

Universality in a  
new dimension

# U 740



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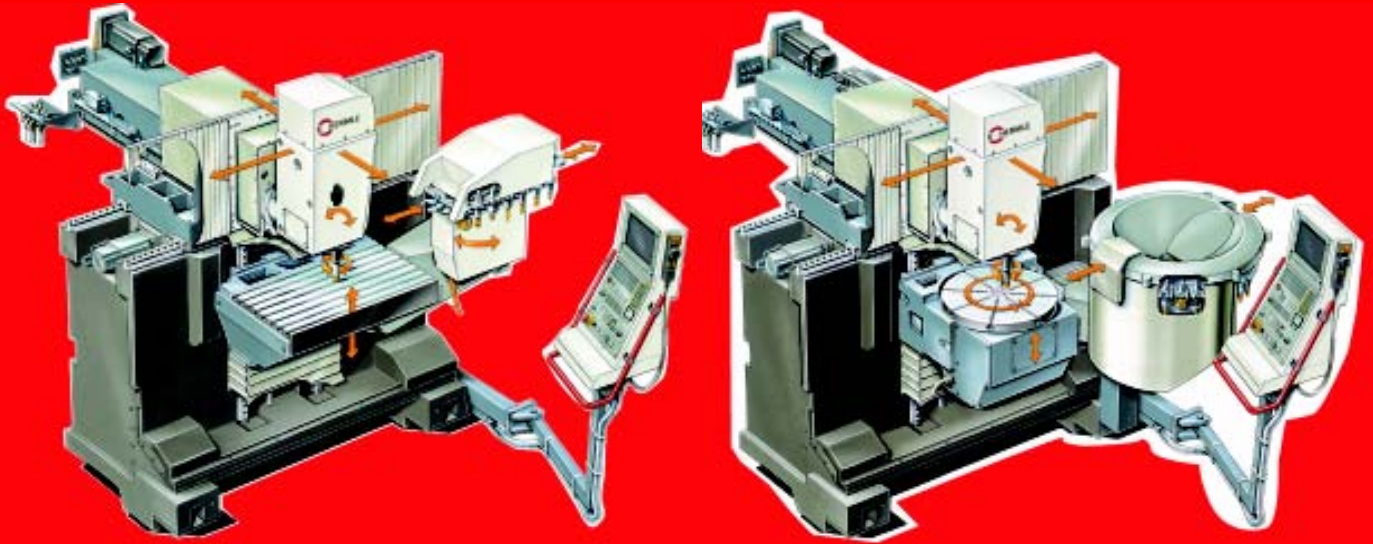
## The outstanding features of the U 740

- Solid block design with 3-point support in proven mineral casting technology
- CNC-controlled B axis swivellable between  $-5^{\circ}$  /  $+95^{\circ}$  with hydraulic clamping
- Main spindle manually swivellable between  $-5^{\circ}$  /  $+95^{\circ}$  with digital display on control unit
- Motor spindle technology with collision protection
- Speed from 12,000 to max. 18,000 rpm and a torque of 200 Nm
- Large X traverse 740 / 915 mm
- Rapid traverses up to 30 m/min
- Acceleration up to  $4 \text{ m/s}^2$
- Max. table loading up to 700 kg
- Fully enclosed easily accessible working area
- Control panel swivellable from the working position to the tool loading and unloading station
- Modular design including extensive options
- Highly advanced control technology with the iTNC 530

**5-side machining or 5-axis simultaneous machining** ►  
the U 740 with CNC-controlled B axis, NC rotary table,  
tool changer and individual options



# Technical details



## Design features

- Compact mineral casting bed in solid block design, for high machine rigidity and precision, with minimum space requirement
- Universal machine with overhead compound table
- X and Y axes in the tool, hence machine dynamics are independent of workpiece weight, ideal for rapid traverses and feed rates up to 30 m/min.
- Z axis in the workpiece, hence constant ergonomic working height independent of the workpiece height
- Machine can be transported completely assembled
- No foundation required (3-point support)
- High inherent rigidity
- Good static and dynamic properties
- High positioning and long-term accuracy

