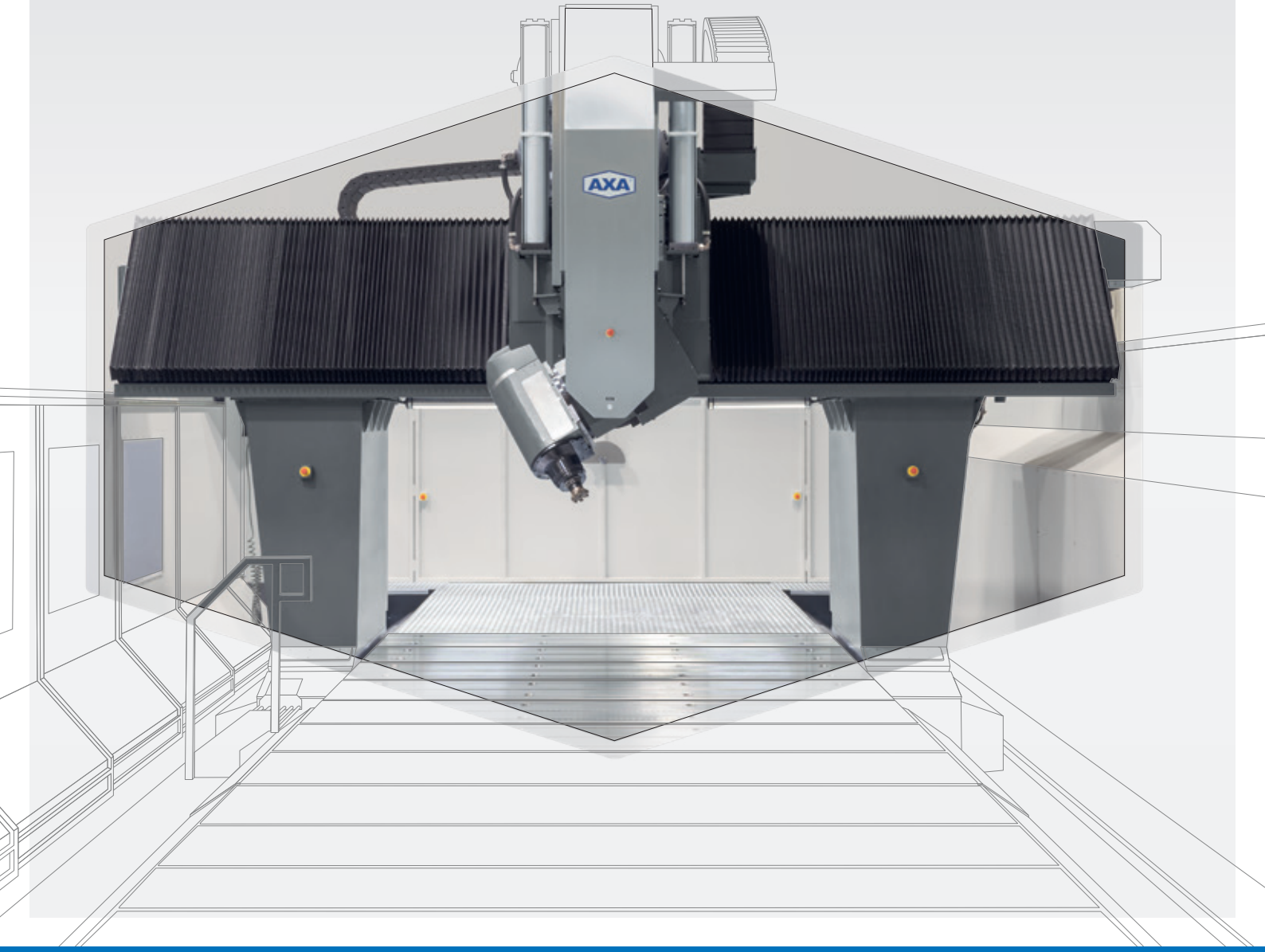
PFZ / UPFZ



Producing success.

With AXA uniqueness.

AXA©

Entwicklungs- und
Maschinenbau GmbH

Size counts: the precision and flexible layout of the large gantry machining centres from the PFZ and UPFZ series makes them particularly strong for solid workpieces

Uniqueness

made by AXA

The large gantry machining centres PFZ and UPFZ

The large gantry machining centres PFZ (as a vertical solution) and UPFZ (as a swivel head solution) are specially designed for machining large-volume workpieces weighing several tonnes.

With precision tools, even very large parts can be milled, drilled and even machined while turning. AXA portal centres deliver the highest cutting performance and offer long travel distances with a small installation footprint.
The stationary clamping table accommodates heavy workpiece weights and minimises the machine's space requirements.

In combination with the universal swivel head of the UPFZ, large workpieces can be machined all around on five sides. The portal machines are built in true gantry design, each with its own drive and measuring system for the left and right sides.

The stationary, centrally arranged tool magazine creates the prerequisite for large magazine chains and can be loaded during machining time.

The large gantry machining centre PFZ: optimal machining of substantial workpieces

PFZ -
The vertical solution for heavy-duty tasks

Main design:
- Extremely rigid, static and dynamically well-balanced ground frame construction
- Portal for large machines in inclined bed design for greater stability
- Massive and easily accessible machine tables
- Direct measuring systems for the X/Y/Z-axes
- Cover according to current machinery directives
- Ideal for crane loading by the open covering over the work area
- Optimal accessibility for all maintenance and service requirements

Guideways and drives:
- Hardened precision steel slideways mounted on manually scraped or grinded surfaces
- Sliding guideways with Turcite coatings in the slides
- High rigidity, outstanding long-term precision performance and excellent vibration absorbing capabilities
- Excellent resetting and adjustability
- Drives and guideways are protected
- Ball screws in all linear axes
- Rack and pinion drive for longer axes (backlash-free due to master/slave drive)

Tool changing system:
- Extremely robust, stationary fixed tool changer for magazine placement during machining
- Short tool change times due to centrally positioned tool transfer
- Double gripper for tool supply parallel to machining time
- Fixed location coded tool management for better operator monitoring
- Support of various tool holding systems such as SK, BT, HSK, CAPTO
- High number of tool places, magazine extensions possible

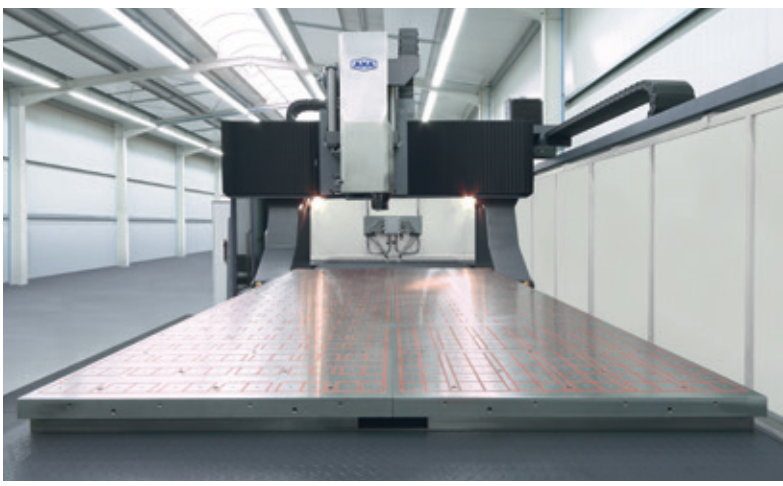
A solid covering is standard even in the basic version – Optionally, the work area can be completely encapsulated with a bellows solution

Optimal accessibility and possibility of crane loading due to generously wide opening doors and opening bellows

Flexible thanks to numerous options

- Through spindle coolant with filter system
- Chip conveyor in slat-band belt, scraper belt or magnetic belt versions
- Controllers either from Heidenhain or Siemens
- Rotary tables horizontally or vertically integrated, in 1 or 2 axes, combined with tailstocks, counter-bearings or a further rotary table in gantry mode for clamping bridges
- Automatic doors
- Clamping systems hydraulic, pneumatic, magnetic or manual
- Touch probes and tool touch probe systems
- Active power monitoring, collision monitoring and complete process monitoring
- Tool identification systems
- Laser breakage control with tool measurement
- Remote maintenance

We develop and manufacture individual solutions according to your requirements.



