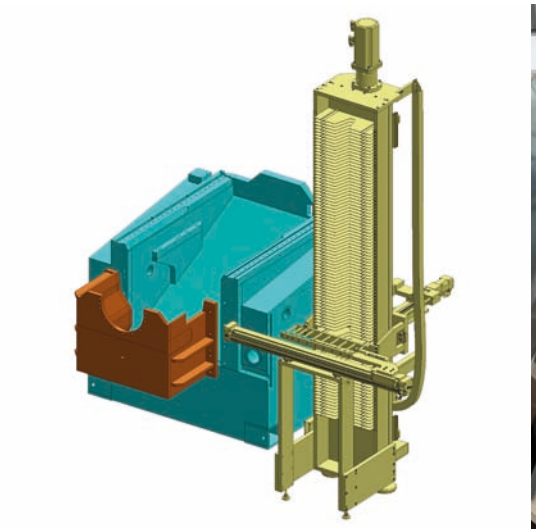
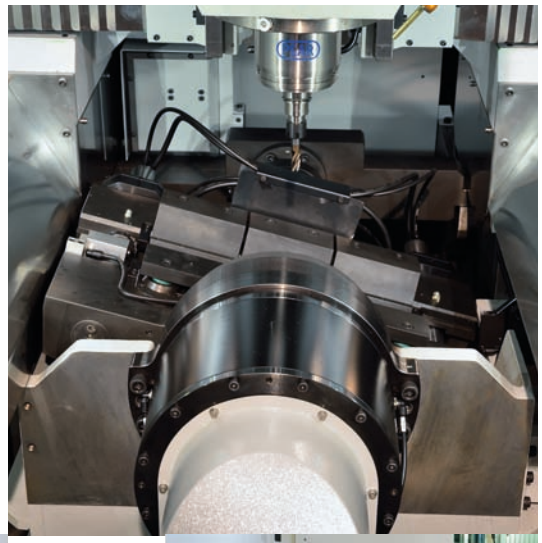
MACHINING CENTER EC43

specialized for the production of fashion accessories and dies for pasta

PEAR





Meccaniche Arrigo Pecchioli
Via di Scandicci 221 - 50143 Firenze (Italy) - Tel. (+39) 055 70 07 1 - Fax (+39) 055 700 623
e-mail: pear@pear.it - www.pear.it

Other files available for additional information regarding this machine

Spindle Hsk32
Control Desk
Z32 NC
Software Peace

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Fields of Application

The field of production of fashion accessories has always represented a very important industrial reality. We were present in this area with our model M64 (since 1983) and then with our model EC68 (since 1992).

In 2005 we were the first in this area to bring to market this new machine model that not only provide for the automatic replacement of the work piece, it also allows the automatic processing on both sides.

From that year we have continued to assign this machine model considerable energy in order to improve it continuously. Among other things we have:

a) added the chip conveyor
b) increased the number of pieces that can be sent in work automatically
c) given the possibility to manage bars having a depth (Y) max of 150 mm
d) put the tool changer outside the working area and then a clean area and brought its capacity to 48 tools
e) added an automatic wash cycle to the vise

Some of soprandicate items are optional accessories

An additional market in which this type of work center has found a valid application is related to the construction of dies for pasta. For this purpose has been realized an accessory specific to the automatic realignment of the bars in case they need to be machined and assembled several times (for example to allow mounting of inserts at half machining).

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Fields of Application

General view of the machine from the left side

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Fields of Application

General view of the machine from the front

The overall dimensions of the machine, despite the presence of feeder bars, are very compact

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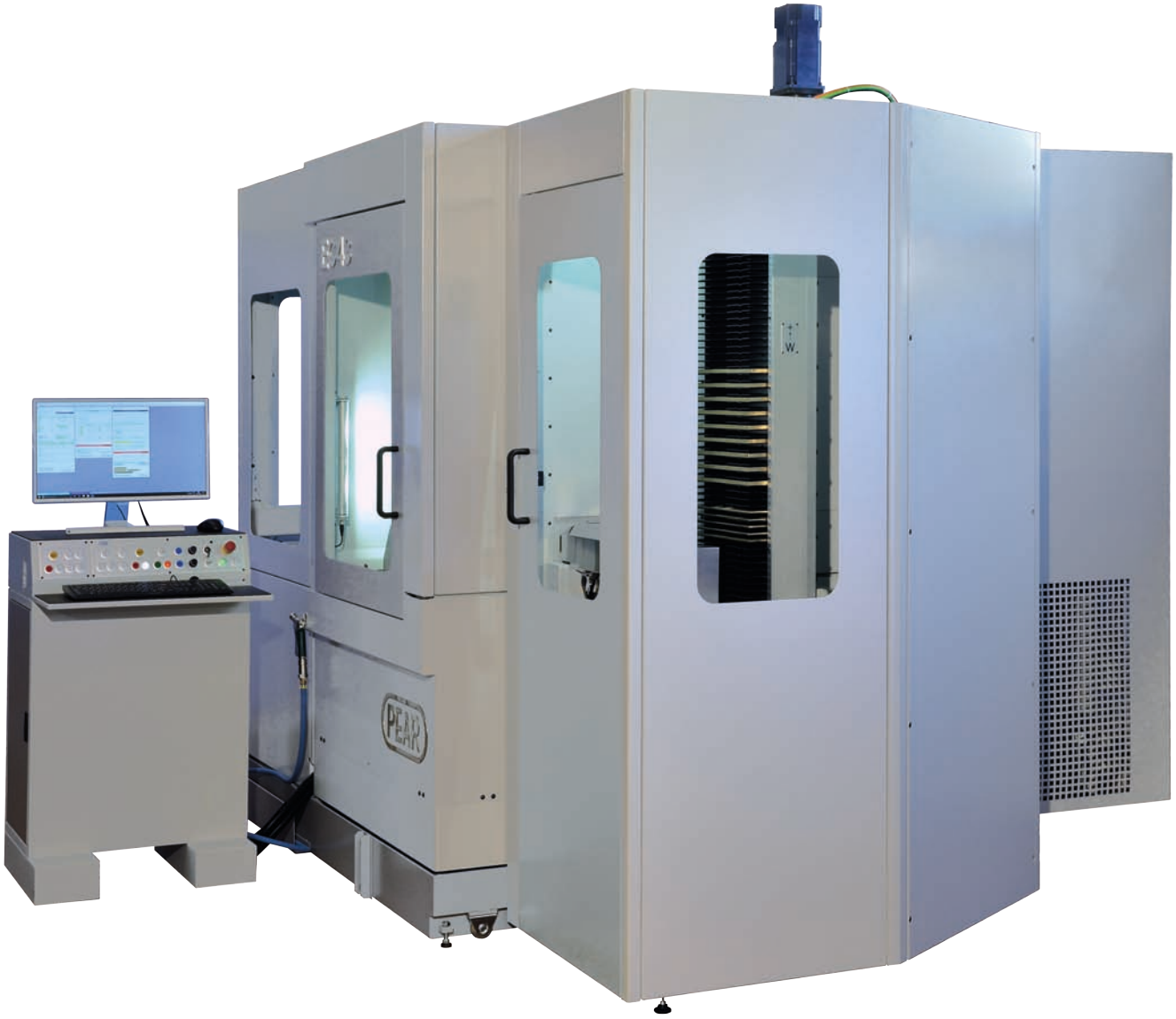
Fields of Application

General view of the machine from the left side



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Fields of Application

Three EC43 for Buckles in Assembly

The last machine in the background is an EC5-52

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Structure

The structure of our work center model EC43, lends itself in particular for the realization of special machines.

On the vertical plane, which in the execution of the machine standard supports the work plane, in this caseis fitted with a "cradle" which fits the full auto-locking rotating pieces.

Since the central part of the base is practically empty, the mounting of this type of device, which has overall dimensions particularly important, it is particularly easy and does not affect in any way the ease of chip discharge typical of this type of machine.

Eight controlled axes

The main sector for which this type of machine finds its use, namely production of fashion accessories, requires that the realization of the sampling should be performed with extreme readiness.

To minimize any kind of manual setting of the machine, we have provided a particularly high number of electrical axes driven directly by the CNC. In particular, we have:

- 3 working Axes (XYZ)
- 1 spindle axis for rigid tapping
- 1 absolute rotary axis for the piloting of drum placement of tool holders
- 1 absolute rotary axis for the continuous control of the rotation of the Vice

- The pieces to be sent to work are fitted manually in individual cells. The pieces feeder that takes these pieces and sends them to work is performed with 2 absolute axes.

Ball bearing screw characteristics and translation axes guides

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

Position transducer axes

Standard: multi-turn absolute encoders on the screws.
On option: absolute optical scales.

