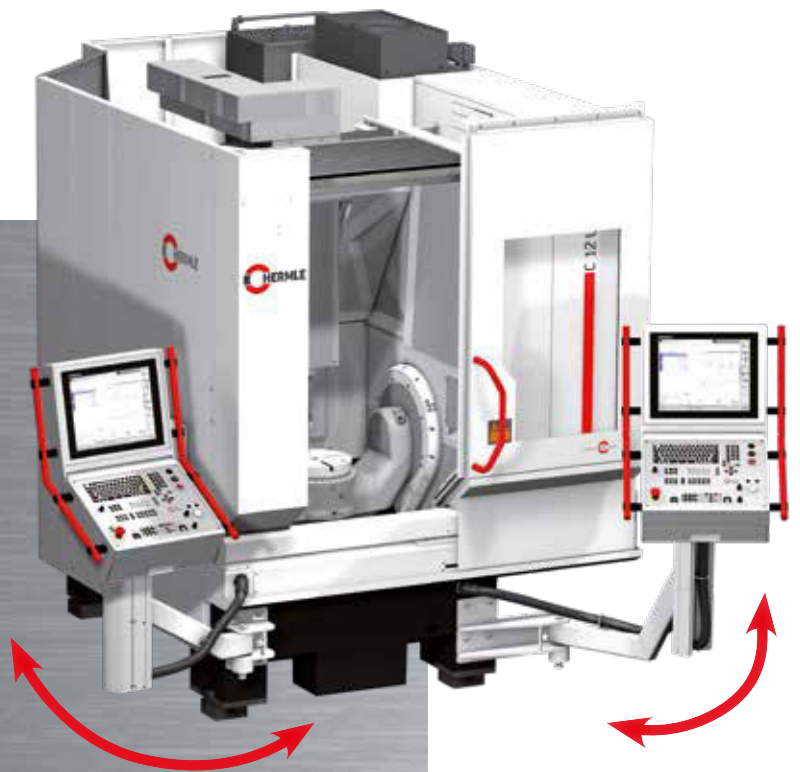


02.3 Ergonomics

Built for daily use: the Hermle C 12 can be ergonomically adapted for every machine operator for optimum ease of use, simple operation and uncomplicated maintenance.

HIGHLIGHTS

- Ergonomic control panel:
 - 19" Touch screen
 - Control panel adaptable to the left or right of the machine (left standard)
 - Control panel pivotable from the tool loading point to the working area
 - Adjustable height +/- 100 mm
 - Tilting screen 5 - 35°
- Optimum loading height
- Crane loading
- Minimum interval between machining table and operator
- Large door opening



Control panel, can be swivelled (standard)

Control panel, can be swivelled (option)

Door opening 720 mm

Vertical table clearance 430 mm

Loading height 990 mm

Screen pivotable by up to 30 °C

Practical, slide-in storage

Control panel +/-100 mm height adjustable



02.4

Table variants

Hermle's swivelling rotary table has revolutionised the concept of 5-axis machining. The C 12 is no exception. We consistently put the focus on 5-axis operation, the advantages of which are fully exploited by the swivelling rotary table with a torque motor. All machining tables are manufactured exclusively and entirely at our plant in Gosheim.



TECHNICAL DATA

High degree of freedom in working area

- Very high table load (up to 100 kg with the highest accuracy)
- No accumulation of chip on the swivelling rotary table (swivel table)
- Swivelling axis A and rotary axis C are located within the workpiece (U-shape)
- Wide spacing between the A axes flanges results in a very large collision circle
- High swivelling range for undercuts

Torque table

- High dynamics on the A and C axes
- No wear
- Direct, absolute measuring system

DRIVE TECHNOLOGY

- Central table load
- Drive directly on table housing = low torsion A-axis
- Direct, absolute measuring system
- Good maintenance accessibility
- A-axis integrated in machine bed

One-sided drive

- Mechanical drive on right of table housing



Swivelling rotary table

Drive type of C-axis: Torque



The "Torque" swivelling rotary table provides the ideal conditions for highly dynamic 5-axis and 5-axis simultaneous machining.



Zero-point clamping systems / pallet clamping systems



System table with table plate . Ø 320 mm
(Ø 450 x 360 mm)

| | |
|--------------------------------------|-----------------------------|
| Clamping surface: | Ø 320 mm |
| T-grooves: | star-shaped 4 units / 14 H7 |
| Swivelling range: | +/- 115° |
| Drive type of C-axis: | torque |
| Speed - rotary axis C (dynamic): | 40 (80) rpm |
| Speed - swivelling axis A (dynamic): | 25 (55) rpm |
| Maximum table load: | 100 kg |



02.5

Tool spindles



The C 12 can be equipped with two-piece or compact spindles. All tool spindles can be replaced quickly and easily in case of failure.

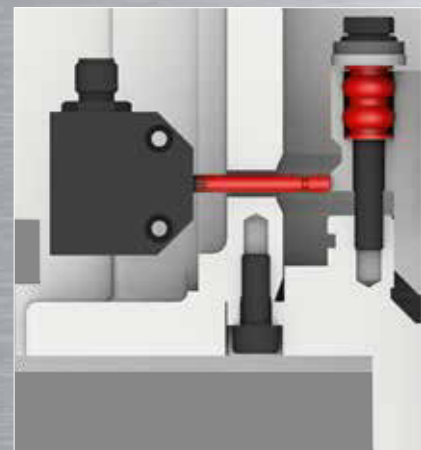
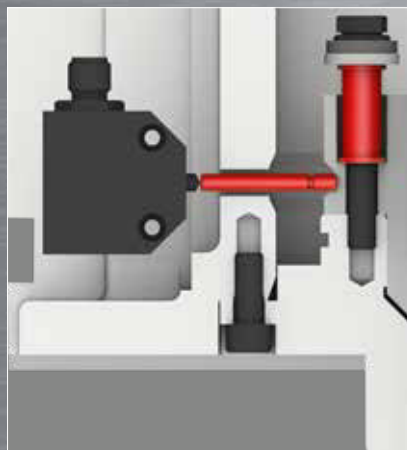
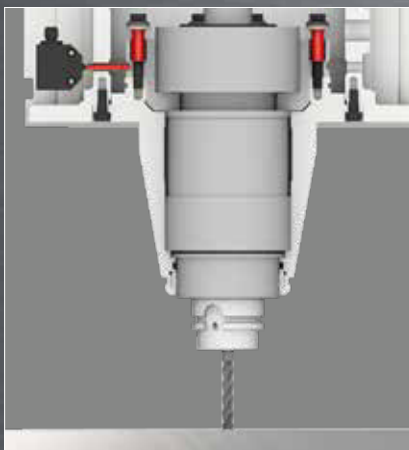
With the different speed ranges and tool holding fixtures the tool spindles are suitable for a wide variety of machining tasks. Like the machining tables, all tool spindles are manufactured exclusively and entirely at our plant in Gosheim.

TECHNICAL DATA

- High-tech tool spindles for demanding milling processes
- Slim-end tool spindle for machining deep cavities
- Few projecting edges (prevention of collision)
- Two-part tool spindle (faster, easier replacement)
- Collision protection (collision sleeves) prevents damage in 50% of collisions

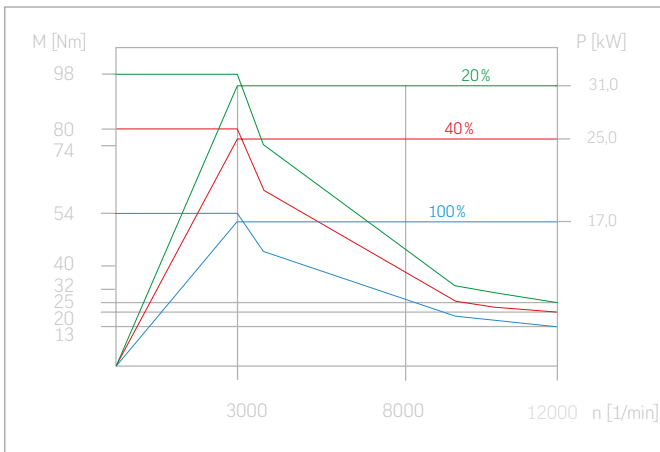
Collision protection with collision inquiry

Each tool spindle has several collision sleeves which compensate collision energy in the Z direction.



