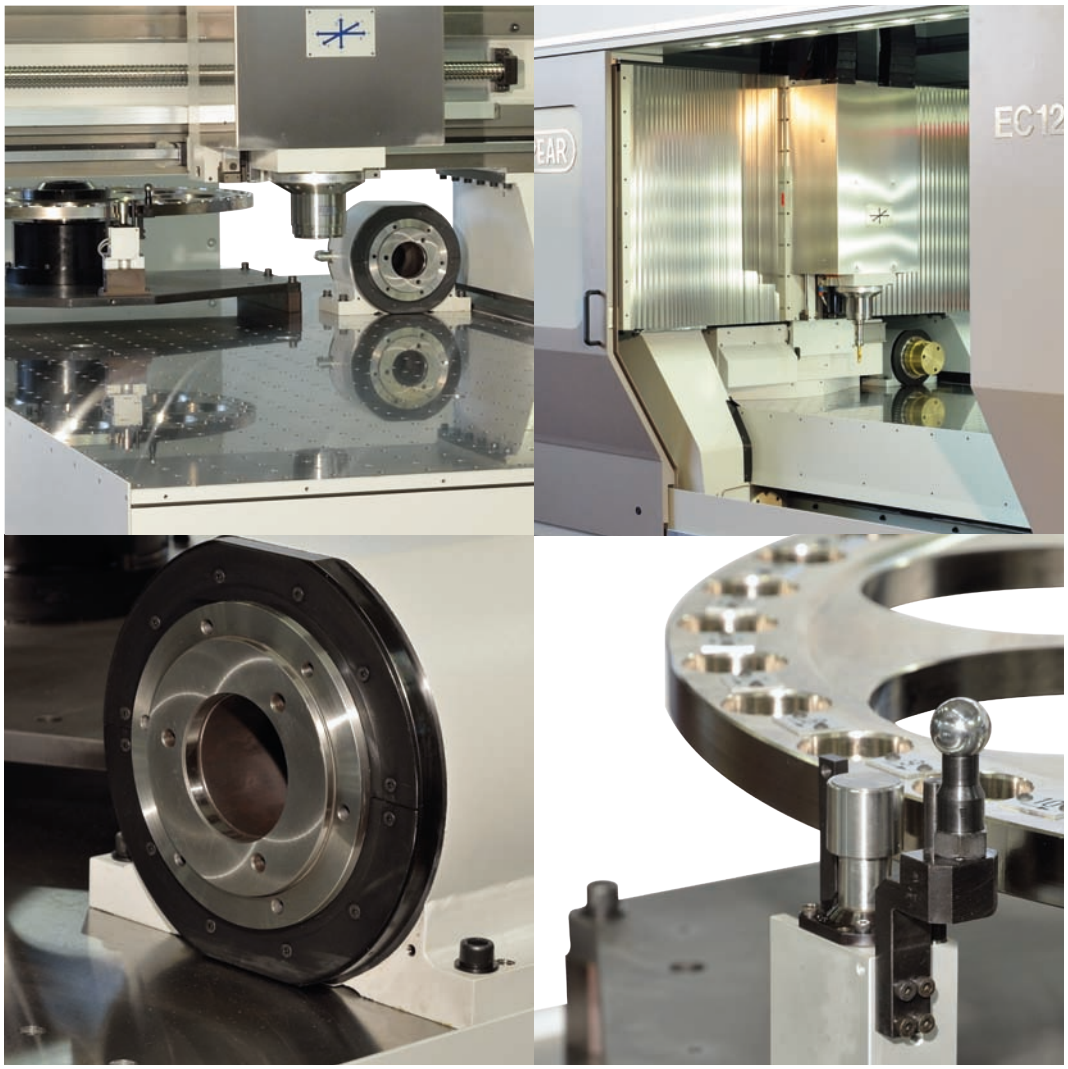
MACHINING CENTER EC1220



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Other files available for additional information regarding this machine

Spindle Hsk40
Probe for Hks40
Probe Software by HEXAGON Metrology
Control Desk
Z32 NC
Software Peace

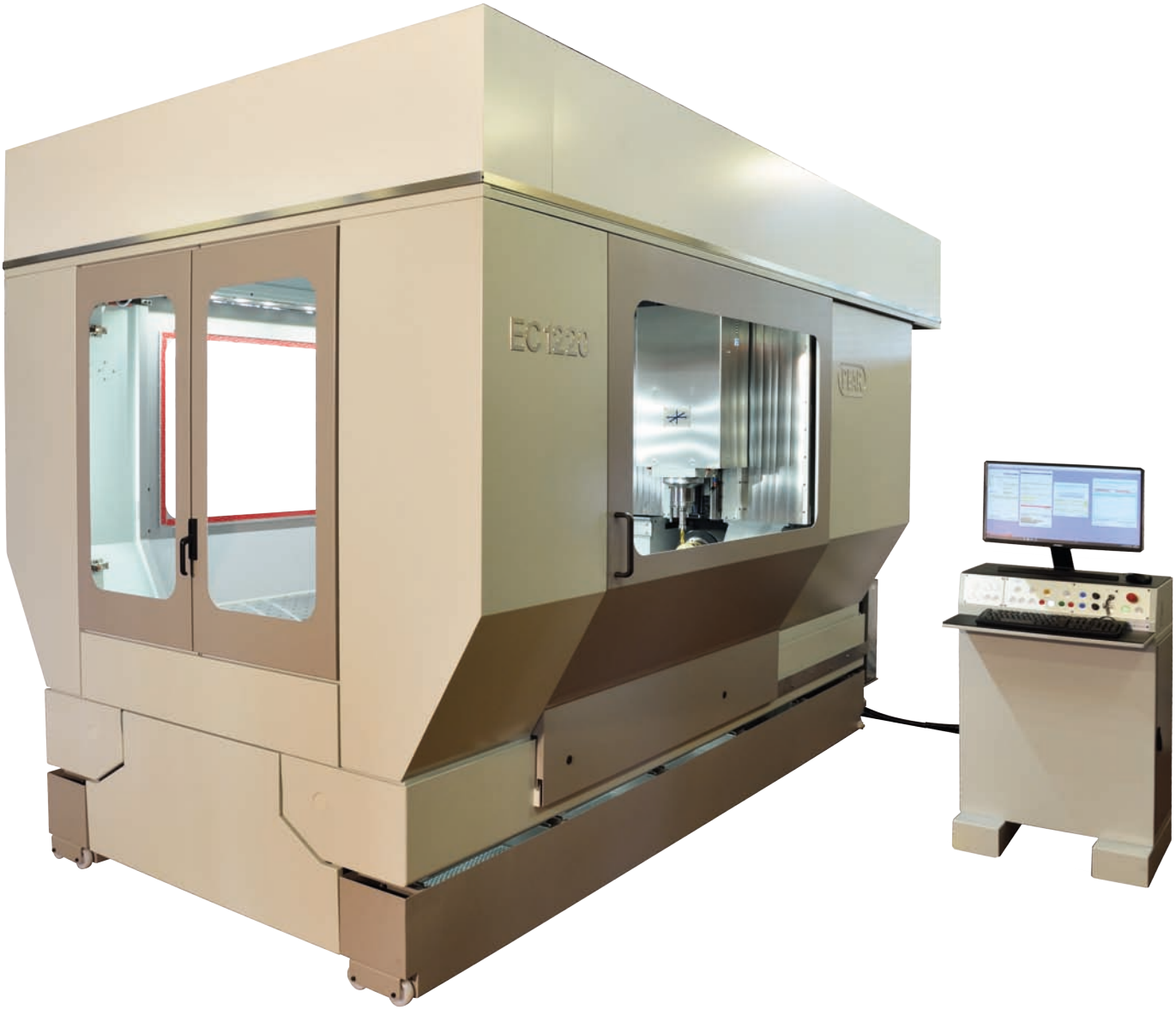
Fields of Application

It is a machining center designed for the execution of machining pieces having dimensions large or very large but which require a degree of finishing and precision construction particularly high. We repeat: we are talking about a machining center and not a "router" and then about a very specialized machine.

Even the removal capacity is not negligible. In this regard the machine structure is particularly robust and therefore the power available on the spindle is fully exploitable.

Fields of Application

Front view of the machine from the operator's side. There are several optional accessories



Structure

It is a portal machine or moving crosshead in which the working plane is stationary and is therefore the spindle that moves freely in the three axes. This solution allows you to have on one side a very large field of work and the other to contain, with respect to the field work performed, the overall dimensions of the machine.

Since the size of the work area very large, the Y-axis has been realized according to the scheme of a "gantry axis electric", ie there are provided two electric motors, two screws and two position transducers for the translation of such axis. This solution allows you to have a very rigid construction of the machine at the same time limiting the weight of moving parts.

Compared to the solution in classical portal made by us with our model M1015H (with which it shares the spindle), however, has the drawback of posing a production cost of such axis substantially higher.

Noteworthy is the fact that both the guides of the Y axis that the support of the two screws of translation of such axis were made directly on the work table having a considerable weight (over 3,500 Kg the only work table!). The movable cross despite being made in welded structure (steel), was constructed according to the technology that provides for the filling of such component polymer with low density and therefore both the side of the work table (made of cast iron) which from the side crosshead gets the maximum damping effect of the vibrations caused by the tool in its movement of material removal and this guarantees a long life of the tool in work.

