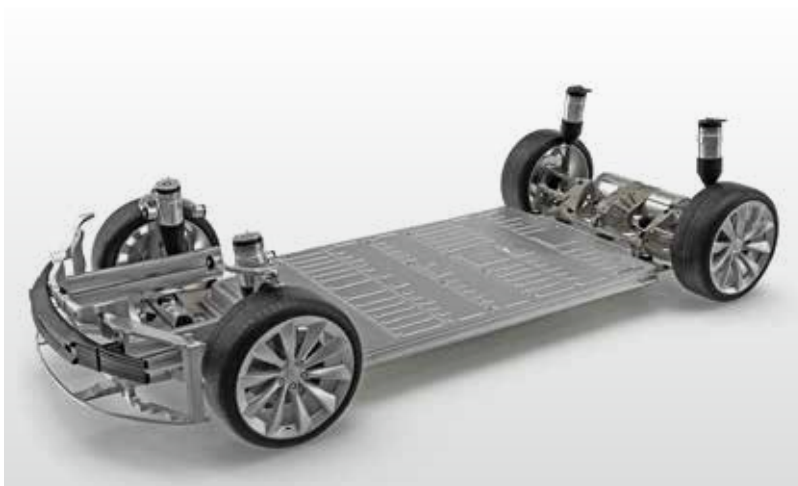


Machining centre for battery frames



Maximum flexibility and productivity

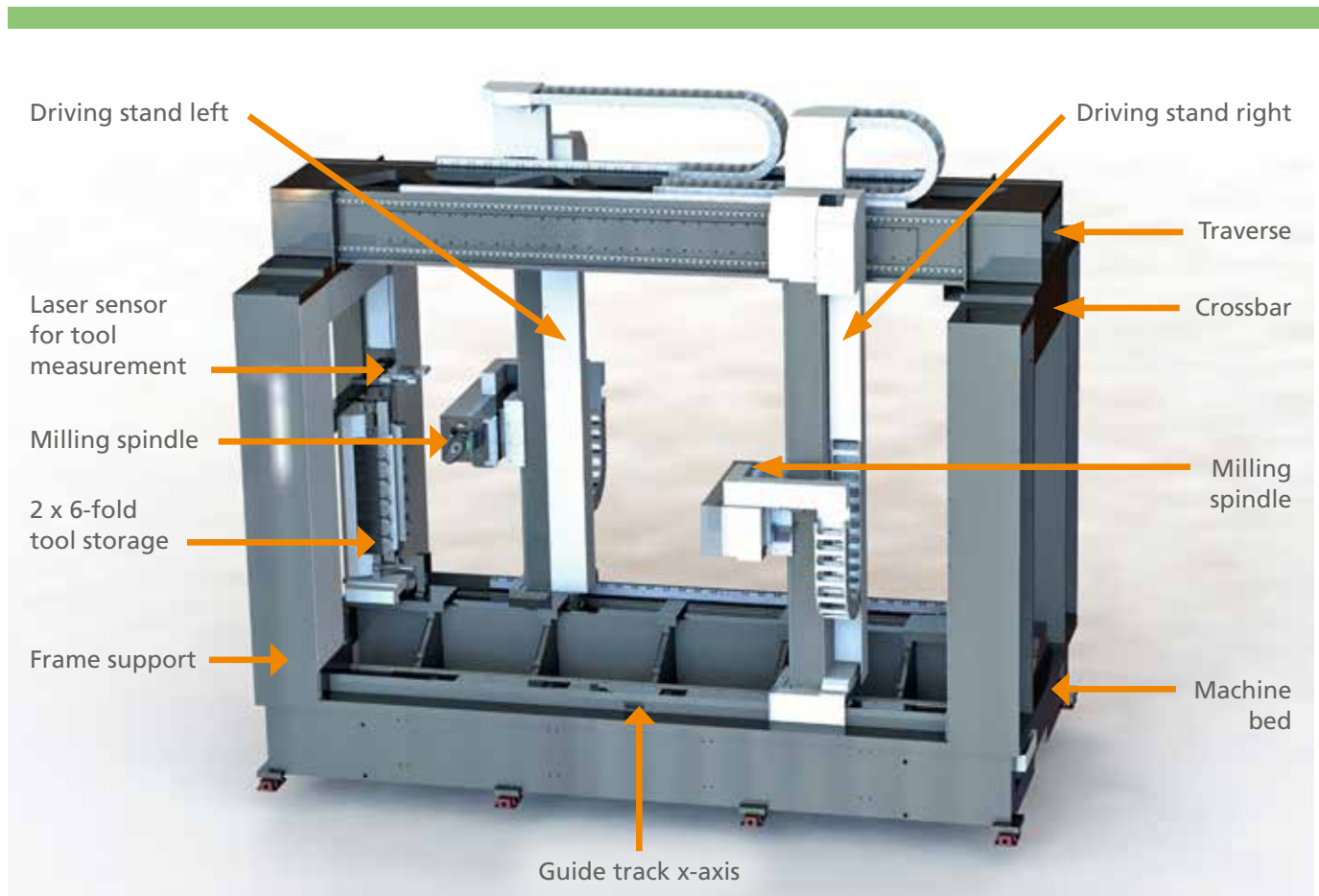
- Short cycle times due to high axis feed speeds
- Powerful motor spindles for powerful cutting
- Component size 2300 x 1500 x 500 mm
- Tool storage for flexible machining