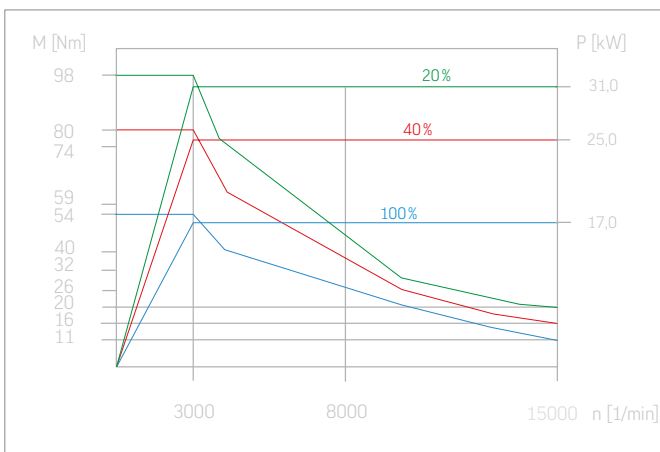


Tool spindle 12000 rpm



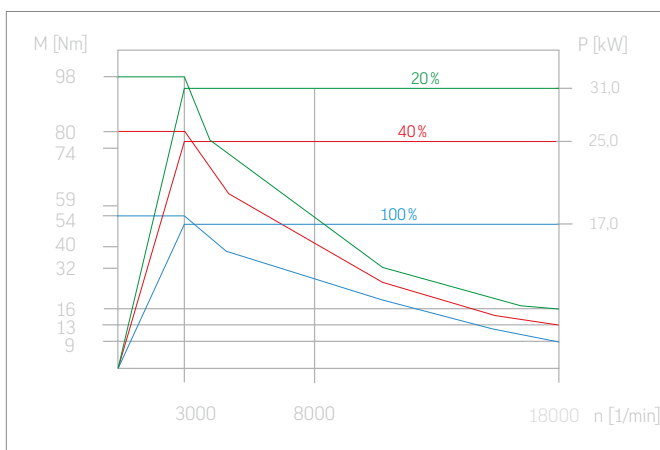
Maximum spindle speed: 12000 rpm
Main Power 20% c.d.f.: 31 kW
Torque 20% c.d.f.: 98 Nm
Tool holding fixture: SK 40 / HSK A 63
Tool spindle: two-piece
Collision protection: collision sleeves

Tool spindle 15000 rpm



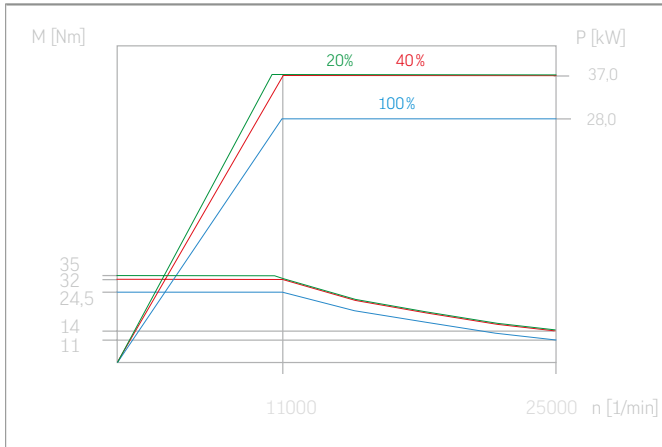
Maximum spindle speed: 15000 rpm
Main Power 20% c.d.f.: 31 kW
Torque 20% c.d.f.: 98 Nm
Tool holding fixture: SK 40
Tool spindle: two-piece
Collision protection: collision sleeves

Tool spindle 18000 rpm



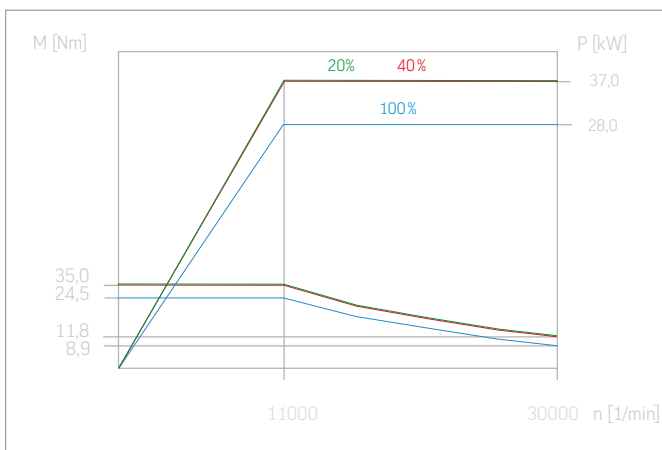
Maximum spindle speed: 18000 rpm
Main Power 20% c.d.f.: 31 kW
Torque 20% c.d.f.: 98 Nm
Tool holding fixture: HSK A 63
Tool spindle: two-piece
Collision protection: collision sleeves

Tool spindle 25000 rpm



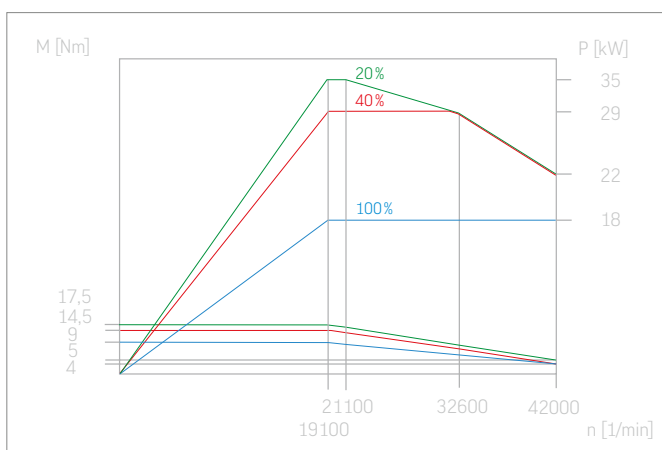
| | |
|------------------------|-----------|
| Maximum spindle speed: | 25000 rpm |
| Main Power 20% c.d.f.: | 37 kW |
| Torque 20% c.d.f.: | 35 Nm |
| Tool holding fixture: | HSK A 63 |
| Tool spindle: | compact |

Tool spindle 30000 rpm



| | |
|------------------------|-----------|
| Maximum spindle speed: | 30000 rpm |
| Main Power 20% c.d.f.: | 37 kW |
| Torque 20% c.d.f.: | 35 Nm |
| Tool holding fixture: | HSK A 50 |
| Tool spindle: | compact |

Tool spindle 42000 rpm



| | |
|------------------------|-----------|
| Maximum spindle speed: | 42000 rpm |
| Main Power 20% c.d.f.: | 35 kW |
| Torque 20% c.d.f.: | 17,5 Nm |
| Tool holding fixture: | HSK E 40 |
| Tool spindle: | compact |

02.6

The tool magazine

The C 12's tool magazine holds up to 36 tools in the standard version and is integrated into the machine bed to save space. As an option a second tool magazine ring can be integrated, without the requirement for additional footprint, of the machine which increases the number of available tools to 71.

