PEAR

MACHINING CENTER EC43

3 Axes with Pallet Loader

- *Fields of Application*
- *Structure*
- *Tool Changer/Pallet*
- *Specifications*

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Updated 22.05.2013 - Specifications subject to change without notice
Name of the file in .PDF format used to print: EC43_3axes_palletloader_en_130522.pdf

Fields of Application

There are many fields of application in which this machine can be employed and in particular:

• Construction of molds in general. The very simple construction of the pallet allows blocking the work piece from the bottom of the pallet to have no overall dimensions due to the clamping brackets in the area in work.

• Machining of mechanical components for small/medium size.

• The presence of the robot loads parts and tool change with a very important number of tools allows to work 24 hours a day even without staff.

Fields of Application

View of the machine with all safety guards fitted

Structure

The particular structure of this machine has allowed us to achieve in a simple way a version characterized by the fact of having a robot for loading workpieces and tools. The main elements that distinguish the following machine model are:

• Z-axis stroke increased to 400 mm to allow mounting of components with an increased thickness.

• Installation of an automatically-locking pallet on the table. Great care was taken to ensure that the clamping surfaces of the pallet on the work table remain extremely clean. A safety device locks in each case further processing if a chip were to be present on the floor of locking. The clamping force on the vertical plane of this device is 100 KN.

• Automatic Device replacement with 12 pallet positions. In relation to the actual size of the workpiece to be handled, other solutions can be studied.

• External tool to the machine, and then in a "clean" position in relation to the work area, having 62 positions.

Ball bearing screw characteristics and translation axes guides

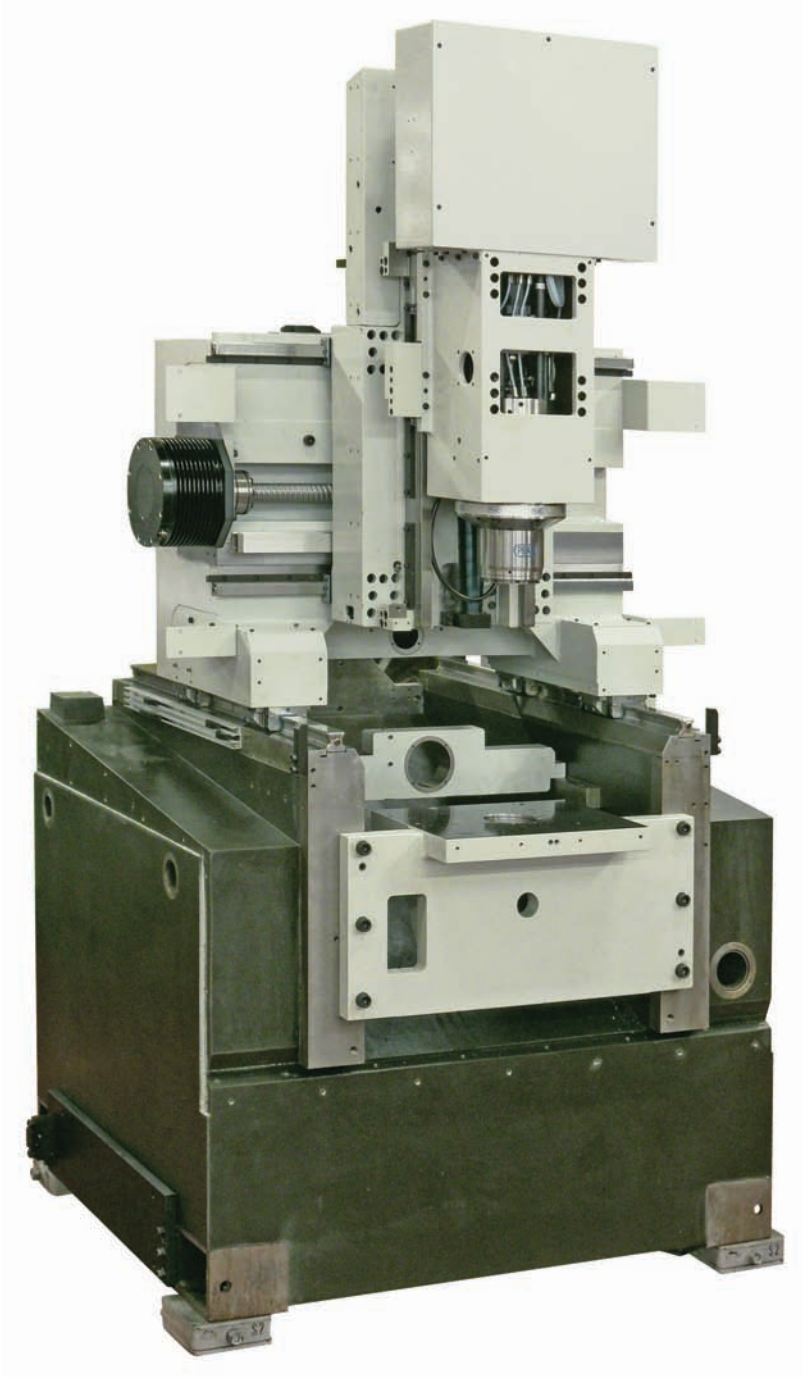
- XYZ axes diameter: 32 mm
- Screw pitch XYZ: 20 mm per revolution
- Material: hardened and ground steel with ceramic material nut balls
- Dimensions ball block size XZ: 25 mm
- Dimensions ball block size Y axis: 35 mm

Position transducer axes

Standard: absolute optical scales

Structure

Compared to the basic machine the work plan has been lowered and was added an automatic locking device pallet