Alternative clamping technology: the large table surface offers many possibilities to arrange clamping devices, such as magnetic clamping plates as shown here

The large gantry machining centre UPFZ: a 2-axis tilting head for 5-side machining of large cubic workpieces

UPFZ –
With univeral swivel head for the toughest demands

Main design:
- Extremely rigid, static and dynamically well-balanced ground frame construction
- Portal in inclined bed design for greater stability
- Massive and easily accessible machine tables
- Direct measuring systems for the X/Y/Z-axes
- Cover according to current machinery directives
- Ideal for crane loading by the open covering over the work area
- Optimal accessibility for all maintenance and service requirements

Guideways and drives:
- Hardened precision steel slideways mounted on manually scraped or grinded surfaces
- Sliding guideways with Turcite coatings in the slides
- High rigidity, outstanding long-term precision performance and excellent vibration absorbing capabilities
- Excellent resetting and adjustability
- Drives and guideways are protected
- Ball screws in all linear axes
- Rack and pinion drive for longer axes (backlash-free due to master/slave drive)

Tool changing system:
- Version and equipment according to PFZ series

Swivel head:
- 2-axis tilting head for 5-side machining
- Tilting head stepless positioning, indexing 1°, 2,5°
- Tilting range A-axis 180°, tilting range B-axis 360°

The inclined bed portal reduces the distance between the Y-guideway and the swivel head, thus increasing the overall stability

Flexible thanks to numerous options

- Through spindle coolant with filter system
- Chip conveyor in slat-band belt, scraper belt or magnetic belt versions
- Controllers either from Heidenhain or Siemens
- Rotary tables horizontally or vertically integrated, in 1 or 2 axes, combined with tailstocks, counter-bearings or a further rotary table in gantry mode for clamping bridges
- Automatic doors
- Clamping systems hydraulic, pneumatic, magnetic or manual
- Touch probes and tool touch probe systems
- Active power monitoring, collision monitoring and complete process monitoring
- Tool identification systems
- Laser breakage control with tool measurement
- Remote maintenance

We develop and manufacture individual solutions according to your requirements.

Standard machine tables with integrated T-slots for workpiece clamping

UPFZ – Gantry machining centre

In horizontal spindle position (A-axis tilted by 90°), the long sides and end faces of the workpieces can be machined

Due to the extended Y-travel path, almost the entire table width is used – an advantage for machining very wide workpieces

Walk-in work area – perfect accessibility and visibility during set-up and equipping of the machine

Technical data PFZ

		PFZ 40	PFZ 50
Working area			
X-traverse range	[mm]	3000 - 10000	3000 - 10000
Y-traverse range	[mm]	1500 - 3000	1500 - 3000
Z-traverse range	[mm]	800 - 1500	800 - 1500
Distance table - spindle nozzle	[mm]	230	230
Machine table			
Table width	[mm]	1500 - 3000	1500 - 3000
Table length approx.	[mm]	X-Weg	X-Weg
T-slots, reference slot H7	[mm]	22 H9	22 H9
T-slots indexing	[mm]	660	660
Max. table load	[kg/m²]	1500	1500 (2000)[2]
Feed drive			
Max. rapid traverse in X/Y/Z	[m/min]	15/15/10 (20/20/15)[2]	15/15/10 (20/20/15)[2]
Max. feed force	[N]	9000	12000
Main spindle drive			
Standard drive no.[1]		110	161
Optional drive no.[1]		100, 111, 113	131, 133, 163, 182
Tool holding fixture			
DIN ISO 7388-1 AD / DIN ISO 7388-3 AD		SK 40	SK 50
Optional		BT 40, HSK A63, C6	BT 50, HSK A100, C8
Tool changer			
Number of tool pockets standard		22	22
Optional expandable up to		60 (90)	60 (90)
Max. tool diameter	[mm]	85	110
By free adjacent pockets	[mm]	135	180
Max. tool length	[mm]	400	400
Accuracy			
Positioning accuracy[3]	[mm]	± 0,02[4]	± 0,02[4]
Repeating accuracy	[mm]	± 0,0075	± 0,0075

[1] Main spindle drives

		100	110	111	113	
Speed range	[rpm]	6000	6000	6000	6000	
Optional up to	[rpm]	15000	12000	12000	12000	
Max. torque (40% DC)	[Nm]	95	143	191	255	
Max. power (40% DC)	[kW]	20	30	40	40	
		131	**133**	**161**	**163**	**182**
Speed range	[rpm]	4000	4000	4000	4000	4000
Optional up to	[rpm]	9000	9000	7500	7500	-
Max. torque (40% DC)	[Nm]	286	355	540	540	820
Max. power (40% DC)	[kW]	45	56	28	57	81

[2] Optional features
[3] Per 1000 mm per axis X/Y/Z
[4] Increased accuracy on request

Technical specifications refer to the standard version. Extensions and modifications upon request and depending on overall configuration and application.

Technical data UPFZ

		UPFZ 40	UPFZ 50
Working area			
X-traverse range	[mm]	3000 - 10000	3000 - 10000
With horizontal spindle minus	[mm]	2 x 410	2 x 460 (2 x 360)[2]
Y-traverse range	[mm]	1500 - 4000	1500 - 4000
With horizontal spindle minus	[mm]	2 x 410	2 x 460 (2 x 360)
Z-traverse range horizontal / vertical	[mm]	800 - 1500	800 - 1500
Min. distance table - spindle nozzle hor./vert.	[mm]	230/230	230/230 (230/330)[2]
Machine table			
Table width	[mm]	1500 - 3000	1500 - 3000
Table length approx.	[mm]	X-Weg	X-Weg
T-slots, reference slot H7	[mm]	22 H9	22 H9
T-slots indexing	[mm]	660	660
Max. table load	[kg/m²]	1500	1500 (2000)[2]
Feed drive			
Max. rapid traverse in X/Y/Z	[m/min]	15/15/10 (20/20/15)[2]	15/15/10 (20/20/15)[2]
Max. feed force	[N]	9000	12000
Main spindle drive			
Standard drive no.[1]		110	161
Optional drive no.[1]		100, 111, 113	131, 133, 163
Tool holding fixture			
DIN ISO 7388-1 AD / DIN ISO 7388-3 AD		SK 40	SK 50
Optional		BT 40, HSK A63, C6	BT 50, HSK A100, C8
Tilting spindle head			
Swivelling range A-axis		180°	180°
Swivelling range B-axis		360°	360°
Indexing		2,5° (1°, 0,001°)[2]	2,5° (1°, 0,001°)[2]
Tool changer			
Number of tool pockets standard		22	22
Optional expandable up to		60 (90)	60 (90)
Max. tool diameter	[mm]	85	110
By free adjacent pockets	[mm]	135	180
Max. tool length	[mm]	400	400
Accuracy			
Positioning accuracy[3]	[mm]	± 0,02[4]	± 0,02[4]
Repeating accuracy	[mm]	± 0,0075	± 0,0075

[1] Main spindle drives

		100	110	111	113
Speed range	[rpm]	6000	6000	6000	6000
Optional up to	[rpm]	15000	12000	12000	12000
Max. torque (40% DC)	[Nm]	95	143	191	255
Max. power (40% DC)	[kW]	20	30	40	40
		131	**133**	**161**	**163**
Speed range	[rpm]	4000	4000	4000	4000
Optional up to	[rpm]	9000	9000	7500	7500
Max. torque (40% DC)	[Nm]	286	355	540	540
Max. power (40% DC)	[kW]	45	56	28	57

[2] Optional features
[3] Per 1000 mm per axis X/Y/Z
[4] Increased accuracy on request

Technical specifications refer to the standard version. Extensions and modifications upon request and depending on overall configuration and application.