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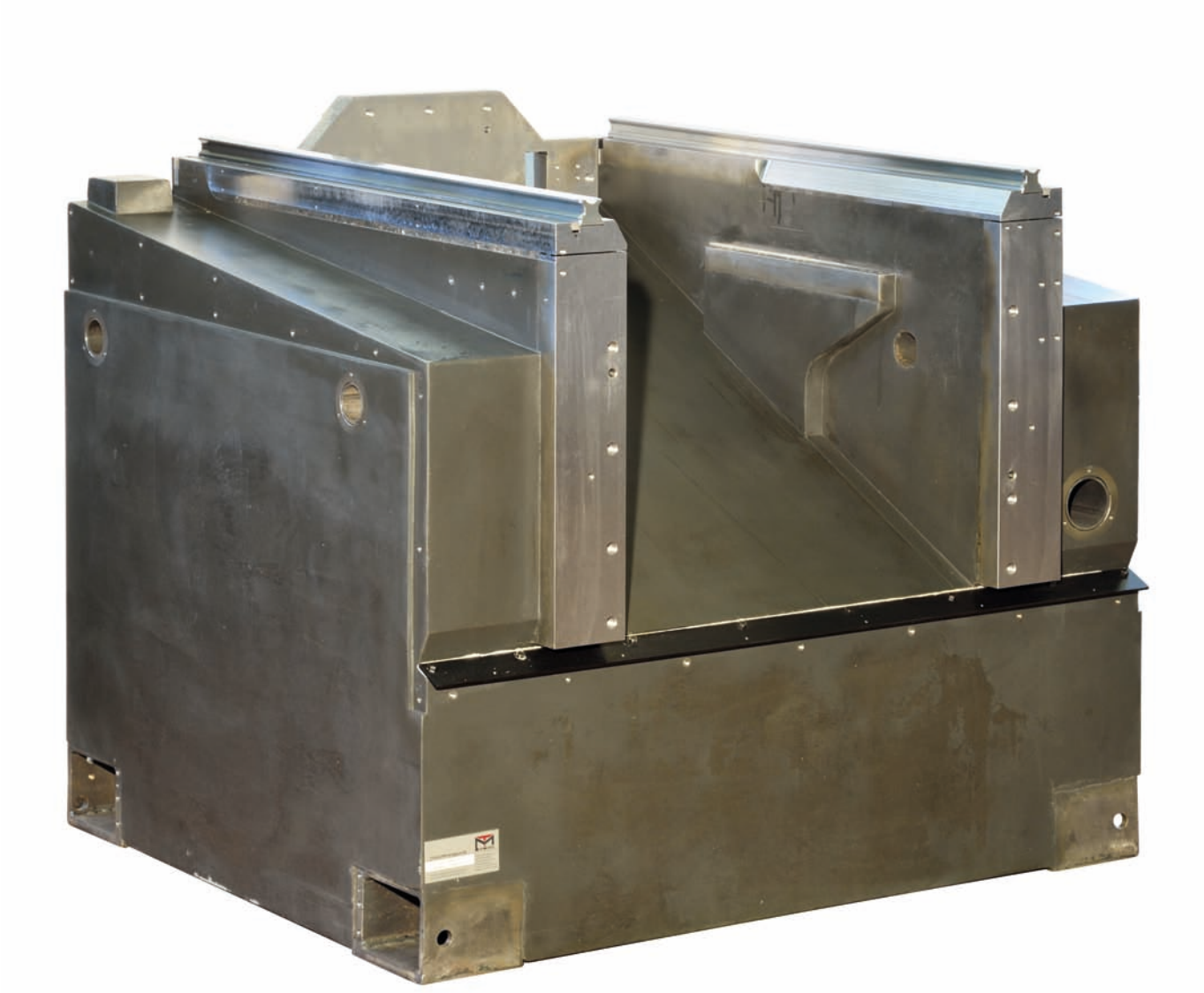
Structure

Polymeric Granite Base

This type of construction allows the maximum rigidity and absorption of vibrations caused by the machining tool



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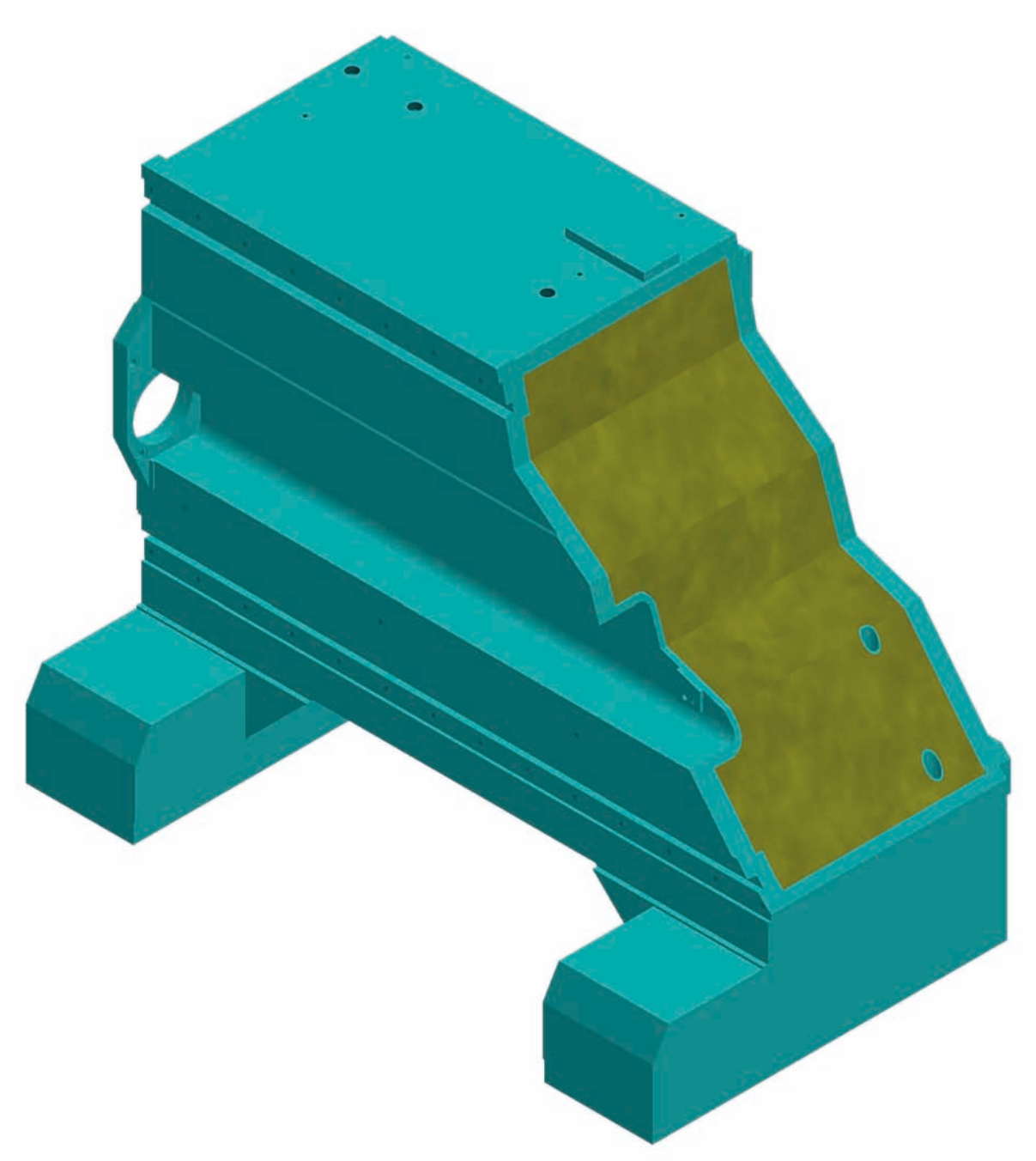
Structure

Moving Crosshead Filled with Polymeric Material Having a Low Density

Allows to dampen the vibration generated by the milling up to 1/10 compared to a structure without filling



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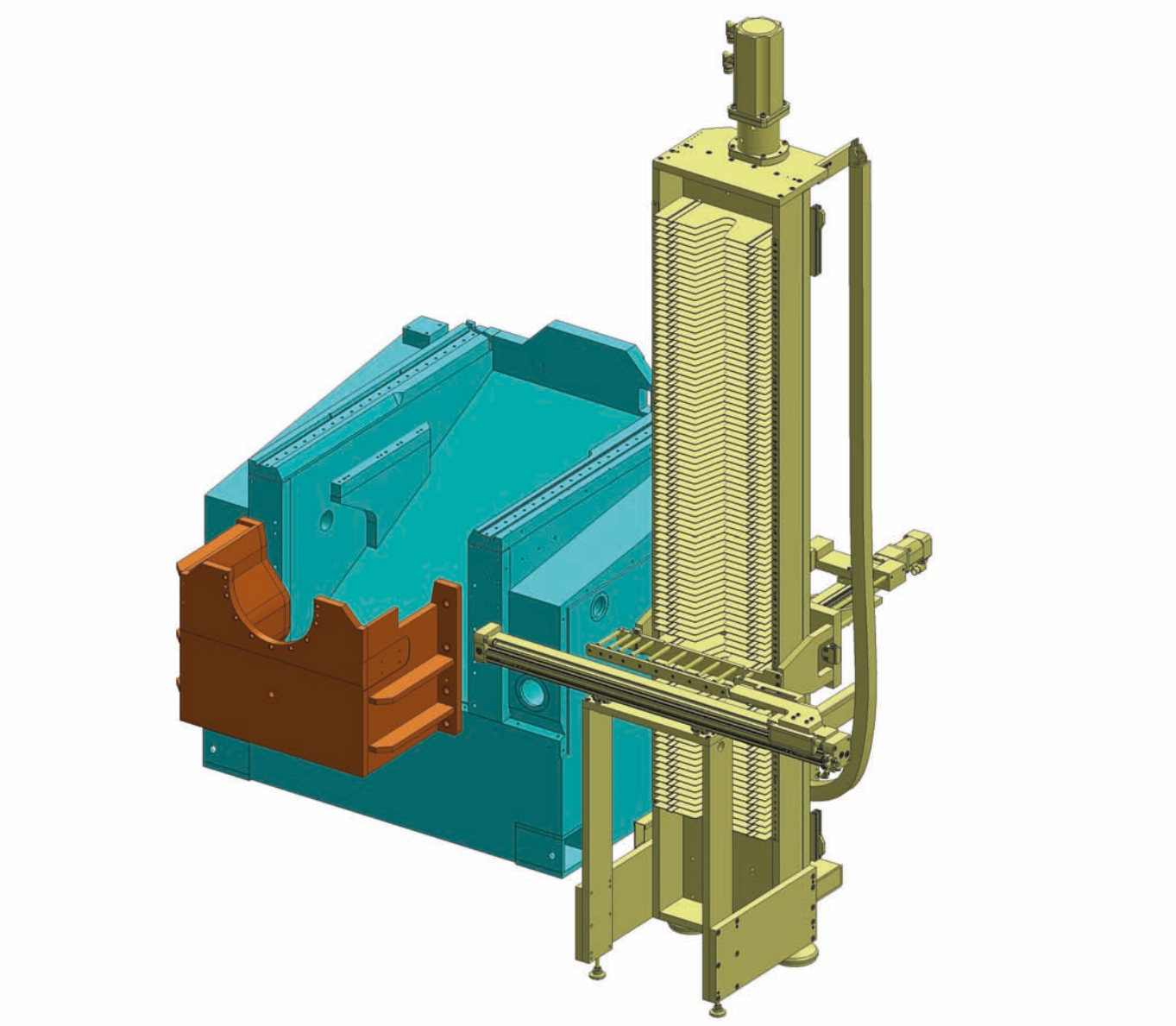
Structure