Structure

Structure Feeder Pallet and Tool Change

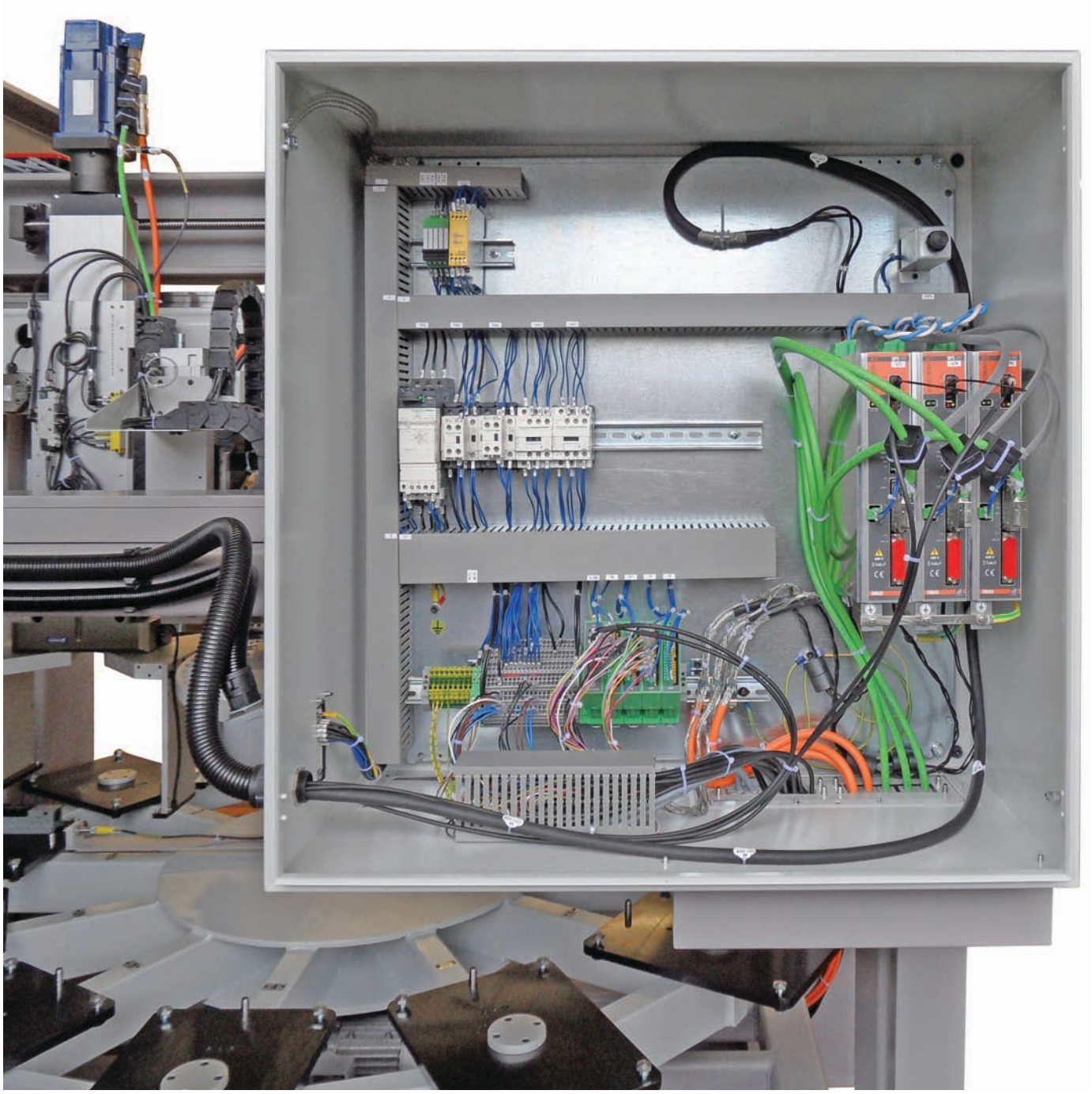
The upper arm serves to change the pallet and to change the tool in work

Structure

Electrical cabinet on the machine. It contains only the electronics of the basic machine

Structure

Control cabinet mounted on the tool change/pallet. It contains only the electronics relative to the axes inherent in these devices



Structure

Safety Guards Removed

The above to ensure a better view of how the machine has been designed

Tool/Pallet Changer

Tool changer

For this type of machine, there is only one type of tool changer with 62 positions located above the area in which the workpieces are mounted. If required, it will be easy to make a tool change with a greater number of tools. Inside the tool change it is also possible to position the probe.

While the machine is working, the tool changer mount on a shuttle the tool that will serve to further processing. So this is an operation that takes place in masked time.

At the end of the current process, the tool below will already be fitted on the shuttle and this for a tool change time as fast as possible. As the processing resumes with the new tool mounted on the spindle, the tool will return it to its previous position, which is that this will happen again in masked time.

Pallet changer

The system used to bring the selected tool in work is largely the usual that is used to bring the pallet in work which then performs a dual function.

At the end of the machining process, the robot will proceed to place the pallet in its position and take the pallet required by the program from the carousel. Everything is perfectly visible from the movie callable directly from this web page.

