# VCC / DBZ

**Producing success.**
*With AXA's uniqueness.*

Entwicklungs- und
Maschinenbau GmbH

Precise and productive, yet compact in form: the travelling column machines of the VCC and DBZ series

# Uniqueness

made by AXA

## True greatness comes from within – The compact travelling column machines VCC and DBZ

Learnt from the large machines, implemented into the smaller ones. Although of a smaller scale, the two machining centres VCC and DBZ are completely flexible in their functionality. Their advantages are put to work in particular when machining small and medium-sized workpieces – in individual machining mode for small batches or in pendulum mode for series production. The machines' small footprint certainly makes the VCC and DBZ series from AXA very interesting for smaller and medium-sized companies.

The VCC and DBZ unite a clear structure with flexible design. A very rigidly constructed workspace is enhanced through fixed machine tables and a stationary positioned tool magazine pool. That gives the machines immense stability and rigidity and at the same time an extremely dynamic travelling column due to the powerful drive sets in the main axes. From workshop production up to fully automatic series production. The field of applications of these machines is so dynamic just as its design and layout. Reliable quality for demanding tasks.

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

## 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 can develop and manufacture special solutions for you upon request.

Can optionally be equipped with a zero-point clamping system and a rotary table - no limitations to movement paths thanks to its position outside of the working area

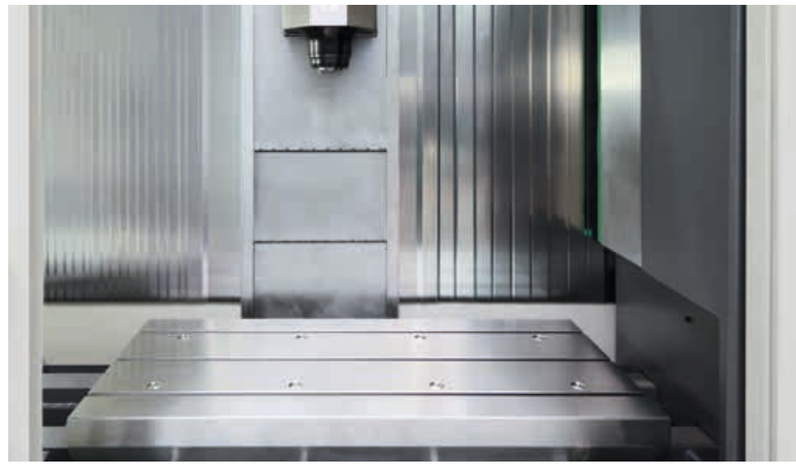
## VCC – Great impact, yet small in size

**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
- Casing according to current machinery directives, totally closed working area with no interfering contours
- 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
- Alternatively with roller guides
- Drives and guideways are protected set outside of working area
- Ball screws in all linear axes

**Tool changing system:**
- Fixed location coded tool management enables better monitoring for the operator
- Support of various tool holding systems such as SK, BT, HSK
- Tool magazine is protected outside of working area
- Placement of the 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

Compact and uncluttered workspace with direct spindle access to the tool magazine



Custom working area for passing long work pieces beneath the tool changer

Basic structure of the VCC 50 with vertical spindle

Basic structure of the VCC 50 with tilting spindle

# VCC 50 - A powerful extension of the VCC series

**Distinctive appearance:**
Powerful spindles and a particularly stable machine bed with a reinforced travelling column as standard - the result is a compact, torsion-resistant base construction, which convinces with its high rigidity and provides extraordinary cutting performance.

Based on the basic model's compact design, the VCC 50 3-axis machining centre is the ideal machining centre for the manufacture of small parts in the heavy-duty cutting field.

**The perfect addition:**
Thanks to the option to extend the three main axes with a swivel head and/or a vertically or horizontally integrated rotary table, the VCC 50 can also be upgraded for 5-axis simultaneous machining. The working area position makes it particularly suitable for use with swivel bridges. Here the swivel head is used in a reinforced version.