Rendering Base and Cradle Support Rotary Vice

The shape of this machine is particularly suitable for the construction of this special application



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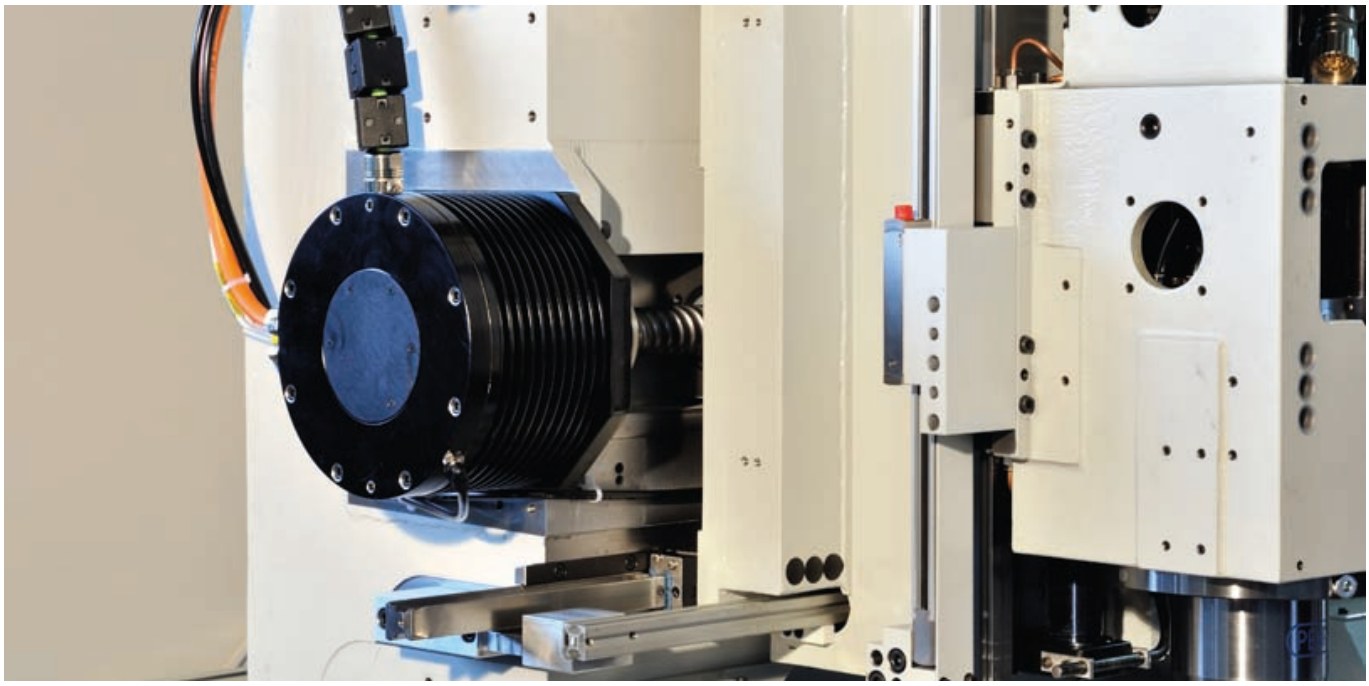
Structure

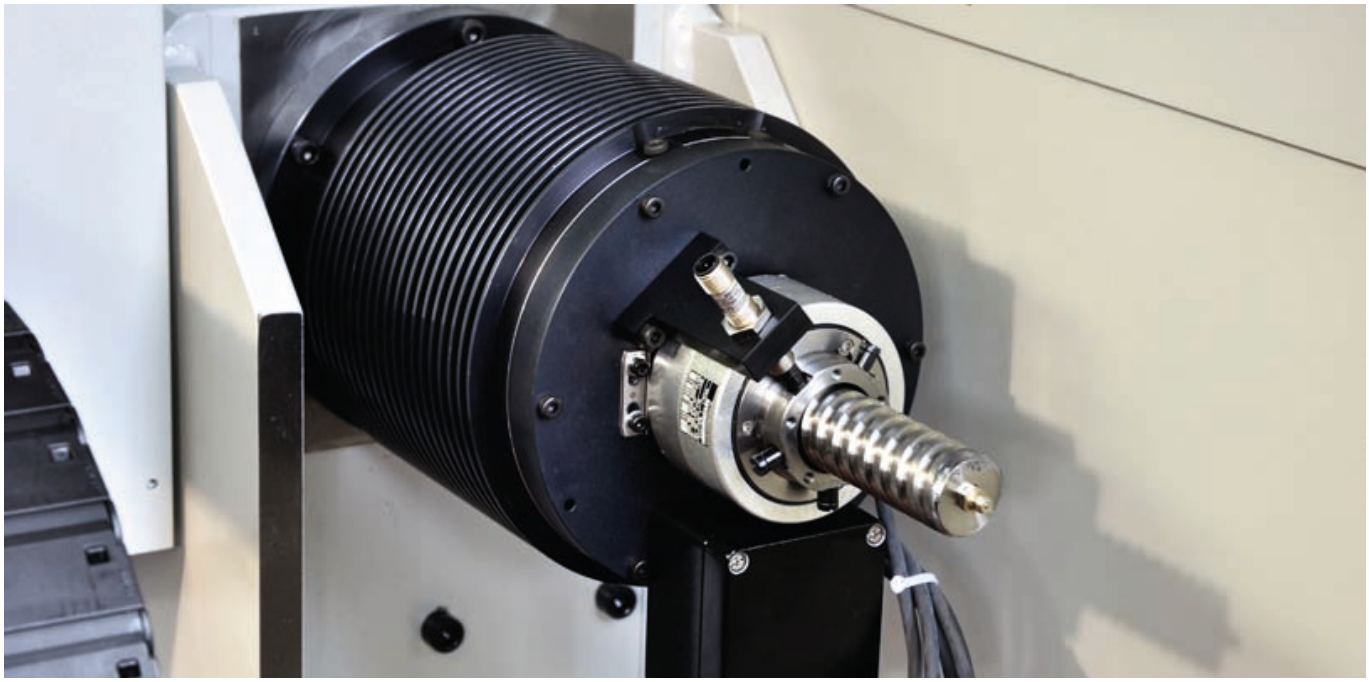
Transducer Z-Axis Made with an Absolute Optical Scale (on Request)

The X-axis motor is coupled directly to the rotating screw to obtain a better degree of finish



Y-Axis Motor

To note the fact that the screw is stopped as it is the nut that is made to rotate



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Structure

Front view from the opposite side of the machine operator

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Structure

View Electrical Cabinet

Note the presence of eight axis drives

Rotary Vice

Vise to hold the work piece and to fold it

To make the best possible working conditions, the work piece is stuck in a very stiff. To meet this condition the Vice that we use only components made of steel or cast iron, and has important dimensions. The rotation is achieved with the use of a controlled axis through the use of a linear motor or "torque" i.e. without mechanical actuators.

It follows not only a great speed of rotation (to perform a shift of 180º the time used is <1 second), but also a great sweetness of movement in order to ensure greater durability and lack of maintenance. The position transducer of the rotation of the vice, absolute in nature, is directly coupled to the rotating axis.

It is also possible to perform all the machining with the vice in any position tilted (within a range of ± 15°) while retaining a great simplicity of programming. In fact, all offsets of axis translations due to the tilted axes are calculated automatically by our software Peace.

The time required to manually change the width of the clamp is less than 1 minute.

Format change made automatically on option

In order to simplify the transition from one process to another and then to speed up to the realization of the samples, it is also possible to obtain a variation of the width (Y) of the clamp in an automatic way by the work cycle. You can then send the job in automatic sequence workpieces having possibly all three dimensions (XYZ) different between them.

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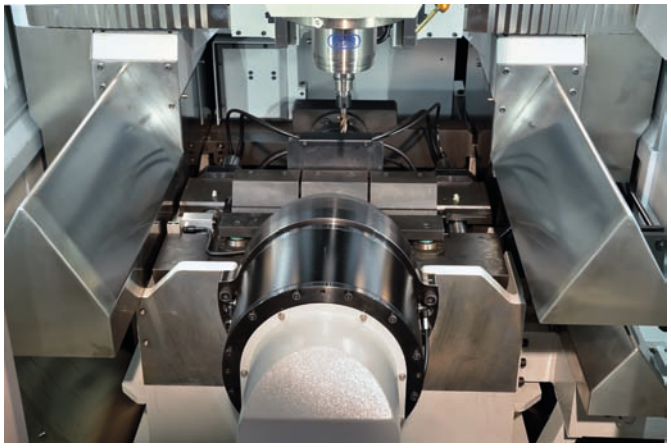
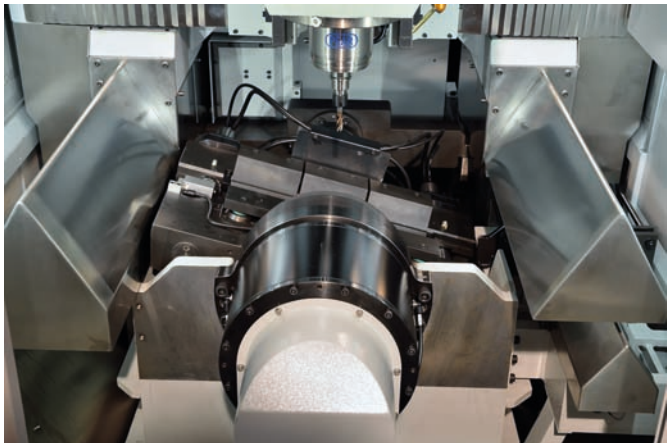
Rotary Vice

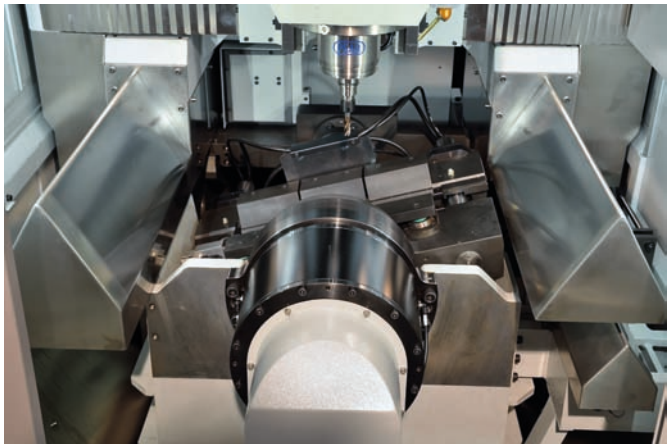
Rotary Vice Positioned on the Front Face