Machining centre
for battery frames

www.hk-con.de

Two-column bed milling machine with vertical clamping frame

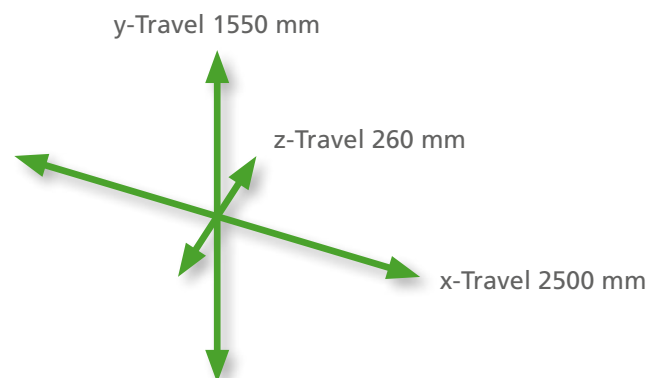


Designed for highest productivity

Our double-column bed milling machine with a fixed vertical clamping frame is used for machining battery carriers and frames. This design with the two horizontal main spindles facing each other, suitable choice of tools and clamping devices enables effective machining on the 6 sides. The machine bed is a welded frame construction with high rigidity and high stability.

With the optional NC swivel heads, 5 NC axes are available simultaneously on both the front and rear of the workpiece. Supplemented by tool storage (6, 12 or 24) with the changing device, it is a very flexible, precise machining centre for all common manufacturing processes: Milling, drilling, countersinking, thread cutting, reaming, grinding, spindling.

The loading and unloading robots and the workpiece storage enable this manufacturing cell to produce parts and production of parts and assemblies in dry or dry or wet machining.



Further applications

- Large cast housings
- Frames
- Welded constructions
- Joined frame and cladding parts
- Battery housings
- Mounting plates
- Aeronautical engineering
- Chassis parts

... for high throughput



Milling spindle left and milling spindle right (under extraction bell) simultaneously in use on two sides

Permanent extraction of the chips

The switchable extraction bell, which encloses the milling cutter during machining, and further extraction interfaces lead to a chip-free workpiece.

Speed and acceleration

The x-axis is designed with a linear drive.

The spindle units

Milling spindle torque with HSK 50: 20 Nm as standard.

Calibration for 100 % precision

The vehicle battery is manufactured in sandwich construction. For the watertight design, the weld seams of the frame girder must be milled down to the level of the profiles. Thus, in a subsequent process, the upper cover and the bulkhead plate can be tightly welded and or glued to the carrier on the later vehicle underside.

To ensure this requirement, the position tolerances of the welding process are compensated with the laser-optical length measuring sensor mounted on the milling spindle. For this purpose, the average value from 4 measuring points per processing point individually corrects the travel path of the milling spindle.

Loading/unloading

The unmachined truss-shaped battery carrier, consisting of welded aluminium profiles and plates, is inserted by the loading/unloading robot into the hydraulic clamping elements of the supporting frame and held by them.

Simultaneous editing

The clamping frame functions as a work table and its geometry allows 6-sided machining of the battery frame. The machining task, in this case the milling of the weld seams, is carried out simultaneously by the two opposing motor spindles. Each spindle works autonomously with its own tool memory, a laser-optical path sensor and, for process reliability, a laser system for tool control. This detects tool wear and breakage before and after machining.



Path sensor and milling spindle with retracted extraction bell



Laser sensor for tool measuring



NC swivel head and linear drive x-axis



Accessibility

Wide-opening doors and the large workspace offer ideal freedom of movement for robots and operators.



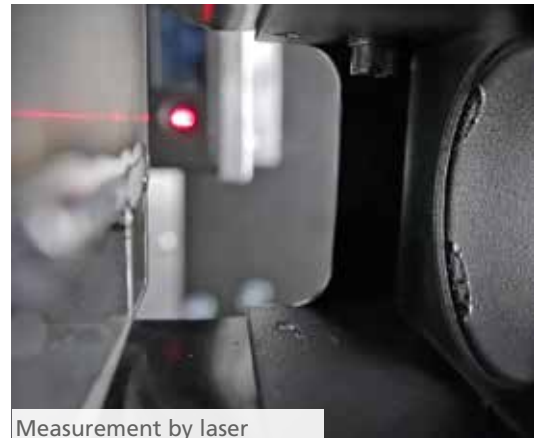
The working area with travelling column (front left), milling head and tool storage (rear)

Highlights

- Simultaneous machining by two independent milling spindles
- Large workspace 2500 x 1550 x 520 mm
- Maximum flexibility through tool storage
- Shortest machining times due to high axis feed speeds and powerful milling spindles
- Dry, wet machining
- Chip-free finished part due to integrated extraction system
- Displacement sensor on spindles for optimising component tolerances
- High process reliability through laser control of the tools
- Automated loading, unloading via robot

Standard equipment

- | | |
|--------------------------|------------------------------|
| • Traverse paths x/y/z | 2500 x 1550 x 260 mm |
| • Motor spindle power | 9,2 kW |
| • Spindle speed | 8000 U/min |
| • Torque (max.) | 20 Nm |
| • Rapid traverse (x/y/z) | 100/30/30m/min |
| • Spindle cone | HSK 50 |
| • Tool store | 2 x 6 pcs. |
| • Machine weight | 25 000 kg |
| • Control | Siemens solution line 840dsl |
| • Chip conveyor/suction | |



Measurement by laser

Special equipment

- NC swivel head
- RFID tool identification
- Second milling stand left/right
- Second clamping frame to reduce cycle time, loading/unloading with simultaneous machining
- Rotating table
- Tool holder HSK-63, HSK-80, HSK-100
- Tool storage 12 pcs. or 24 pcs.

Machine dimension

- Machine tool incl. periphery: 7500 mm x 3100 mm



Tool change