Note that the two screws of the Y axis are not rotating, but that is the nut that rotates as directly mounted inside the rotor motor which will also have a hole for passing inside the screw axis of translation. The above in order to minimize the inertia of the rotating parts. Indeed, the inertia of any rotating screw, given the stroke of axis Y, would be particularly important.

These two screws are both pre-tensioned. The pre-tensioning allows you to have a torsional stiffness and axial four times higher compared to a pre-stressed screw.

In order not to introduce any element of thermal distortion, the two motors housed inside the Y-axis of the moving crosshead, are liquid cooled.

Concerning the construction of the X axis, to note the absence of the coupling between motor and screw. The motor axis, of our construction provides the rotor mount directly on the screw drive shaft and this guarantees a greater roundness of movement for this axis.

Structure

Ball bearing screw characteristics and translation axes guides

– X axes diameter: 40 mm
– X axes diameter: 40 mm – Two screws present
– X axes diameter: 32 mm
– Screw pitch X Y Z: 20 mm per revolution
– Material: hardened and ground steel with ceramic material nut balls
– Dimensions roller block size X Z axis: 25 mm
– Dimensions roller block size Y axis: 45 mm

Position transducer axes

For all three axes are used optical absolute scales

Structure

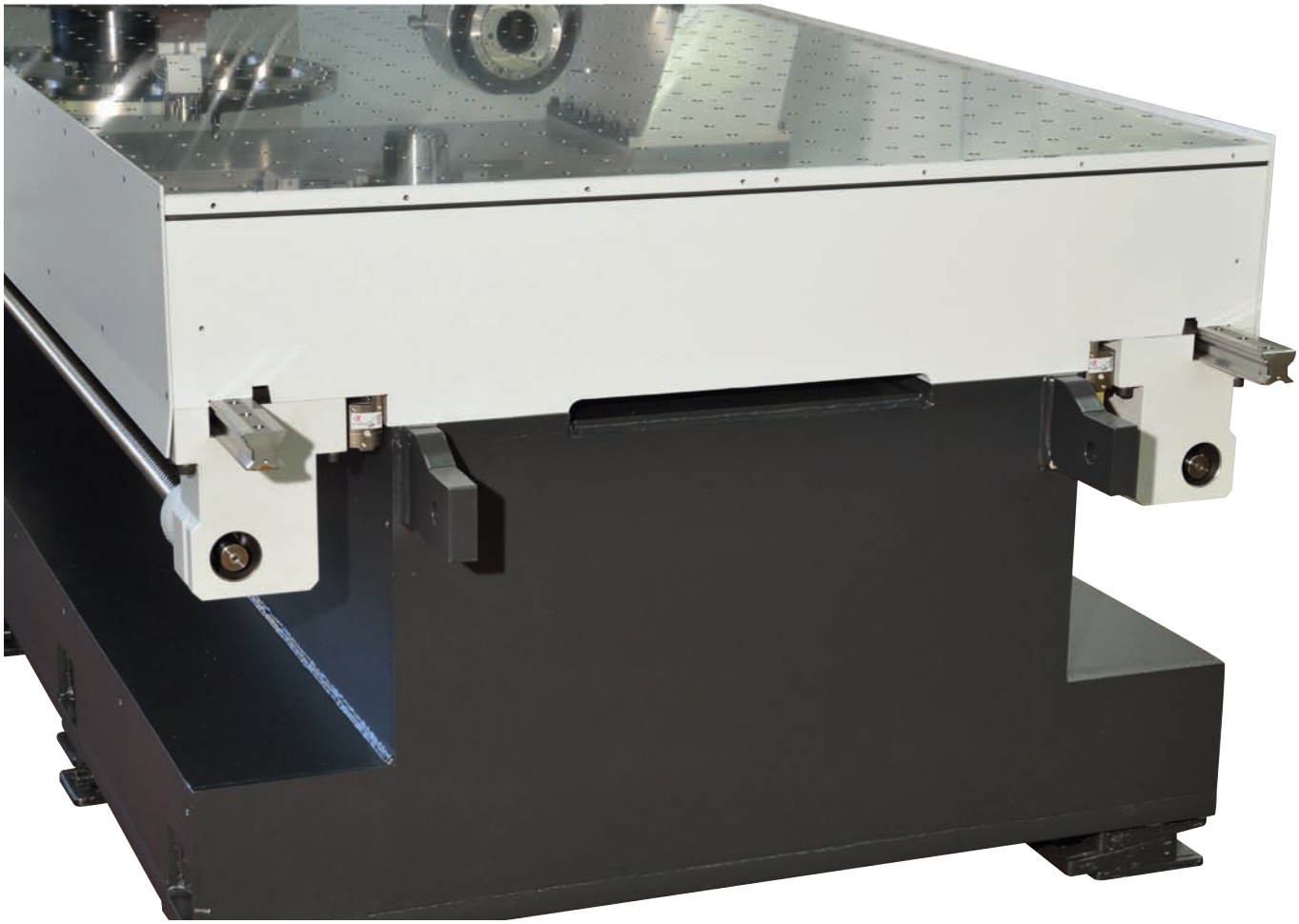
View of the Machine During Assembly

The rotary table that can be positioned continuously DC23 model that you see on the right, is an optional accessory

Structure

Extremely Rigid Worktable

The thickness of the worktop is 220 mm. As an indication once worked it weighs 3,500 kg!



Structure

Access to the Work Plane from the Front Door

Despite the large size of the machine, the accessibility of the work area is always very easy

Structure

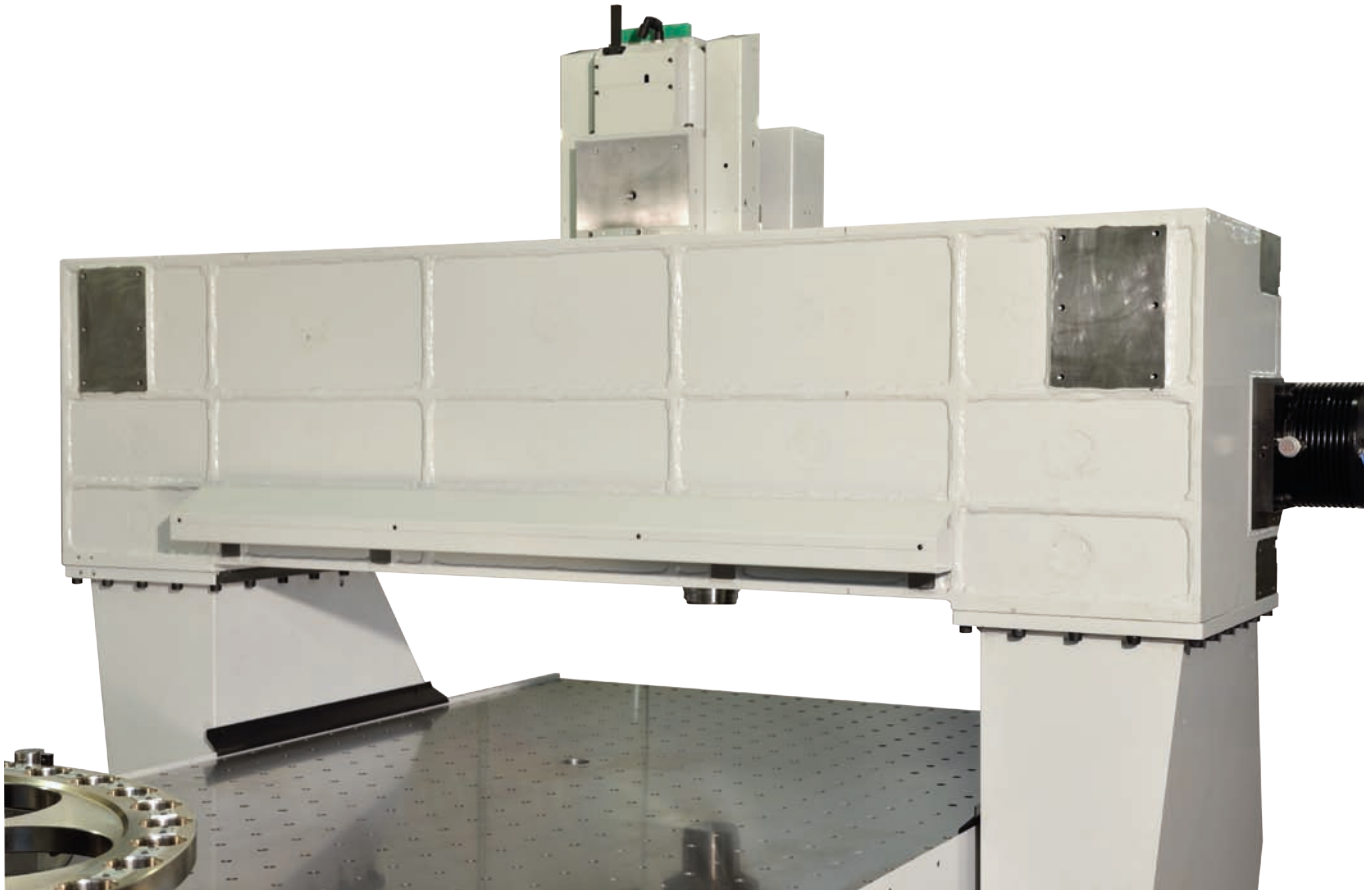
Tank Recovery Chips

It is an optional accessory. There are many options available regarding the evacuation of chips