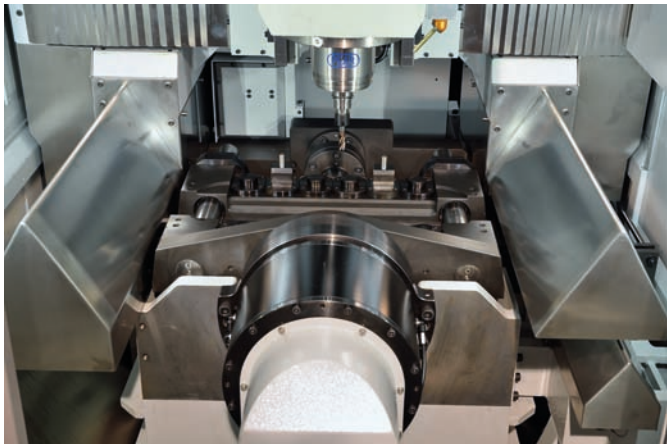
Rotary Vice Positioned Tilted with Respect to the Front Face



Rotary Vice Positioned Tilted with Respect to the Front Face

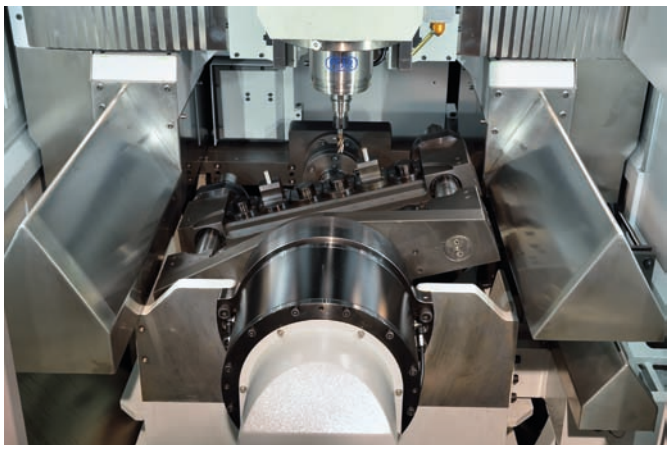


Rotary Vice Positioned on the Rear Face



Rotary Vice Positioned Tilted with Respect to the Rear Face

Rotary Vice Positioned Tilted with Respect to the Rear Face



Loading/Unloading Workpieces

Feeder pieces to be sent in working

The feeder pieces, which does not require any type of registration in order to adapt it to various sizes of pieces can move, can hold up to 90 pieces in separate cells. It is therefore unnecessary to use slabs perfectly flat and on each cell you can assign a different program.

The movement of the pieces to be sent to work is through cylinders that push the piece on specific sliding surfaces. At the end of the loading cycle, the workpiece will be perfectly in the end stop of the X axis. It will be possible to send in work even pieces of considerable weight without ever risking that the presence of chips or bars not perfectly cleaned could compromise the regular handling of pieces, inconvenience that instead we could have if we had used a solution of the grip piece by a vacuum suction.

Eliminating manually alternately trays on which are mounted the pieces to be sent in process, it will be also possible to mount pieces of the substantially increased thickness is to say up to 28 mm. To make these particulars compatible with the clamping brackets, they must preventively milled laterally to bring the thickness to a maximum of 12 mm and with width for this part equal to 3 mm.

Ejection device workpieces on option

At the end of the processing cycle, also the unloading of the worked pieces can be automated so as to keep them separate from the chips produced by the milling.

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Loading/Unloading Workpieces

Feeder of The Pieces is of Cell Type

You can add pieces to be processed without interrupting the machining process

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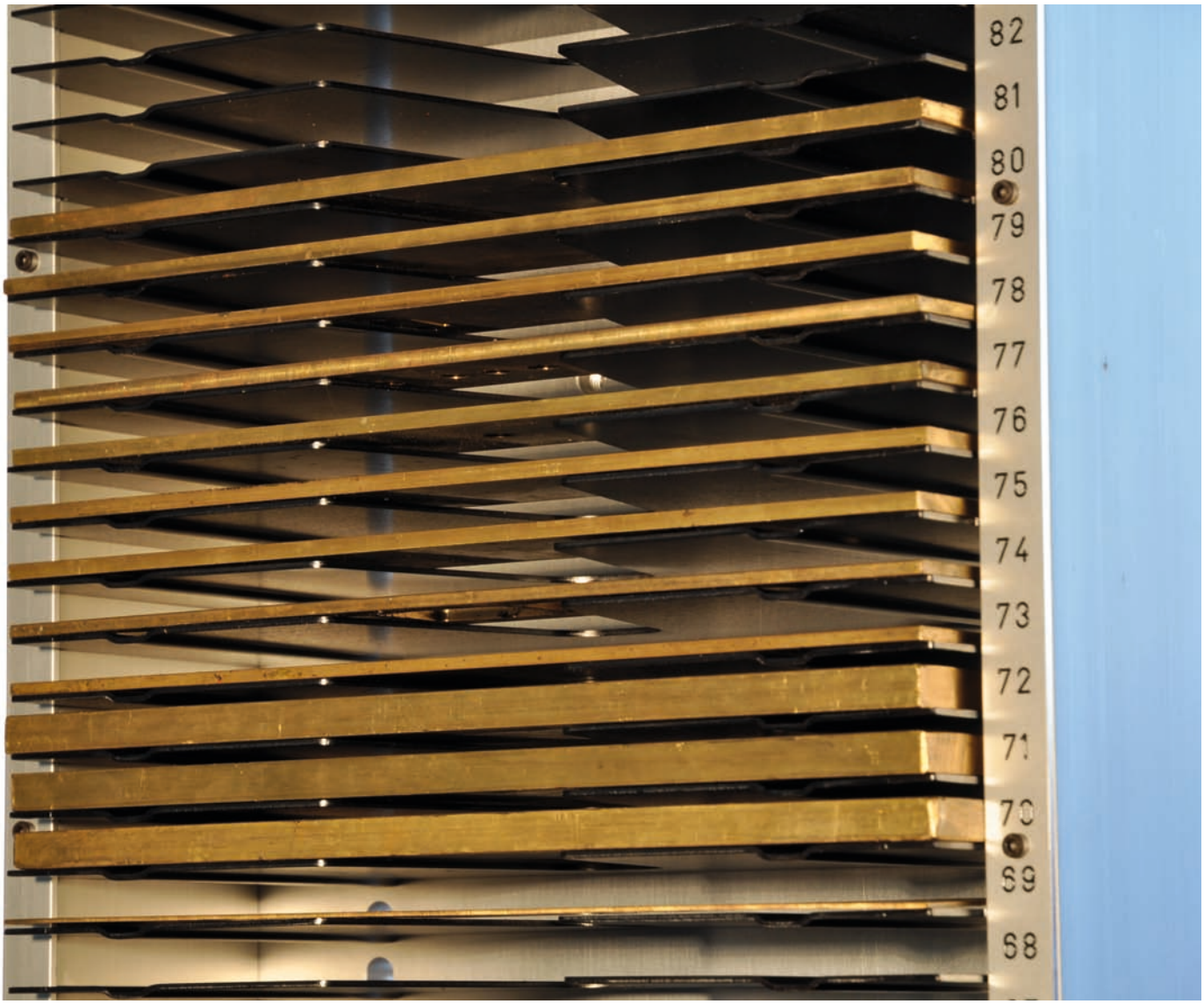
Loading/Unloading Workpieces

Detail of Feeder of the Pieces

Of each cell can be mounted pieces having different sizes



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Loading/Unloading Workpieces

Detail of Feeder of the Pieces

Removing the trays alternately, can be mounted pieces of important thickness

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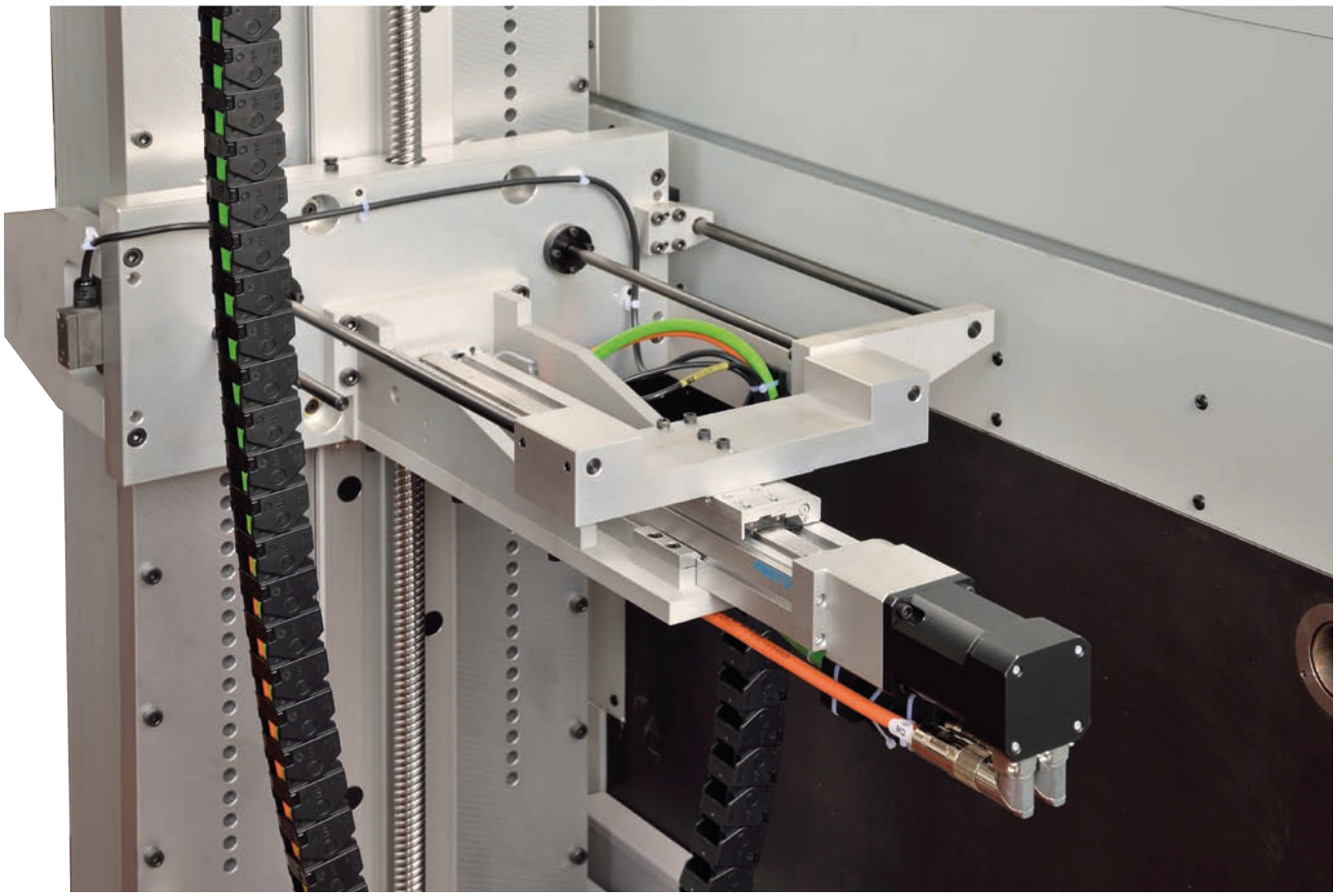
Loading/Unloading Workpieces

