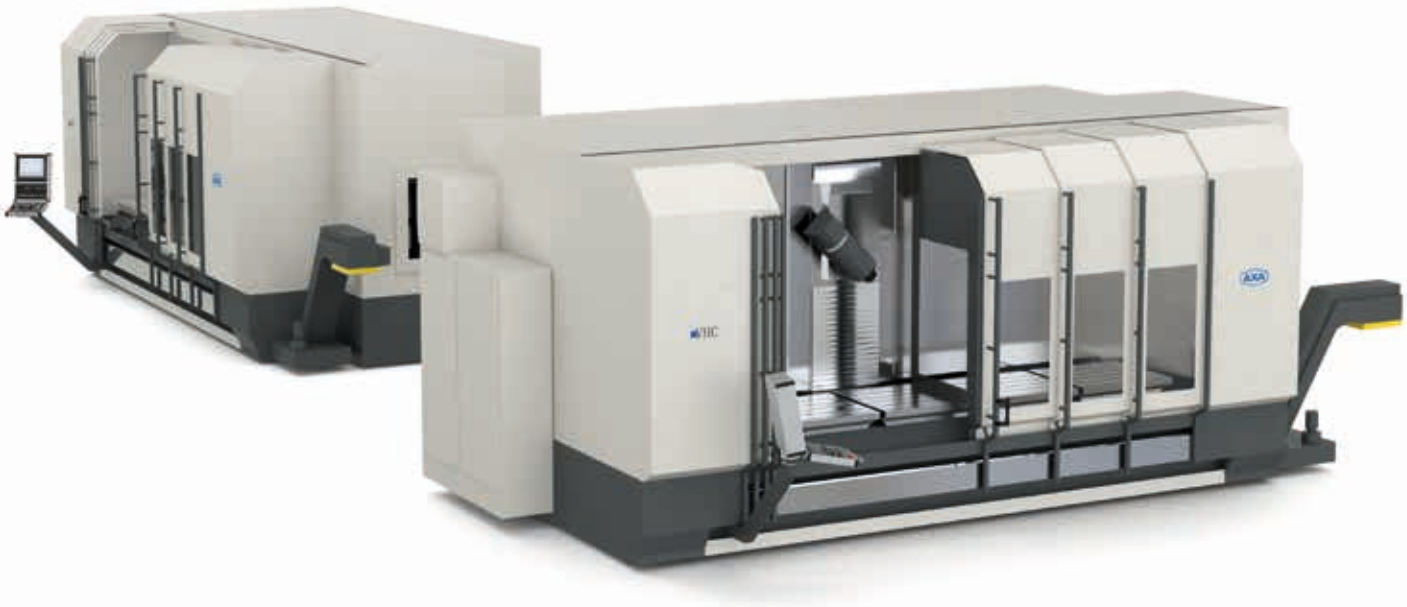
VSC / VHC



Pure Technology!

Entwicklungs- und
Maschinenbau GmbH

Right at the heart of your production process: the machining centres of the VSC and VHC series stand out through precision quality and flexible design

Pure Technology!

The VSC and VHC travelling column machines – The new centrepiece of your manufacturing facility

On hand at all times. Showing no weakness despite being non-stop in action. Always mastering new challenges – machine tools are at the centre of the production process in the metal processing industry. They must correspond to the highest requirements concerning availability and precision.
AXA tradition lies in the development, construction and assembly of machine tools. Your customer wishes falls on open ears and minds to bring about creative ideas which are then individually implemented as best as possible.

The travelling column machines VSC and VHC combine these advantages: clear in their structure, yet flexible in their assembly. The working area is constructed to be extremely rigid. The fixed machine tables and stationary positioned tool magazine pool ensure that only the travelling column is in motion. Strong drive motors cater for the very dynamic performance of our machine tools.
The combination of fixed machine tables with linear motion axes on the tool side opens up a whole world of possibilities: small and compact machine variants for the manufacturing of small parts are just as possible as sophisticated machines for large and complex work pieces. The machines are also capable of operating in pendulum processing machining mode, which minimises set-up times so as to be quickly ready for operation.