Structure

Moving Crosshead

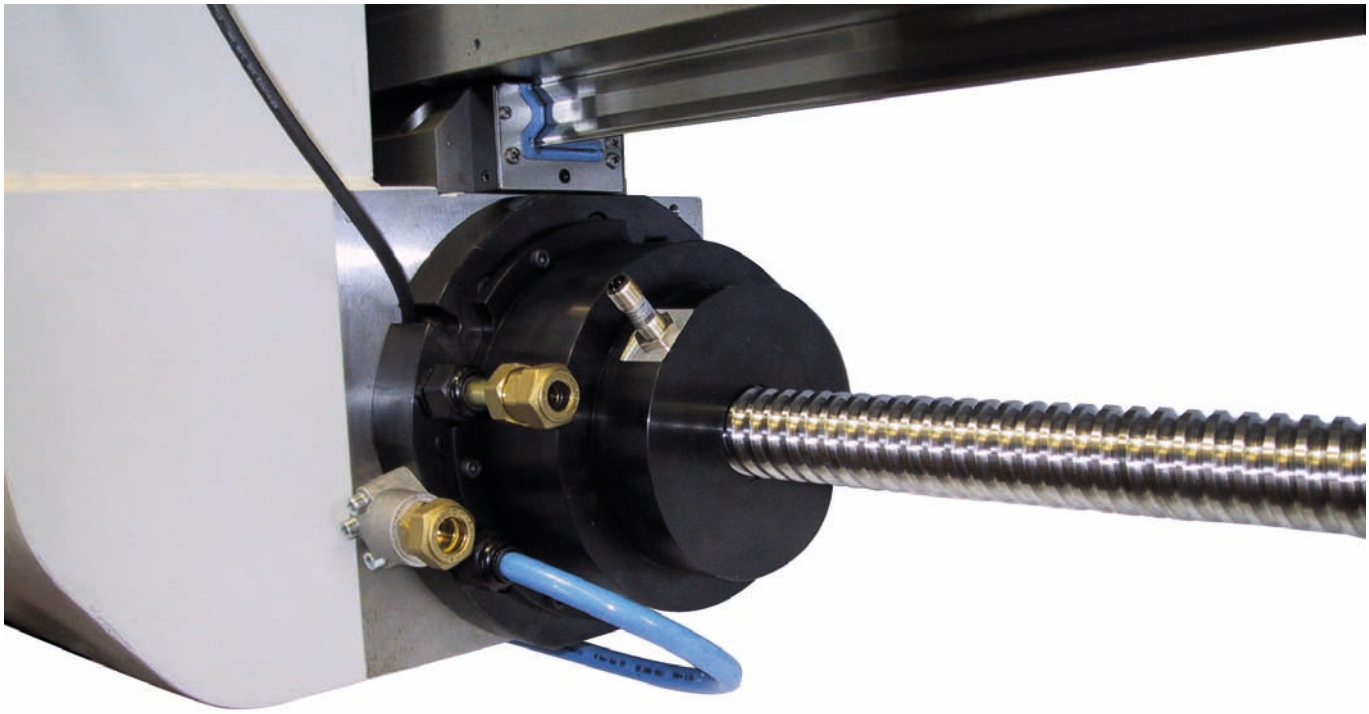
It was filled with the polymeric material of low density in order to absorb vibrations



Structure

One of the two Motors Axis Y

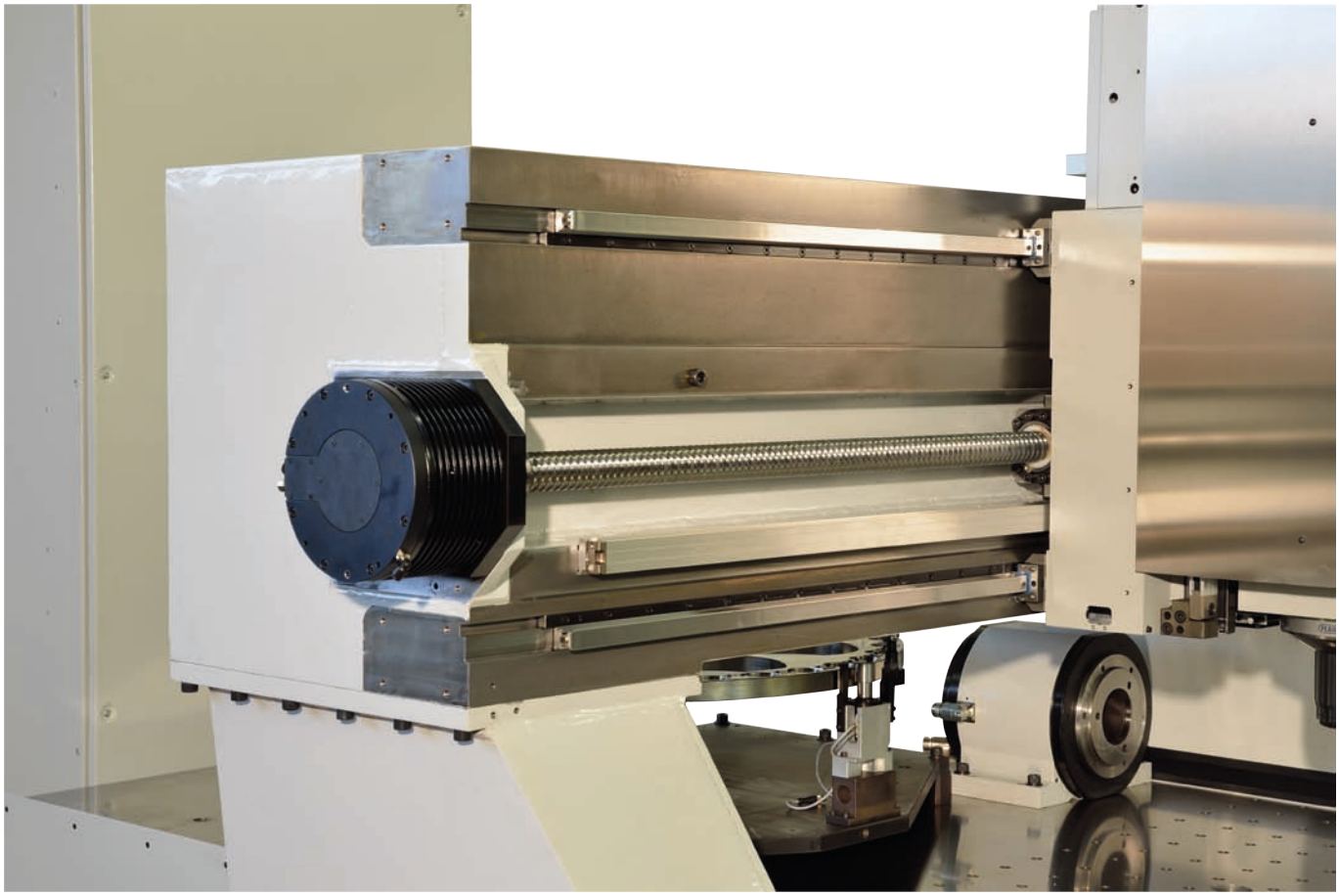
Note that the screw is stopped (in fact it is the nut that is rotating) and that the cooling is done using a liquid



Structure

X Axis Motor

The rotor is mounted directly on the screw drive shaft and this guarantees a greater roundness of movement



