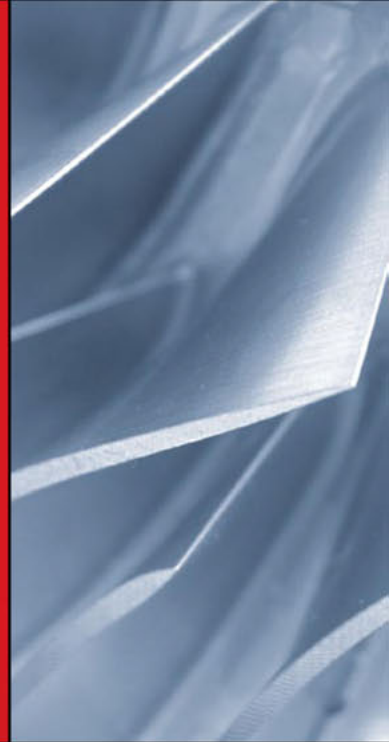


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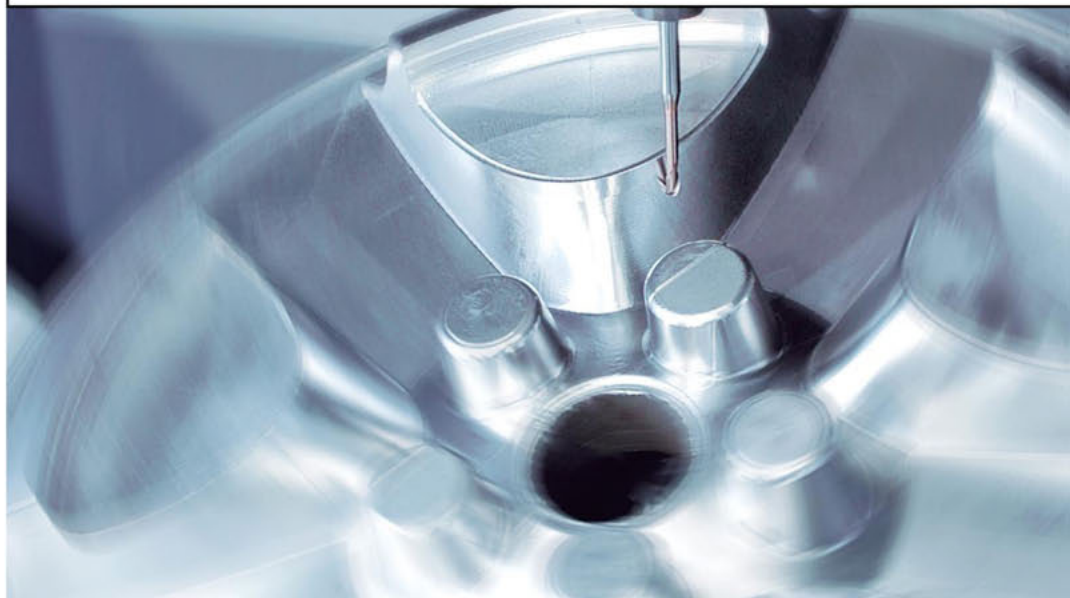


Phoenix Machine Tool LTD.



## VMC 630TC - 5x

five-axis vertical machining center





Machine features



# VMC 630TC - 5X

The machine designed for continuous 5-axis machining of complex parts. Its configuration and performance properties enable manufacturing of complex molds and 5-sided full part machining.



The high machine rigidity for power machining of parts. High precision of the VMC 630TC - 5X machine perfects the possibilities of 5-axis machining and complex part manufacturing in one setting. The machine is characterized by high dynamics both in terms of tool motion (3 axis) and in terms of workpiece motion (2 axis). Dynamics are ensured by means of direct drives in rotary axes of the rotary and tilting table and allocation of individual axis motions 3+2.