TECHNICAL DATA

Pick-up tool magazine

Integrated in the machine bed

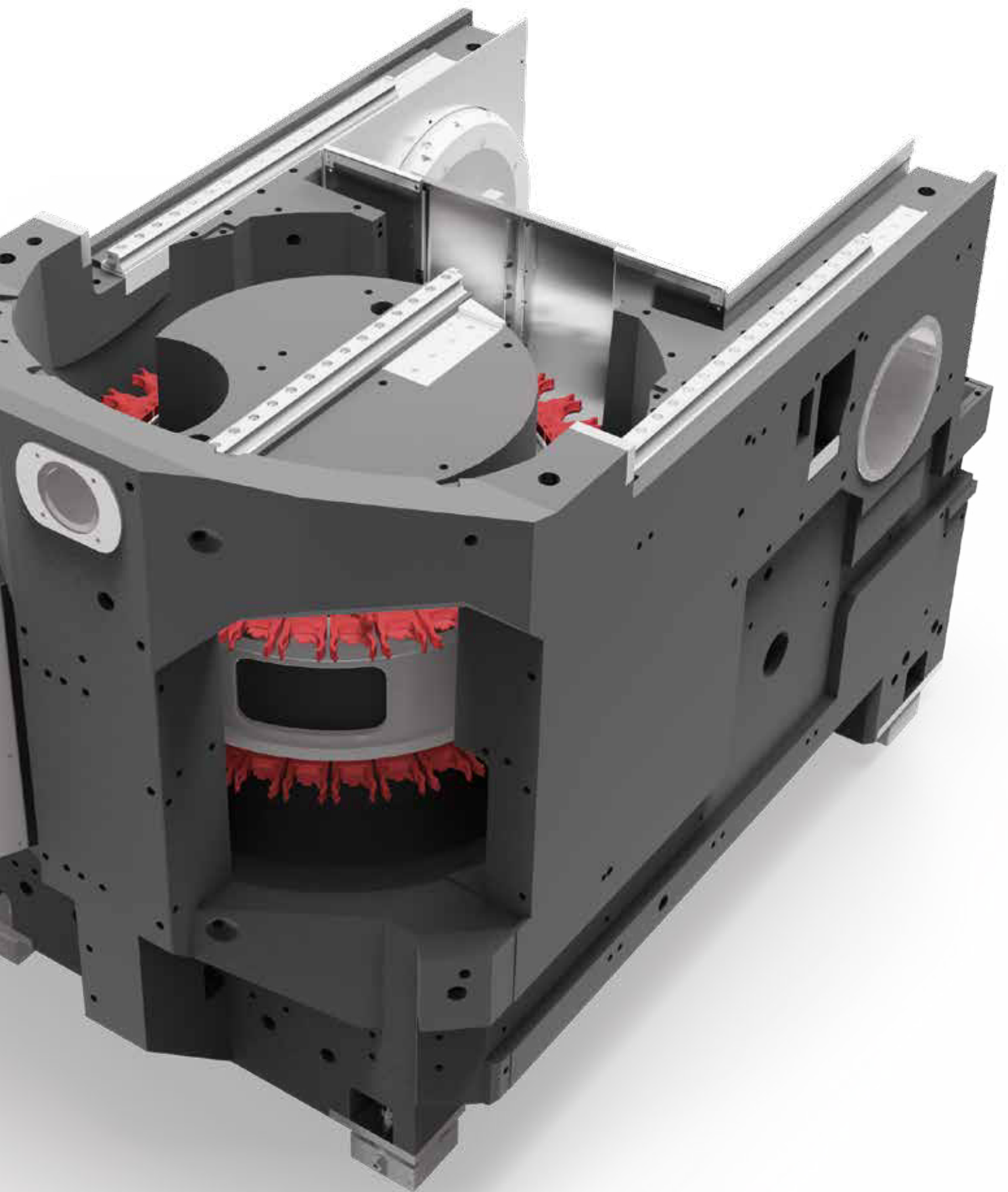
Excellent accessibility

Additional tool magazine ZM 35 as a second ring

Tool changer (pick-up)

| | |
|--|---|
| <i>Interface:</i> | <i>SK 40 / HSK A 63 / HSK A 50 / HSK E 40</i> |
| <i>Magazine pockets:</i> | <i>36 tools in the ring magazine</i> |
| <i>Additional tool magazine ZM 35:</i> | <i>35 tools in the second ring magazine</i> |
| <i>Max. tool weight:</i> | <i>8 / 8 / 6 / 2.5 kg</i> |
| <i>Max. tool diameter:</i> | <i>Ø 80</i> |
| <i>Max. tool length:</i> | <i>200 mm</i> |
| <i>Max. magazine load:</i> | <i>144 kg in the ring magazine</i> |
| | <i>140 kg in the second ring magazine</i> |
| <i>Chip-to-chip time:</i> | <i>approx. 4.5 s</i> |





02.7

Control unit

The C 12 can be equipped with the Heidenhain TNC 640 control unit. The control unit provide diverse program functions. Hermle simplifies programming and operation still further with comprehensive extra features.

Heidenhain

Heidenhain TNC 640

- Dynamic Efficiency – Active Chatter Control (ACC), Adaptive Feed Control (AFC), trochoidal milling
- Dynamic Precision – Cross Talk Compensation (CTC), Active Vibration Damping (AVD), Load Adaptive Control (LAC)
- 19" TFT colour touchscreen
- Keyboard unit with full keyboard, integrated trackball, USB and Ethernet interfaces
- Fully digital with HSCI interface and EnDat interface
- Programming in Heidenhain plain text or per DIN/ISO
- Standard drilling and milling cycles
- Touch probe system cycles
- Free contour programming
- Special functions for fast 3D machining
- Automatic calculation of cutting data
- Software option Kinematic Opt (Measurement cycle for improving accuracy of rotational and swivelling operations)

For further advantages and detailed technical data, please see the Heidenhain brochures.



Hermle setups

Standard

Standard

- Standard setting.
- Switches back to the standard setting after a different setup has been used.

Heavy duty machining

Heavy duty machining

- For roughing in conjunction with high milling power.
- Greater machining performance possible thanks to reduced machine vibration (depending on the tool and the selected technology data).

High production

Production

- Quicker machining with programs which have many cycle calls or subprograms.



Hermle control tools



Hermle "Tool Management Control"

Simple Hermle tool management for Heidenhain controls.



Hermle "Automation Control System"

Convenient automation and order management software developed in-house by Hermle.



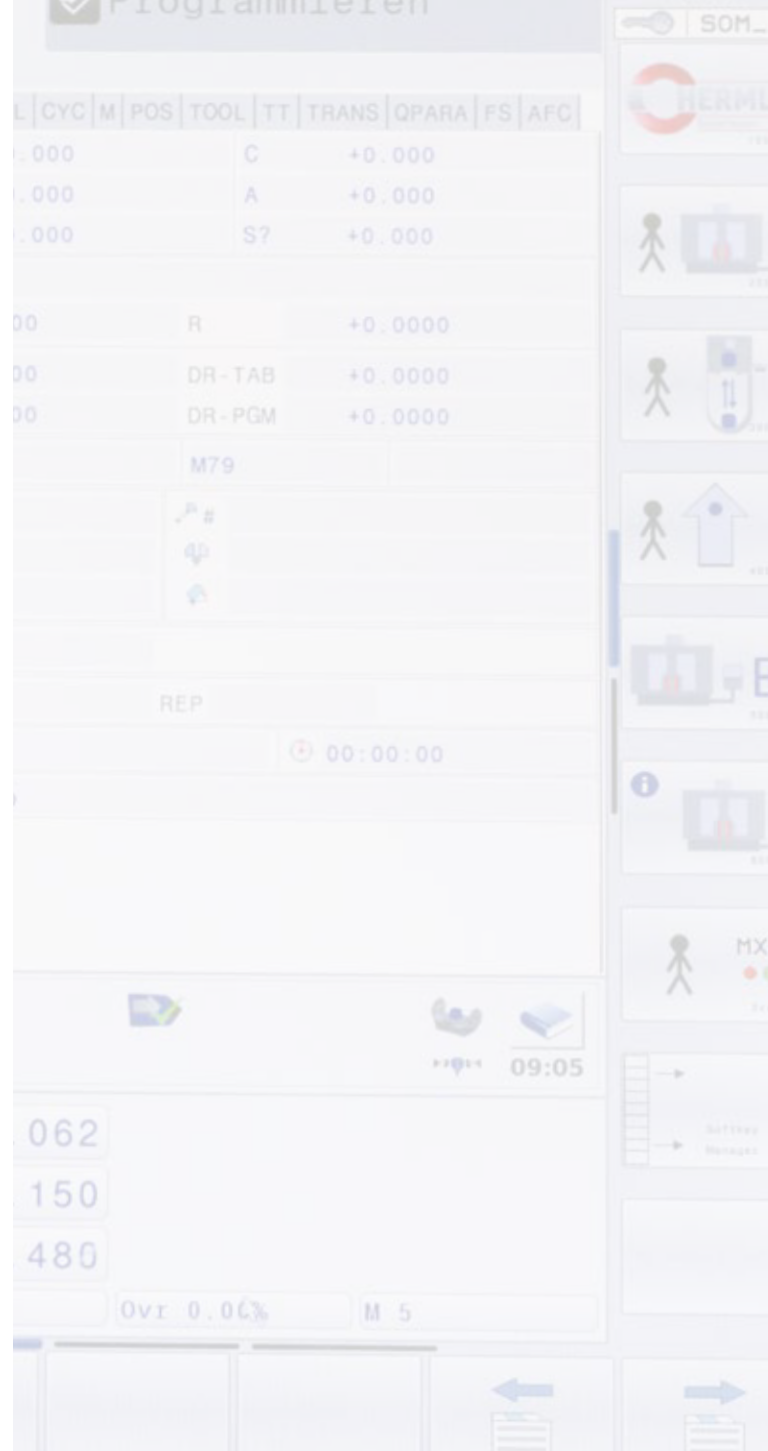
Hermle "Information-Monitoring-Software"

The „Information-Monitoring-Software“ is used to display the live status of machines and send events via e-mail.



Hermle "Wear Diagnosis System"

Machine status is continually monitored by the Hermle wear diagnosis system. It facilitates rapid machine diagnostics and status-oriented detection of maintenance tasks.



3D contour tolerance max.