Structure

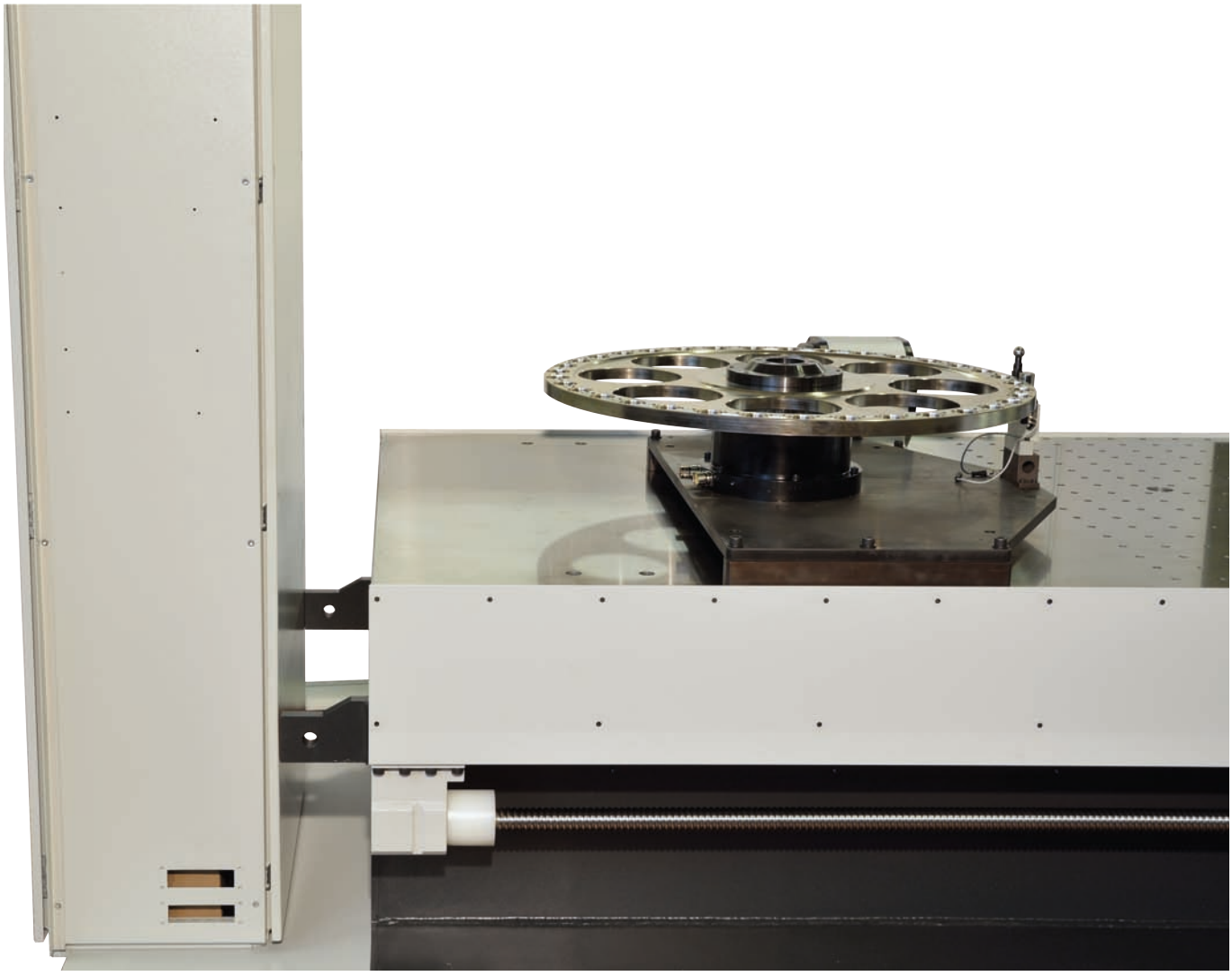
Transducers Axes Made through Optical Absolute Scales

Respectively, from left to right, the axes X, Y, Z. For the Y axis are provided two optical lines being a gantry axis

Structure

Control Cabinet Mounted along with the Machine Base

It was mounted far from the machine structure so as not to transmit the heat and therefore be the source of thermal drifts



Structure

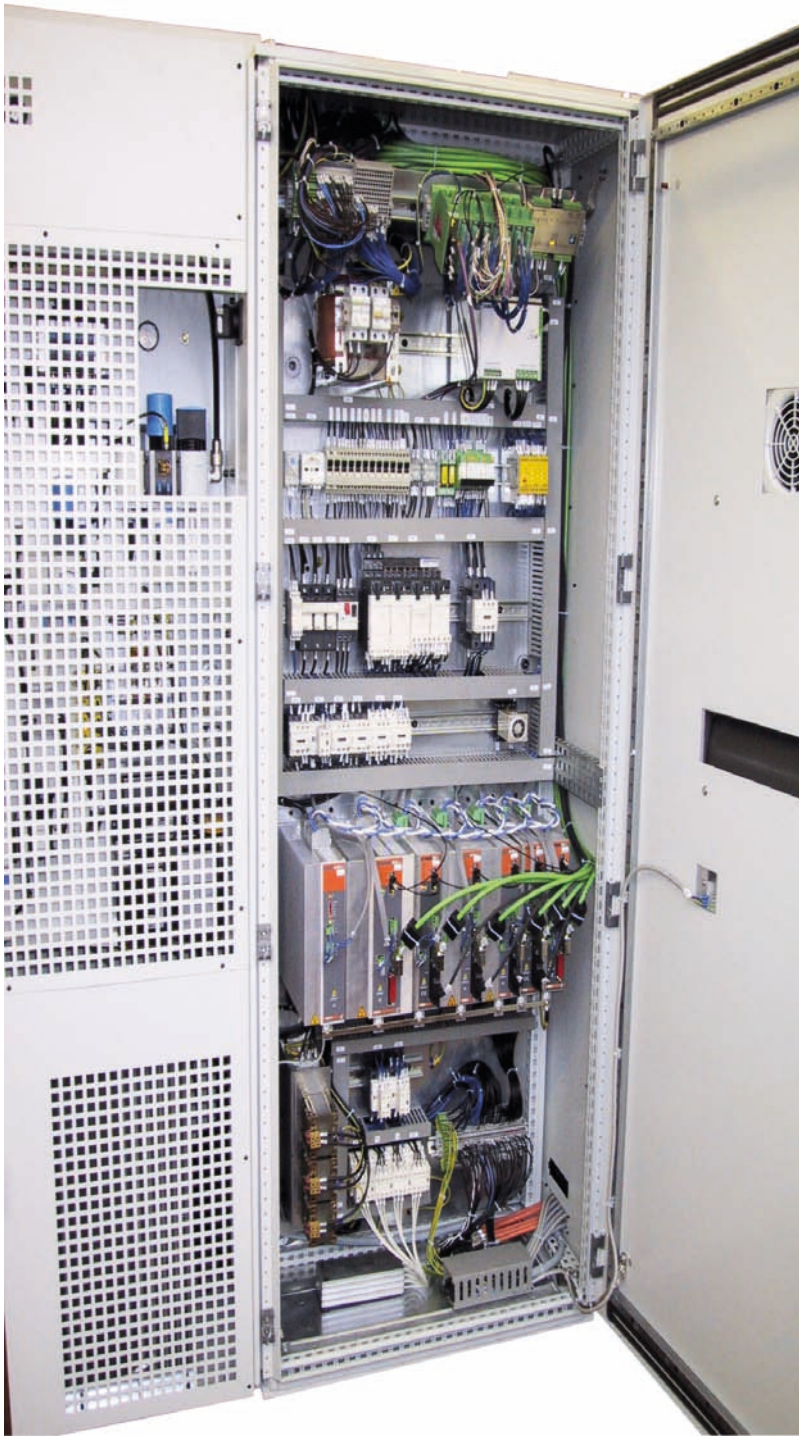
View Power Switch On/Off

All axes are absolute, and then the procedure of zero-axis is not required

Structure

Control Cabinet View

As it is mounted directly on the base, putting the machine into operation is simplified



Structure

Front View from the Opposite Side of the Machine Operator

Both the right side door and the left side have the same size

Structure

The Front Doors Are Open at the Top

It is therefore possible to fit pieces of important dimensions with the use of cranes or forklifts

Structure

Front Doors with Top Closure

The top closure is an optional accessory

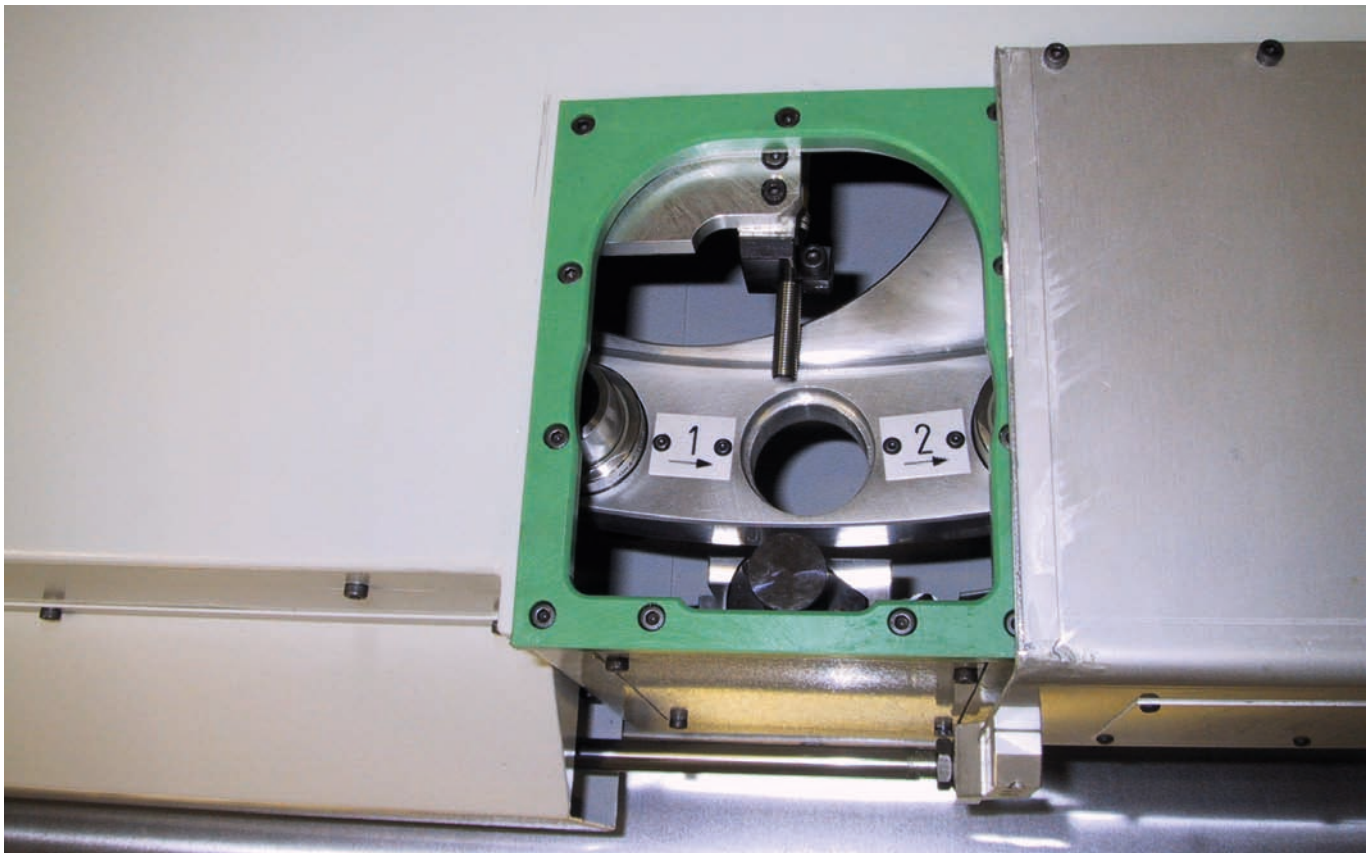
Tool Changer

The tools are deposited / withdrawn from a drum placed directly on the working table outside the working area. You can not mount tools having a diameter greater than Ø 34 and you can not have access to the drum directly from the outside of the machine for inspection at the sight.