**Machining example:**
The material hardness and toughness of Hardox 400 represent particular challenges for machine tools, the VCC 50 masters them easily.

Exemplary cutting values for the VCC 50 when processing Hardox 400:

| | | | |
|---|---|---|---|
| **Material properties** | | | |
| 370 - 430 HBW Brinel | | | |
| 40 - 45 HRC Rockwell | | | |
| **Face milling** | | | |
| D = | 80 mm | | |
| fz = | 0,12 mm | vc = | 80 m/min |
| ap = | 5 mm | ae = | 50 mm |
| **Conture milling** | | | |
| D = | 50 mm | | |
| fz = | 0,15 mm | vc = | 80 m/min |
| ap = | 45 mm | ae = | 10-15 mm |
| **HPC conture milling** | | | |
| D = | 20 mm | | |
| fz = | 0,16 mm | vc = | 180 m/min |
| ap = | 45 mm | ae = | 1 mm |
| **Slot milling** | | | |
| D = | 20 mm | | |
| fz = | 0,075 mm | vc = | 120 m/min |
| ap = | 20 mm | ae = | 20 mm |

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

## 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 can develop and manufacture special solutions for you upon request.

Compact and uncluttered workspace with direct spindle access to the tool magazine

## DBZ – Performance on both sides

**Main design:**
- Double place machining centre
- 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
- Casing according to current machinery directives, totally closed working area with no interfering contours
- 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
- Alternatively with roller guides
- Drives and guideways are protected set outside of working area
- Ball screws in all linear axes

**Tool changing system:**
- Fixed location coded tool management enables better monitoring for the operator
- Support of various tool holding systems such as SK, BT, HSK
- Tool magazine is protected outside of working area
- Placement of the 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

The plate changer is easily accessible from the front

The tool changer is located behind the control panel

# Technical data VCC

| Technical data | | VCC | VCC 2 | VCC 50 |
|---|---|---|---|---|
| **Working area** | | | | |
| X-traverse range | [mm] | 750<br>1200 | 1200 | 1350 |
| Y-traverse range | [mm] | 550 | 600 | 750 |
| Z-traverse range | [mm] | 600 | 700 | 850 |
| Distance table - spindle nozzle | [mm] | 180 - 780 | 180 - 880 | 180 - 1030 |
| **Machine table** | | | | |
| Clamping surface, grinded, approx. | [mm] | 1000 x 500<br>1350 x 500 | 1350 x 600 | 2050 x 850 |
| T-slots, reference slot H7 | [mm] | 14 H9 | 14 H9 | 18 H9 |
| T-slots indexing | [mm] | 160 | 160 | 160 |
| Number of T-slots | | 3 | 4 | 5 |
| Max. table load | [kg/m²] | 800 | 800 | 1200 |
| **Feed drive** | | | | |
| Max. rapid traverse | [m/min] | 25/25/20 | 25/25/20 | 40/40/30 |
| Max. feed force | [N] | 9000 | 9000 | 9000 |
| **Main spindle drive** | | | | |
| Standard drive no. [1] | | 110 | 110 | 131 |
| Optional drive no. [1] | | 100 / 111 | 100 / 111 | 133 / 163 |
| **Tool holding fixture** | | | | |
| DIN 69871 A / DIN 69872 A | | SK 40 | SK 40 | SK 50 |
| Optional | | HSK A63 | HSK A63 | HSK A100 |
| **Tilting spindle head (optional)** | | | | |
| Swivelling range | | | | ± 90° or ± 100° |
| Indexing | | | | 0,001° (hydr. clamped or fully interpolating) |
| **Tool changer** | | | | |
| No. of tool pockets standard | | 22 | 22 | 22 |
| Optional expandable up to | | 30 | 30 | |
| Max. tool diameter | [mm] | 85 | 85 | 110 |
| By free adjacent pockets | [mm] | 135 | 135 | 180 |
| Max. tool length | [mm] | 400 | 400 | 400 |
| Tool change time approx. | [s] | | | |
| **Accuracy** | | | | |
| Positioning accuracy [2] | [mm] | ± 0,02 | ± 0,02 | ± 0,015 |
| Optional | [mm] | ± 0,015 / ± 0,0075 | ± 0,015 / ± 0,0075 | ± 0,0075 |
| Repeating accuracy | [mm] | ± 0,005 | ± 0,005 | ± 0,005 |