Feeder of the Pieces is of Cell Type

The extraction pieces feeder was performed with an electric motor for maximum ease



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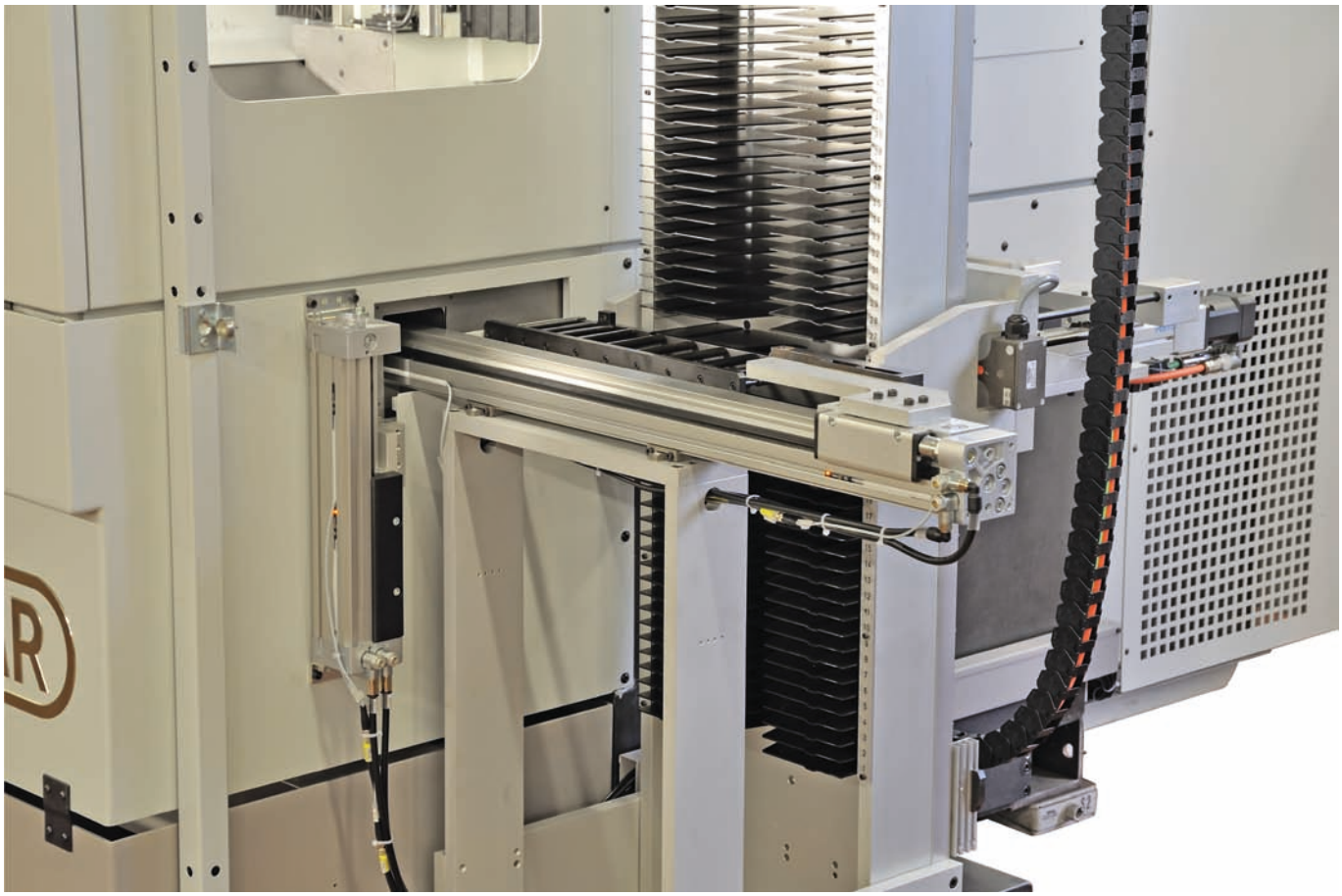
Loading/Unloading Workpieces

Feeder of the Pieces is of Cell Type

Overall view. Safety guards removed to allow visibility



Loading/Unloading Workpieces

Water Pump - Ejector Machined Parts - Chip Conveyor

Are optional equipment for maximum ease of use of the machine

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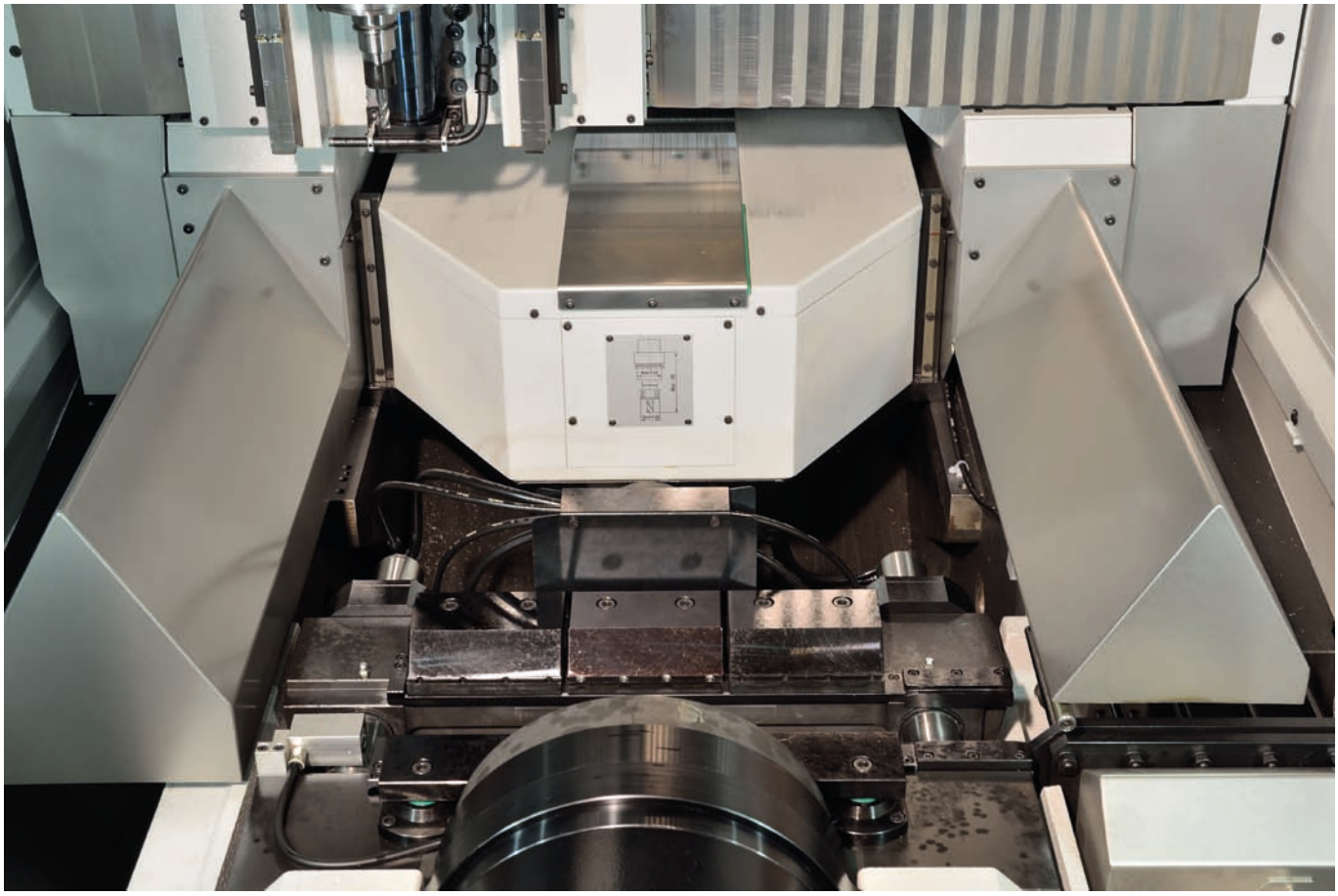
Tool Changer

For this type of work, the tool changer with 22 positions inside is particularly suitable and it is also the one normally delivered.