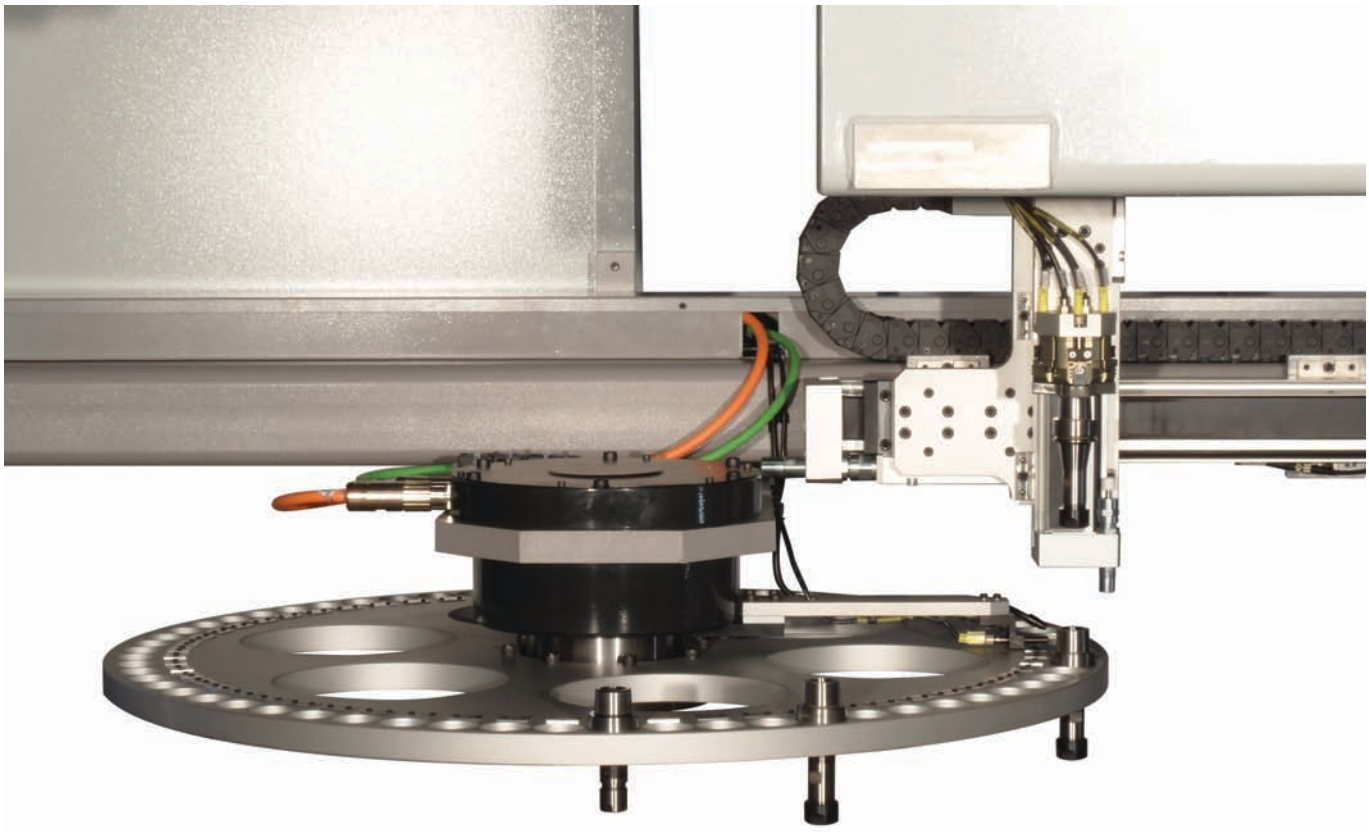
Tool/Pallet Changer

http://www.youtube.com/watch?feature=player_embedded&v=YIHGoCtwRc8

Tool/Pallet Changer

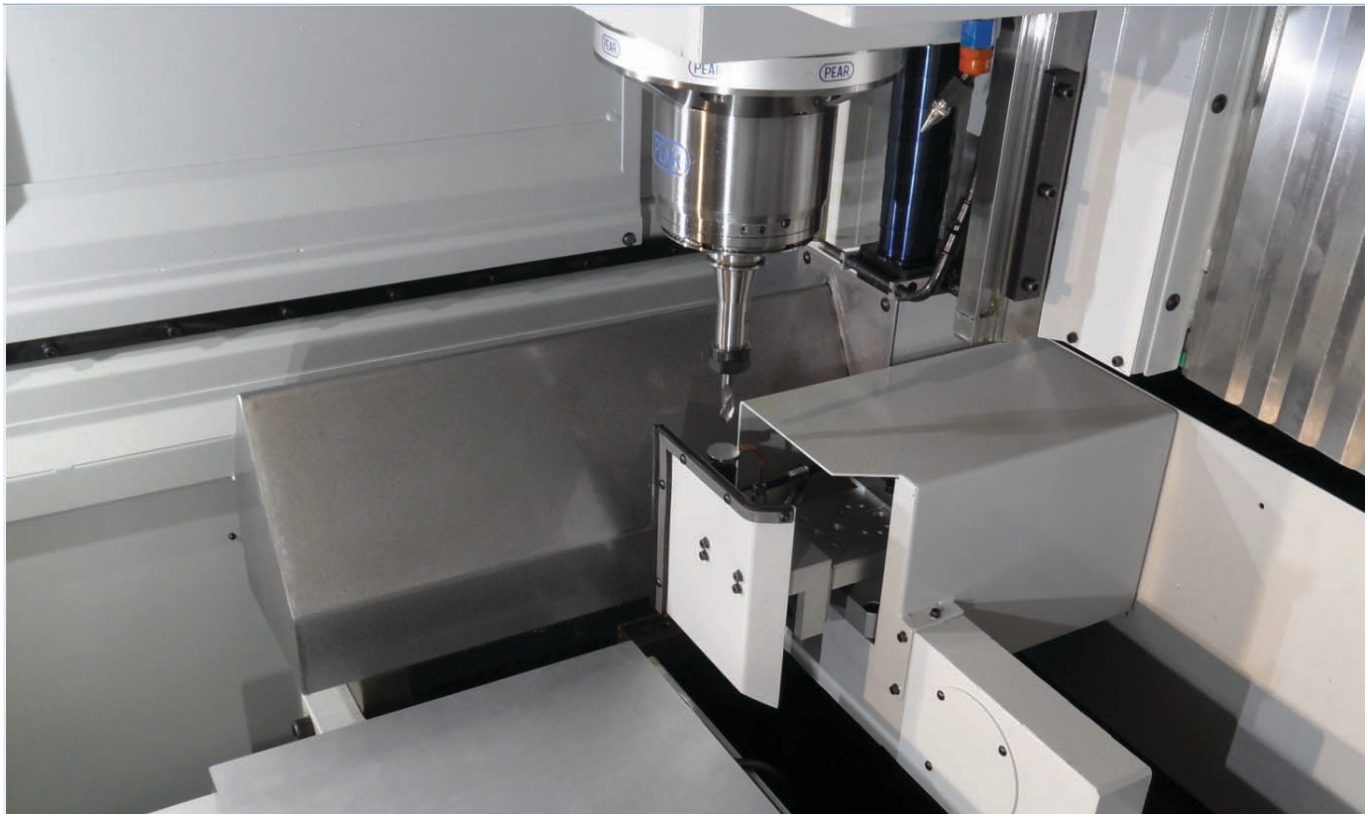
Detail of the Tool Change

The rotation of the wheel takes place with a torque motor and this for the benefit of the highest reliability