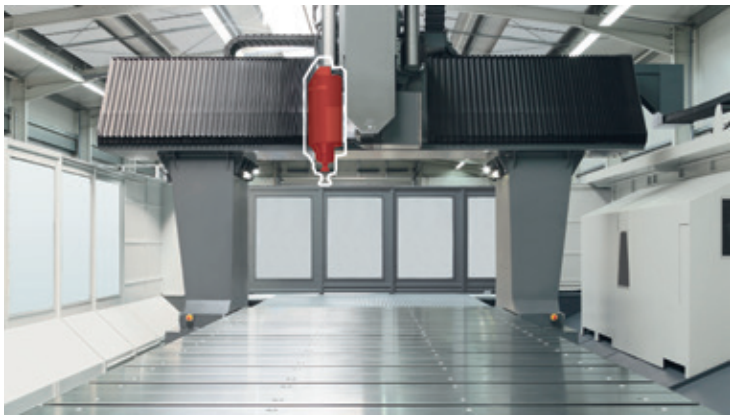
UPFZ – Gantry machining centre with 2-axis tilting head

The main feature of the UPFZ is the 2-axis tilting head. It enables the spindle to work vertically, horizontally or even diagonally in the working area. Thus, the spindle can machine the fixed workpiece from all five sides as it can move in any position around the workpiece, including an inclined-position. The swivel head positions in angular increments of 1°, 2.5° or optionally infinitely variable. During the individual machining process, the tilting head remains clamped.

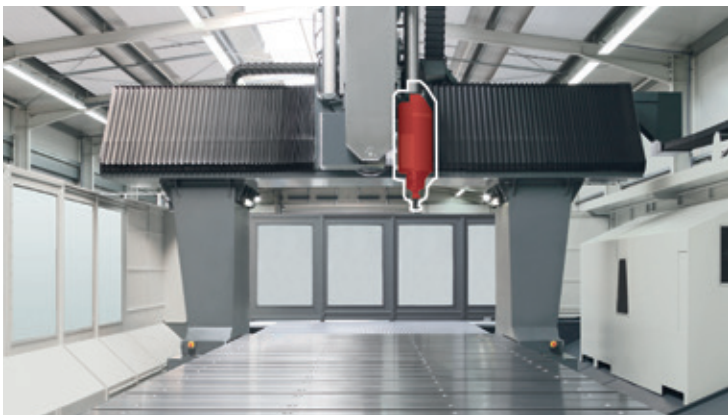

AXA

Machining from any angle

The entire swivel head of the UPFZ is accommodated in the Z-slide. In the home position, the spindle is in a vertical position on the operator side.
The A-axis swivels the head with B-axis and spindle up to 180° around the X-axis. The B-axis swivels the spindle by up to 360° around the Y-axis, relative to the home position.