## Machine highlights

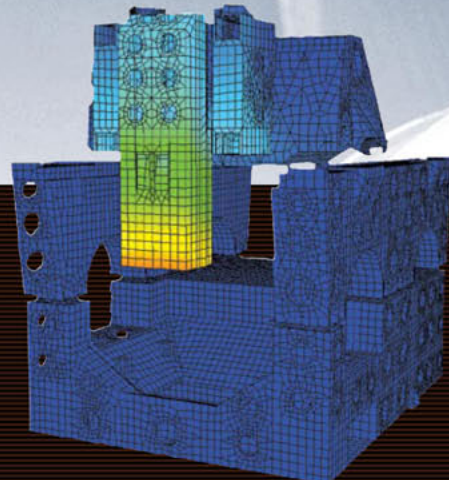
- gantry concept of the machine - high rigidity, precision, thermal stability
- solid and rigid machine frame from grey and modular cast iron
- tool motion in 3 axes - constant dynamic properties
- drive of rotary and tilting table by means of direct drives
- heavy workpieces
- large working space
- universal options that meet production needs

## Technological data of machines *VMC 630TC - 5X*

*Technical data of machine VMC 630TC - 5X power*

| Material              | Tool         | Spindle speed                       | Cutting rate | Tool cut | Material removal |
|-----------------------|--------------|-------------------------------------|--------------|----------|------------------|
|                       | mm           | rpm                                 | m            | (wxd)    | Cm <sup>3</sup>  |
| <b>VMC 630TC - 5X</b> |              |                                     |              |          |                  |
| Milling               | carbon steel | face cutter Ø 63 - 5 teeth<br>- 45° | 1800         | 356      | 52x4<br>674      |
| <b>VMC 630TC - 5X</b> |              |                                     |              |          |                  |
| Milling               | carbon steel | face cutter Ø 80 - 8 teeth<br>- 45° | 800          | 200      | 75x6<br>1035     |

*Machine frame has been optimised regarding static rigidity and dynamic properties by means of a finite elements method.*