Tool/Pallet Changer

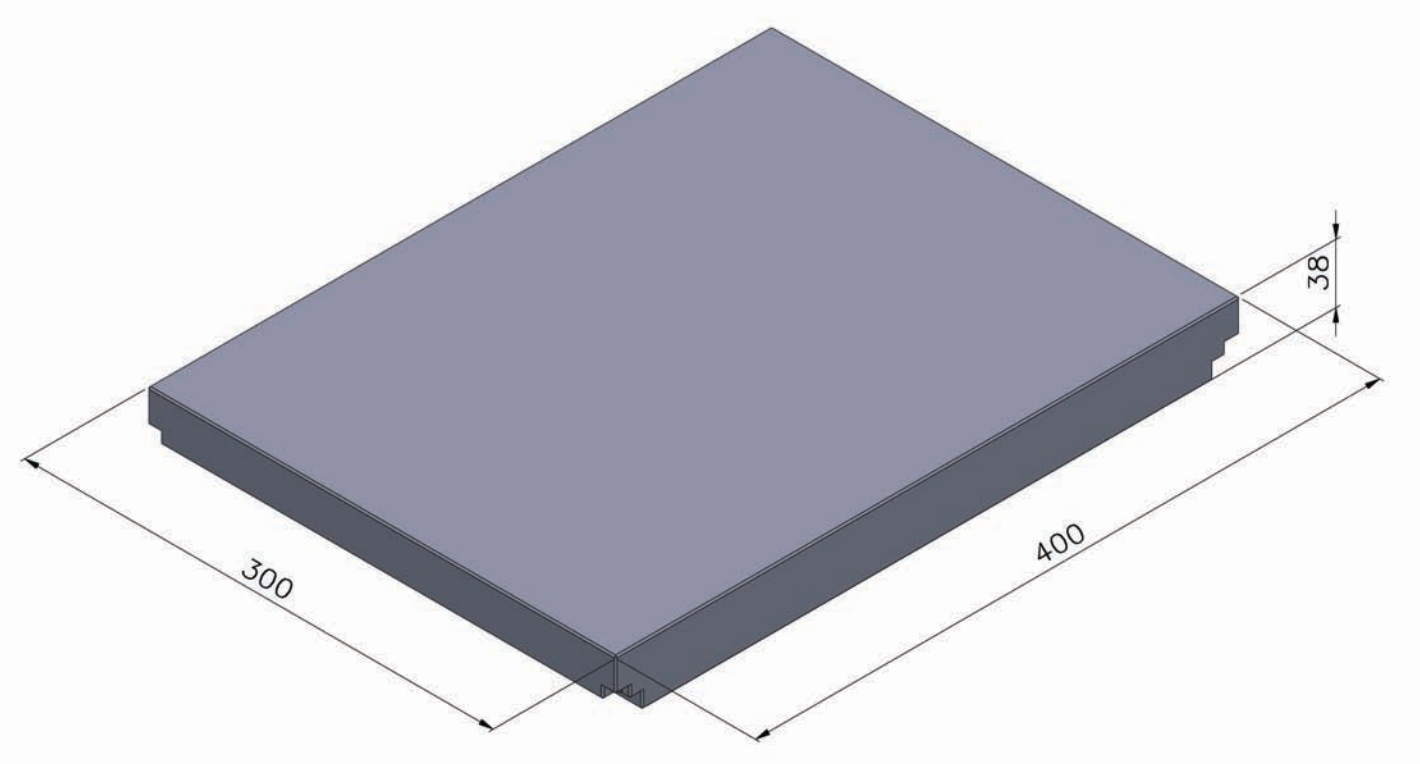
Preset length compensation in the "open" position



Tool/Pallet Changer

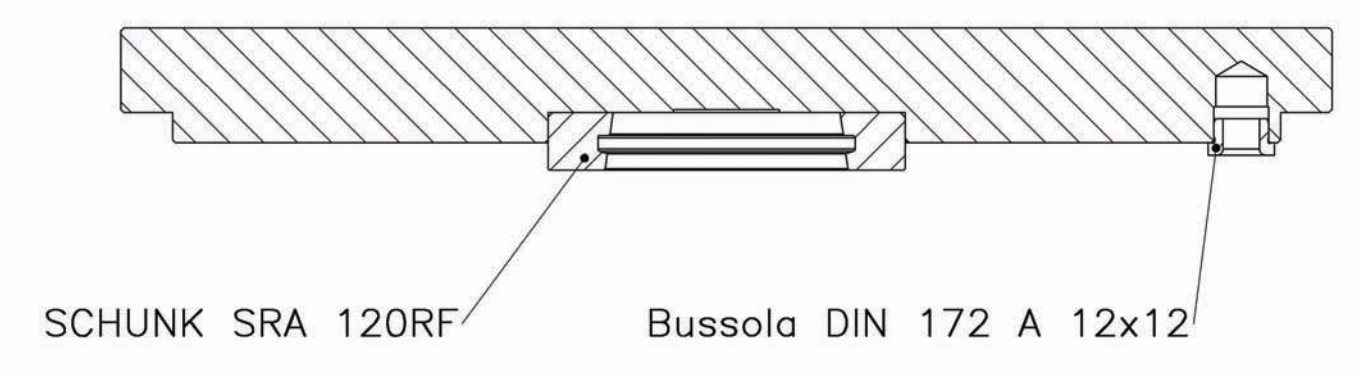
Overall Dimensions of the Pallet

Having a very simple construction drawing can be constructed directly by the end user