Place your trust in the specialist with plenty of tradition: AXA.

Ready for use in many industries and many applications:

- Plant and equipment manufactories
- Precision tool making including fixtures, mould and press tools
- Automotive industry
- Aerospace industry
- Subcontract machining
- Jobbing shop for large and small manufacturing series
- Rail track and rolling stock equipment
- Medical industry
- Automation technology
- Packaging machines
- Hydraulic components
- Valve manufacture
- Profile machining
- Plastics and aluminium machining
- Machining of glass, ceramics, wood or graphite

Conception and construction from a single source: overview of the VSC main assembly

VSC – Power and intuition for every workpiece

Thanks to constant further developments, the VSC has become the precision tool for any production site. State-of-the-art technology and experience from countless projects has created this top performer.

Main design:
- Cross slides, travelling columns and spindle head stock are made from high-quality cast iron
- Extremely rigid, static and dynamically well balanced ground frame construction
- Direct measuring systems for X/Y/Z axes
- Casing according to current machinery directives, totally closed working area with no interfering contours – also in pendulum operation mode
- Total access to working area when doors are fully open
- Excellent accessibility for maintenance and service tasks
- Machine transport in one piece

Guideways and drives:
- Hardened precision steel slideways mounted on manually scraped or grinded surfaces
- Optimal guiding by extremely large guidance ratio and Turcite coatings
- High rigidity, outstanding long-term precision performance and excellent vibration absorbing capabilities of the guideways
- Excellent resetting and adjustability of the guideways
- Drives and guideways are protected set outside of working area
- Ball screws in all linear axes with patented support units for ball screws in the X-axis for large travel lengths

Tool changing system:
- Fixed location coded tool management enables better monitoring for the operator
- Tool pre-selection by double gripper arm during machining
- Support of various tool holding systems such as SK, BT, HSK, CAPTO
- Tool magazine is protected outside of working area
- Placement of the XTS magazine during machining possible
- Tool change takes place behind working area cladding: no disturbing contours in the working area during tool change by the gripper or parts
- Transport unit from XTS magazine has its own drive and moves at up to 120 m/min to the spindle position for the tool change
- Any number of tool pockets are provided by several compact XTS towers
- Tool pockets within a tower can also be expanded at any point in time in the future

Maximum efficiency: the workspace is partitioned into two sections and thus reduces set-up times to a minimum

Rotary table in the left and right workspace or rotary tables in gantry mode for clamping bridges in long bed machining mode

Rotary table combined with a tailstock as well an additional pick-up station for special tools, angular heads or multiple spindle heads

Ingenuity and great ideas

Its strength is its flexible structure. The VSC gives you the possibility to implement your ideas and requirements. The AXA experts develop and design solutions – also by integrating other technologies.

- 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, counterbearings 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 can develop and manufacture special solutions for you upon request – our range covers standard solutions as well as custom-made ones.

Flexibility in every detail:
Your ideas become our mission!