## Drives and guideways

- The spindle slide is guided steadily over the complete traverse on a compound rest
- Profiled rail system in all linear axes
- Digital AC servo drives with pre-tensioned ball screws
- Direct position measuring system
- The automatic central grease lubrication requires little maintenance
- Permanent position monitoring

## Mineral casting design

- Mineral casting has excellent cushioning properties, very low thermal conductivity and is not hygroscopic
- Extremely high form and contour accuracy in all planes
- Optimum surface finish in combination with very narrow tolerances
- Ecological manufacturing and disposal of mineral casting





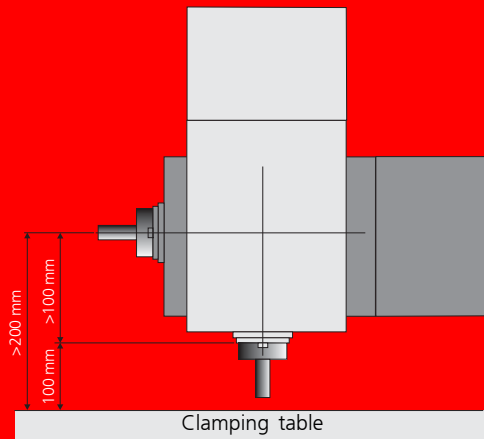
The U 740 is a must wherever flexibility, precision and universality are required.

A machine concept that has proven itself a thousand times, in a new solid block design, ideal for tool and mould making along with production of single parts and small series.



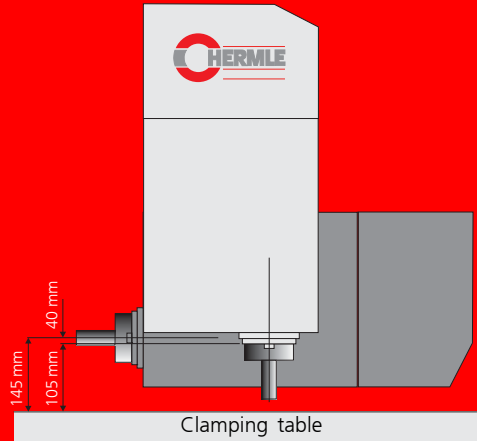
### Conventional main spindle

Z-offset is more than 100 mm between vertical and transverse machining surface



### Main spindle U series (patented)

Z-offset is only 40 mm between vertical and transverse machining surface



### Main spindle

- Collision protection with collision inquiry
- Hollow shaft, water-cooled AC spindle motors
- Standard spindle speed of 12,000 rpm (18,000 rpm optionally)
- Supply lines for air, cooling lubricant or minimum quantity lubrication, single or combined, through the spindle or from the outside.
- Rigid main spindle or as B axis  $-5^{\circ}$  to  $+95^{\circ}$  continuously swivellable manually (digital display) or CNC-controlled

### The clever idea is in the main spindle

In conventional swivellable main spindles, the spindle center is exactly at the center of rotation, so that the spindle, when changing from the vertical to the transverse (horizontal) position, moves away from the table clamping surface by half a spindle width, making it necessary to place a support plate under flat parts.

Hermle has placed the spindle center away from the center of rotation, thus moving the spindle in the transverse position closer to the table clamping surface. The tedious operation of placing supports underneath is substantially reduced.

### Tool change

- Automatic tool change
- Chain magazine for 16 SK 40 tools, automatically swivellable in and out of the working area
- Ring magazine for 28 SK 40 or HSK A 63 tools
- Tool magazine located outside the working area, hence the tools are protected against soiling

### Electronics

- Frequency-based recovery of the braking energy into the mains
- Absolute measurement systems
- The entire electronics is integrated in a central cabinet
- Latest 600 V technology
- Switch cabinet with heat exchanger / cooling unit
- Latest control technology
- Digital drives

# U 740



## U 740

### Traverses

Traverse	X axis	740 mm
	X axis	915 mm*
Traverse	Y-axis	500 mm
Traverse	Z-axis	500 mm