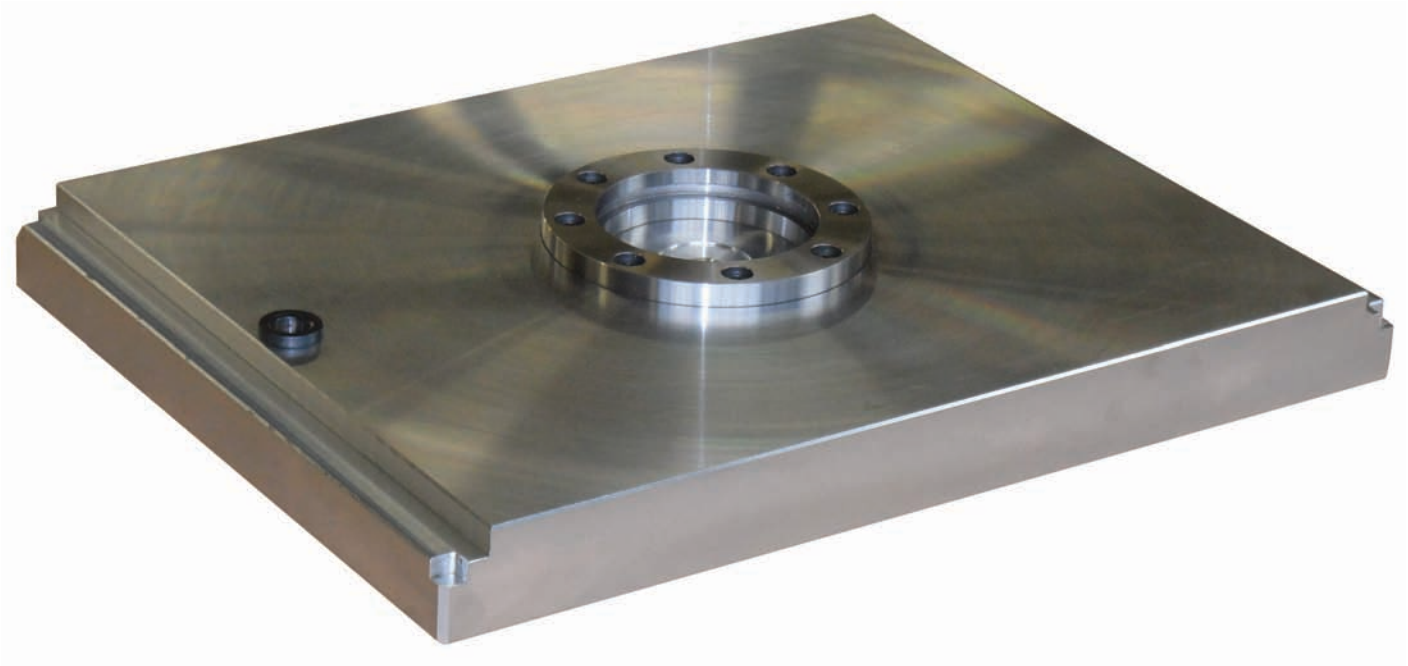
Tool/Pallet Changer

The clamping of the pallet on the work area is made with elements from trade. Above you will find a detailed list