3D contour tolerance max.

- For 3D roughing with low machining performance.
- Very high machining speed, mainly for free-form surfaces.

3D contour tolerance min.

3D contour tolerance min.

- For very high demands of machining accuracy, mainly for free-form surfaces.
- Can also be used with conventional programs.

3D path smoothing

3D path smoothing

- For very high demands on the surface quality, mainly for free-form surfaces.



02.8

The details

The C 12 is built using an elegant cassette panel construction. This high-tech building block concept is used throughout from the standard machine to the flexible manufacturing system. The machining centre can be transported without any disassembly and set up without a foundation. Furthermore, all units are arranged for easy maintenance and servicing.

HIGHLIGHTS

Comprehensive fluid technology

Optimised chip management

Diverse cooling lubricant units

Scraper belt conveyor

We provide the correct method of chip removal from the working area for all kinds of chip



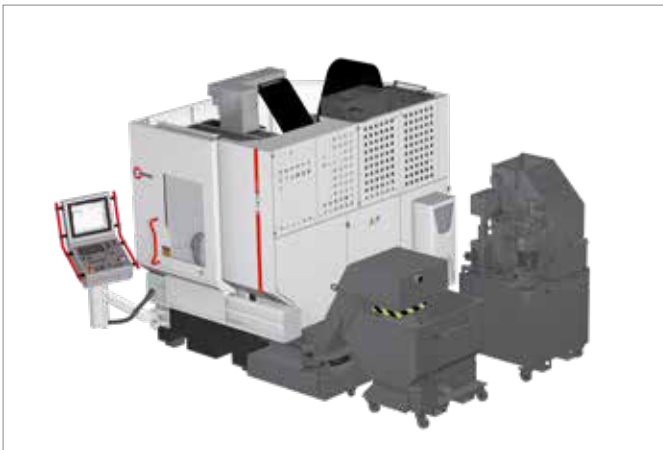
Space-saving chip conveyor arrangement



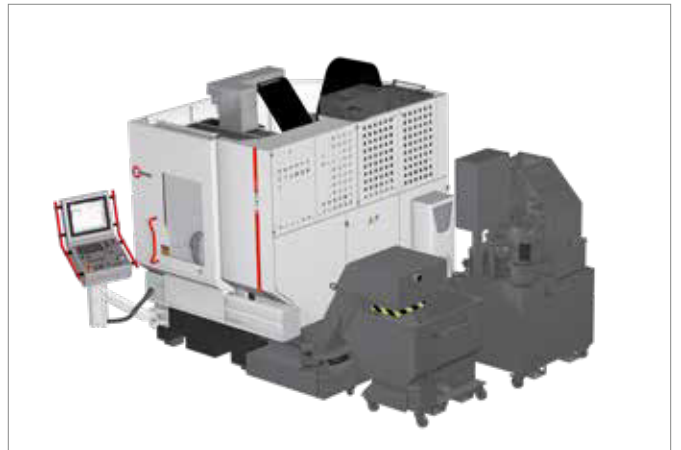
Chip slide



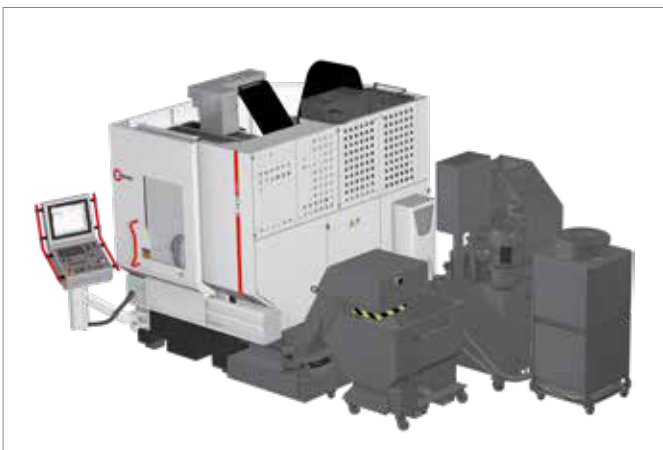
Chip conveyor



Chip conveyor with internal cooling lubricant supply ICS 40



Chip conveyor with internal cooling lubricant supply ICS 80

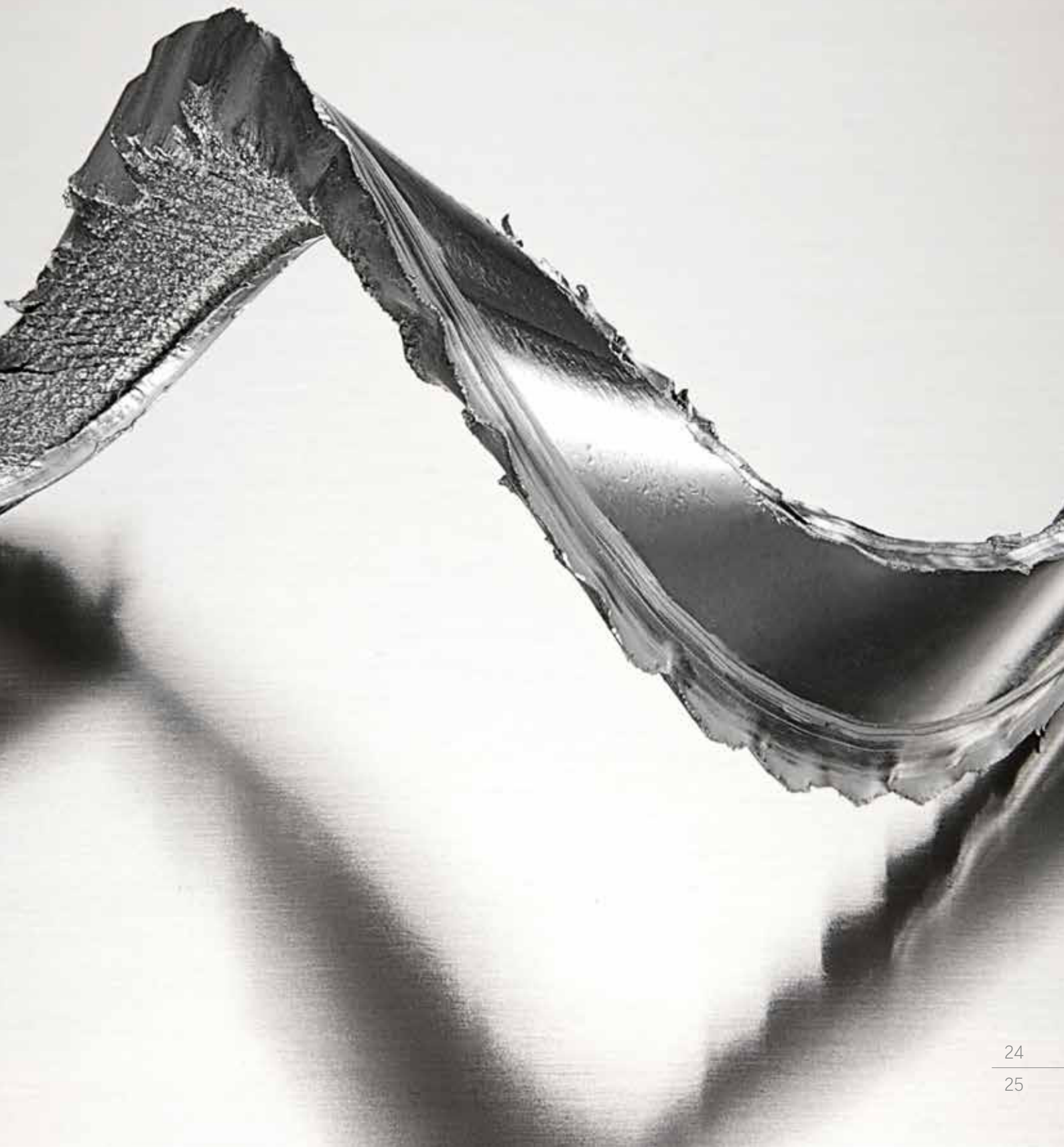


Chip conveyor with internal cooling lubricant supply ICS 80 and recooling unit

03

Technical data . C 12





03.1

Technical data . C 12

| | | | |
|--------------------------------|--|------------|------------------------|
| Working area | Traverse | X-axis | 350 mm |
| | Traverse | Y-axis | 440 mm |
| | Traverse | Z-axis | 330 mm |
| | Rapid linear traverse (dynamic) | X-Y-Z | 30 m/min (50 m/min) |
| | Linear acceleration (dynamic) | X-Y-Z | 4 (8) m/s ² |
| | Linear feed force | X-Y-Z | 3000 N |
| | Max. vertical table clearance | | 430 mm |
| | Max. workpiece diameter | | Ø 320 mm |
| | Max. workpiece height | | 265 mm |
| | Collision circle (A axis) in 0° position | | Ø 610 mm |
| Main spindle drive | Speed | 12000 rpm | SK 40 / HSK A 63 ● |
| | Main power/Torque | 20% c.d.f. | 31 kW / 98 Nm |
| | Speed | 15000 rpm | SK 40 ○ |
| | Main power/Torque | 20% c.d.f. | 31 kW / 98 Nm |
| | Speed | 18000 rpm | HSK A 63 ○ |
| | Main power/Torque | 20% c.d.f. | 31 kW / 98 Nm |
| | Speed | 25000 rpm | HSK A 63 ○ |
| | Main power/Torque | 20% c.d.f. | 37 kW / 35 Nm |
| | Speed | 30000 rpm | HSK A 50 ○ |
| | Main power/Torque | 20% c.d.f. | 37 kW / 35 Nm |