## Skeleton of machine VMC 630TC - 5X

Cross rail

Tool-holding slide

Slide

Tool magazine - 32/64 stations (24)\*

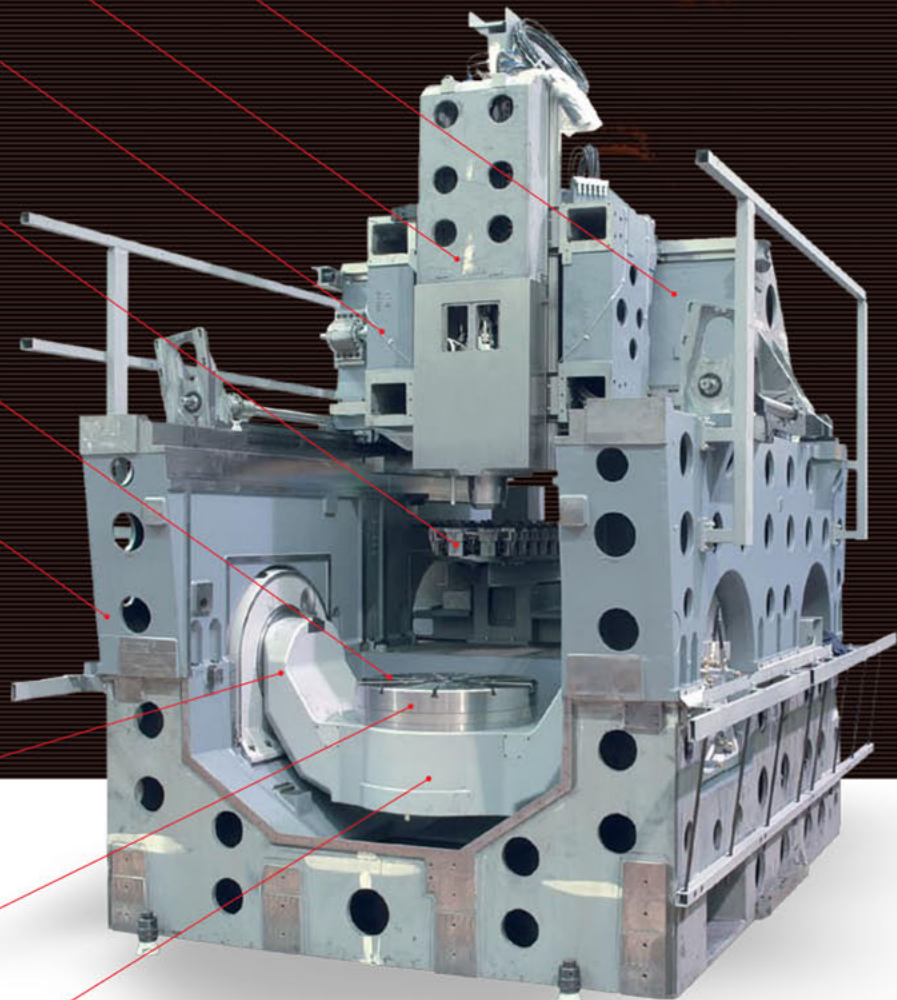
Max. weight on table - 850 kg

Bed

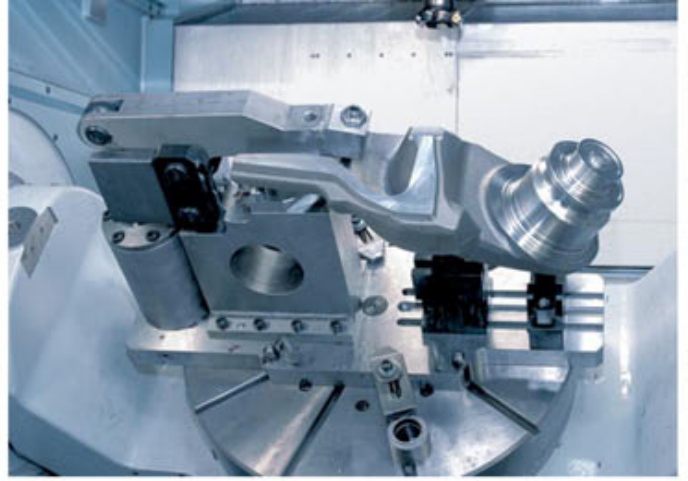
Tilting Axis A + 30° - 120°

Table clamping surface dia. 630 mm