Tool/Pallet Changer

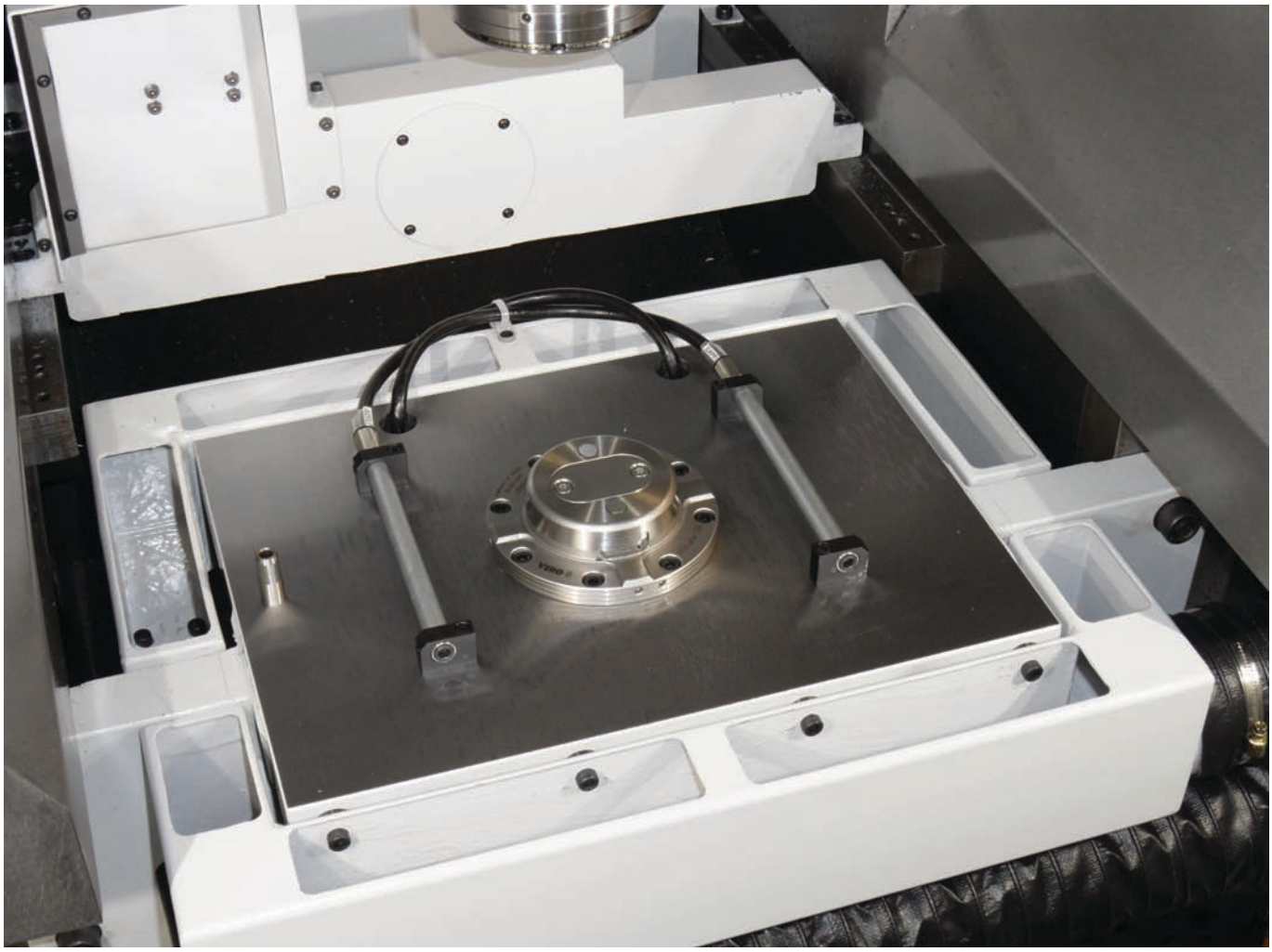
Rear view of the pallet



Tool/Pallet Changer

Plan of Work without the Pallet Fitted

In the middle you see the pallet clamping device, laterally the two puffs of air to keep clean the device

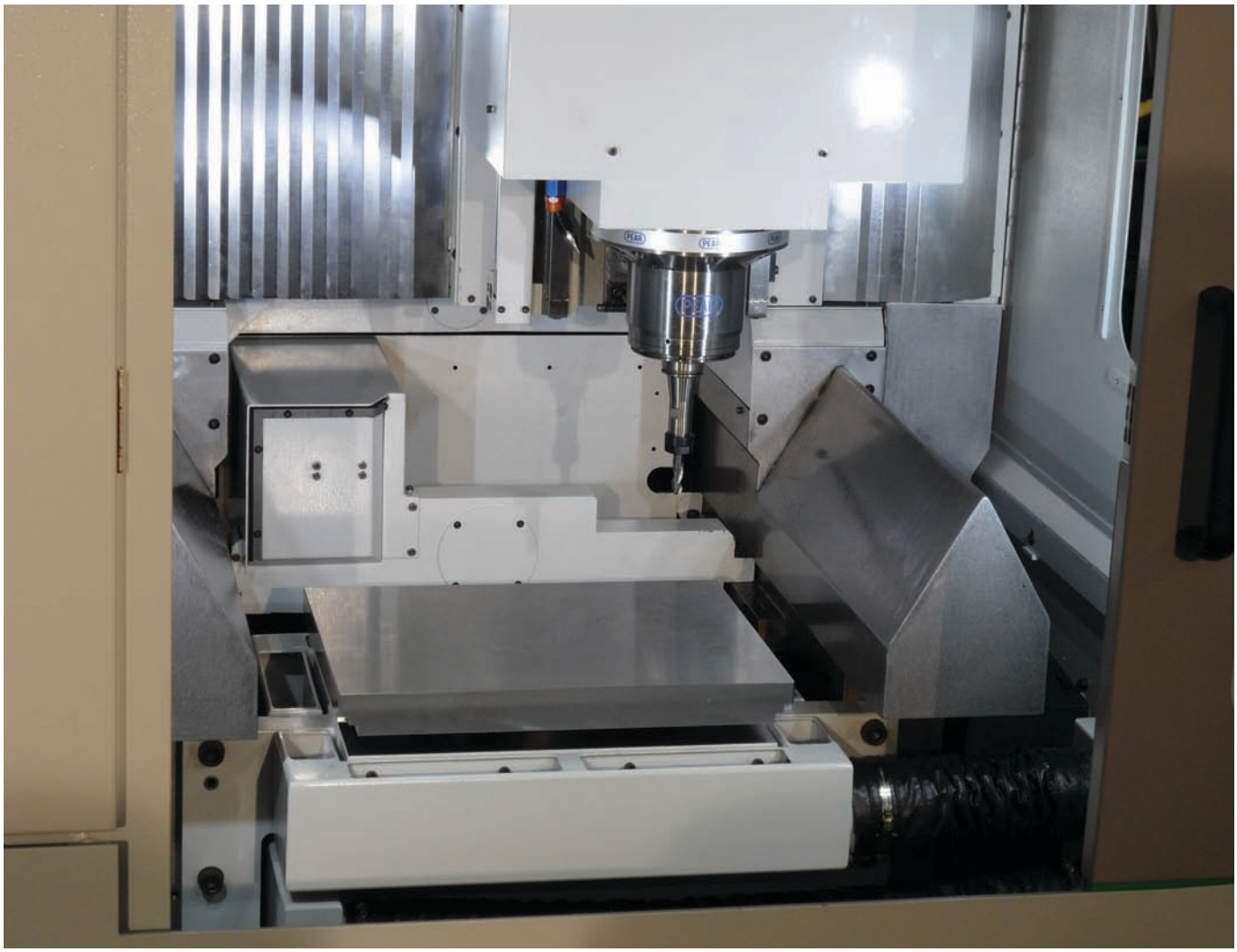


Tool/Pallet Changer

View of a Detail
Pallet clamping device

Tool/Pallet Changer

Pallet in the working position



Specifications

Polymeric Granite Base	
Overall dimensions	4,500×3,000×2,600 mm
Net working travels	X=400, Y=400, Z=400 mm
ool holder Hsk40/E	DIN 69893
Maximum RPM	32,000
Spindle power continuous duty (S1)	12 Kw
Max torque spindle	9.3 Nm
Maximum workpiece thickness under the bridge	230 mm
Maximum distance from maximum thickness piece to attack tool holder	185 mm
Minimum distance between the pallet and attack tool holder	90 mm
Minimum distance between the pallet and the standard tool nut	10 mm
Rigid tapping standard	
Preset tool length standard accessory	
Total weight	4,500 kg

AXES

Working speed	from 0 to 30,000 mm per min
Rapid traverse rate	30 meters per min
Maximum thrust on each axis	500 N
Positioning precision (VDI 3441)	±0.008 mm
Repeatability accuracy (VDI 3441)	±0.001 mm

WORKING TABLE

Dimensions	(400×360) 400×300 mm

TOOL CHARGER

Number of tools available	60
Maximum tool ø	34 mm
Max tool locked with standard collect ø	16 mm
Tool change time chip to chip average	9 sec
Time to swap tools	3 sec