Tool Changer

View Tool Magazine Full of Preset Tool Length

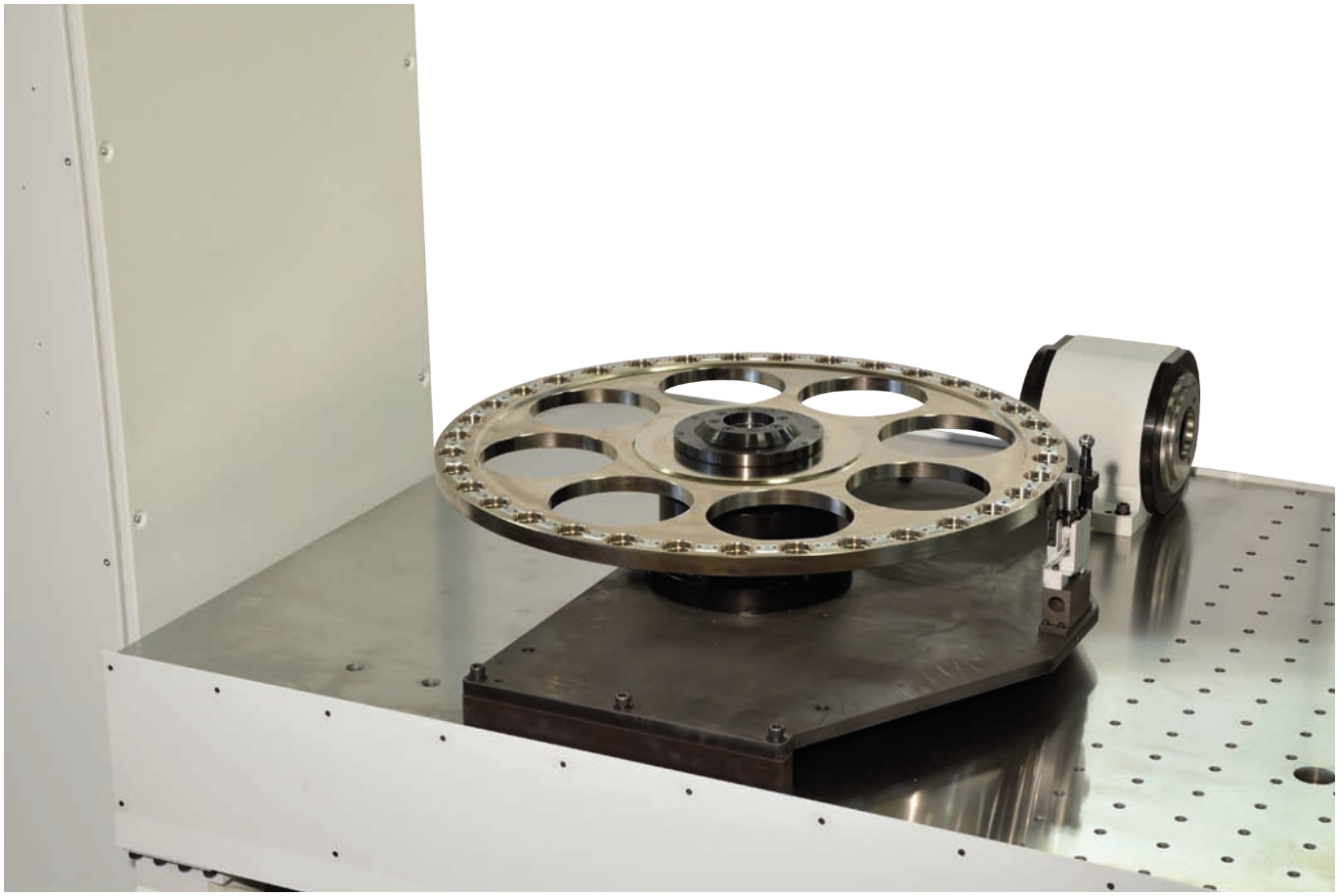
Note the presence of the safety switch to prevent mounting a tool to a position that is already employed



Tool Changer

Tool Change Structure

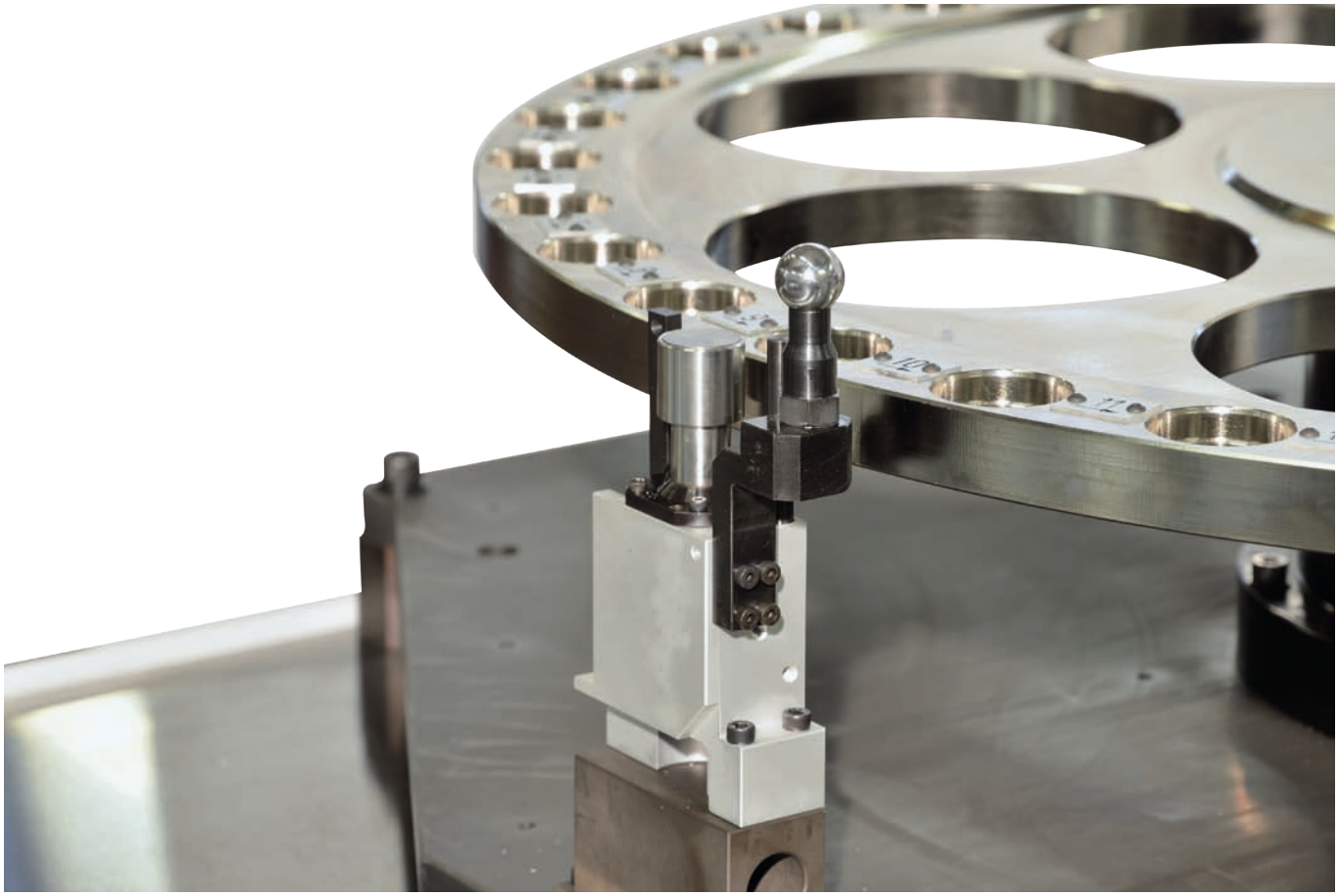
It is simply a rotary drum driven by a torque motor. The divisor in the background is an optional accessory.