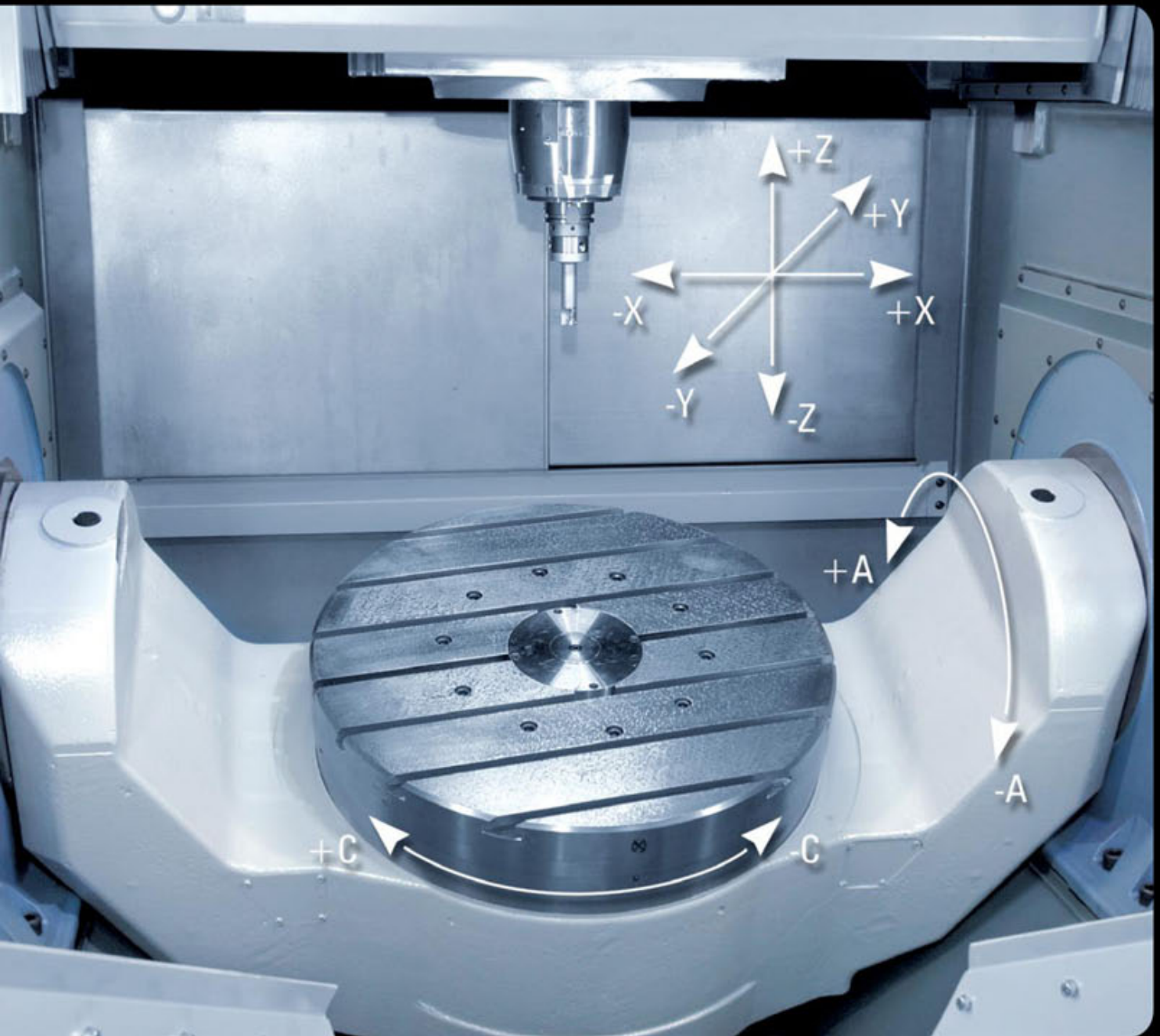
Rotary axis C 360°



\* applicable to machine VMC 630TC - 5X power



Kinematics of the VMC 630TC - 5X machine





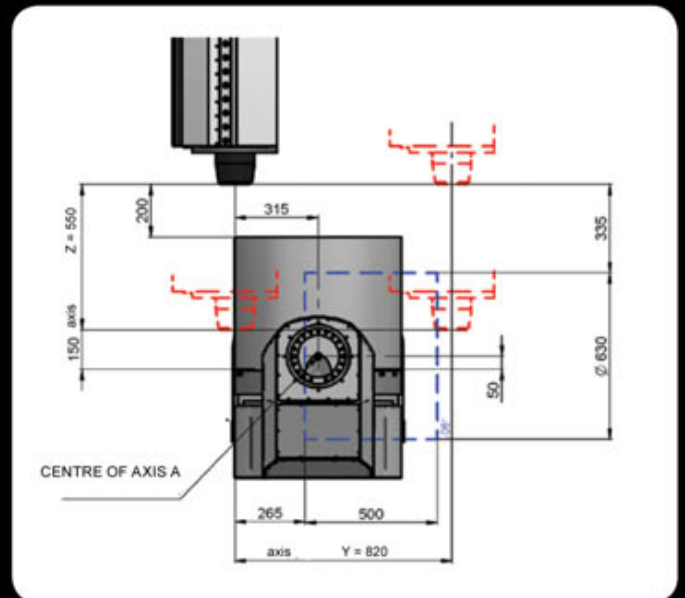
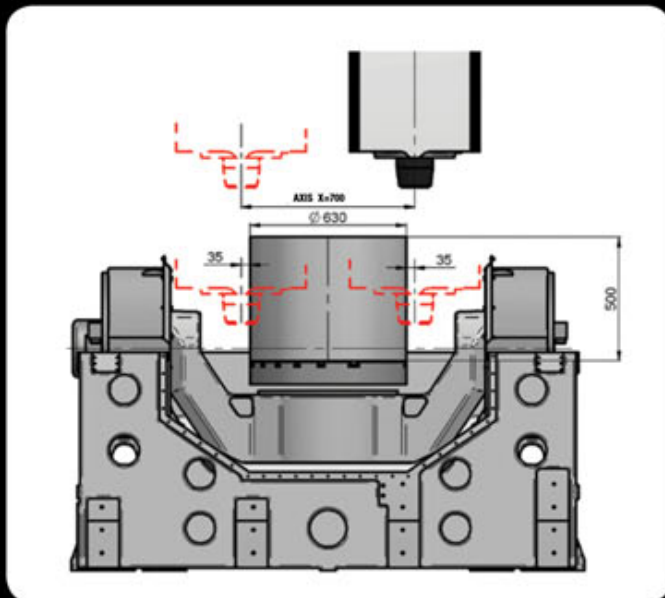
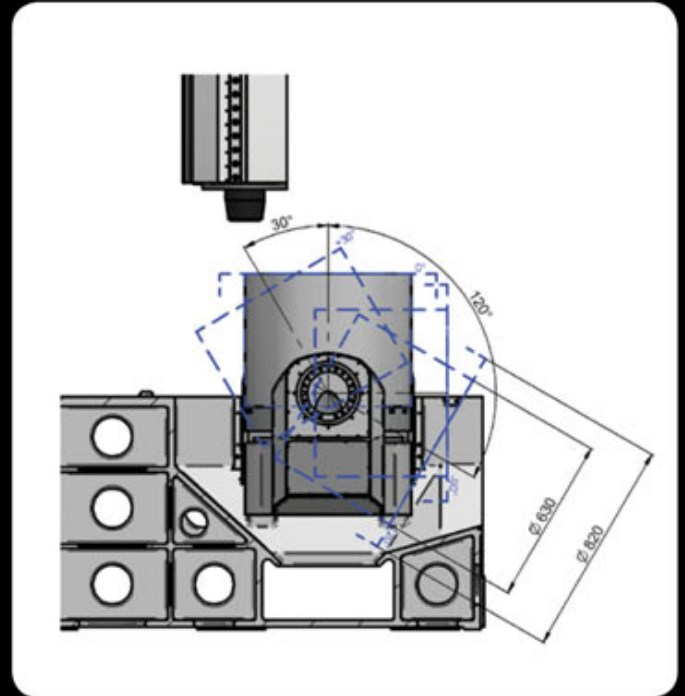
↳ Ring (direct) motor