| | Speed | 42000 rpm | HSK E 40 ○ |
| | Main power/Torque | 20% c.d.f. | 35 kW / 17.5 Nm |
| Control | Heidenhain | | TNC 640 ● |
| Tool changer (pick-up) | Magazine pockets | | 36 items ● |
| | Additional tool magazine ZM 35 | | 35 items ○ |
| | Chip-to-chip time | | approx. 4.5 s |
| | Max. tool length | | 200 mm |
| | Max. tool diameter with | | Ø 80 mm |
| | Max. magazine load | | 144 kg |
| Swivelling rotary table | Swivelling rotary table | | Ø 320 ● |
| | Clamping surface | | Ø 320 mm |
| | Swivelling range | | +/- 115° |
| | C-axis drive mode | | Torque |
| | Swivelling axis A speed standard (dynamic) | | 25 (55) rpm |
| | Rotary axis C speed standard (dynamic) | | 40 (80) rpm |
| | Max. table load | | 100 kg |
| | T grooves star-shaped | | 4 / 14 H7 |

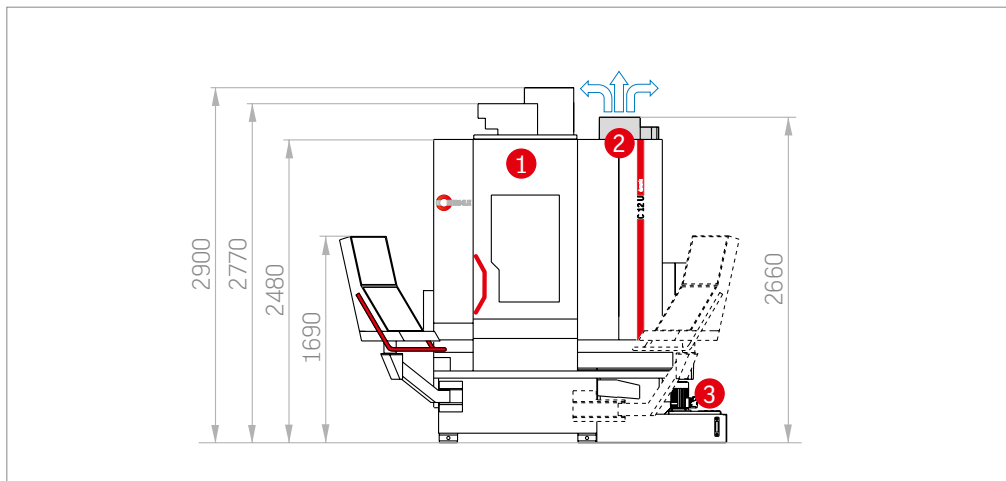
| | | | |
|---|--|---------------------------|---------------------------|
| Positional uncertainty | P in X-Y-Z axes according to VDI/DGQ 3441 (calculated at a constant ambient temperature of 20 °C +/-1 °C. Our products are subject to the German Export Law and require authorization since the attainable precision may be less than 6 µm.) | 0.008 mm | ● |
| Chip slide | Removable chip slide | | ● |
| Chip conveyor | Scraper belt or hinge conveyor ejection height ejection height chip cart | at least 960 mm 450 l | ○ ○ |
| External cooling lubricant supply | With chip slide and cooling lubricant tank Base container capacity chip slide Base container capacity chip conveyor | 236 l 325 l | ● |
| Internal cooling lubricant supply with paper band filter | Capacity of base container | 100 l | 100 l ○ |
| | Capacity of cooling lubricant tank | 570 l | 750 l |
| | Pressure (manually adjustable up to) | max. 40 bar / 26 l/min | max. 80 bar / 18 l/min |
| | Mains connection (ICS) | - | 400 V / 50 Hz |
| | Power consumption (ICS) | - | 15 kVA |
| Hydraulics | Operating pressure | 120 bar | ● |
| Central lubrication | Minimum grease lubrication quantity | | ● |
| Connected loads (machine) | Mains connection | 400 V / 50 Hz | |
| | Power consumption | 46 kVA | |
| | Compressed air | 6 bar | |
| Weight | (Standard version without optional extras, attachments, workpieces and cooling lubricant) | about 7.2 t | |

- Included in standard delivery
- Available upon request

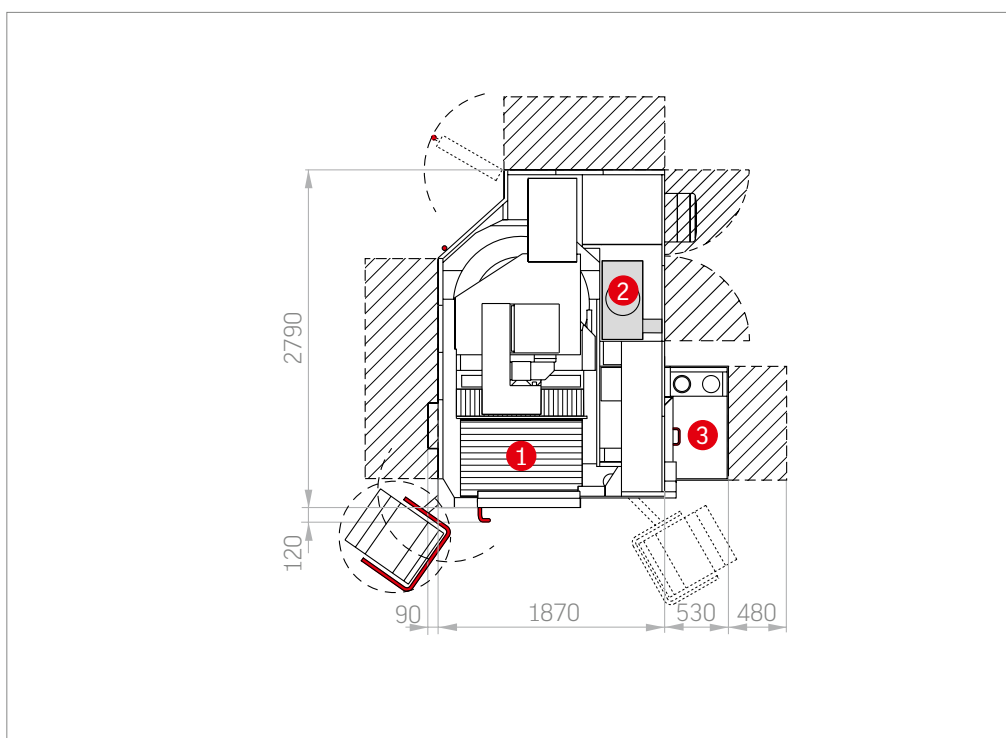
03.2 Options

The C 12 is prepared for anything: numerous optional extras make machining even more efficient and powerful in real applications and enable you to optimise your work with the machining centre still further.