Tool Changer

Preset Tool Length of our Construction

In the picture the protective casing has been removed. The sphere is used to qualify the probe item (optional accessory)



Specifications

Overall dimensions	3,100×5,000×2,680 mm
Net working travel	X=1,200 mm Y=2,000 mm Z=400 mm
Maximum workpiece thickness under the bridge	310 mm
Maximum distance from maximum thickness piece to attack tool holder	190 mm
Minimum distance between the work plan and attack tool holder	105 mm
Minimum distance between the work plan and the standard tool nut	25 mm
Tool holder HSK40/E	DIN 69893
Maximum RPM	32,000
Spindle power continuous duty (S1)	12 Kw
Max torque spindle	9.3 Nm
Rigid tapping standard	
Preset tool length standard accessory	
Total weight	extimated 9,000 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	6.0 m/s^2
Positioning precision (VDI 3441)	± 0.01 mm
Repeatability accuracy (VDI 3441)	±0.005 mm

WORKING TABLE

Dimensions	1,280×2,160 mm
Threaded holes clamping pieces	M12x18
Total number of holes	589
Distance between holes	70×70 mm

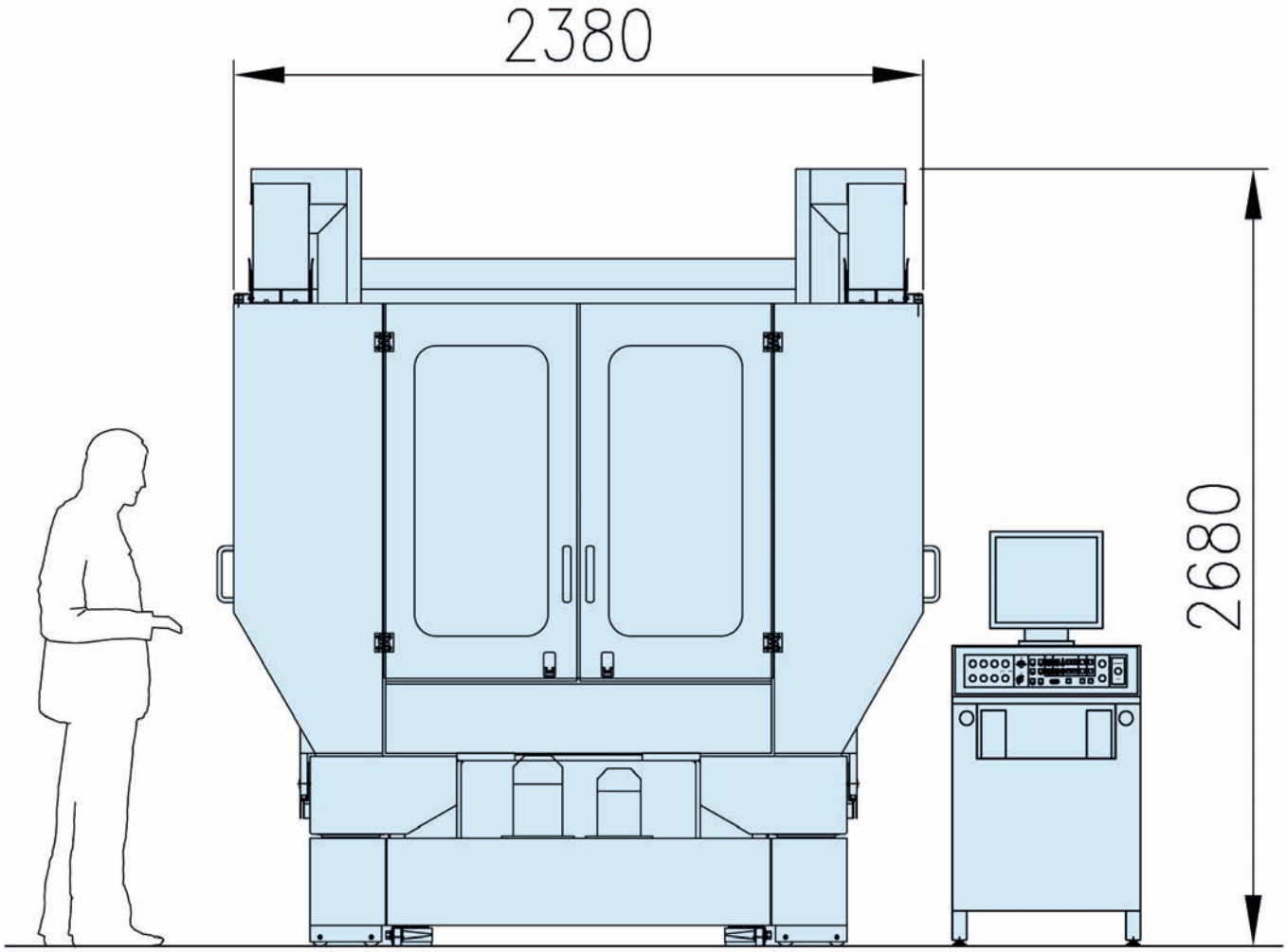
TOOL CHANGER

Number of tools available	35
Maximum tool Ø	34 mm
Max tool locked with standard collect Ø	16 mm
Maximum tool lenght	190 mm
Tool change time chip to chip average	10 sec
Time to swap tools	3 sec

Specifications

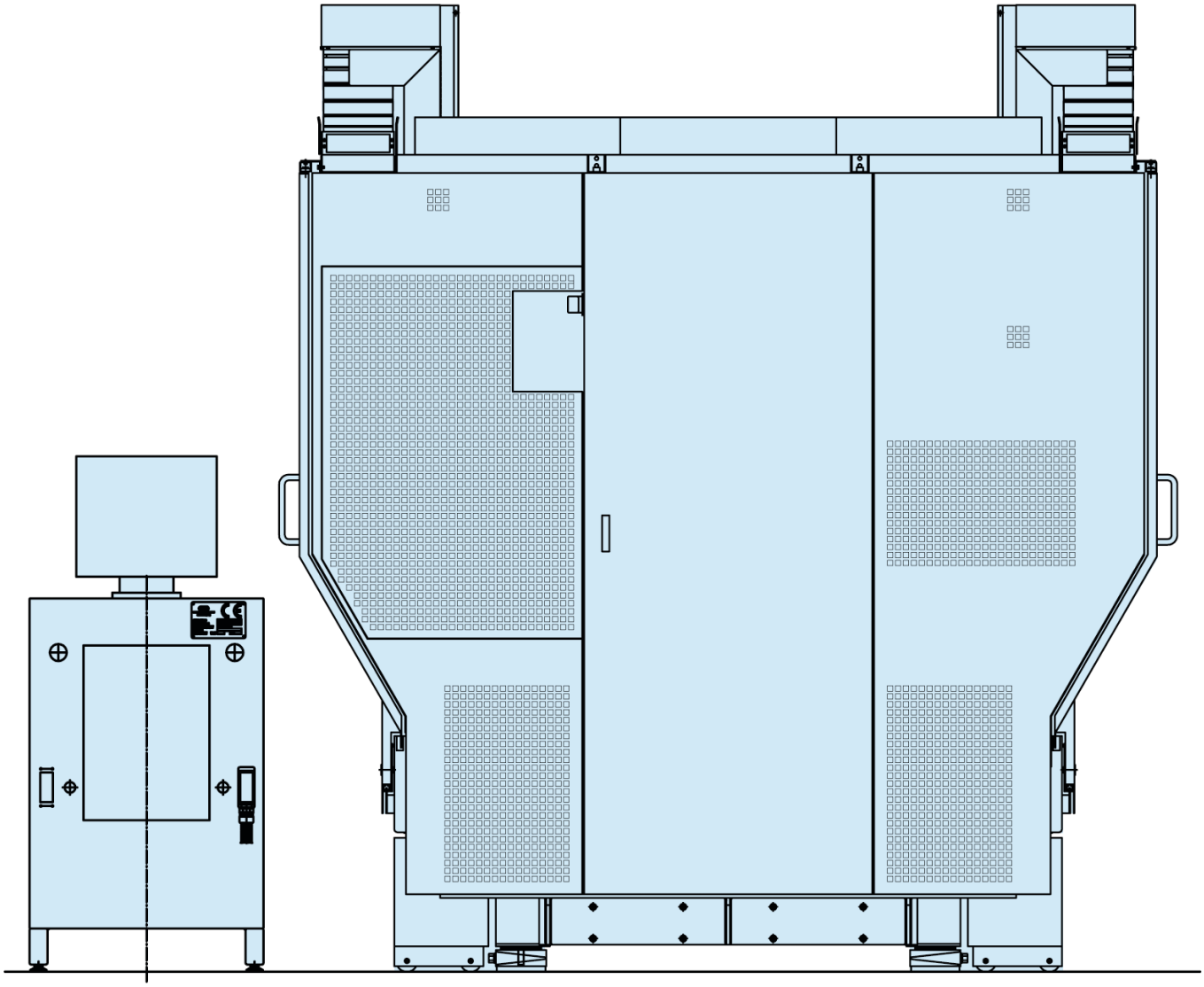
EC1220 Front View

The two front doors also give you access to pieces of important dimensions supported from above by ropes