### Rapid traverses

Linear rapid traverses	X-Y-axis	30 m/min
Linear rapid traverse	Z-axis	20 m/min
Linear acceleration		4 m/s <sup>2</sup>
Feed force	X-Y-axis	6000 N
Feed force	Z-axis	max. 6000 N

### Control unit

Heidenhain	iTNC 530
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### Main spindle

Speed	20-12,000 rpm	SK 40 / HSK A 63
Main power/torque 30% ED		32 kW / 200 Nm
Speed	20-18,000 rpm	SK 40 / HSK A 63
Main power/torque 30% ED		32 kW / 200 Nm

### Main spindle in 3 designs

#### - Rigid design

- **Manually swivellable via crank handle**  
with digital display on control unit -5° / +95°

- **CNC-controlled B axis**  
with hydraulic clamping -5° / +95°  
Speed 15 rpm

\*Not possible with the tool changer for 28 tools.



**Table variants**

**Rigid clamping table**

Clamping surface 900 x 500 mm  
 Table load 700 kg

**NC rotary table**

Clamping area Ø 630 mm  
 Speed 20 rpm  
 Table load 500 kg

**Tool magazine**

The chain magazine can be swivelled automatically in and out of the working space.

**Chain magazine**

Tool holding fixture SK 40  
 Max. tool length 250 mm  
 Max. tool diameter Ø 80 mm  
 Max. tool diameter in case of free adjacent pockets Ø 100 mm  
 Max. tool weight 6 kg  
 Max. magazine load 64 kg

**Ring magazine**

Tool holding fixture SK 40 / HSK A 63  
 Max. tool length 300 mm  
 Max. diameter Ø 80 mm  
 2 magazine pockets tool diameter Ø 125 mm  
 Max. tool weight 6 kg  
 Max. magazine load 112 kg

# Details



## Useful details for individual machining

- Clean  
Internal coolant supply with coil-type suction filter and additional paper ribbon filter.
- Reliable  
The extremely wide chip conveyor allows continuous chip removal from the working space at a very high volume.
- Cleaned  
The coolant nozzle can be used to remove chips from the workpiece, the clamping device or the clamping tables.
- Odorless  
The oil mist extractor extracts and filters the oil mist from the working area.
- Monitored  
The tool breakage monitoring with laser light barrier monitors the tools for breakage or measures their length and diameter.
- Practical  
The control panel can be swivelled from the operating position to the tool loading position.
- Precise  
The touch probe reduces setup times. It is used to check workpiece geometry, to detect the workpiece position, and to measure pockets and bores. In 5-axis/5-side machining, the use of the touch probe greatly increases the number of applications.
- Setup  
The electronic hand-held control is ideal for setting up complex workpieces.
- Adapted  
Via the Ethernet interface you can adapt the iTNC 530 to a network and connect the machine tool to your PC or to a work station.
- Versatile  
Nozzle ring with adjustable nozzles supply coolant to the tools and cutting edges and remove chips.
- Free  
A swiftly rotating disk (Rotoclear) provides a free view into the working space even if the spindle coolant supply is used.
- Oil-free  
The automatic central grease lubrication provides perfect lubrication of all movable parts without oil leakage.

# Control unit



## Heidenhain iTNC 530

The control unit is designed for sophisticated milling processes and exhibits numerous advantages in production machining or high-speed machining, whether for tool manufacturing or mould making.

The control unit is equipped with large-sized TFT color screen, user-defined soft keys and additional software functions. This allows user-friendly handling, especially in programming directly on the machine.

The electronic hand-held control module makes for easy setup of complex workpieces.

### Safe controls

Control with integrated safety technique according to category 3 of EN 954-1.

The "Safe Control" design makes it possible to work in operating mode II at a speed of 2,500 rpm and a feed rate of 2 m/min., with the protective cabin open. In operating mode III (can be switched on as an option by means of a code), a spindle speed of 3,500 rpm and a feed rate of 5 m/min is possible.

### eMessenger

The eMessenger software allows the machine to send an e-mail or an SMS (on the mobile phone), depending on the settings selected, to pre-defined recipients. This increases the availability of the machines and minimizes interruptions in production by allowing immediate notification in case of malfunctions. Likewise, the maintenance intervals can be adapted to the actual operating time, and preventive as well as planned machine stops can be made via warning messages.