C 12 standard machine dimensions



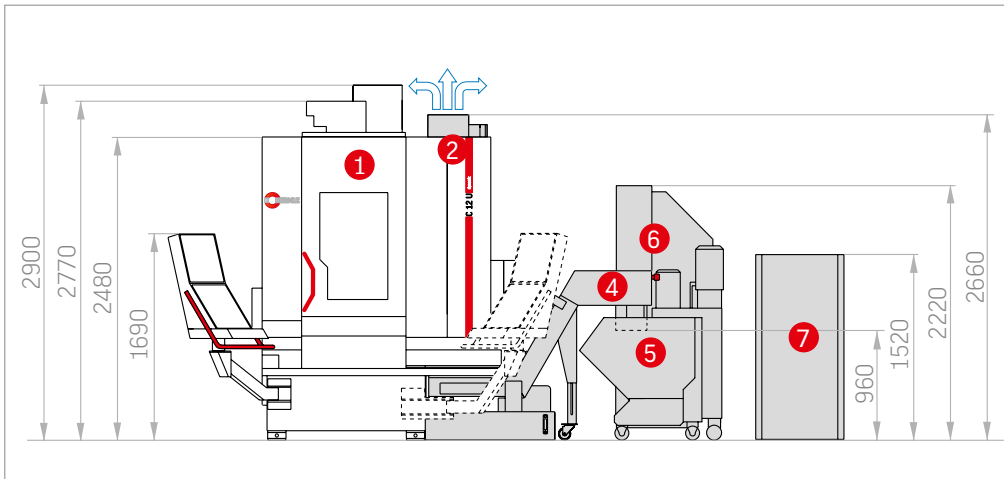
- 1 Machining center
- 2 Emulsion mist extraction
- 3 Chip slide



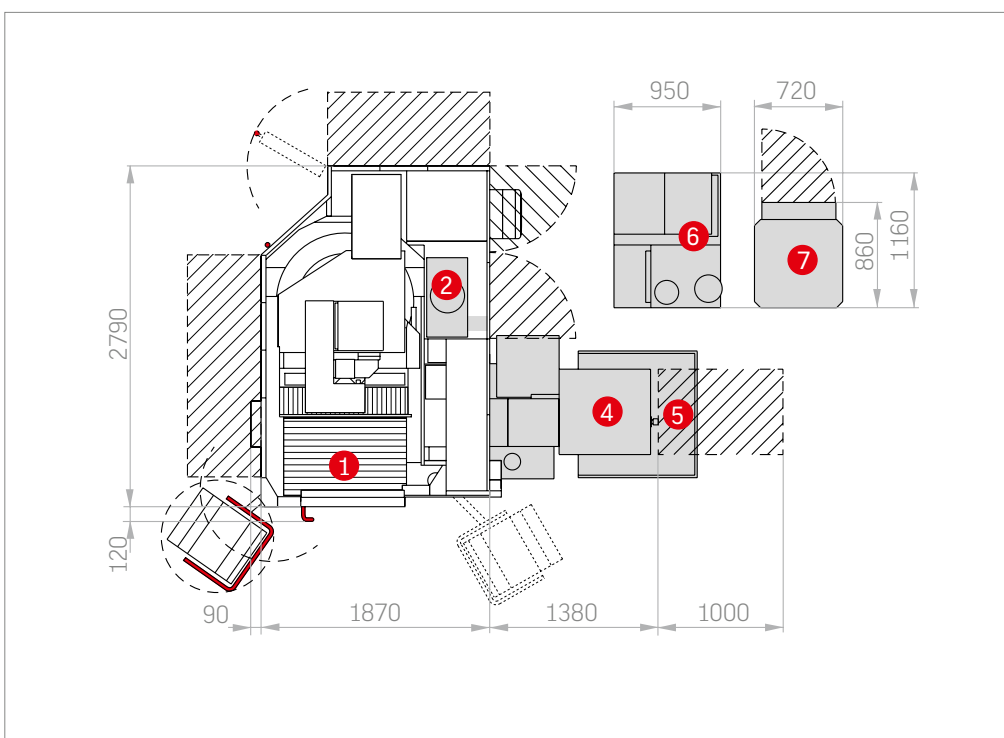
Options

- Air blowing device
- Automation package front
- Automation package side
- Automatic cabin top
- Automatic cabin doors
- BDE signal
- Control panel 19" touchscreen
- Additional control panel to tool magazine
- Bed flushing
- Blow air through spindle centre
- 6-fold rotary feedthrough
- Elec. hand-held control module
- Electr. heat compensation
- Emulsion mist extraction
- Fluid cabinet doors
- Precision packages
- Internal cooling lubricant supply
- Touch probe incl. preparation
- Pallet clamping system
- Pallet storage
- Pallet changer
- Recooling unit for ICS
- Rotating setup station
- Signal lamp
- Chip conveyor
- Coolant nozzle
- Chip cart
- Sealing air for scales
- Signal tower
- Laminated safety glass panes
- Preparation for touch probe system
- Tool breakage monitoring / measuring system
- Additional tool magazine ZM 35

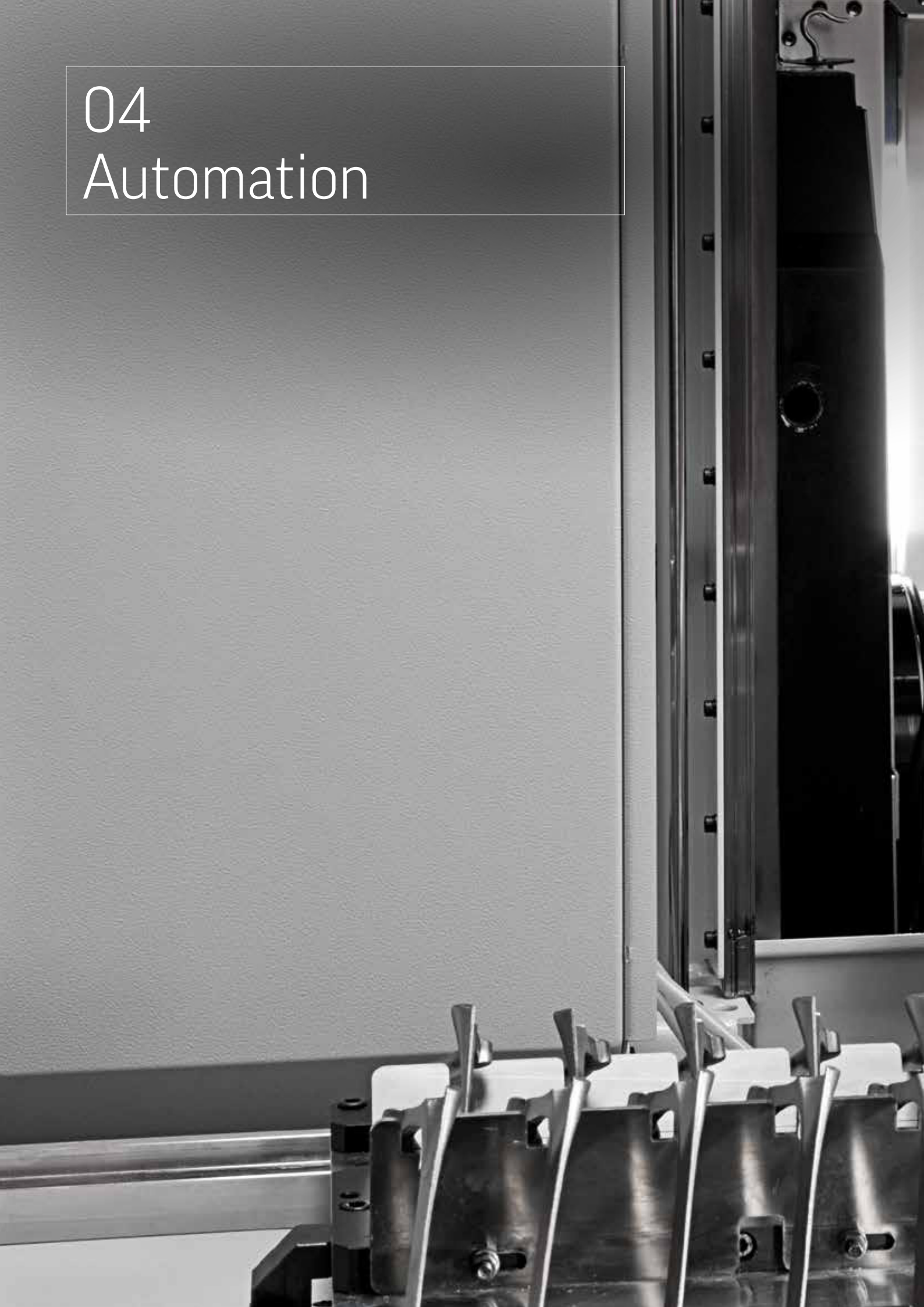
C 12 machine dimensions



- 1 Machining center
- 2 Emulsion mist extraction
- 4 Chip conveyor
- 5 Chip cart
- 6 Internal cooling lubricant supply
- 7 Recooling unit for ICS