22-Position Tool Changer

Overall view



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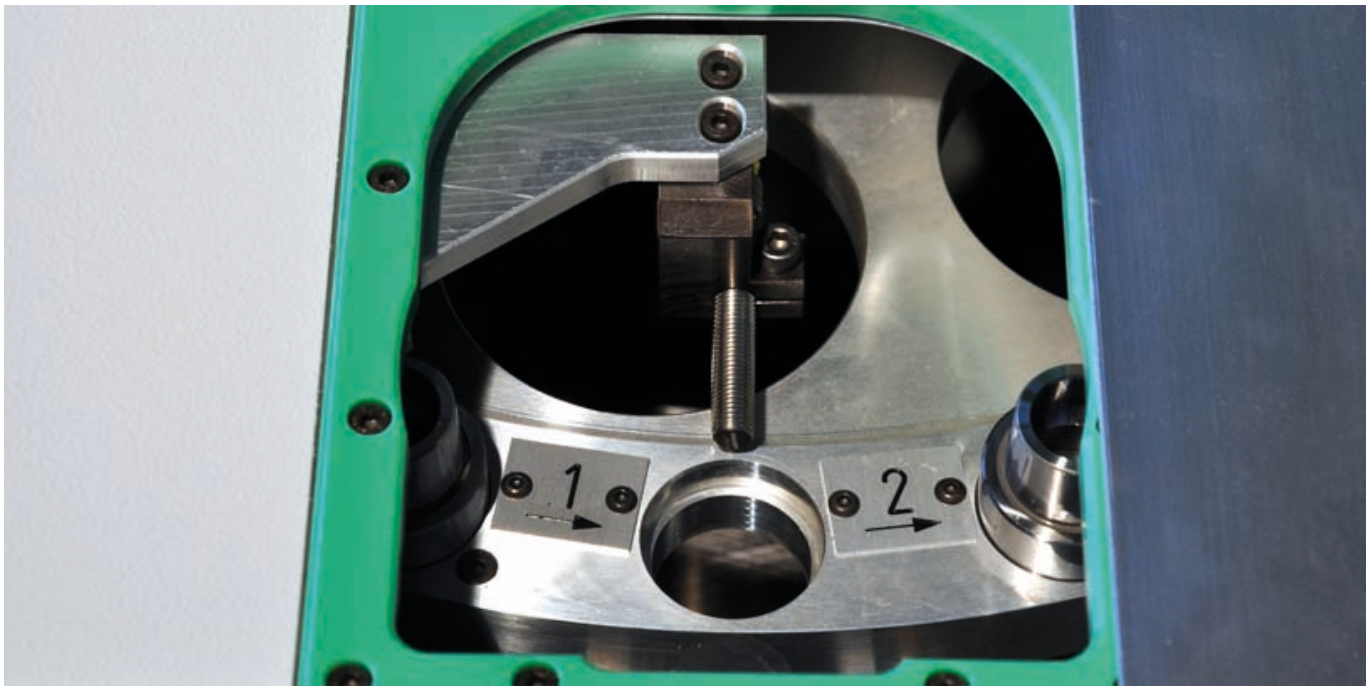
Tool Changer

View of a Detail of the Tool Changer

Note the presence of the safety switch to prevent tools to be mounted on already occupied position



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Tool Changer

The tool to be picked up is prepared in masked time during the working time of the previous tool. In this way you get the benefits of having a tool exchange time faster and the storage area of the tool holders in the clean area.

48 positions tool changer

Overall view

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Specifications

Polymeric Granite Base	
Overall dimensions	2,580×3,000×2,500 mm
Net working travels	X=400, Y=300, Z=400 mm
Tool holder Hsk32/E	DIN 69893
Maximum RPM	30,000/40,000
Spindle power continuous duty (S1)	5 Kw
Max torque spindle	4.1 Nm
Rigid tapping standard	
Preset tool length standard accessory	
Total weight	3,400 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
Acceleration on three axes	10,000 mm per sec^2 (1G)
Positioning precision (VDI 3441)	±0.015mm
Repeatability accuracy (VDI 3441)	±0.005 mm
Positioning precision with optical scales (VDI 3441)	±0.008 mm
Repeatability accuracy with optical scales (VDI 3441	±0.001 mm

TOOL CHANGER

Number of tools available	22/48
Max tool with standard collect Ø	10 mm
Tool change time chip to chip average	9 sec
Time to swap tools	3 sec

SIZE OF BARS

Width (X) minimum/maximum	280/335 mm
Depth (Y) minimum/maximum	40/120 (150 on option) mm
Thickness (Z) minimum/maximum	1/12 mm

AUTOMATIC VICE LOCKING PIECE

Rotation performed in a continuous way with a torque motor	
Number of degrees of rotation	±180°
Ability to perform work with vice tilted up to	±15°

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Specifications

AUTOMATIC PIECES FEEDER FROM SEPARATE CELLS

Number of positions available	90
Time to load/unload parts	40 sec

MAIN OPTIONS

- Device for automatic format change (possibility of mounting pieces having different depth (Y) between them)
- Device for ejection of the bar at the end of the processing
- Coolant system
- Chip conveyor
- Extra work table

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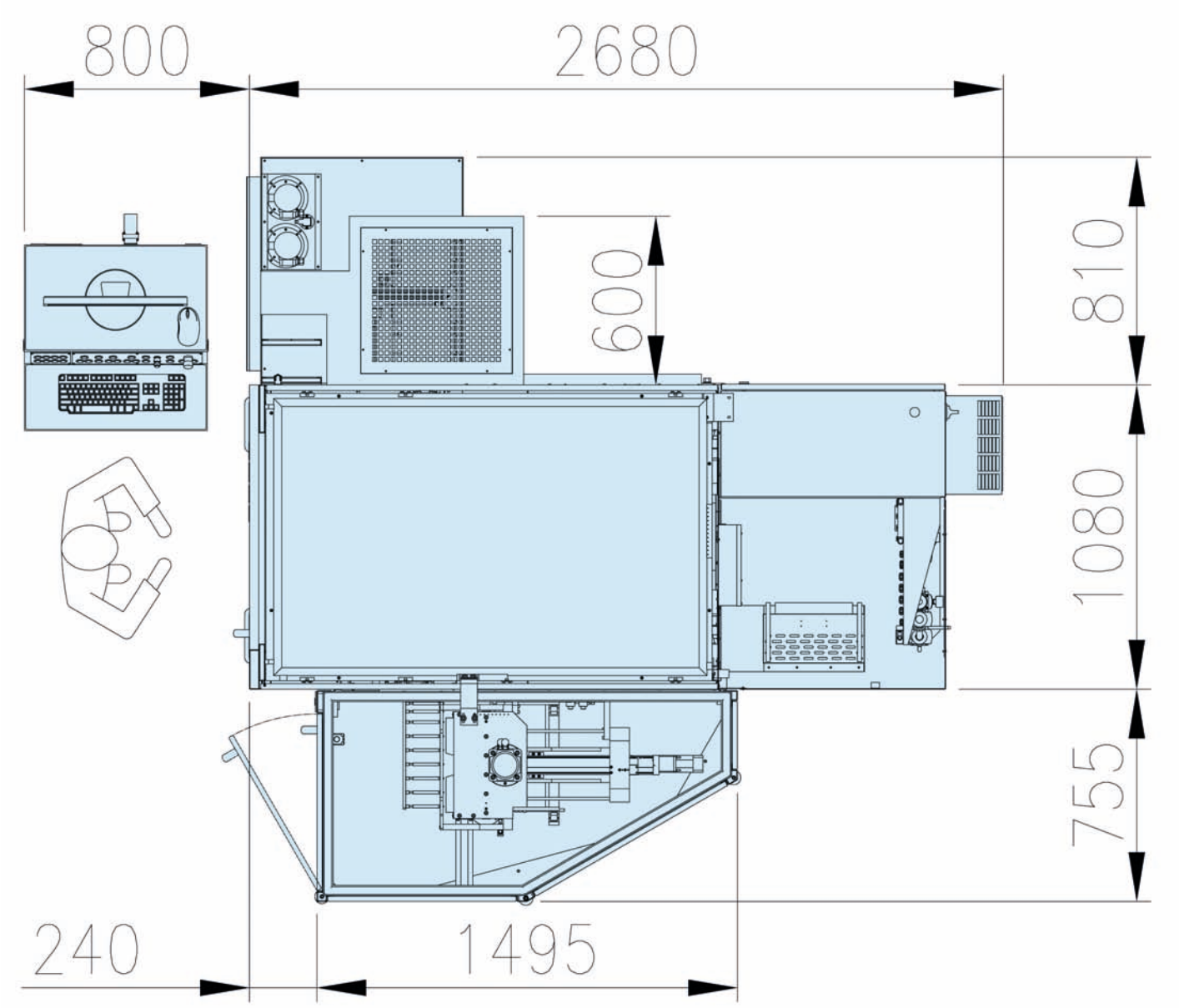
Specifications