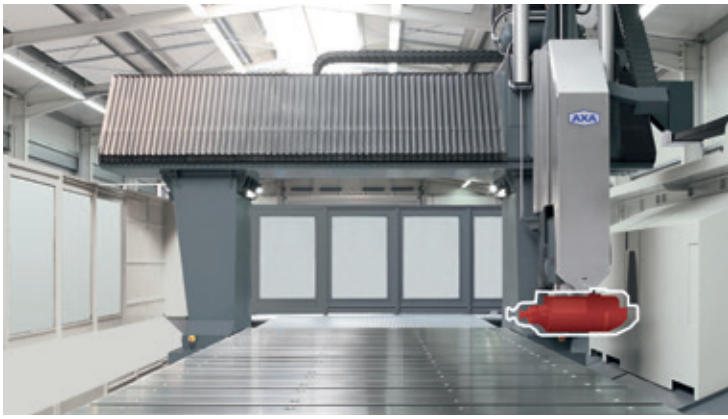


Standard setting: A-axis 0°, B-axis 0°

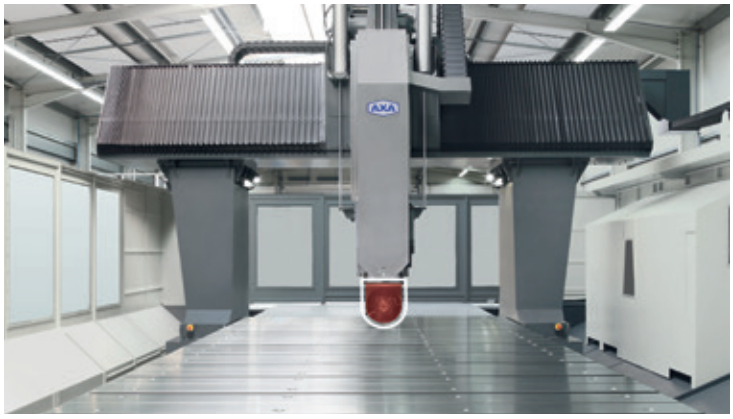


A-axis 180°, B-axis -180°

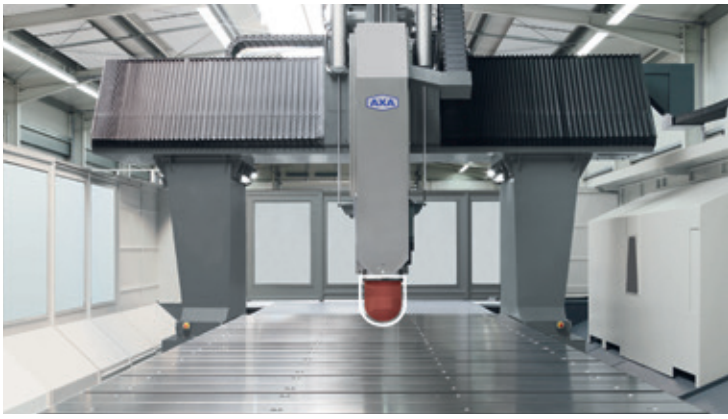
A-axis 90°, B-axis 0°



A-axis 90°, B-axis -180°



A-axis 90°, B-axis -90°

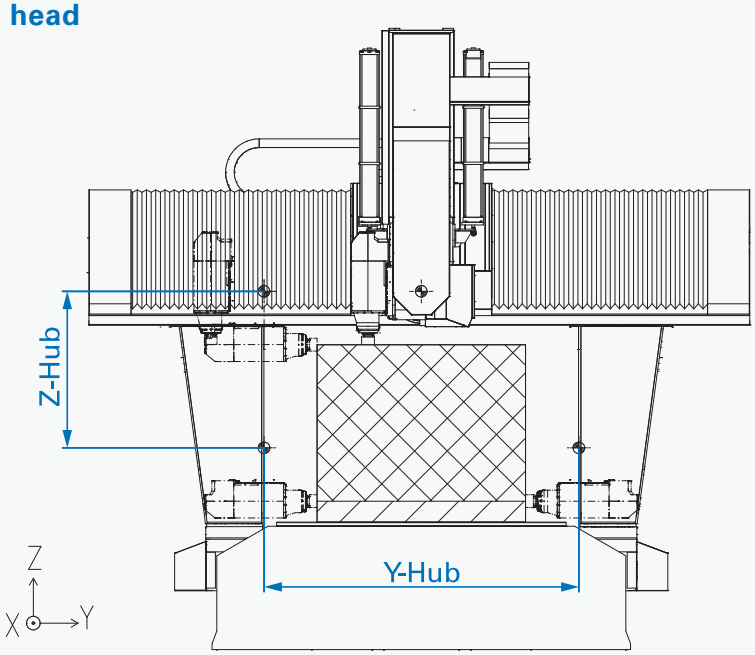


A-axis 90°, B-axis 90°

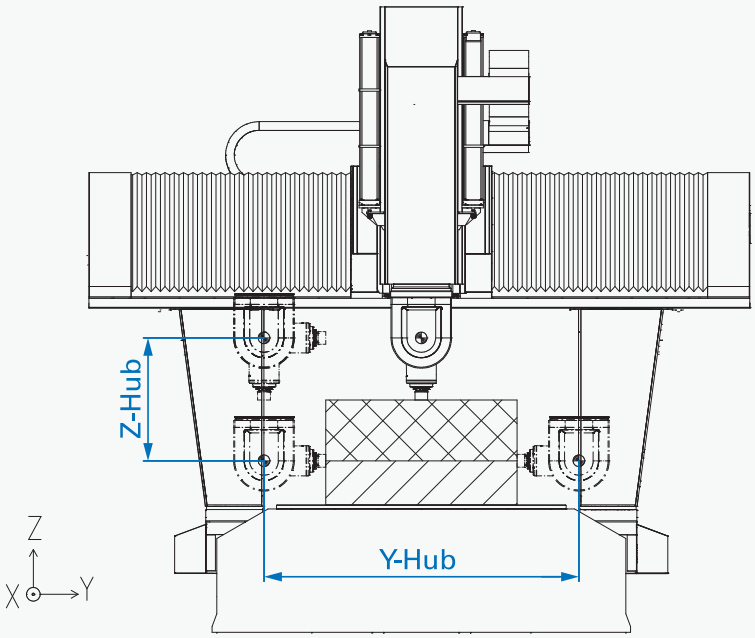
Benefits of the UPFZ swivel head

This special arrangement of the UPFZ swivel head offers a clear advantage compared to the use of a fork head. Thanks to the AXA 2-axis swivel head, almost no Z-travel is lost when swivelling between vertical and horizontal spindle positions.
This allows the portal to be designed comparatively low, which in turn increases stability.
The extendable Y-stroke on the portal beam, which can be extended by up to 1000 mm compared to the table width, compensates for the stroke losses that occur due to the swivel radii.

UPFZ 2-axis swivel head



Fork head



The tool changer

The tool magazine is integrated stationary in the machine so that a large number of tool places can be provided. Furthermore, loading of the magazine is also possible during machining.

The tool change between magazine and spindle is carried out using a transfer double gripper.
The tool preselection parallel to the machining time provides the following tool in the gripper and thus minimises the changeover times.
A user-friendly, fixed-position coded system is used for tool management.

Spindle moves into position for tool change

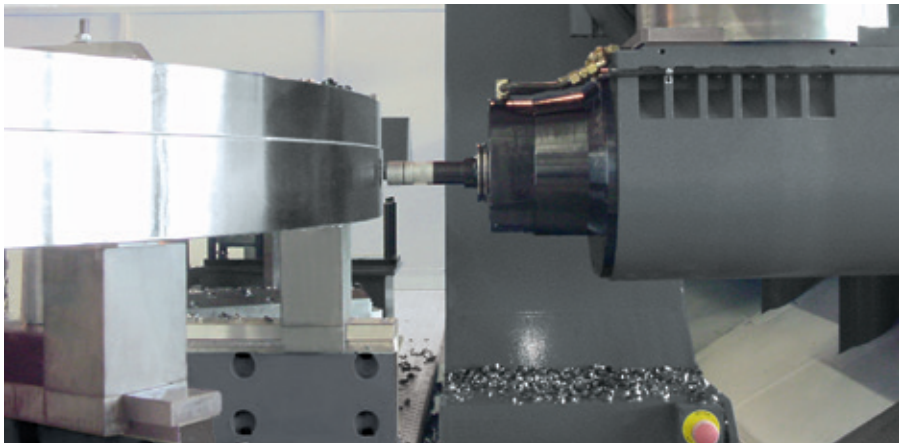
Transfer double gripper with the tool already preselected

Deposit of the used tool

Pick up of the new tool

Machining on NC-rotary table

Adding an NC-rotary table for large, rotation-symmetric workpieces to the gantry machining centre enables further machining processes in just one setting. This increases machine flexibility and productivity and reduces unpopular auxiliary process times and sources of error by changing and setting workpieces. The 2-axis tilting head multiplies the possibilities thanks to horizontal and inclined milling and drilling.



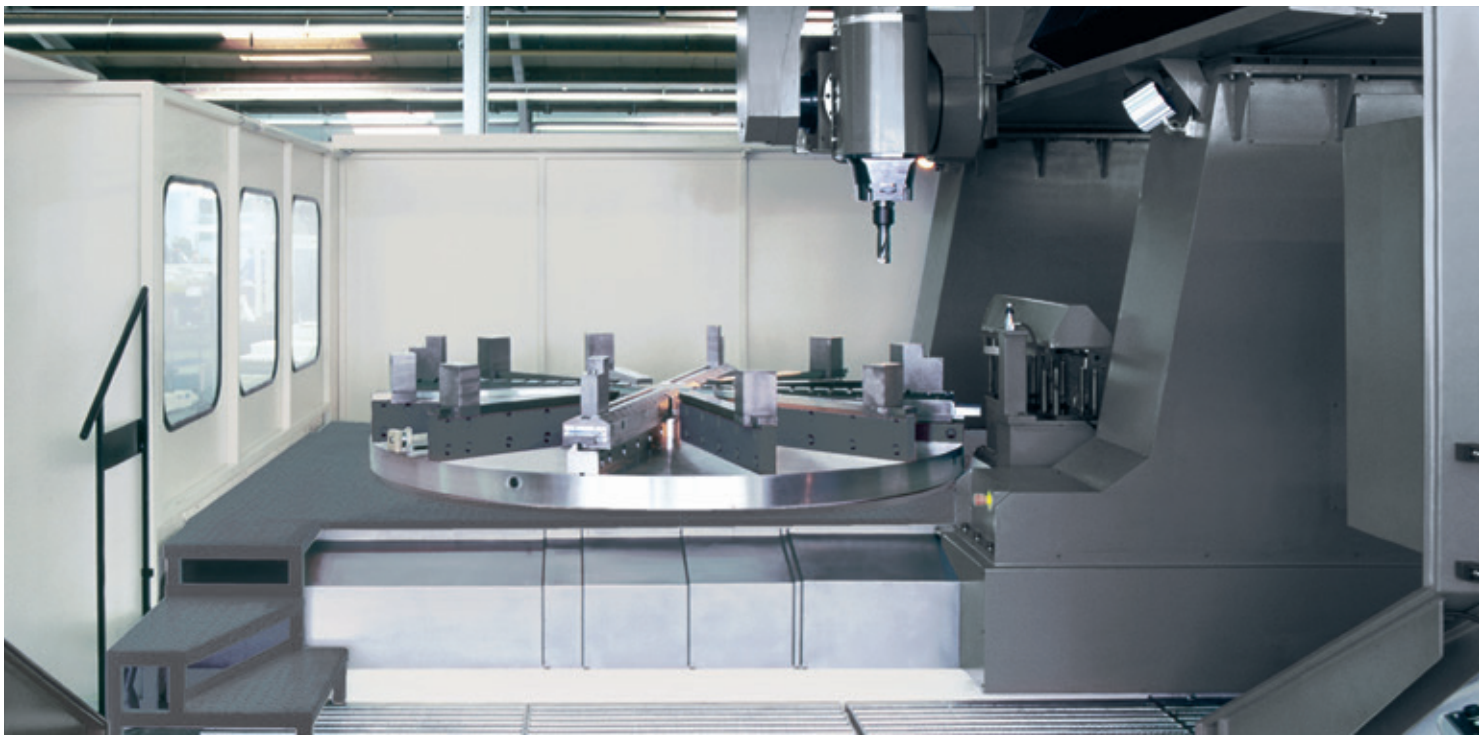
Horizontal ring machining with 2-axis tilting head and a rotary table

Immerging the working spindle into the part for inner machining of the rings is even possible for large workpieces.