↑ Easily accessible working space, possibility of loading by means of crane

↓ Working space of the VMC 630TC - 5x machine



The rotary tilting table is designed with rotary axes drives by means of ring (direct) motors. Technological parameters of this solution bring a high useful value of machine. Main contribution is enhancement of accuracy and dynamics of rotary axes A and C necessary for continuous 5-axis machining.





↑ Control panel



↑ Cooling unit for direct drives of the rotary and tilting table



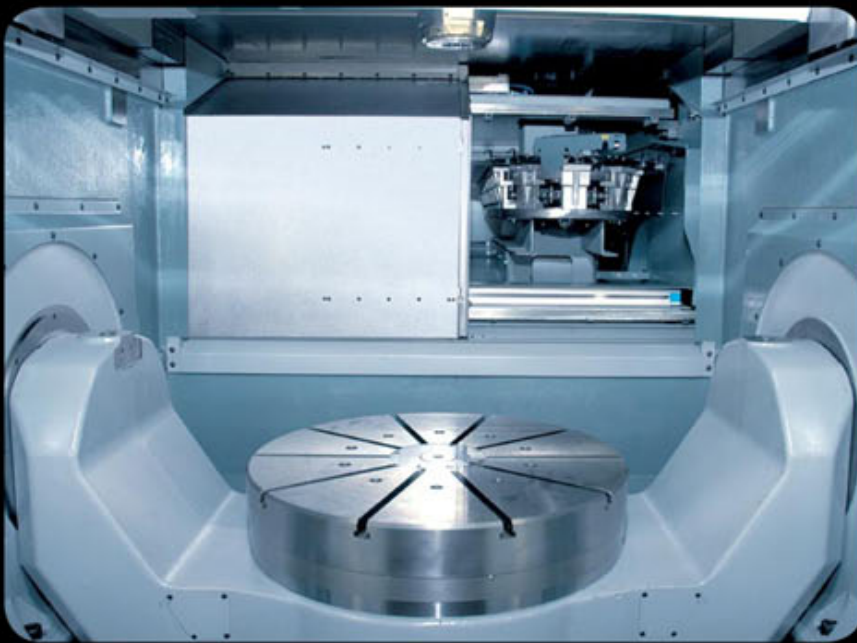
- ↑ Rear part of machine VMC 630TC - 5X
- Access to machine units
- ↘ Outer and centric tool cooling units
- ↙ Chip conveyor





↑ Pick up tool magazine - 32 / 64 stations

↑ Tool magazine loading in the rear part of machine



Pick up tool magazine - 32 / 64 stations

3D scanning workpiece probe

Laser tool probe



Significant machine feature is a large working space. Axes travel allow machining of bulky and complex parts. You can machine a 630mm part with a height of 500mm using our 5-axis unlimited with the possibility of using long tools.