Technical data VSC

Technical data		VSC 1 - M	VSC 2 - XTS	VSC 2 - XTS50		VSC 3 - XTS	VSC 3 - XTS50	VSC 50 - XTS
Working area								
X-traverse range	[mm]	1760 - 9000	1760 - 9000	1760 - 9000	[mm]	1760 - 9000	1760 - 9000	2000 - 9000
Optional pendulum travel	[mm]	(X-axis - 500) / 2	(X-axis - 500) / 2	(X-axis - 500) / 2	[mm]	(X-axis - 500) / 2	(X-axis - 500) / 2	(X-axis - 600) / 2
Y-traverse range	[mm]	500	600	600	[mm]	700 (900, 1000) [2]	700 (900) [2]	1000
Z-traverse range	[mm]	600	800	800	[mm]	850 (950) [2]	850	1000
Distance table - spindle nozzle	[mm]	180 - 780	180 - 980	180 - 980	[mm]	180 - 1030 (1130) [2]	180 - 1030	180 - 1180
Machine table								
Clamping surface, grinded, approx.	[mm]	(X-axis + 400) x Y-axis	(X-axis + 400) x Y-axis	(X-axis + 400) x Y-axis	[mm]	(X-axis + 400) x Y-axis	(X-axis + 400) x Y-axis	(X-axis + 400) x Y-axis
T-slots, reference slot H7	[mm]	14 H9	14 H9	18 H9	[mm]	14 H9	18 H9	18 H9
T-slots indexing	[mm]	160	160	160	[mm]	160	160	160
Number of T-slots		3	4	4		5 (6) [2]	5 (6) [2]	6
Max. table load	[kg/m²]	800	1000	1000	[kg/m²]	1200	1200	1500
Feed drive								
Max. rapid traverse	[m/min]	30/30/25 (40/40/30) [2]	40/40/30	40/40/30	[m/min]	40/40/30	40/40/30	30/30/25
Max. feed force	[N]	9000	9000	9000	[N]	9000	9000	15000
Main spindle drive								
Standard drive no. [1]		110	110	131		110	131	161
Optional drive no. [1]		100	100, 111, 113	133		100, 111, 113	133	163, 182
Tool holding fixture								
DIN 69871 A / DIN 69872 A		SK 40	SK 40	SK 50		SK 40	SK 50	SK 50
Optional		BT 40, HSK A63, C6	BT 40, HSK A63, C6	BT 50, HSK A100, C8		BT 40, HSK A63, C6	BT 50, HSK A100, C8	BT 50, HSK A100, C8
Tool changer								
Number of tool pockets standard		22	22	26		22	26	30
Optional expandable up to		72	216 [3]	156 [3]		288 [3]	180 [3]	180 [3]
Max. tool diameter	[mm]	85	85	110	[mm]	85	110	110
By free adjacent pockets	[mm]	135	135	180	[mm]	135	180	180
Max. tool length	[mm]	400	400	400	[mm]	400	400	400
Tool change time approx.	[s]	4	5	7	[s]	5	7	8
Accuracy								
Positioning accuracy[4]	[mm]	± 0,015 (± 0,0075) [2]	± 0,015 (± 0,0075) [2]	± 0,015 (± 0,0075) [2]	[mm]	± 0,015 (± 0,0075) [2]	± 0,015 (± 0,0075) [2]	± 0,015
Repeating accuracy	[mm]	± 0,005	± 0,005	± 0,005	[mm]	± 0,005	± 0,005	± 0,005
Weight								
Standard version approx.	[kg]	9500	14000	15000	[kg]	14700	15500	32000
Per meter X-stroke plus approx.	[kg]	2250	2500	2750	[kg]	2750	3000	3500

[1] Main spindle drives		100	110	111	113		131	133	161	163	182
Speed range	[rpm]	6000	6000	6000	6000	[rpm]	4000	4000	4000	4000	4000
Optional up to	[rpm]	15000	12000	12000	10000	[rpm]	9000	9000	7500	7500	-
Max. torque (40% DC)	[Nm]	95	143	191	255	[Nm]	286	355	540	540	820
Max. power (40% DC)	[kW]	20	30	40	40	[kW]	45	56	28	57	81

[2] Optional features
[3] e.g. 3 fully equipped towers
[4] Per 1000 mm per axis X/Y/Z

VHC travelling column machine with tilting spindle head:
machining a workpiece from all sides in only one setting

VHC – Precise results from every viewpoint

The tilting spindle head is the major feature of the VHC machine tool series. Machining workpieces from practically every position, horizontally and vertically, allows you to truly maximise your potential.