# Technical data DBZ

| Technical data | | DBZ | DBZ 2 |
|---|---|---|---|
| **Working area** | | | |
| X-traverse range | [mm] | 2 x 750 | 2 x 900 |
| Y-traverse range | [mm] | 550 | 600 |
| Z-traverse range | [mm] | 600 | 700 |
| Distance table - spindle nozzle | [mm] | 180 - 780 | 180 - 880 |
| **Machine table** | | | |
| Clamping surface, | [mm] | 2 x (1000 x 500) | 2 x (1000 x 600) |
| T-slots, reference slot H7 | [mm] | 14 H9 | 14 H9 |
| T-slots indexing | [mm] | 160 | 160 |
| Number of T-slots | | 3 | 4 |
| Max. table load | [kg/m²] | 800 | 800 |
| **Feed drive** | | | |
| Max. rapid traverse | [m/min] | 25/25/20 | 25/25/20 |
| Max. feed force | [N] | 9000 | 9000 |
| **Main spindle drive** | | | |
| Standard drive no. [1] | | 110 | 110 |
| Optional drive no. [1] | | 100 / 111 | 100 / 111 |
| **Tool holding fixture** | | | |
| DIN 69871 A / DIN 69872 A | | SK 40 | SK 40 |
| Optional | | BT 40, HSK A63 | BT 40, HSK A63 |
| **Tool changer** | | | |
| No. of tool pockets standard | | 22 | 22 |
| Optional expandable up to | | 30 | 30 |
| Max. tool diameter | [mm] | 85 | 85 |
| By free adjacent pockets | [mm] | 135 | 135 |
| Max. tool length | [mm] | 400 | 400 |
| Tool change time approx. | [s] | 4 | 7 |
| **Accuracy** | | | |
| Positioning accuracy [2] | [mm] | ± 0,015 | ± 0,015 |
| Optional | [mm] | ± 0,0075 | ± 0,0075 |
| Repeating accuracy | [mm] | ± 0,005 | ± 0,005 |

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

[2] Per 1000 mm per axis X/Y/Z

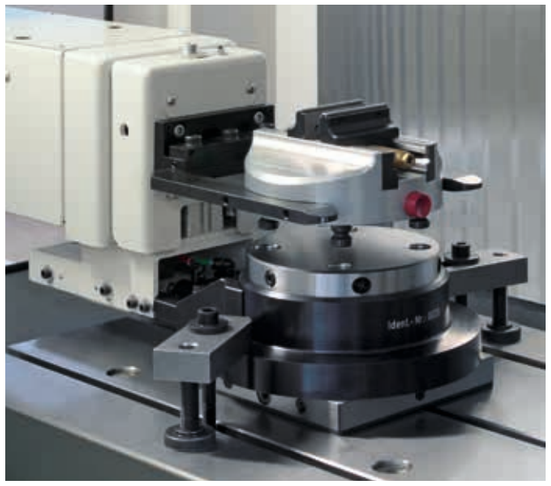
# Tension in every detail

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.