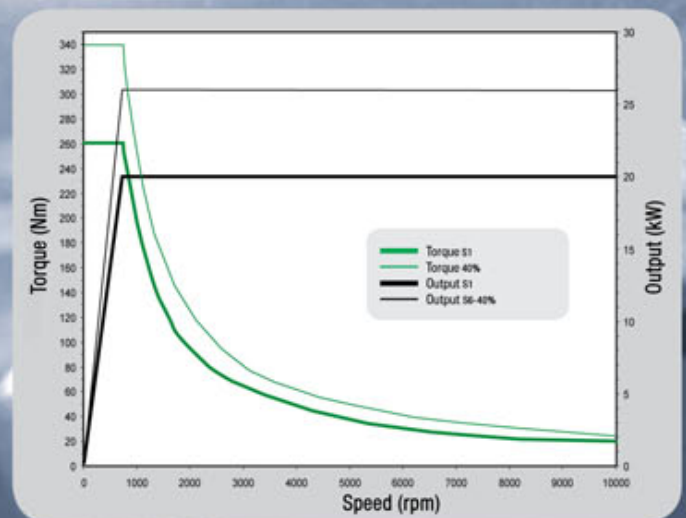
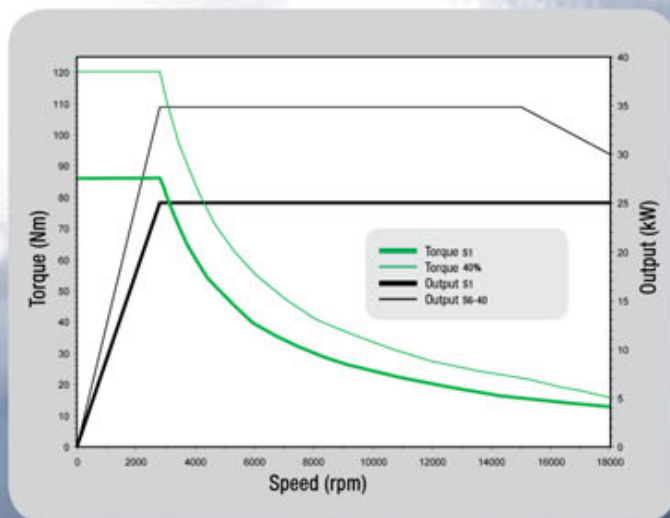
| TECHNICAL DATA                  |                     | VMC 630TC -5X      |
|---------------------------------|---------------------|--------------------|
| <b>ROTARY AND TILTING TABLE</b> |                     |                    |
| Rotary table top dia.           | mm                  | 630                |
| Tilting axis A                  | °                   | +30° / -120°       |
| Rotary axis C                   | °                   | 360°               |
| T-slots (number×width)          | -                   | 10×14              |
| Max. weight on table            | kg                  | 850                |
| Tool height over floor          | mm                  | 920                |
| <b>WORKING RANGE</b>            |                     |                    |
| Working travel:                 | -                   | -                  |
| X-axis                          | mm                  | 700                |
| Y-axis                          | mm                  | 820                |
| Z-axis                          | mm                  | 550                |
| <b>FEED RATE</b>                |                     |                    |
| Rapid traverse X/ Y/ Z          | m.min <sup>-1</sup> | 60                 |
| Max. speed - axis A             | rpm                 | 25                 |
| Max. speed - axis C             | rpm                 | 100                |
| Acceleration X/ Y/ Z            | m.s <sup>-2</sup>   | 6,5                |
| <b>CONNECTION TO THE MAINS</b>  |                     |                    |
| Max. total machine input        | kVA                 | 85                 |
| <b>PNEUMATIC SYSTEM</b>         |                     |                    |
| Air operating pressure          | MPa                 | 0,6                |
| <b>TOOL COOLING SYSTEM</b>      |                     |                    |
| Max. tank capacity              | l                   | 270                |
| Max. total coolant capacity     | l                   | 500                |
| <b>ACCURACY VDI/DGQ 3441</b>    |                     |                    |
| Measuring system                | -                   | direct             |
| Coordinate setting accuracy     | mm                  | 0,01               |
| Positioning accuracy            | mm                  | 0,005              |
| <b>ACCURACY JIS B 6336</b>      |                     |                    |
| Measuring system                | -                   | direct             |
| Accuracy                        | mm                  | ±0,003             |
| Repeatability                   | mm                  | 0,002              |
| <b>MACHINE DIMENSIONS</b>       |                     |                    |
| Floor space required (L×W×H)    | mm                  | 4200 x 2400 x 2900 |
| For transport                   | mm                  | 4200 x 2400 x 2900 |
| Max. machine height             | mm                  | 3600               |
| <b>MACHINE WEIGHT</b>           |                     |                    |
| Machine with electrical cabinet | kg                  | 18000              |
| Chip conveyor                   | kg                  | 450                |