Main design:
- Cross slides, travelling columns and spindle head stock are made from high-quality cast iron
- Extremely rigid, static and dynamically well balanced ground frame construction
- Direct measuring systems for X/Y/Z axes
- Casing according to current machinery directives, totally closed working area with no interfering contours – also in pendulum operation mode
- Total access to working area when doors are fully open
- Excellent accessibility for maintenance and service tasks
- Machine transport in one piece

Guideways and drives:
- Hardened precision steel slideways mounted on manually scraped or grinded surfaces
- Optimal guiding by extremely large guidance ratio and Turcite coatings
- High rigidity, outstanding long-term precision performance and excellent vibration absorbing capabilities of the guideways
- Excellent resetting and adjustability of the guideways
- Drives and guideways are protected set outside of working area
- Ball screws in all linear axes with patented support units for ball screws in the X-axis for large travel lengths

Tool changing system:
- Fixed location coded tool management enables better monitoring for the operator
- Tool pre-selection by double gripper arm during machining
- Support of various tool holding systems such as SK, BT, HSK, CAPTO
- Tool magazine is protected outside of working area
- Placement of the XTS magazine during machining possible
- Tool change takes place behind working area cladding: no disturbing contours in the working area during tool change by the gripper or parts
- Transport unit from XTS magazine has its own drive and moves at up to 120 m/min to the spindle position for the tool change
- Any number of tool pockets are provided by several compact XTS towers
- Tool pockets within a tower can also be expanded at any point in time in the future

Tilting spindle head:
- Vertical and horizontal machining
- In combination with a rotary table, 5 face machining or 5 axes simultaneous machining can be achieved.
- Tilting spindle head indexing 2,5° and 1° increments by hirth coupling, 0,001° indexing increments or fully interpolating.
- Tilting range up to ± 100°

Rotary tables in gantry mode for clamping bridges as well as further, removable pick-up station left for pendulum operation or right for long bed operation

The tilting spindle head in operation:
enables the machine to work in a range of ± 100°

Separating the working area in two smaller ones – symmetrically, asymmetrically or with an adjustable partition wall

Ingenuity and great ideas

Its strength is its flexible structure. The VHC gives you the possibility to implement your ideas and requirements. The AXA experts develop and design solutions – also by integrating other technologies.

- 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, counterbearings 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 can develop and manufacture special solutions for you upon request – our range covers standard solutions as well as custom-made ones.

One machine, many solutions:
Your ideas become our mission!

Technical data VHC

Technical data		VHC 2 - XTS	VHC 2 - XTS50	VHC 3 - XTS		VHC 3 - XTS50	VHC 50 - XTS
Working area							
X-traverse range vertical	[mm]	1760 - 9000	1760 - 9000	1760 - 9000	[mm]	1760 - 9000	2000 - 9000
Optional pendulum travel vertical	[mm]	(X-axis - 400) / 2	(X-axis - 500) / 2	(X-axis - 500) / 2	[mm]	(X-axis - 500) / 2	(X-axis - 600) / 2
Y-traverse range horizontal / vertical	[mm]	600	600	700 (900,1000) [2]	[mm]	700 (900) [2]	1000
Z-traverse range horizontal / vertical	[mm]	800 / 770	800 / 740	850 (950) [2]	[mm]	850 / 790	1000 / 970
Distance table - spindle nozzle vert.	[mm]	0 - 770	0 - 740	40 - 890 (990) [2]	[mm]	0 - 790	0 - 970
Distance table - spindle nozzle hor.	[mm]	180 - 980	250 - 1050	250 - 1100 (1200) [2]	[mm]	250 - 1100	280 - 1280
Machine table							
Clamping surface, grinded, approx.	[mm]	(X-axis + 400) x Y-axis	(X-axis + 400) x Y-axis	(X-axis + 400) x Y-axis	[mm]	(X-axis + 400) x Y-axis	(X-axis + 400) x Y-axis
T-slots, reference slot H7	[mm]	14 H9	18 H9	14 H9	[mm]	18 H9	18 H9
T-slots indexing	[mm]	160	160	160	[mm]	160	160
Number of T-slots		4	4	5 (6) [2]		5 (6) [2]	6
Max. table load	[kg/m²]	1000	1000	1200	[kg/m²]	1200	1500
Feed drive							
Max. rapid traverse	[m/min]	40/40/30	40/40/30	40/40/30	[m/min]	40/40/30	30/30/25
Max. feed force	[N]	9000	9000	9000	[N]	9000	15000
Main spindle drive							
Standard drive no. [1]		110	131	110		131	161
Optional drive no. [1]		100, 111, 113	133	100, 111, 113		133	163, 182
Tool holding fixture							
DIN 69871 A / DIN 69872 A		SK 40	SK 50	SK 40		SK 50	SK 50
Optional		BT 40, HSK A63, C6	BT 50, HSK A100, C8	BT 40, HSK A63, C6		BT 50, HSK A100, C8	BT 50, HSK A100, C8
Tilting spindle head							
Swivelling range B-axis		± 90° (± 100°) [2]	± 90° (± 100°) [2]	± 90° (± 100°) [2]		± 90° (± 100°) [2]	± 90° (± 100°) [2]
Indexing		2,5° (1°, 0,001°, fully interpolating) [2]	2,5° (1°, 0,001°, fully interpolating) [2]	2,5° (1°, 0,001°, fully interpolating) [2]		2,5° (1°, 0,001°, fully interpolating) [2]	2,5° (1°, 0,001°, fully interpolating) [2]
Tool changer							
Number of tool pockets standard		22	26	22		26	30
Optional expandable up to		216 [3]	156 [3]	288 [3]		180 [3]	180 [3]
Max. tool diameter	[mm]	85	110	85	[mm]	110	110
By free adjacent pockets	[mm]	135	180	135	[mm]	180	180
Max. tool length	[mm]	400	400	400	[mm]	400	400
Tool change time approx.	[s]	5	7	6	[s]	7	8
Accuracy							
Positioning accuracy [4]	[mm]	± 0,015 (± 0,0075) [2]	± 0,015 (± 0,0075) [2]	± 0,015 (± 0,0075) [2]	[mm]	± 0,015 (± 0,0075) [2]	± 0,015
Repeating accuracy	[mm]	± 0,005	± 0,005	± 0,005	[mm]	± 0,005	± 0,005
Weight							
Standard version approx.	[kg]	14000	15000	17000	[kg]	18000	32000
Per meter X-stroke plus approx.	[kg]	2250	2500	2250	[kg]	3000	5000