ROBOT TO LOAD THE PIECES

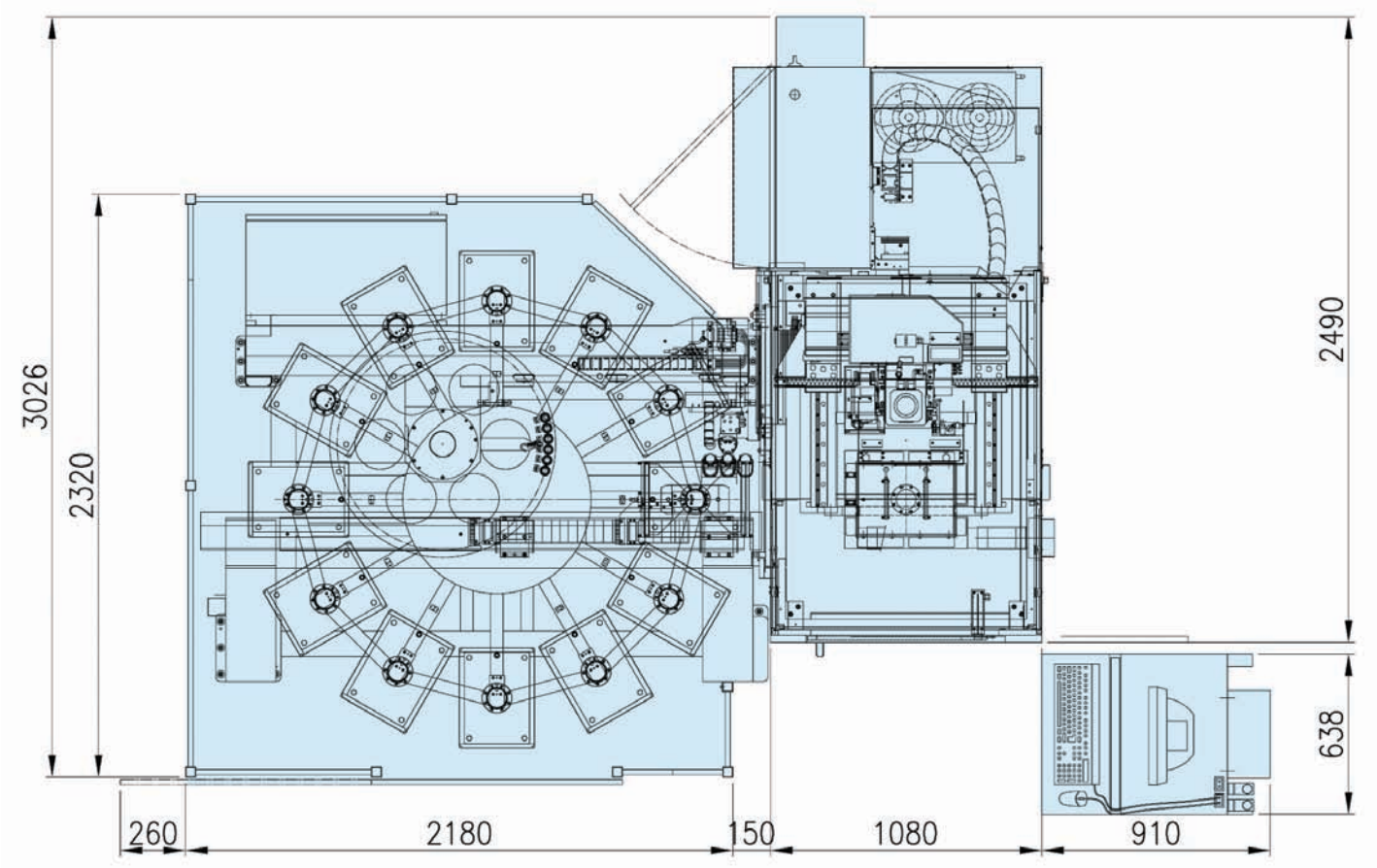
Number of positions	(10) 12

MAIN OPTIONS

- Chip conveyor complete with rotating filter
- Probe of work piece

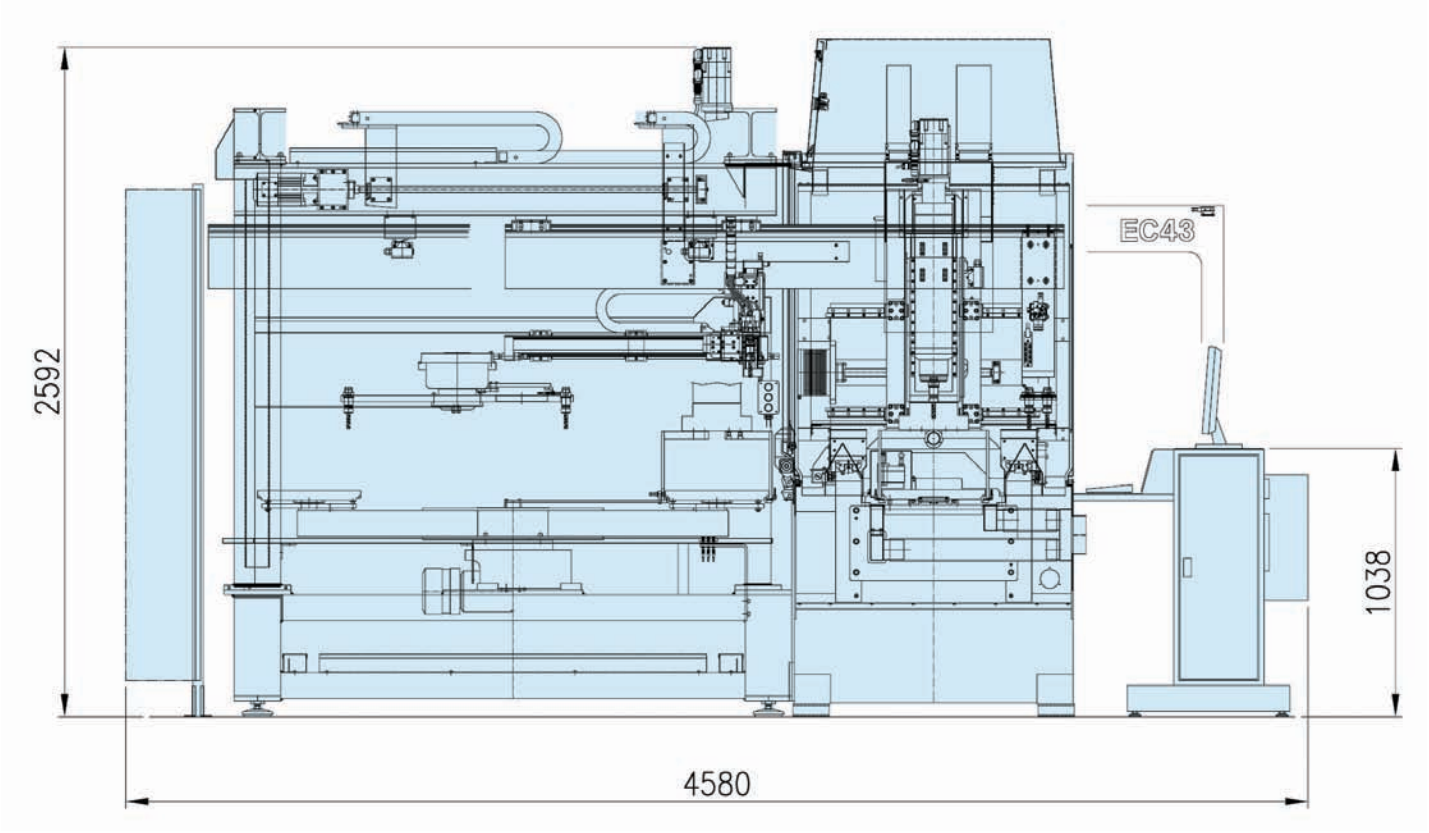
Specifications

Plan view