Additional angle heads for inner machining can be implemented to machine smaller ring diameters. Complete machining has now become reality.

A firm and secure hold of the workpieces is thus an important factor for perfect results. Regardless, whether mechanical, hydraulic or magnetic: We find the correct clamping technology and hold your workpiece firmly in place.

We have the perfect clamping device!

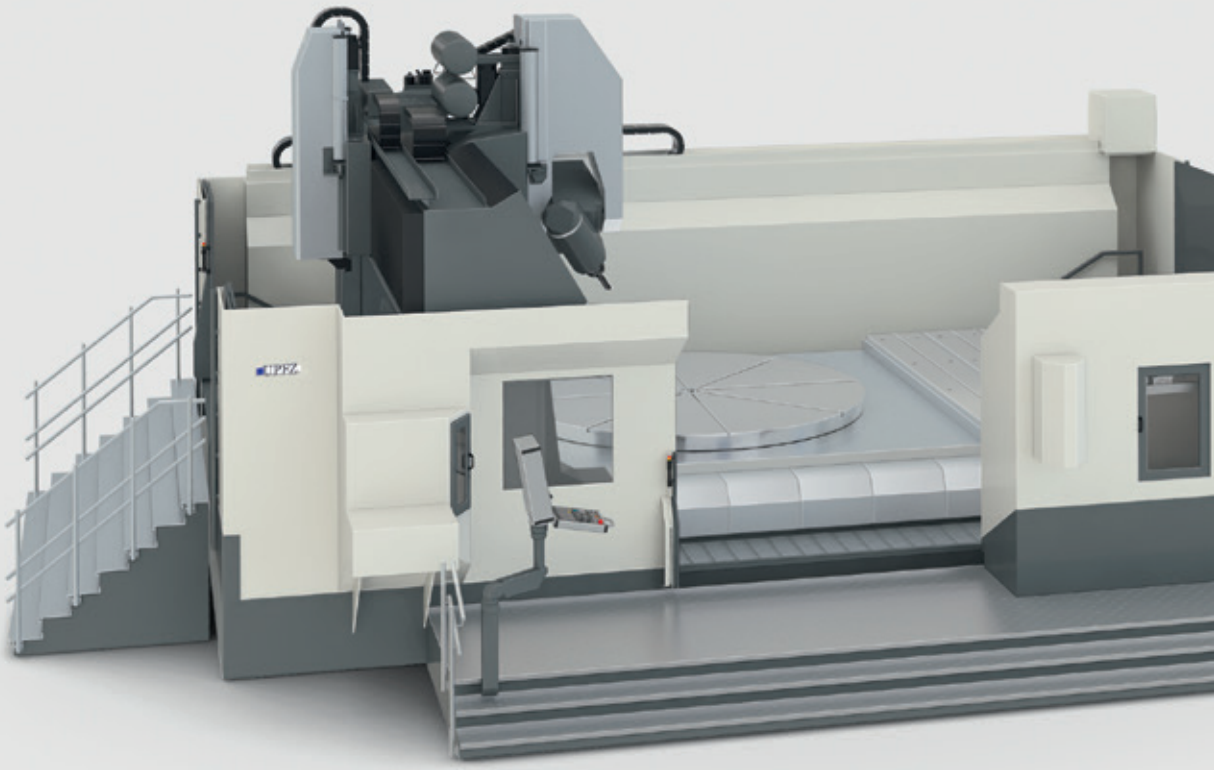


Ring machining with large gantry column machine combined with a rotary table

Additional auxiliary turning equipment

Combined milling and turning operation is possible with the gantry machining centre together with optional additional auxiliary turning equipment. A fast turning rotary table is integrated here that either supports or replaces the fixed machine tables. A further guideway system for a second vertical Z-slide, implemented with a turning tool holder in CAPTO C6, is mounted on the gantry backside to hold the turning tools. The separate clamping unit for turning tools ensures utmost stability, clear orientation of the turning tools and at the same time avoids further stress on the main spindle bearing. Alongside the standard tool magazine for drilling and milling tools, a further independent tool magazine for turning tools can be integrated into the working area.

Adapting the complete machine covering into the corresponding security requirements goes without saying in this specially designed construction.



The combined milling and turning operation of workpieces is possible in one setting when using additional auxiliary turning equipment

Milling operation: standard 2-axis swivel head for milling and drilling operations

Turning operation: an additional cross support with Y-/Z-axis and CAPTO C6 tool holder

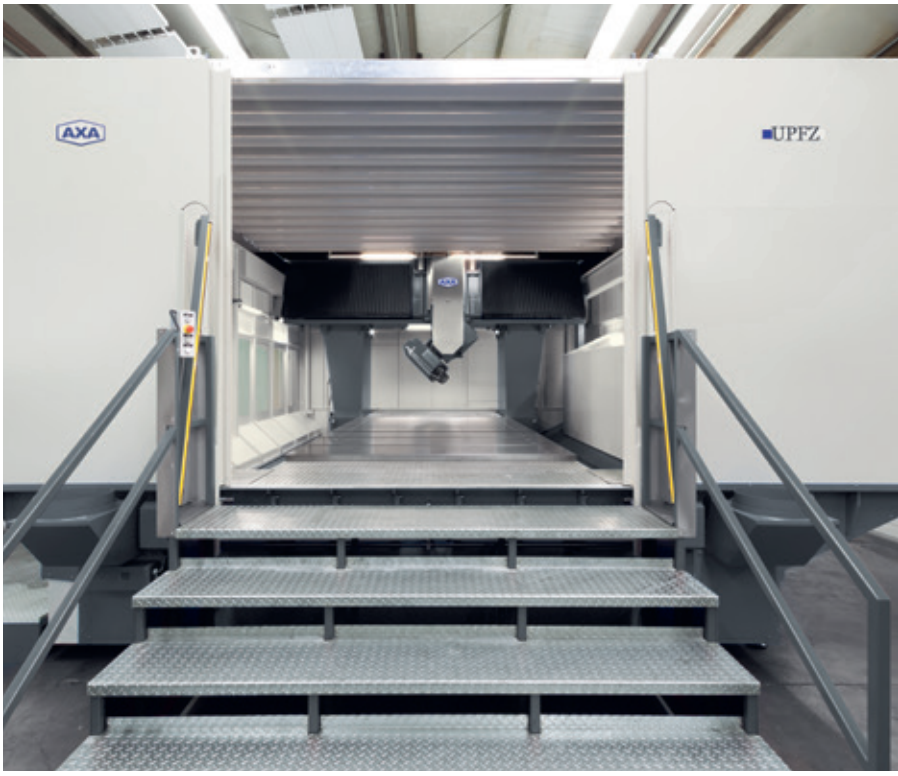
Machine full covering with bellow solution

Individual tool machine requirements demand very individual solutions for covering and suction demands. Various possibilities are thus available to effectively protect employees and machine alike. These come in different versions when choosing the required covering and suction.