[1] Main spindle drives		100	110	111	113		131	133	161	163	182
Speed range	[rpm]	6000	6000	6000	6000	[rpm]	4000	4000	4000	4000	4000
Optional up to	[rpm]	15000	12000	12000	10000	[rpm]	9000	9000	7500	7500	-
Max. torque (40% DC)	[Nm]	95	143	191	255	[Nm]	286	355	540	540	820
Max. power (40% DC)	[kW]	20	30	40	40	[kW]	45	56	28	57	81

[2] Optional features
[3] e.g. 3 fully equipped towers
[4] Per 1000 mm per axis X/Y/Z with vertical spindle

Top notch in all movements during milling, drilling and turning

Increasingly complex turning and milling jobs are demanded upon the metal processing industry.
The machines of the VSC and VHC series have been so designed to fulfil these requirements. To ensure this success, the machines are equipped with rotary tables that are directly driven by quick-turning, high performance torque motors as well as vertical or horizontal turning spindles to create very high speeds.

A further firmly fixed, hydraulic turning tool holder with automatic pull-in next to the working spindle serves to assimilate the corresponding required turning tools.
The separate clamping unit for turning tools thus ensures for utmost stability, a clear orientation of the turning tools and avoids further stress on the main spindle bearing during turning operation.

Tool changing between two tool holding systems thanks to the adjustable XTS changer and gripping arm is one of the outstanding benefits of the machine. For example, one magazine chain can be set with CAPTO C6 uptake for turning tools and at the same time a second magazine can be carried out with SK 50 for drilling and milling tools.