Plan view



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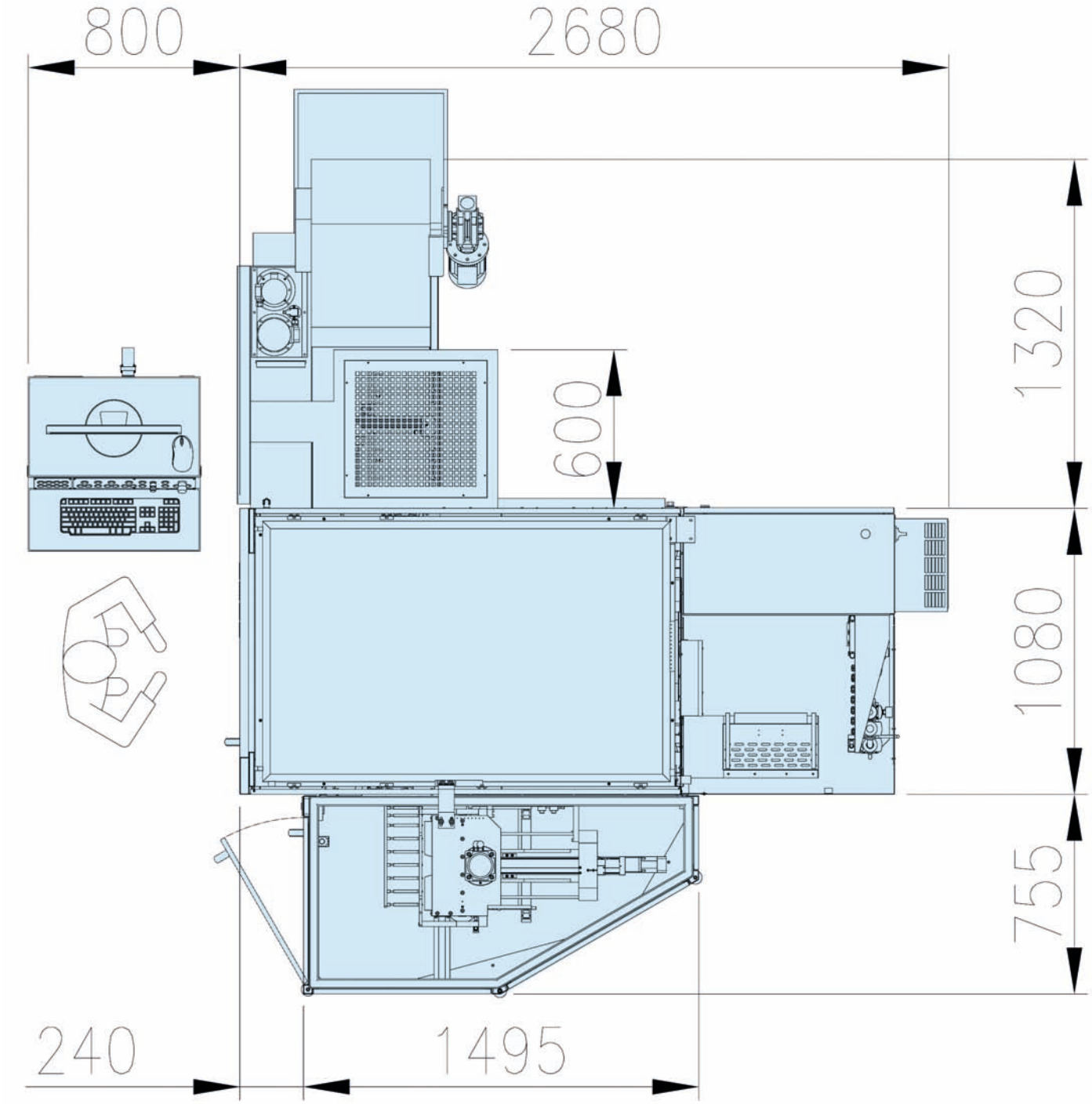
Specifications

Plain view with chip conveyor



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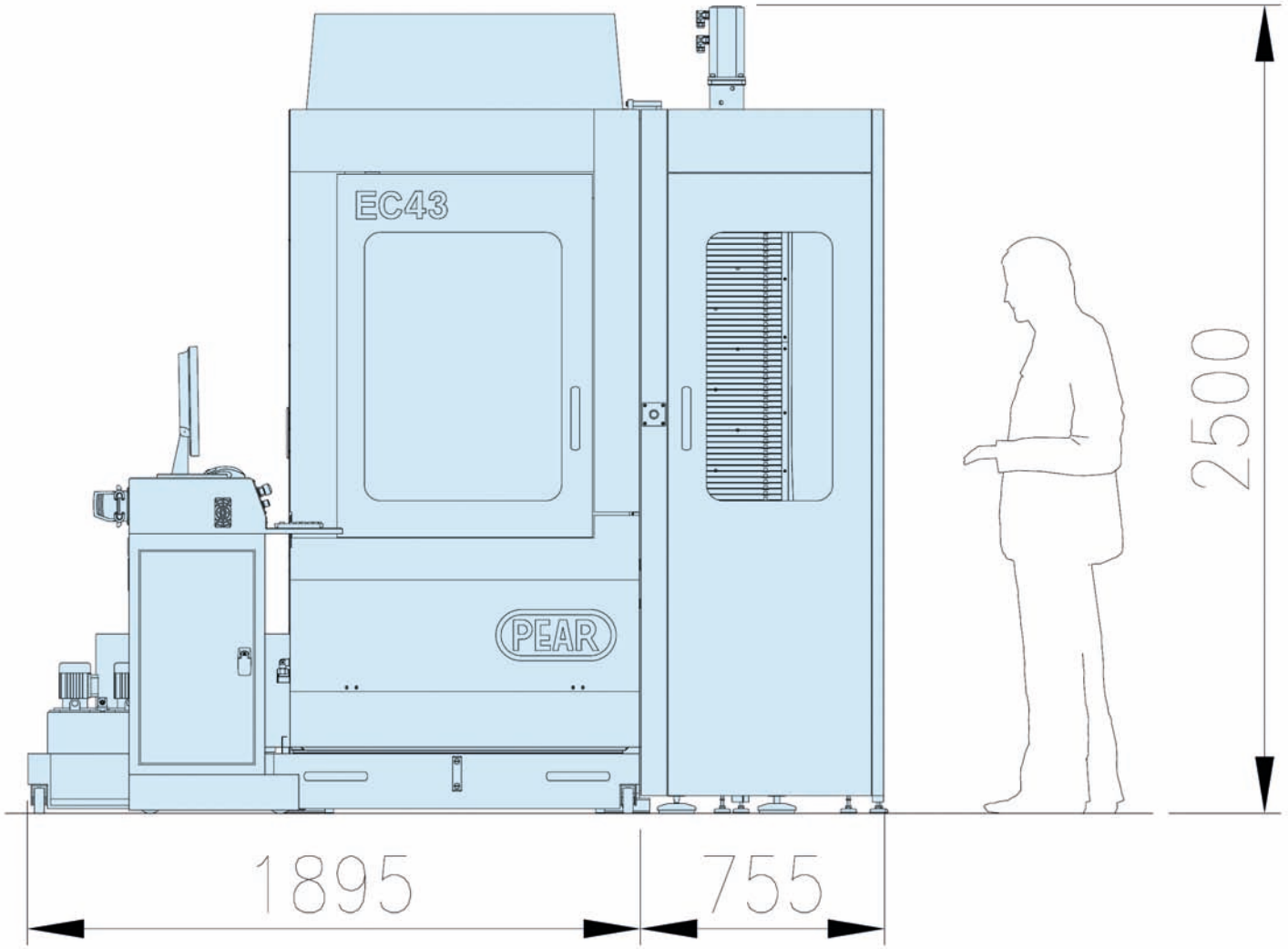
Specifications

Front view



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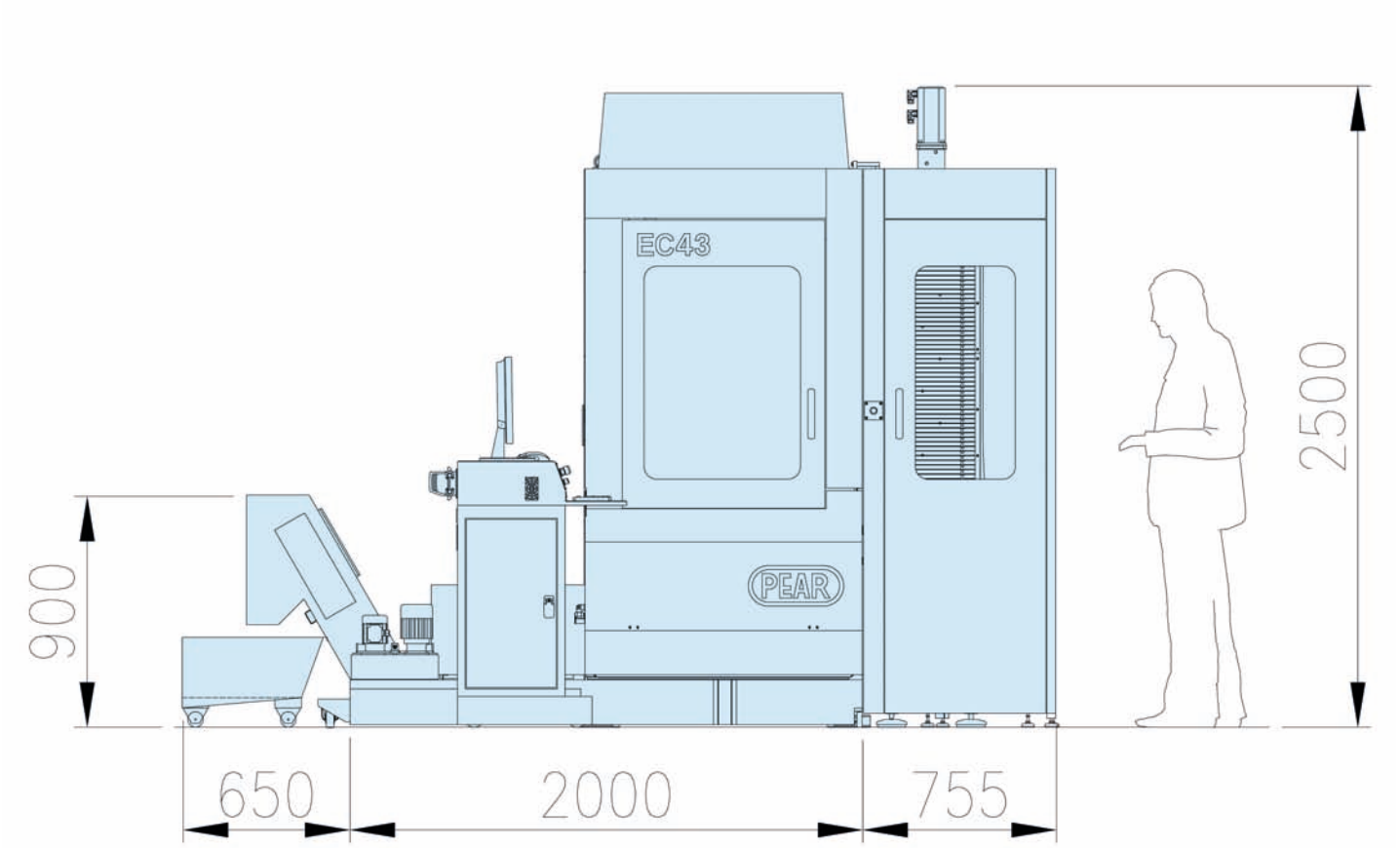
Specifications