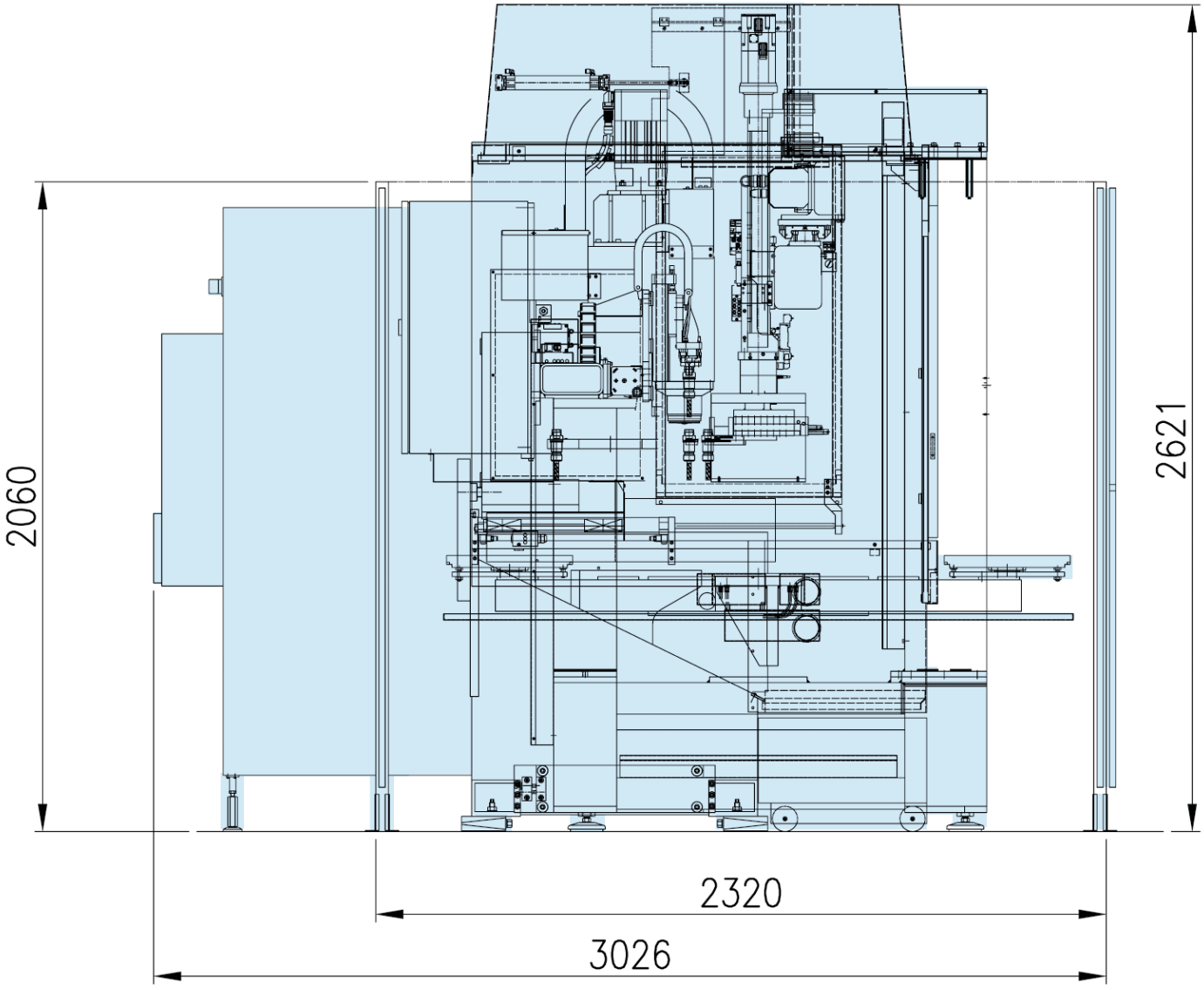
Specifications

Lateral view



Specifications

Front view



Specifications

Ec43 3 Axes with the Spindle Mounted Model Hsk32

This drawing shows the maximum thickness of the work piece and the various lengths max and minimum of the tool