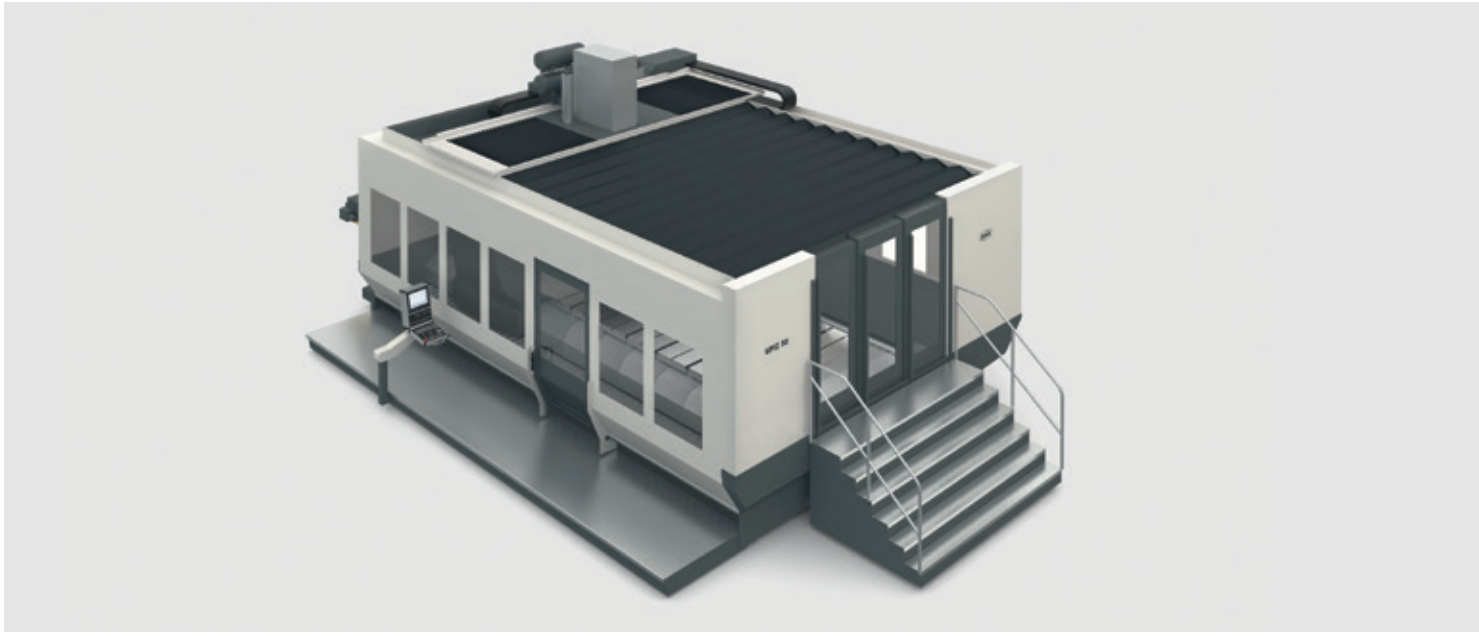
Additional to the standard machine covering, it is also possible to expand this with a bellow roof. The bellow is locked to the gantry and opened and closed via the gantry travel.
An additional drive is therefore not required and the advantage of the low machine height remains.

Advantages of a bellows over a complete enclosure:
- Low height, as the roof closes below the Z-axis
- Considerably reduced working area
- More economical extraction system due to minimal extraction volume

Open roof for loading



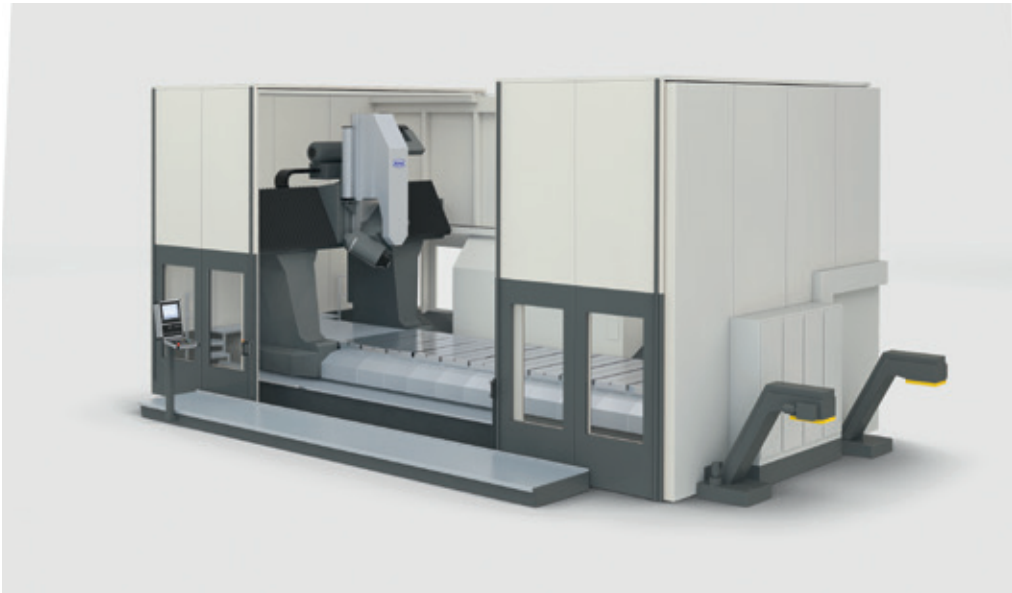
Closed roof during machining



Completely enclosed working area by expanding the entire encasement by a roof with bellow solution

Machine full covering with cabin solution

In some cases, a full enclosure of the machining centre is necessary. This is custom-made for the corresponding machine. In this case, the machine tool is completely enclosed with a separate cabin.



The implementation of automatically driven angle gates furthermore enables crane loading by opened cabin

Large gantry machining centre without machine table

In the design without a machine table, bulky and heavy workpieces can be rolled into the working area at ground level.
By eliminating the machine table, a greater working area height is available so that even tall parts can be machined in the upper area.
Necessary water channels, clamping possibilities as well

Gantry machining centre UPFZ in special design without machine table and complete covering with front-facing doors

as the cladding are integrated directly into the foundation of the machine and built on top of it.

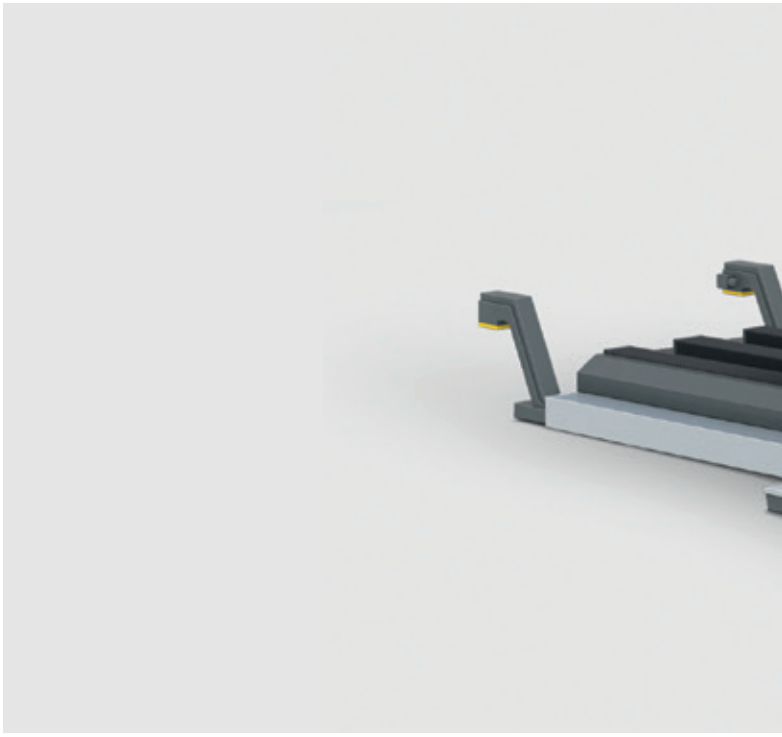
Generous side doors offer good accessibility when setting up the workpieces