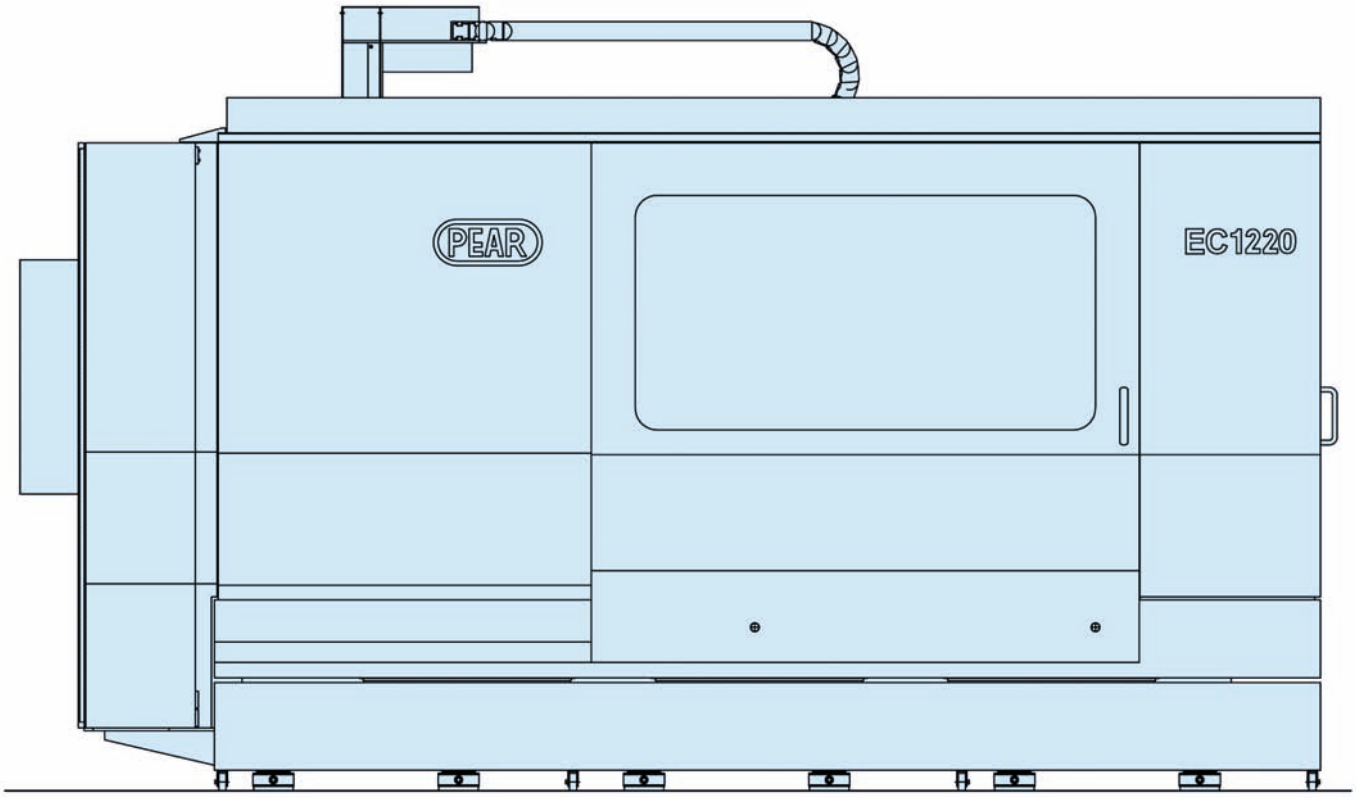
Specifications

Rear View



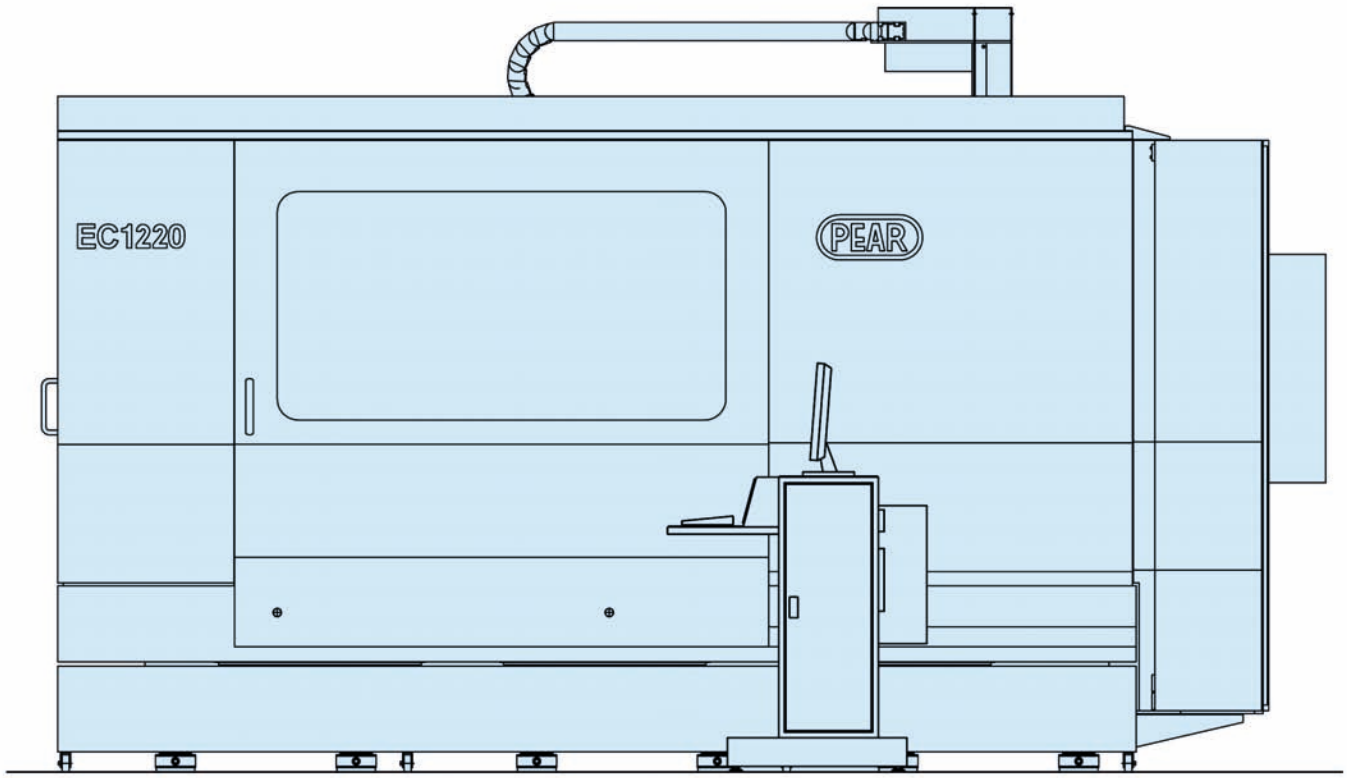
Specifications

Side view of the opposite side with respect to the operator. Even in this case remarkable is the size of the access door