04 Automation





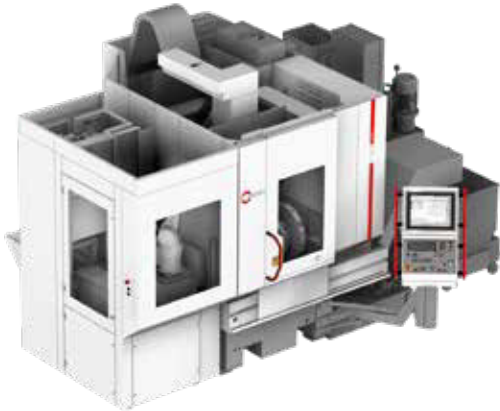
04.1 Automation . C 12



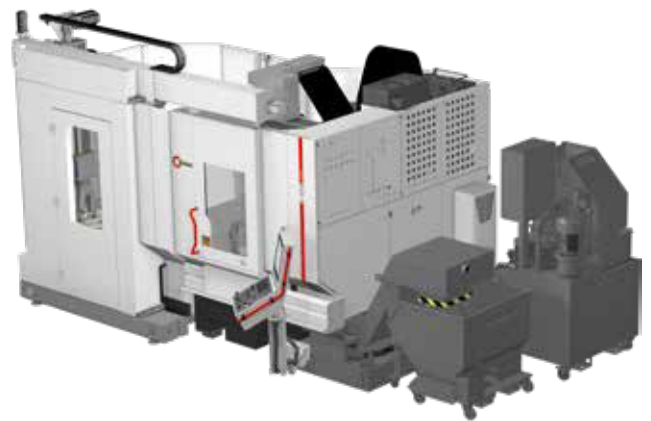
Everybody is talking about automation, but it's much more than just a trend. We ourselves have changed from being a machine manufacturer to a process provider because we believe that the decisive criterion for automated efficiency is integration of the entire environment. In keeping with this philosophy, we are continuing what began with economical pallet changing and intelligent handling systems with highly advanced robot solutions.

Our pallet changer is setting new standards for parallel setup in our highly dynamic machining centres. A further increase in productivity allows for more adaptable storage systems. Machining centres can be set up via pallet storage for production-oriented machine runs with minimum operator interference/without operator interference or for customer-specific runs using a wide range of parts. Furthermore, multiple machining centres can be linked to form a complete manufacturing system.

Robot system RS 05



Pallet changer PW 100



Handling system HS flex



THE ADVANTAGES

- Completely free access to the machining centre
- Quick and easy installation
- No floor anchorage required
- Complete transport (no disassembly)
- Side-mounted setup station
- Setup station optionally rotatable
- Large pallet storage
- Additional pallet storage space (for PW 100 only)



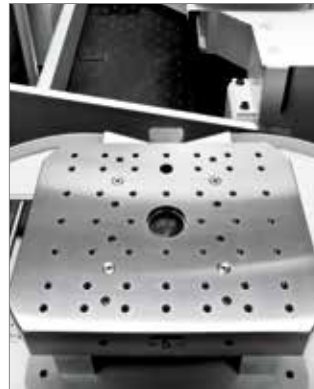
Loading a workpiece using the robot



Double gripper for 2 x 100 kg



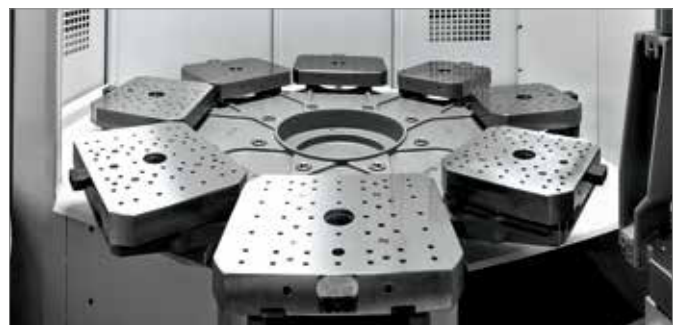
Pallet changer setup station



Fix setup station
(rotatable setup station option)



The C 12 machining centre with left-hand adapted RS 05 robot system



PW 100 pallet changer with setup station and 11-fold pallet storage

PW 100 . Compact pallet changer:

Gripper as double gripper

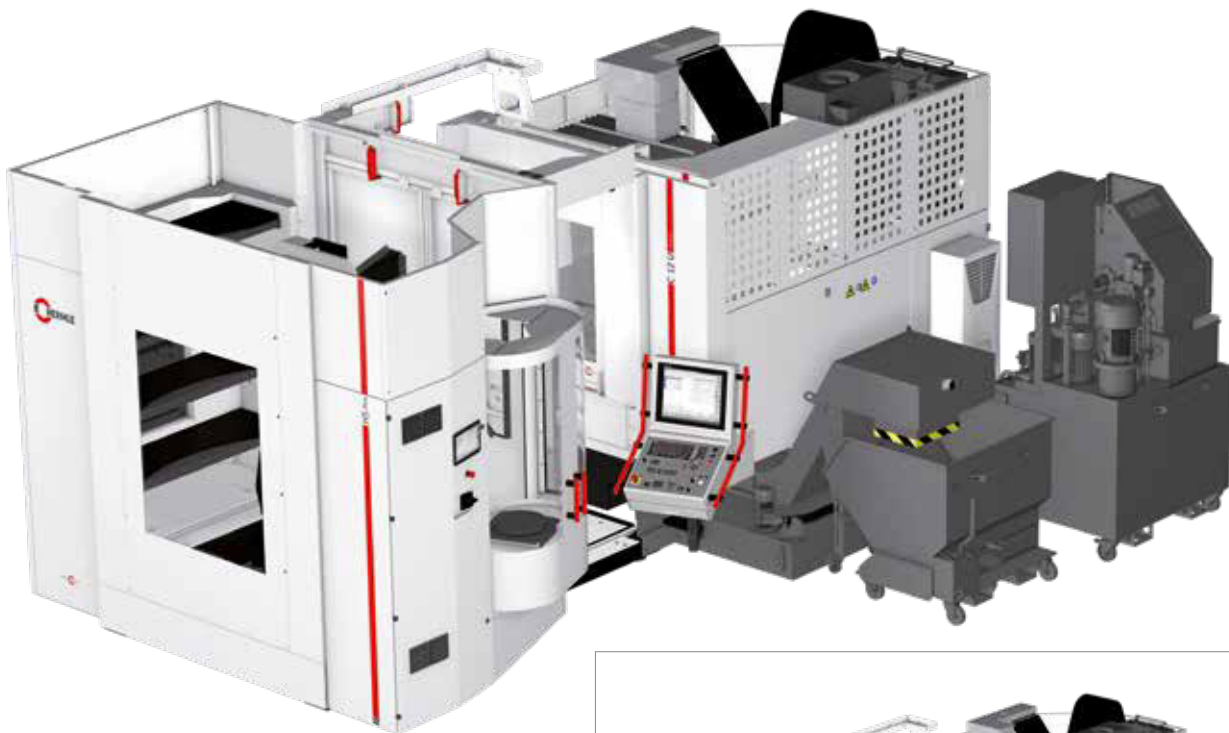
| Pallet storage | with 3-fold storage | with 8-fold storage | with 15-fold storage |
|--------------------------------------|---------------------|---------------------|----------------------|
| Pallets | 6 units | 11 units | 18 units |
| Pallet dimensions | 320 x 320 mm | 320 x 320 mm | 320 x 320 mm |
| Max. workpiece diameter | Ø 320 mm | Ø 320 mm | Ø 320 mm |
| Max. workpiece height | 360 mm | 360 mm | 305 mm |
| Max. transport weight (incl. pallet) | 2 x 100 kg | 2 x 100 kg | 2 x 100 kg |
| Pallet change time | approx. 18 s | approx. 18 s | approx. 18 s |

Repeating accuracy < 0.01 mm

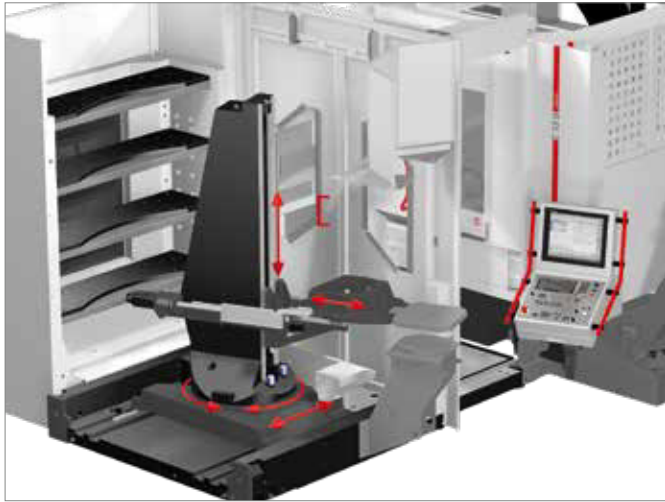
04.1 Automation . C 12

The HS flex handling system is an automation solution providing cost-effective entry into machining centre automation. The front-mounted modification ensures a space-saving layout with direct connection to the machining centre. The large intermediate space provides direct access to the working area for manual operator activities. In automatic mode, a double door blocks operator access and in setup mode it blocks access to the handling system. The customisable pallet storage module provides numerous combination options for a large range of parts. A second pallet storage module can also be integrated into the handling system, making for a further significant increase in pallet storage capacity.