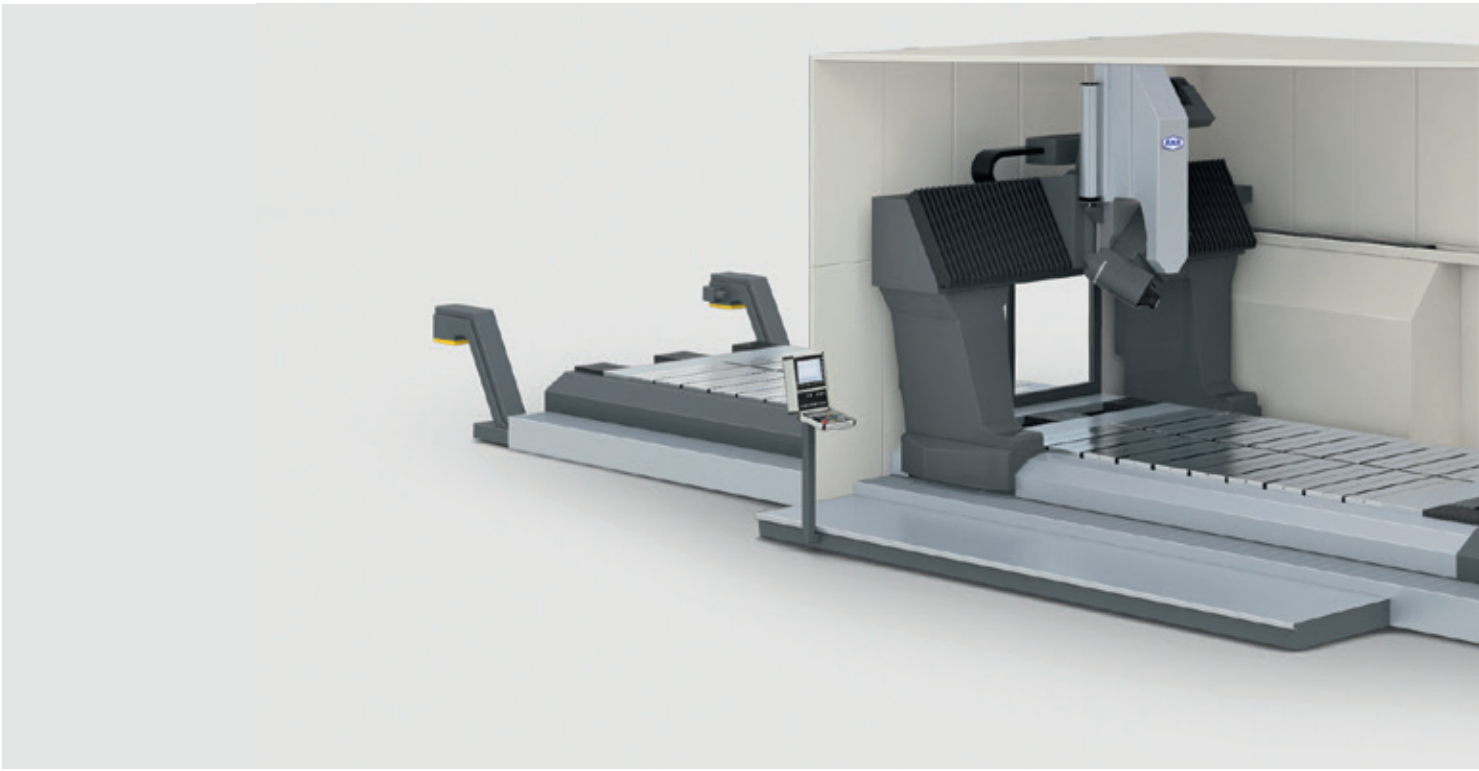
Heavy, solid workpieces are rolled into the machine at ground level – Tie bars with grooves embedded in the floor offer sufficient clamping possibilities

Large gantry machining centre as pallet machine

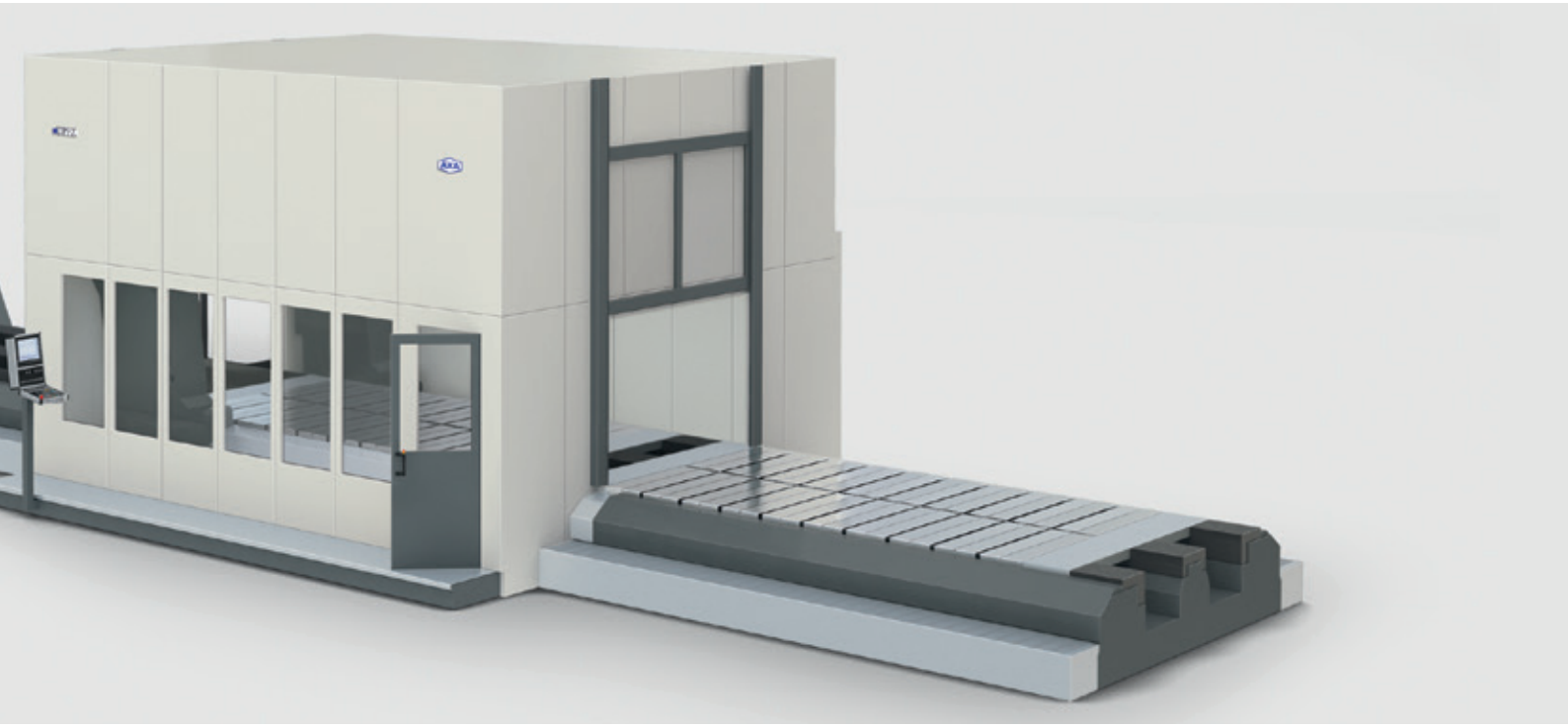
As a pendulum solution, we offer our large gantry machining centres in pallet design. The basic structure of the machine remains the same. The machining station is located in the centre and is loaded alternately via the two machine tables. For set-up, the tables move to the respective loading and unloading stations outside the machining station.