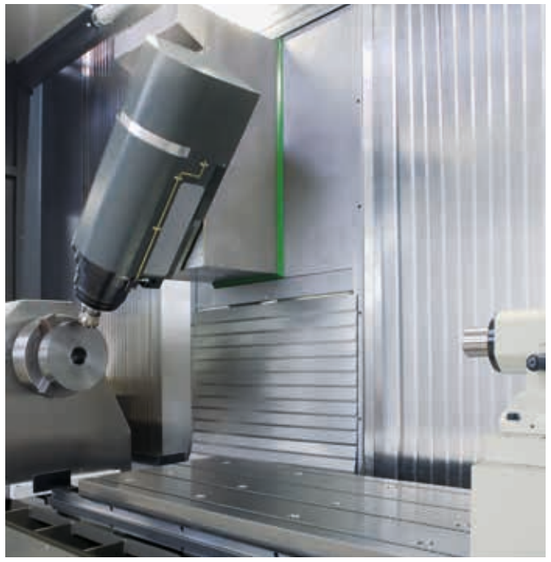
Thanks due to the expandable tool shop, you can set the configuration of the magazine chains yourself and therefore determine the number of required tools for turning and drilling/milling. Initial set-up is also possible on another XTS tower and the chain configuration can be determined at a later point in time. Thus, the machine can then be equipped to an altered machining situation any time later on. The clamping system not in use is then closed during milling and turning operation and is thus in this case ideally protected.

The perfect twist!

The deliberately chosen separate clamping unit for rotary tools provides optimal stability during turning machining

All intermediary angles can be set on the turning tool position beside the vertical and horizontal spindle position

Milling, drilling and turning in one setting with vertical and horizontal spindle position



Turning spindle with 1500 rpm in combination with a tailstock that can be manually adjusted over the fixed machine table in longitudinal direction for varying lengths of the turning workpieces

Two different tool holding fixtures can be changed by the XTS changer – for example one magazine with CAPTO C6 and a second one with SK 50

Keeping a firm grip on small and large workpieces alike

A firm and secure hold is the key to a faultless result. The requirements are just as different as the forms of the workpieces. Alongside fixing, other factors play an essential role when choosing the right clamping technology: cost effectiveness, operator convenience and machine reliability.

The AXA experts give the right advice on the choice of the right clamping technology: Regardless whether mechanical, hydraulic, magnetic or vacuum technology – place your trust in our experience. Systems that already exist can also be integrated – just as much as individual solutions can be developed. Together with numerous partners, we find the correct clamping technology.

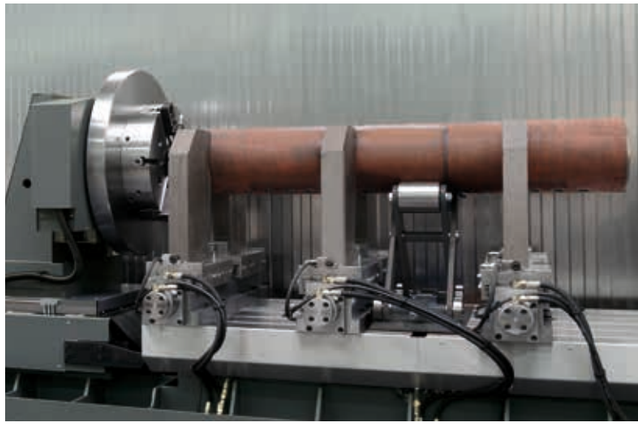
VSC and VHC: Let's clamp together!

Clamping technology in its diversity:

- Chucks or clamping devices
- Machine vices
- Centering vices
- Box jaws
- Multiple clamping systems
- Clamping towers
- Simple table clamping systems
- Clamps of moulded parts with special clamping system

Quick set-up change from very small workpieces to very large and long workpieces by main supporting units - These can be adjusted manually in the X-direction or be NC-driven - Quickly changing clamping elements can be incorporated by the zero-point clamping systems

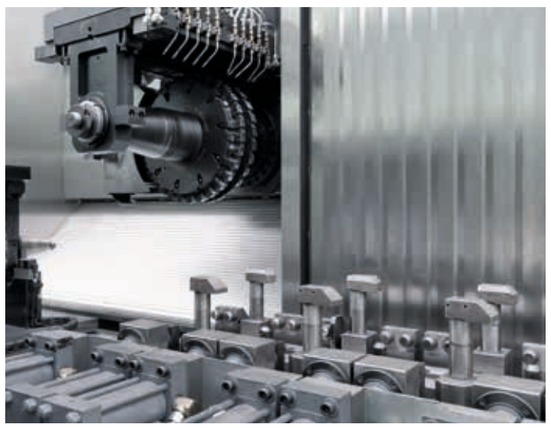
Manual or NC-driven pre-centering and presetting of the clamping elements for the next workpiece diameter