Our Hermle Automation Control System (HACS), operated via the integrated touch panel, provides an ideal platform for intuitive operation and control of the handling system.



HS flex with two pallet storage modules and a setup station, adapted to a C 12 U machining centre.



Functional and traverse plan for the handling system. Compact design and space-saving arrangement, with optimal accessibility for the operator.

THE ADVANTAGES

- Automation solution for large pallet storage capacity
- Optimised, user-friendly access to machining centre
- Large, configurable pallet storage module
- Additional pallet storage module, available
- Lateral setup station (optionally rotatable)
- Touch panel with integrated HACCS operating software
- No floor anchors required
- Easy and fast setting up and commissioning

Technical data . HS flex:

| Pallet storage (storage module 1 or 2) | 25 x Pallet storage | 20 x Pallet storage | 12 x Pallet storage | 9 x Pallet storage |
|---|------------------------|------------------------|--|--|
| Storage locations per module | 25 units | 20 units | 12 units | 9 units |
| Pallet size | 240 x 320 mm | 240 x 320 mm | 240 x 320 mm 320 x 320 mm 400 x 320 mm | 240 x 320 mm 320 x 320 mm 400 x 320 mm |
| Workpiece height max.* | | | | |
| Intermediate rack level | 260 mm | 260 mm | 260 mm | 485 mm |
| Upper rack level | 625 mm | 625 mm | 625 mm | 625 mm |
| Transport weight max.** (incl. pallet) | | | | |
| Single cone | 100 kg | 100 kg | 100 kg | 100 kg |
| Pallet weight min. | 20 kg | | | |
| Pallet change time | 50 s | | | |

* Please pay attention to the maximum workpiece height that can be machined.

** Please pay attention to the maximum permitted table load.

05 Precision



PRECISION IN EVERY DIMENSION: Hermle has a thorough understanding of the requirements for manufacturing high-precision machining centres for processing smaller and larger workpieces of up to 2.5 t in weight. For this reason, "The Original" only uses German machines for production and materials from European suppliers.

Furthermore, the entire machining production department is fully air conditioned and kept clean by a central chip disposal system.

Hermle machining centres have also been thoroughly tested by intensive endurance tests and in manufacture-oriented machining processes in our own machining manufacturing department. Our meticulous manufacturing processes allow Hermle to set new precision standards which undercut those demanded by the DIN/ISO 10791 standard in every way.

At Hermle, we distinguish between positional uncertainty (accuracy with which a certain position within the working area can be pinpointed on one axis) and geometric precision.

The latter is significant for the precision of the entire machine – it encompasses the following factors:

- Positioning of linear and rotary axes.
- Straightness and angular deviation of the linear axes.
- Rectangularity and parallel alignment of all axes to one other.
- Concentricity and axial run-out of the swivelling rotary table.
- Concentricity of the working spindle.

The precision of Hermle machining centres originates during mechanical production and is not produced by subsequent electronic compensation. This further improves the precision of the individual axes (precision package 1 and 2).



PRECISION LEVELS

Hermle standard:

X-Y-Z: Positional uncertainty $P \leq 8 \mu$

A: Positional uncertainty $P \leq 10''$

C: Positional uncertainty $P \leq 8''$

Hermle improved precision*:

X-Y-Z: Positional uncertainty $P \leq 5 \mu$

A: Positional uncertainty $P \leq 6''$

C: Positional uncertainty $P \leq 6''$

*To achieve improved precision, components must be selected with care. Tolerances must also be taken into account whilst the machine is still being constructed. Hermle also recommends the HSK A 63 tool holding fixture, electric heat compensation and an ICS recooling. Test and operating conditions are as follows: air conditioned room (+20 °C, +/- 2 °C) and temperature fluctuation of only 0.5 °C in one hour or max. 2 °C within 24 hours.

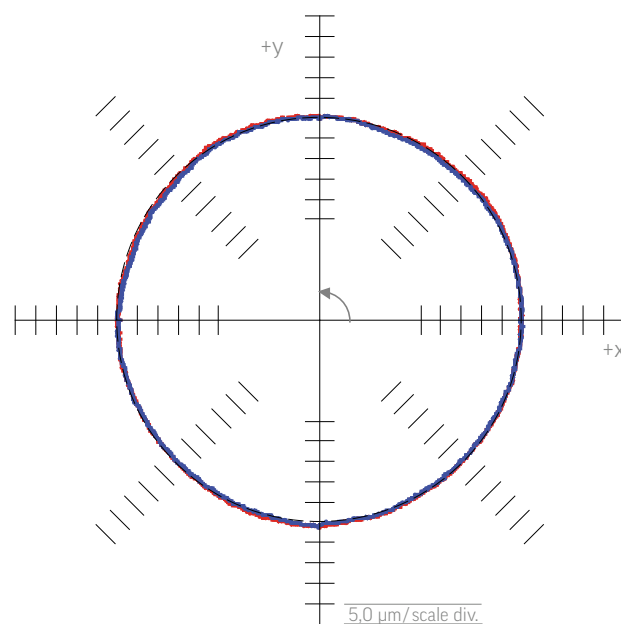
IMPROVED PRECISION PACKAGES

Precision package 1 (linear axes X, Y, and Z)

- Straightness optimisation
- Geometry adjustment and optimisation
- Straightness measurement
- X, Y, Z positioning accuracy: Pos. uncertainty $\leq 5 \mu$
- Laser measurement according to VDI/DGQ 3441 or ISO 230-2

Precision package 2 (rotary axes A and C)

- Table geometry
- Axial run-out bearings
- C-axis bearing
- Adjustment of complete table
- Position of A and C axes relative to basic geometry
- Positional uncertainty A 6''
- Positional uncertainty C 6''
- Laser measurement according to VDI/DGQ 3441 or ISO 230-2



Run 1

Run 2

06

Energy efficiency

Both manufacturer and customer benefit from efficient production processes. Therefore, Hermle has focused on integrated resource sustainability and energy efficiency for many years. We can rightly claim pioneer status in the "bluecompetence" initiative founded by the VDW (German Machine Tool Builders Association).

From development to low-energy manufacturing (with a high level of in-house production) to the operation of CNC machining centres – Hermle has stood for a principle of sustainable environmental protection combined with economic considerations for many years. Energy recovery is just one of the advantages enjoyed by our customers.

BLUECOMPETENCE

Machine Tools

EFFICIENT MANUFACTURING

We use energy efficient manufacturing methods not because it is the current trend or because it is required of us, but on principle. And we always have.

Low energy component manufacture

- Mineral casting technology
- Lightweight construction

*Virtual machine optimisation /
machine development*

*Reduction in the energy required for transport
through:*

- High levels of in-house production
- Just one production plant
- Locally sourced components
and materials
- No material tourism

High-quality, high-efficiency components

- Ball screws
- Guideways
- Antifriction bearing etc.

EFFICIENT OPERATION

*Our machining centres are energy efficient both during
their manufacture and during operation.*

*Energy recovery has been standard
at Hermle for over 20 years*

High quality servo axes

*Ideal drive design for
the respective application*

*Demand-based cooling technology
both for dimensioning and
in application*

*De-energize system:
Up to 80% less energy consumption
in stand-by mode*

Very long machine service life

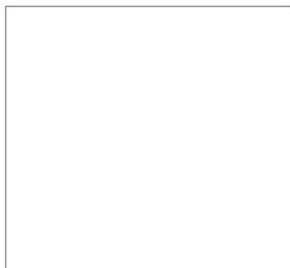
07 Services

The perfection we insist on for our development and production of our machines is also mirrored by our service department. Our service team provides more than just spare parts and rapid response support within hours. At Hermle, we see ourselves as a comprehensive service provider which provides customers with numerous benefits.

Alongside standard services, these include:

- Our superior, cost-effective, practical and flexible training programmes carried out by sales representatives directly at the customers' premises.
- Our continual pursuit of optimisation and perfection. Our motto – those who stop improving today will not make the grade tomorrow.
- Intensive expert consultation on milling in general, programming and handling of our products.
- Our application technicians who are experts in machining processes and who are quick to assist and advise our customers.





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