Continuous operation is ensured by setting up the machine in parallel to machining time.

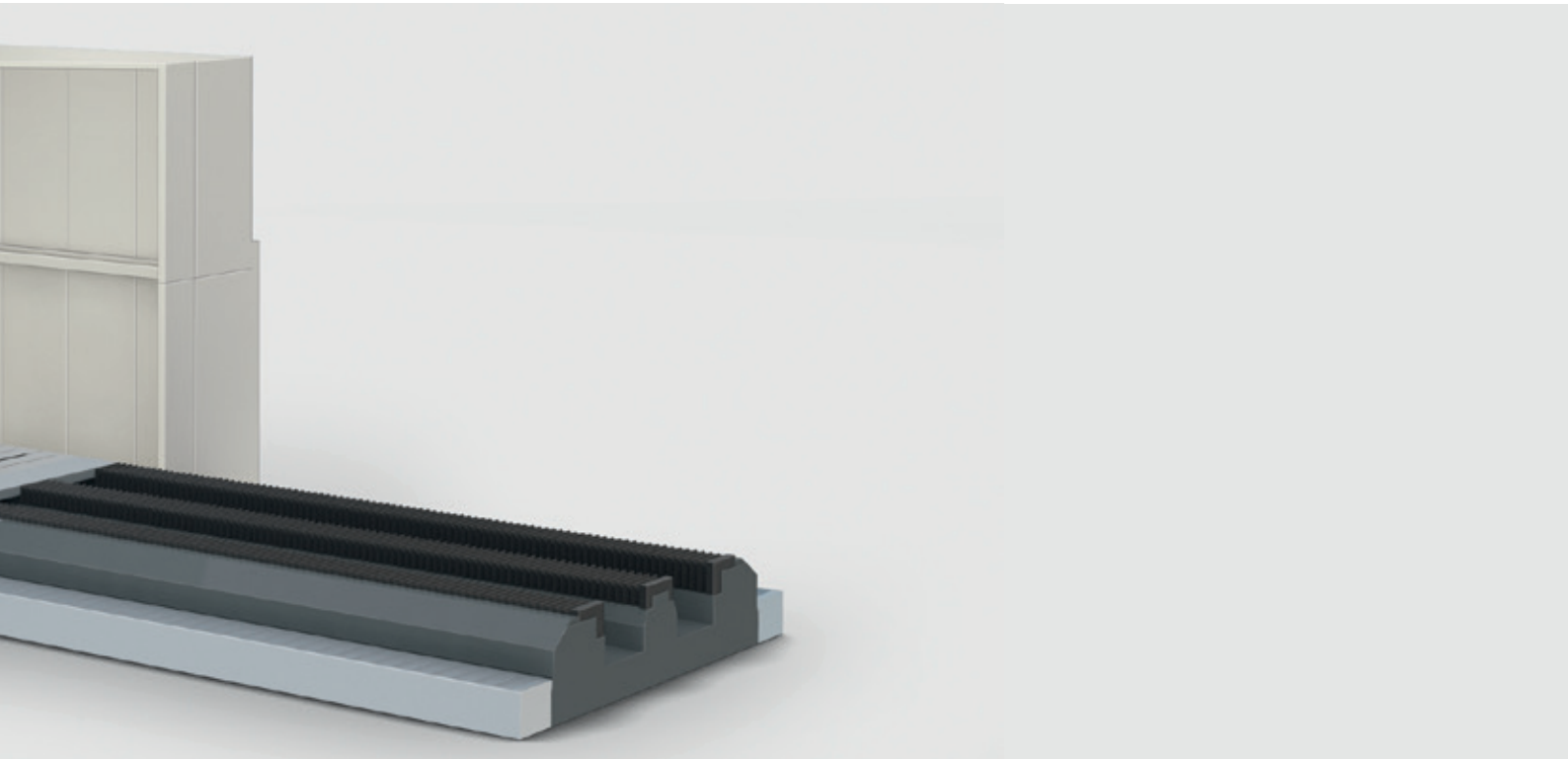




Cabin sectional view of the UPFZ machining station with pallet table



UPFZ as pallet machine with machining station in the middle and a loading and unloading station in front and behind the machining centre



Product overview

TMP

Gantry machining centre for 5-side-machining in mould making for large-scale workpieces

X-travel:	2300 - 2940 mm (vertical) 2000 - 2640 mm (horizontal)
Y-travel:	1400 - 2200 mm
Z-travel:	900 mm
Spindle power:	27 - 56 kW

VSC

VHC

Travelling column machining centres with vertical spindle or swivel head for 5-side-, long bed and pendulum machining

X-travel:	1200 - 10000 mm
Y-travel:	550 - 1100 mm
Z-travel:	600 - 1250 mm
Spindle power:	20 - 81 kW

DBZ

VCC

Vertical travelling column machining centres in compact design in short bed version, with pendulum machining or with swivel rotary table

X-travel:	750 - 1760 mm - 2 x 750 / 2 x 900 mm
Y-travel:	550 - 750 mm
Z-travel:	600 - 850 mm
Spindle power:	20 - 56 kW

VPC 2800 U

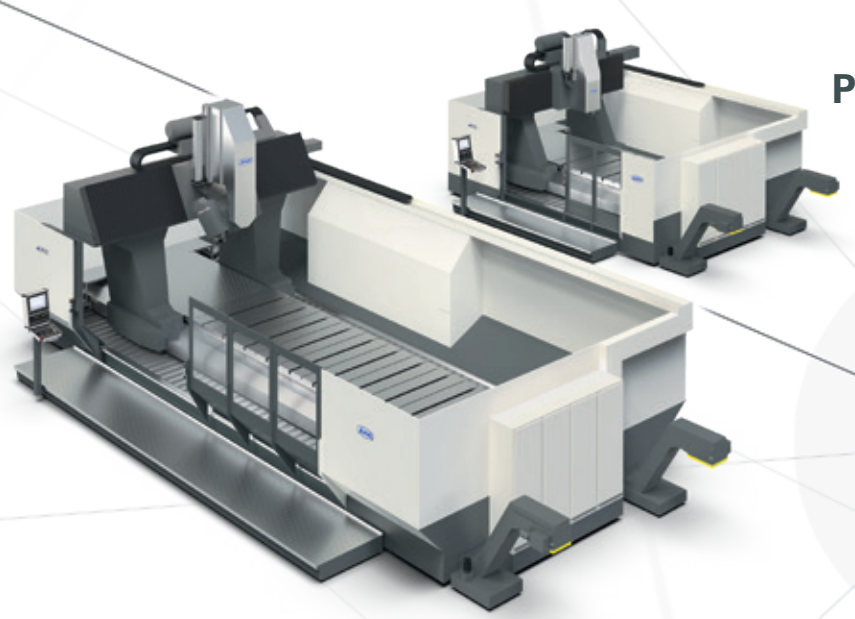
VPC

VPC U

Gantry machining centres in compact design with vertical spindle or swivel head for 5-side-machining

X-travel:	2200 - 5000 mm
Y-travel:	1200 - 2940 mm
Z-travel:	500 - 1300 mm
Spindle power:	20 - 70 kW

PFZ



UPFZ

Large gantry machining centres with vertical spindle or swivel head for 5-side-machining

X-travel:	3000 - 10000 mm
Y-travel:	1500 - 4000 mm
Z-travel:	800 - 1500 mm
Spindle power:	20 - 81 kW

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