Frontal view with chip conveyor



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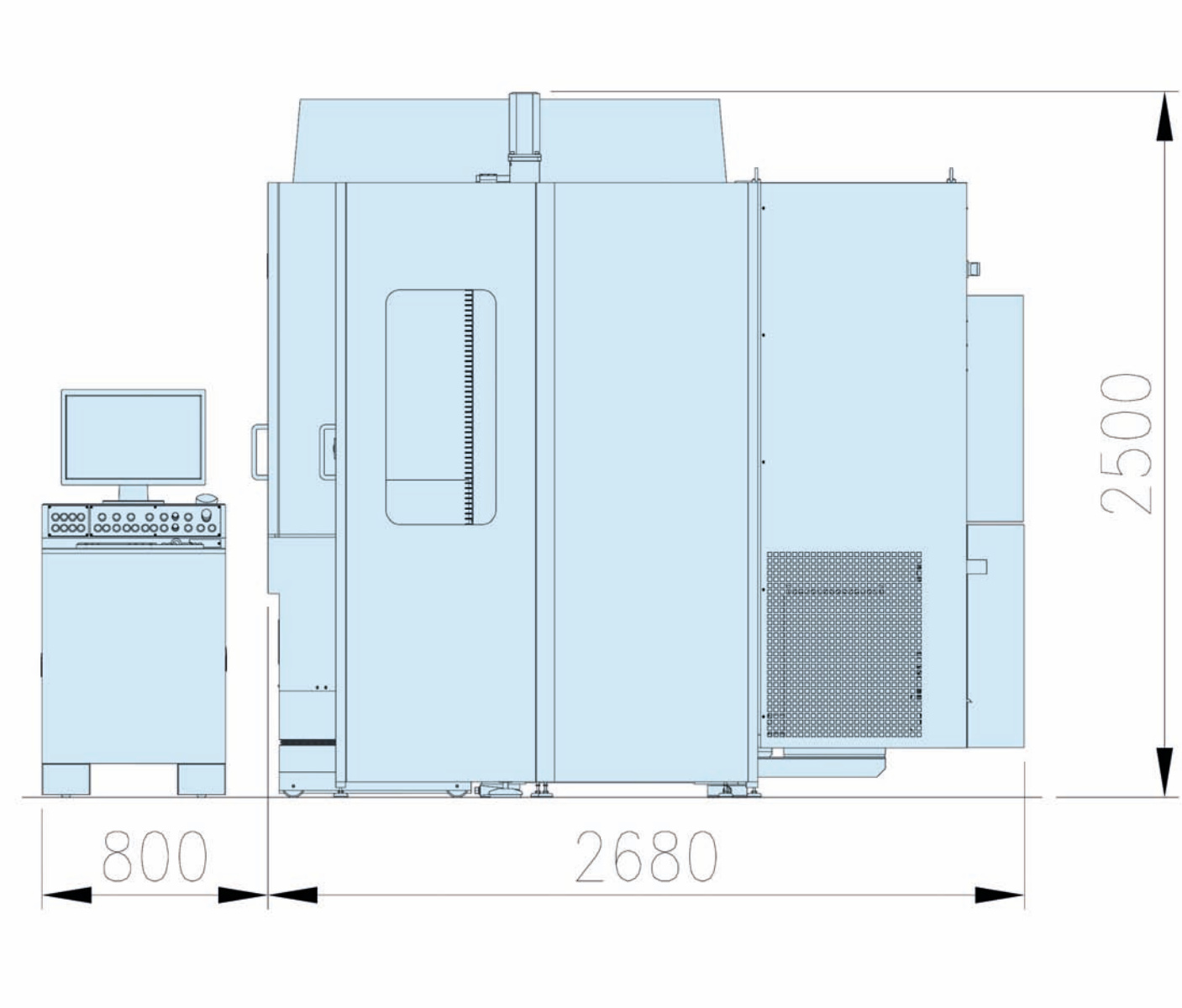
Specifications

Lateral view



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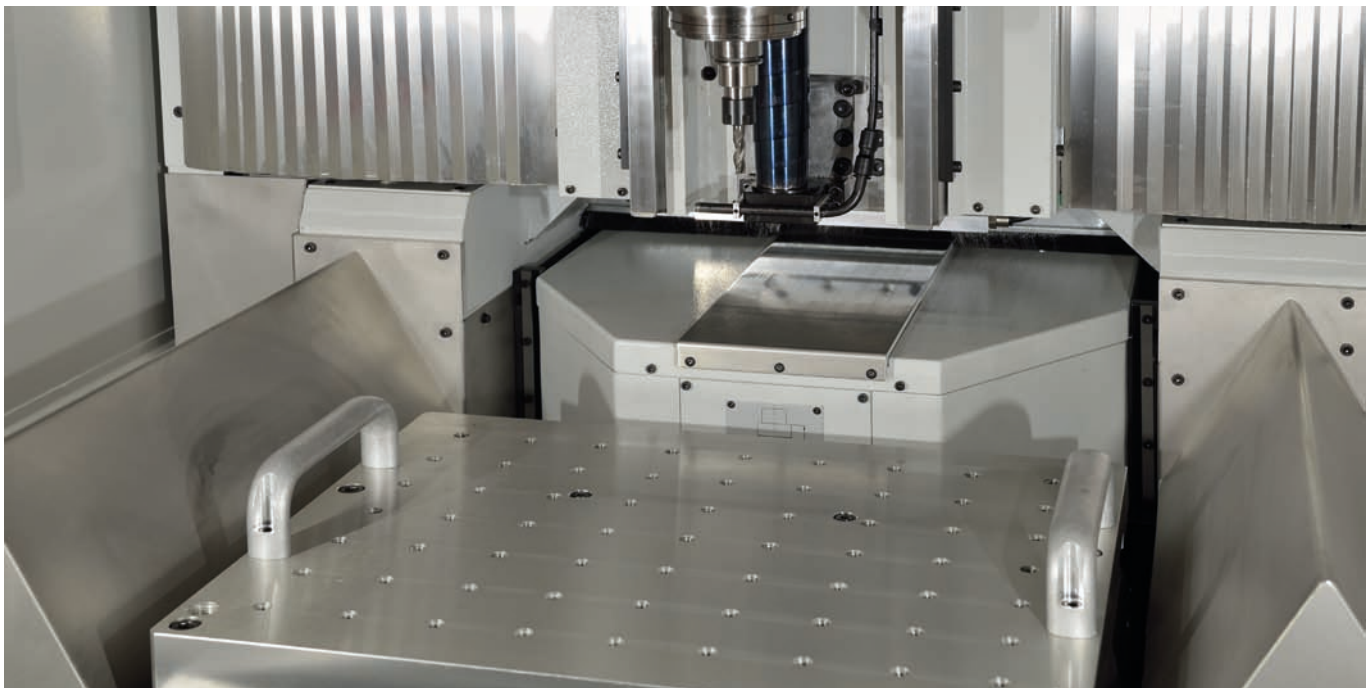
Specifications

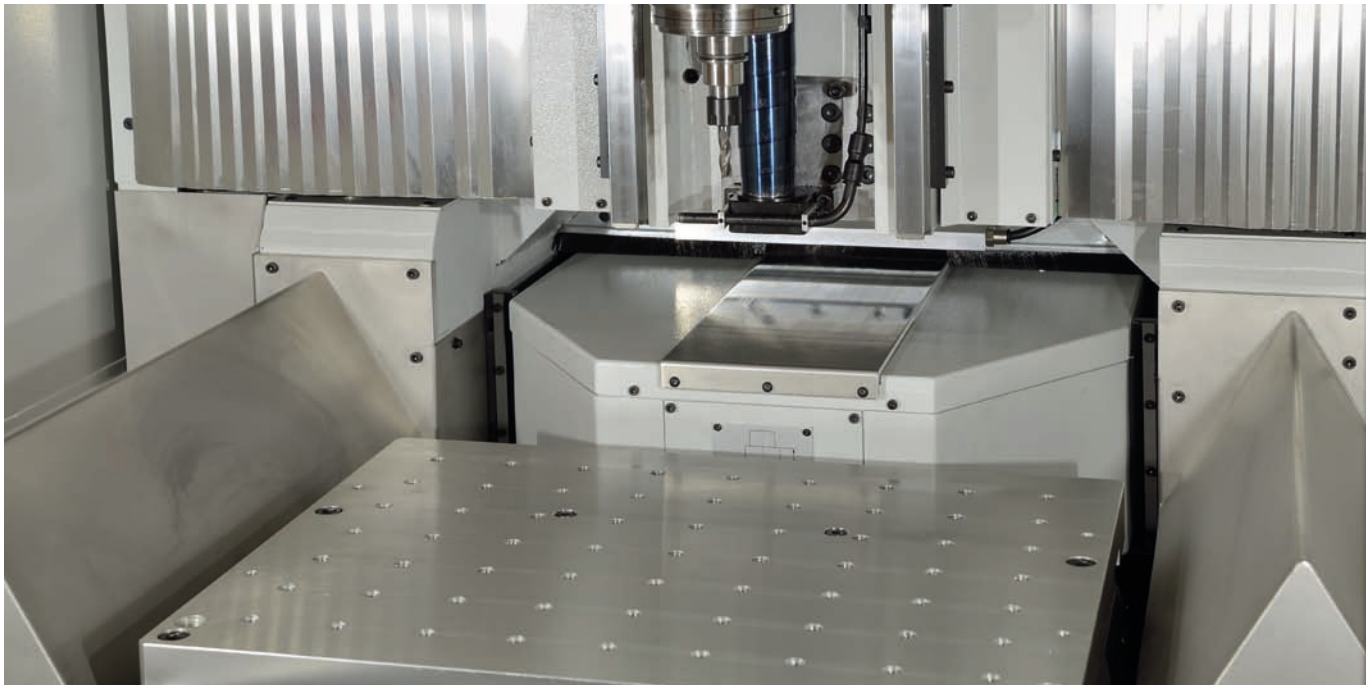
Extra Work Table (with Handles Mounting)

Used to use this machine as a standard machining center with three-axis



Extra Work Table (without Handles Mounting)

Accessory on request



Meccaniche Arrigo Pecchioli
Via di Scandicci 221 - 50143 Firenze (Italy) - Tel. (+39) 055 70 07 1 - Fax (+39) 055 700 623
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