### Remote diagnosis

Remote diagnosis gives you faster assistance in case of programming and operating problems. Errors can be analyzed and detected immediately. New software versions can be implemented directly, and service charges can be reduced. The availability of your machine is increased.

\* For detailed information, please consult the individual catalogs.

# Services



## Service

- Fast  
Our hotline assists you with solutions and troubleshooting before major problems arise.
- Decentralized  
Our service personnel are stationed locally near you. In our partnership firms abroad, local service personnel is available directly on-site.
- Digital  
Remote diagnosis, E-Messenger, Remote maintenance - the data technologies linking you and us to your machines.
- Competent  
Guaranteed fast supply of spare parts for all machine models.

## Sales

- A modern worldwide distribution network with competent and reliable partners ensures that you get detailed information and advice directly on-site.
- Direct sales in Germany. Our Hermle + Partner Vertriebs GmbH offers you optimum and individual customer care.

## Training

- High quality  
In our worldwide training centers, we offer basic to advanced operator/programming instructions.
- Economical  
We will assist you to optimize your Hermle machine tool.
- Customized  
Customised concepts for operating and programming your Hermle machine tools or for their maintenance and repair.

## Application Engineering

- Innovative  
In our technology and training centers, we feature individual milling demonstrations on innovative milling machines and machining centers.
- Intensive  
Extensive advice on machining, programming and the handling of our products.
- Professional  
We guarantee professional support concerning tooling, clamping fixtures, mounting devices, data transmission and CAD/CAM.



## Production and Assembly

- Precise  
Innovative and high precision products require a demanding production process. Machines are subjected to extensive tests, including a geometric examination. Approval according to VDI and company standards.
- Flexible  
Latest laser and punch press machines for sheet metal work, highly flexible high-precision manufacturing cells for machining processes and our highly experienced factory staff provide high quality products.
- Tested  
Constant checking and adjustment of work processes provide increasingly improved work procedures and product optimization.
- Target oriented  
Target oriented investments ensure that our factories are equipped with the latest technology.
- Clean  
The cyclic assembly of complex machine series and testing of the machines take place in a bright, friendly and clean environment.
- Reliable  
Safe and ergonomic workplaces for consistently good quality.
- Organized  
Teamwork in all sectors ensures optimizing of work procedures and constant product improvement.
- Qualified  
More than 10% of our employees are apprentices, allowing us to train our personnel systematically and to ensure qualified manpower for tomorrow.

# Technical data



## U 740 Technical data

### Working area

Traverse	X axis	740 mm
	X axis	915 mm*
Traverse	Y-axis	500 mm
Traverse	Z-axis	500 mm

### Feed drives

Rapid traverses	X-Y-axis	30 m/min
Rapid traverses	Z-axis	20 m/min
Linear acceleration	X-Y-Z	4 m/s <sup>2</sup>
Feed force	X-Y-axis	6000 N
Feed force	Z-axis	max. 6000 N

### Main spindle drive

Speed	12,000 rpm	SK 40 / HSK A 63
Main power/torque 30% ED		32 kW / 200 Nm
Speed	18,000 rpm	SK 40 / HSK A 63
Main power/torque 30% ED		32 kW / 200 Nm

### Main spindle in 3 designs

Rigid design		
Manually swivellable via crank handle with digital display on control unit		-5° / +95°
CNC-controlled B axis with hydraulic clamping		-5° / +95°
Speed		15 rpm

### Tool changer

Chain magazine	16 pockets
Tool holding fixture	SK 40
Max. tool length	250 mm
Max. tool diameter	Ø 80 mm
Max. tool diameter in case of free adjacent pockets	Ø 100 mm
Max. tool weight	6 kg
Max. magazine load	64 kg

Ring magazine	28 pockets
Tool holding fixture	SK 40 / HSK A 63
Max. tool length	300 mm
Max. diameter	Ø 80 mm
2 magazine pockets tool diameter	Ø 125 mm
Max. tool weight	8 kg
Max. magazine load	112 kg