The workpiece can be rotated to position when clamped

Large chucks for complete machining of rings, for example, a 6 jaw chuck with 3 centrering and three adjustable jaws as well as additionally adjustable support guide-rail for the workpiece

Manually adjustable jaw chuck or hydraulic jaw chuck with automatic stroke of the main jaws which are also manually adjustable



Rail-guide profile machining of up to 12 metres in length. Hydraulically driven and controlled swivel clamps hold the workpiece in position

The swivel clamps are automatically moved aside during machining in the area of the milling tool and then swung back again after the machining has been completed

Automisation at every work cycle

Assured quality at optimal task repetition – the VSC and VHS machining tool series fulfil such aspirations. Highly developed automisation technology plays an essential role in achieving this. Furthermore, it reduces production costs and protects staff from heavy and dangerous activities.

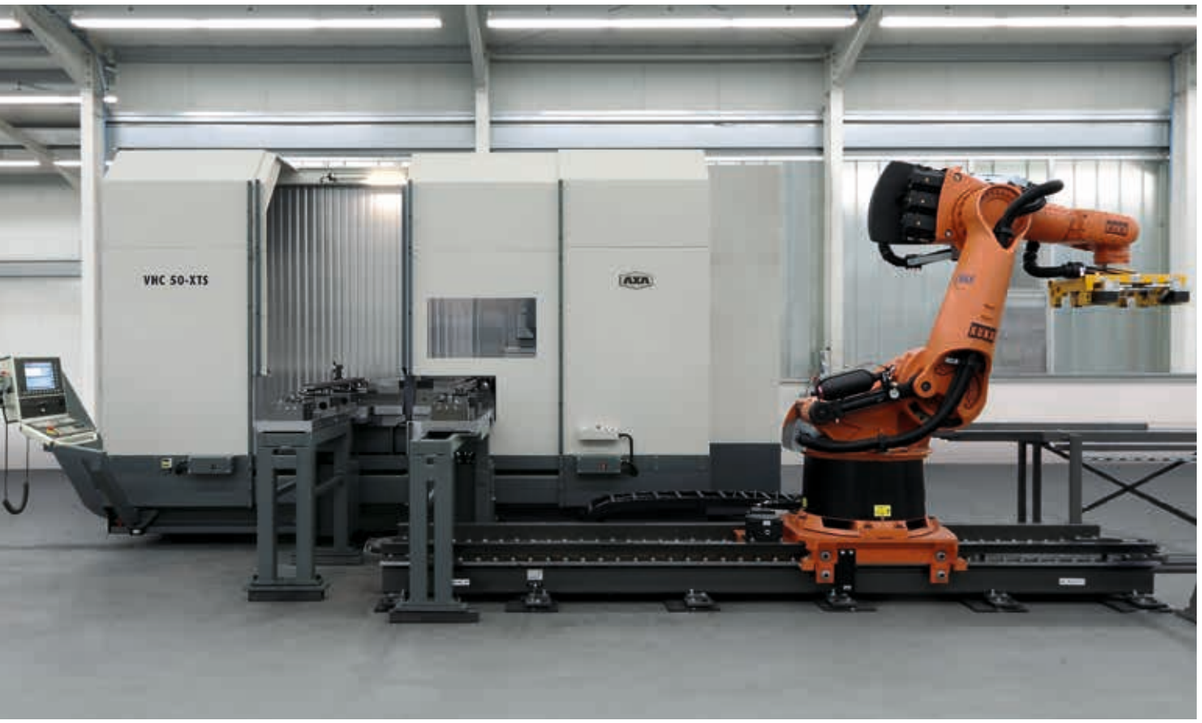
Automating the complex movements around loading and unloading workpieces as well as finding the right choice of clamping technology belong just as much to an ideal automisation solution as workpiece machining and process control. AXA masters these requirements as well – individually created around customer requests. Here is where the decisive machine value added originates for production. Regardless whether this centres around a large production series or applications for the production of small series.