TECHNICAL DATA OF THE SPINDLE AND TOOL MAGAZINE

|   |     | SPRINT     | POWER      |
|---|-----|------------|------------|
| <b>SPINDLE</b>  |     |            |            |
|   |     | HSK - A63  | ISO 50     |
| Spindle motor output S1/S6 - 40%                            | kW  | 25 / 35    | 20 / 26    |
| Max. torque S1/S6 - 40%                                     | Nm  | 87 / 130   | 262 / 340  |
| Max. spindle speed  | rpm | 18 000     | 10 000     |
| Speed change  | -   | continuous | continuous |
| Max. speed start time                                       | s   | 2,0        | 2,0        |
| Max. speed stop time  | s   | 4,5        | 4,5        |
| Tool clamping force   | N   | 25 000     | 25 000     |
| Distance from spindle nose to rotary table clamping surface | mm  | 150 - 700  | 110 - 660  |
| <b>TOOL MAGAZINE</b>  |     |            |            |
| Tool change mode  | -   | pick up    | pick up    |
| Magazine capacity   | -   | 32 (64)    | 24         |
| Max. tool length  | mm  | 280        | 230        |
| Max. tool dia.  | mm  | 80         | 130        |
| Max. tool dia. - adjacent stations empty                    |     | 130        |            |
| Max. tool weight  | kg  | 10         | 10         |
| Change time of adjacent tool                                | s   | 6          | 6          |

Spindle motor output and torque - SPRINT

Spindle motor output and torque - POWER



## Standard Machine Version and Accessories

- Spindle for tool clamping - taper HSK-A63, ISO 50 (Power)
- CNC system Accupath IV
- Digital Feed and spindle drives
- Direct drives (torque motors) in axes A, C
- Direct measuring of linear and rotary axes positions
- Pick up tool magazine - 32 stations (24 stations - Power)
- Tool magazine loading from rear machine part
- Tool clamping control by means of pushbuttons at spindle
- Hydraulic unit
- Pneumatic elements FESTO
- Air-operated slide balancing
- Circulating cooling of spindle and motors of axes A, C
- Spindle bearing lubrication oil-air
- Central lubrication
- Cooling unit for outer tool cooling
- Cooling unit for electrical cabinet
- Manual working space rinsing
- Waterproof working compartment
- Chip conveyor
- Machine run signaling
- Working space lighting
- Working voltage 240v; 60Hz
- Operating Manual

## Special Accessories

- High-pressure centric tool cooling - operating pressure 6 MPa
- Pick up tool magazine - 64 stations (only HSK-A63)
- Band filter of cooling liquid
- 3D scanning workpiece probe
- Laser tool probe
- Automatic top cover shifting

## Special Machine Version on Customer's Demand

- Other voltage than 240v; 60Hz

In view of continuous machine development and innovation, specifications in the advertising material are subject to change without notice.

The machine conforms to 

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