### Table variants

Rigid clamping table	
Clamping surface	900 x 500 mm
Table load	700 kg
NC rotary table	
Clamping area	Ø 630 mm
Speed	20 rpm
Table load	500 kg



**Direct position measuring system**

Resolution 0.0001 mm

**Positional tolerance**

Tp in X-Y-Z axes according to VDI/DGQ 3441 0.010 mm

(determined at a constant ambient temperature of 20°C +/-1°C)

**Control unit**

Heidenhain iTNC 530

**Cooling system**

Amount of coolant 210 l

**Through the spindle coolant supply**

Amount of coolant 600 l  
 Pressure 40 bar / 40 L/min  
 Paper ribbon filter

**Chip conveyor**

Scraper belt conveyor or hinged belt conveyor  
 Chip cart 450 l

**Hydraulic system**

Operating pressure 120 bar

**Central lubrication system**

Minimum quantity lubrication

**Connected load**

Mains supply 400 V / 50 Hz  
 Power consumption 30 kVA  
 Compressed air 6 bar

**Weight**

(Standard version) approx. 6.0 t

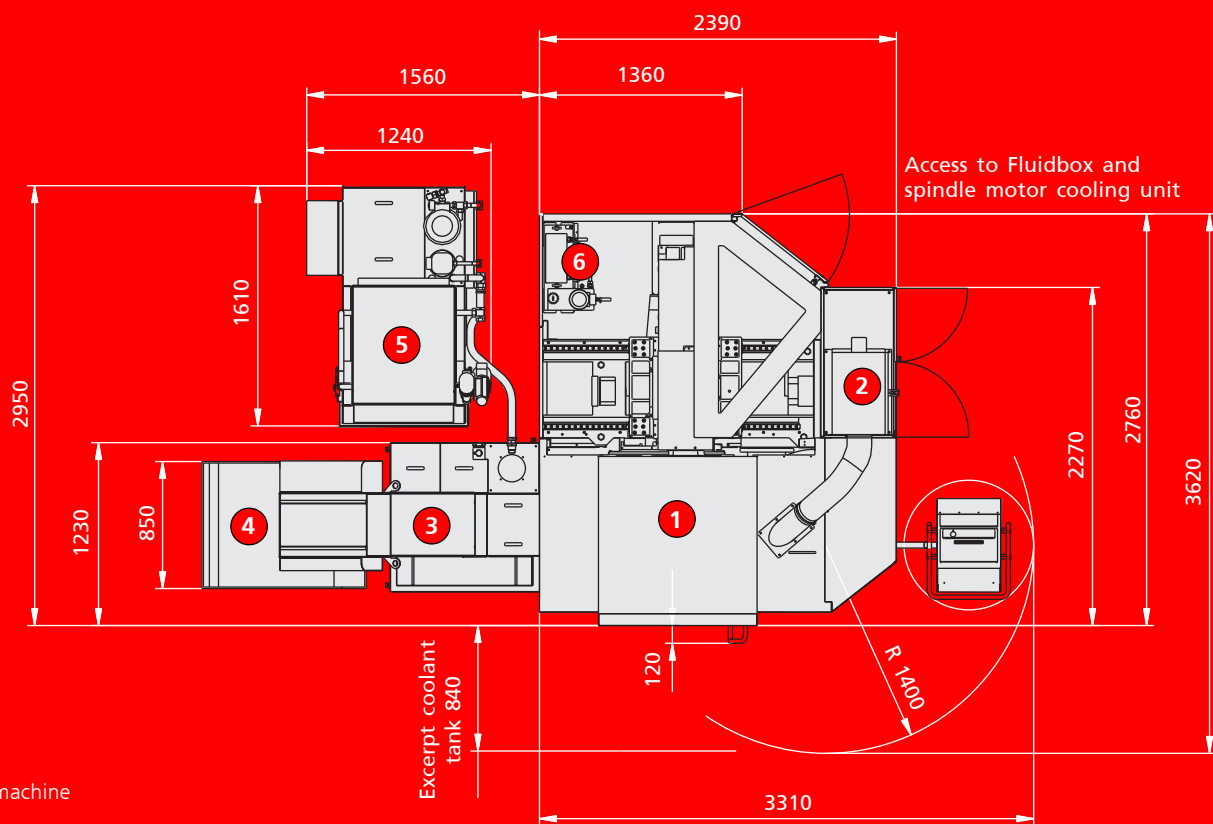
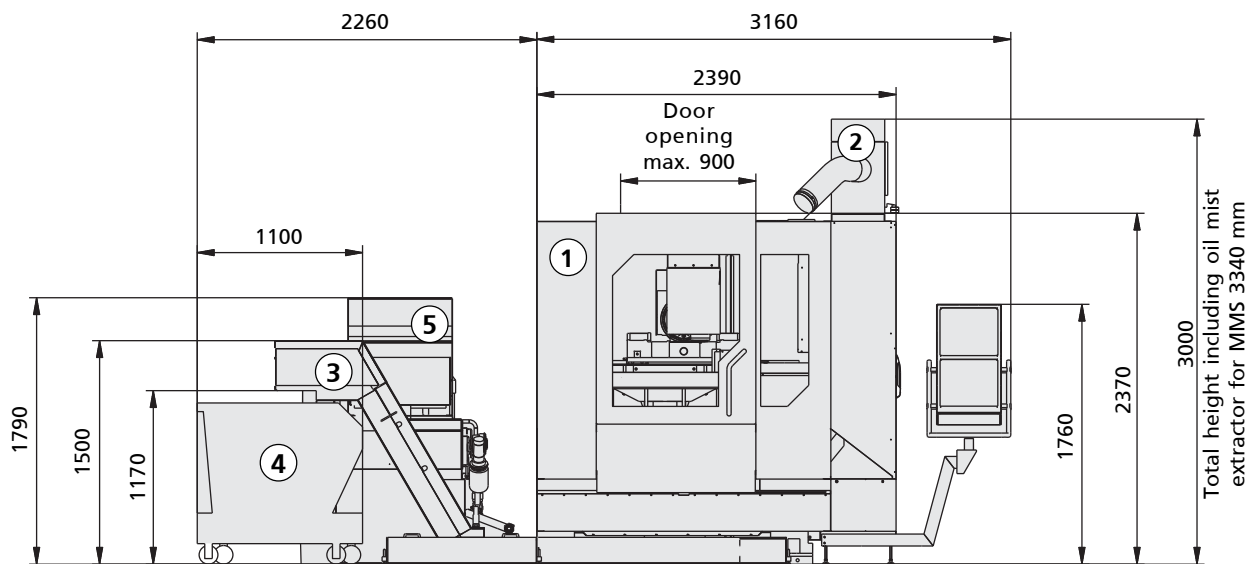
\*Not possible with the tool changer for 28 tools.