Engineering from AXA: Automatically finding a good solution!

Installed industrial robot in front of the travelling column machine for direct machine loading and unloading with workpieces

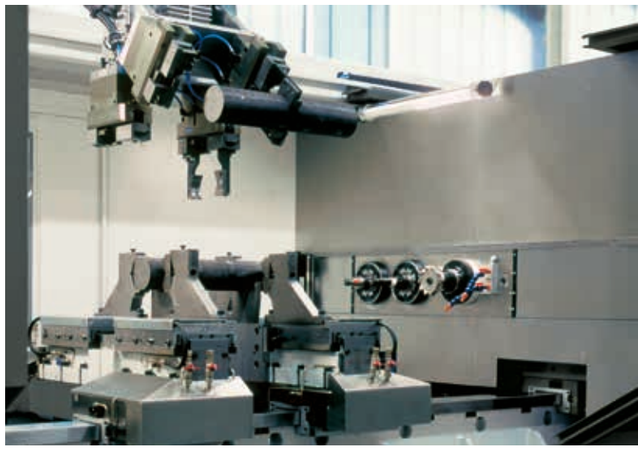
Quick and simple automisation by compact complete solution with workpiece storage, handling system and zero-point clamping

Complex hydraulic clamping unit, modularly designed by AXA, for quick conversion and secure chip flow



In X-travelling industrial robot to load and unload palettes with clamped components in pendulum operation

Machine buffer store reduces set-up times due to long transport distances of the robot system - During machining, the robot changes the workpieces from the buffer into the workpiece storage unit



Double gripper swaps the finished item with the raw material in one work cycle - As loading takes place from above by the portal robot, machine accessibility remains intact

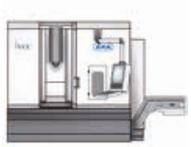
Product overview

VCC DBZ

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

X-travel:	720 - 1200 mm 2 x 750 / 2 x 900 mm
Y-travel:	500 - 600 mm
Z-travel:	600 mm
Tool holder:	SK40 / HSK-A63
Spindle power:	20 - 40 kW

VCC



DBZ

VSC VHC

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

X-travel:	1200 - 12000 mm
Y-travel:	500 - 1000 mm
Z-travel:	600 - 1000 mm
Tool holder:	SK40/50 / HSK-A63/A100
Spindle power:	20 - 57 kW

VSC

VHC

VPC VPC-U

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

X-travel:	2360 - 3000 mm
Y-travel:	1200 - 1600 mm
Z-travel:	500 - 900 mm
Tool holder:	SK40/50 / HSK-A63/A100
Spindle power:	20 - 57 kW

VPC

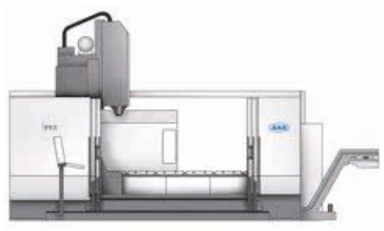
VPC-U

PFZ UPFZ

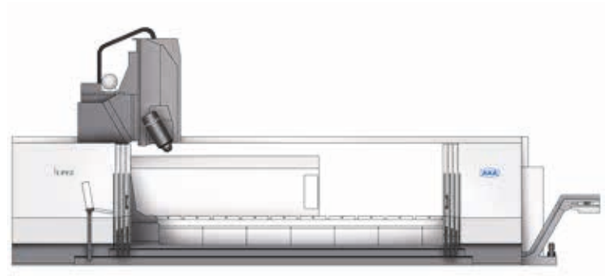
Large gantry machining centres with vertical spindle or swivel head for 5-side-machining

X-travel:	2000 - 12000 mm
Y-travel:	1500 - 4000 mm
Z-travel:	650 - 1200 mm
Tool holder:	SK40/50 / HSK-A63/A100
Spindle power:	20 - 57 kW

PFZ



UPFZ



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