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



Main body made of aluminium with integrated intake for handling systems, mounting pins for zero-point clamping and clamping devices for the workpiece

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

# Automisation at every work cycle

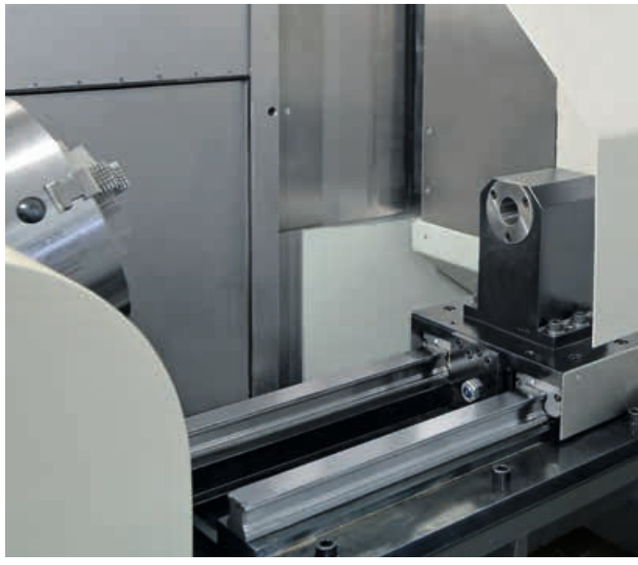
Assured quality at optimal task repetition – the VCC and DBZ machining tool series fulfil such aspirations. Highly developed automisation technology plays an essential role in achieving this. Furthermore, it reduces production costs and protects staff from heavy and dangerous activities.

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.

Rotary table with counter bearing and swivel bridge for mechanical multiple clamping system

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

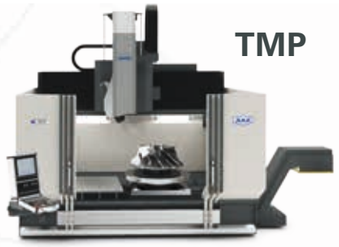
2 axes NC-tilting rotary table from AXA with continuous 360° round axis and tilting axis from 0° to 90°



Tailstock can be manually adjusted for varying lengths of workpieces

# Product overview

## TMP



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

| | |
|---|---|
| X-travel: | 2300 - 2940 mm (vertical)<br>2000 - 2640 mm (horizontal) |
| Y-travel: | 1400 - 1600 mm |
| Z-travel: | 900 mm |
| Spindle power: | 27 - 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: | 2360 - 3900 mm |
| Y-travel: | 1200 - 2940 mm |
| Z-travel: | 500 - 1100 mm |
| Spindle power: | 20 - 63 kW |

## VSC

## VHC

**Travelling 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 |
| Spindle power: | 20 - 81 kW |

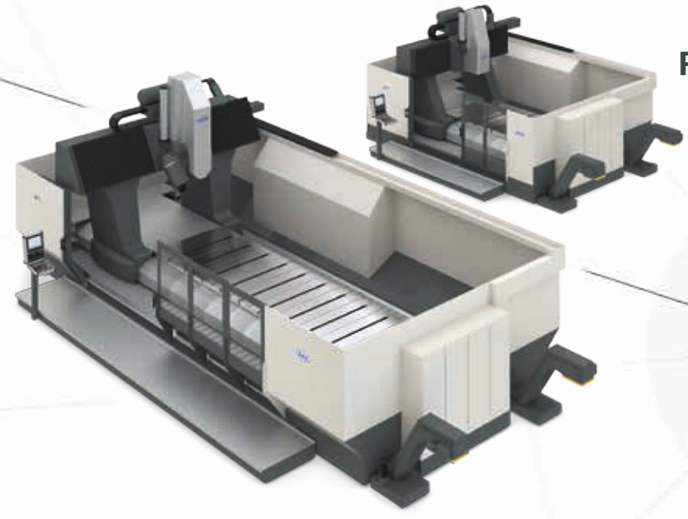
## VCC

## DBZ

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

| | |
|---|---|
| X-travel: | 750 - 1200 mm - 2 x 750 / 2 x 900 mm |
| Y-travel: | 500 - 600 mm |
| Z-travel: | 700 mm |
| Spindle power: | 20 - 40 kW |

## 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 |
| Spindle power: | 20 - 57 kW |

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*Brochure effective: A1 – 02/2018*