## Additional options for optimized working processes

- Chip conveyor  
Scraper belt conveyor or hinged belt conveyor for optimal chip removal from the work area
- Through the spindle coolant supply  
Ideal cooling and chip removal for deep drilled holes
- Coolant nozzle  
Cleaning of workpieces and devices
- Laser system  
For measuring tools or detecting tool breakage
- Blowing device  
For cleaning and cooling of the workpieces
- Oil mist extractor  
Oil mist free work area
- Ethernet interface  
Fast data transfer
- Electronic hand-held control module  
To change or traverse axes
- Electronic compensation of thermal expansion  
provides higher accuracy for the linear axes
- Internal and external minimum quantity lubrication  
Optimal oil supply amount during machining
- Touch probe  
Reduces setup times, checks workpiece geometry, detects workpiece position, and measures pockets and bores.
- Laminated glass panes
- Slip-on quill
- NC indexing head
- Table probe system
- Improvement of visibility (Rotoclear)
- Positive air pressure to glass scales

# Dimensions of the machine



- ① Standard machine
- ② Oil mist extraction
- ③ Chip conveyor
- ④ Chip cart
- ⑤ Through the spindle coolant supply
- ⑥ Spindle motor cooling unit

## U 740 transport dimensions (basic machine)

Width: 2,450 mm  
 Depth: 3,410 mm  
 Height: 2,520 mm

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