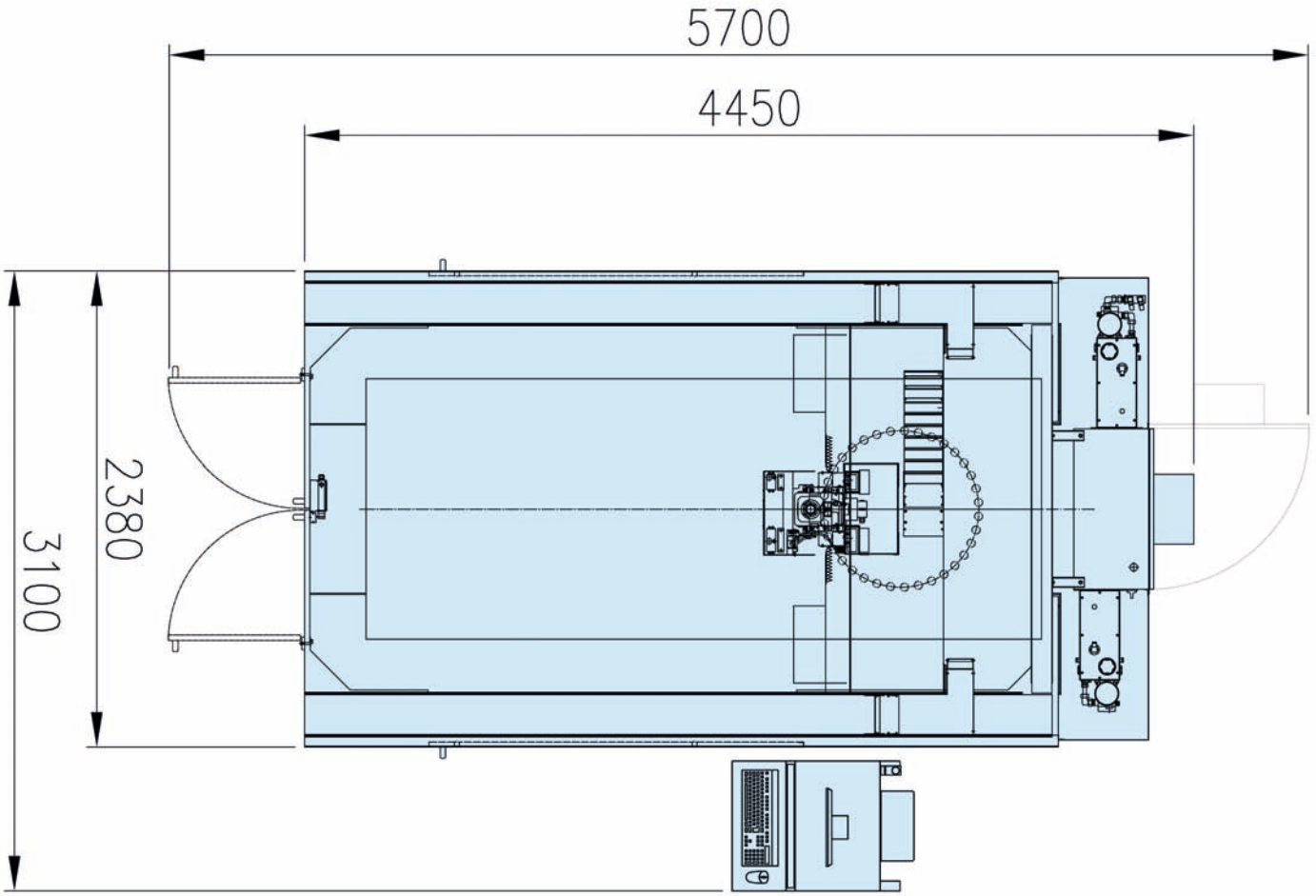
Specifications

Side view on the operator side. Note the important dimension of the access door to the inside



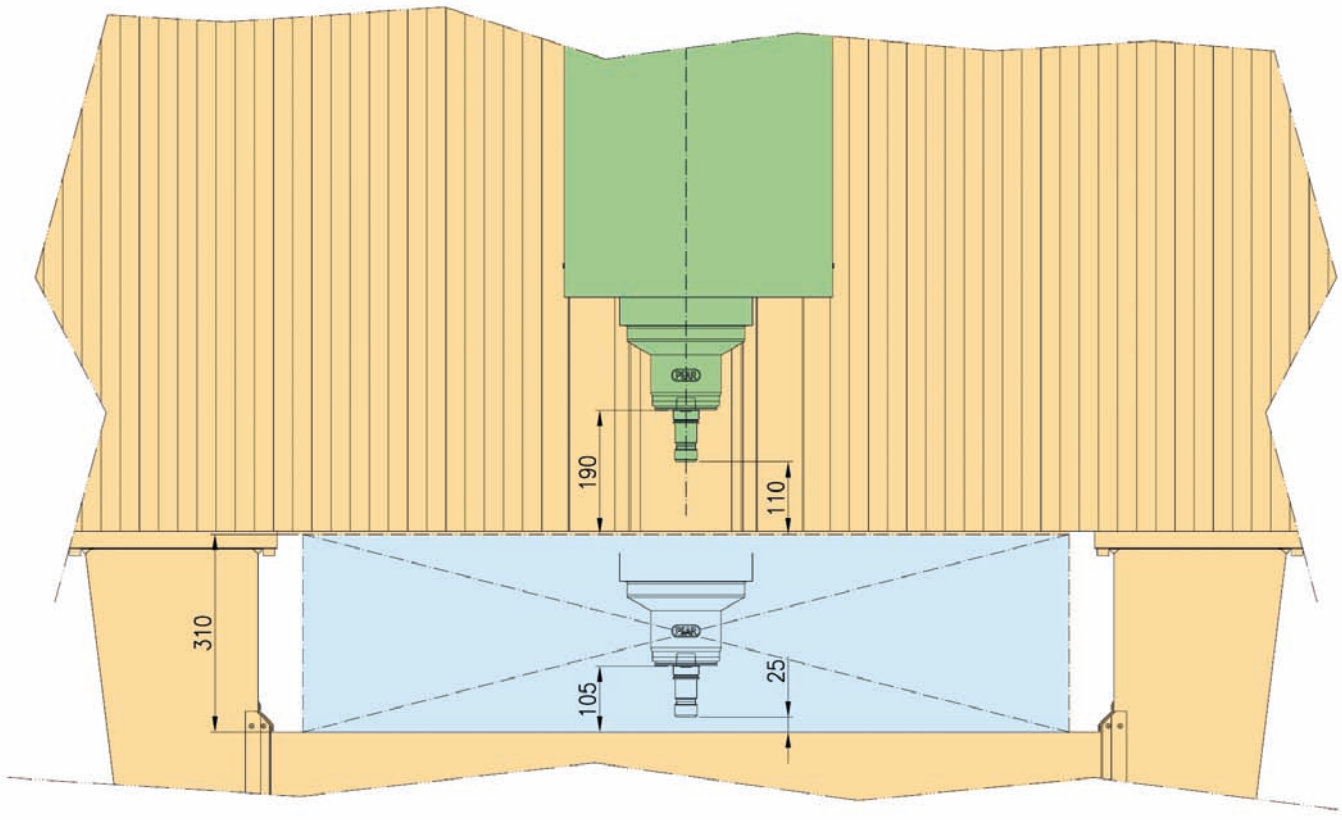
Specifications

Plan view



Specifications

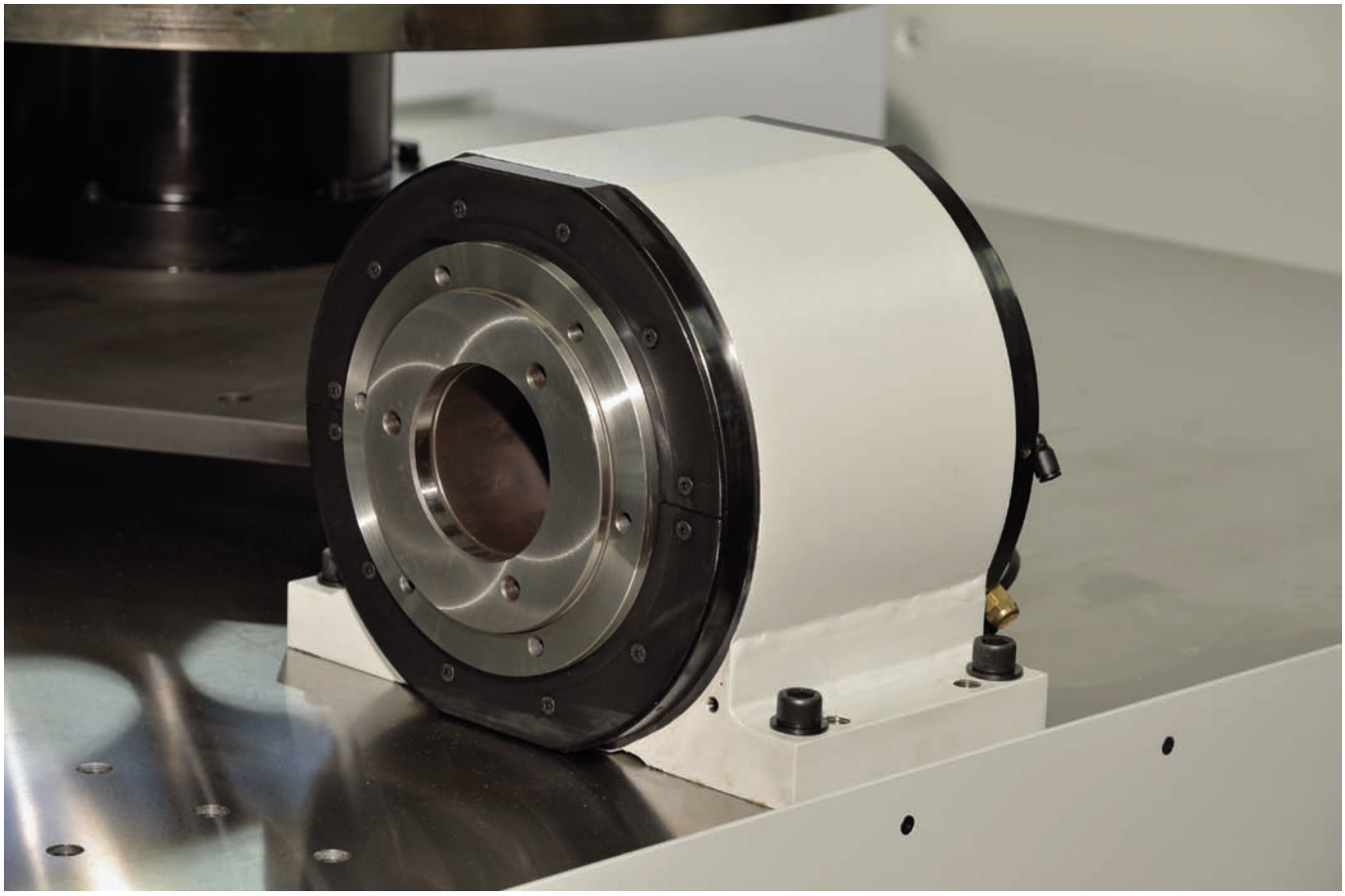
This drawing shows the maximum thickness of the work piece and the various lengths max and minimum of the tool



Specifications

Dividing Table in Continuous Model DC23

Made using the "torque motor" technology, allows the mounting of pieces having max diameter of 230 mm



Specifications

Dividing Table in Continuous Model DC23

It has been placed outside the working area with which does not interfere at all

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