# VERTICAL MACHINING CENTRES

## VMC | VARIO | X-5

## Fabryka Obrabiarek Precyzyjnych

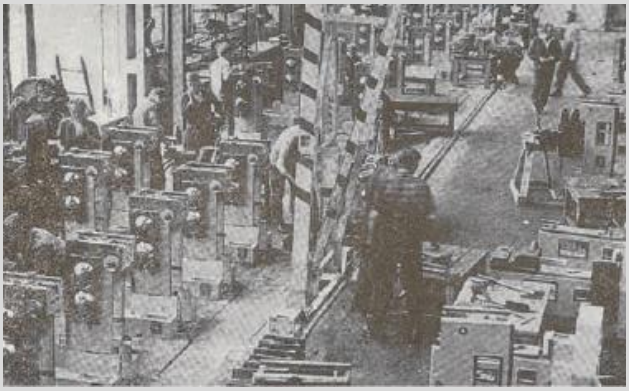
## AVIA S. A.

# ABOUT US...

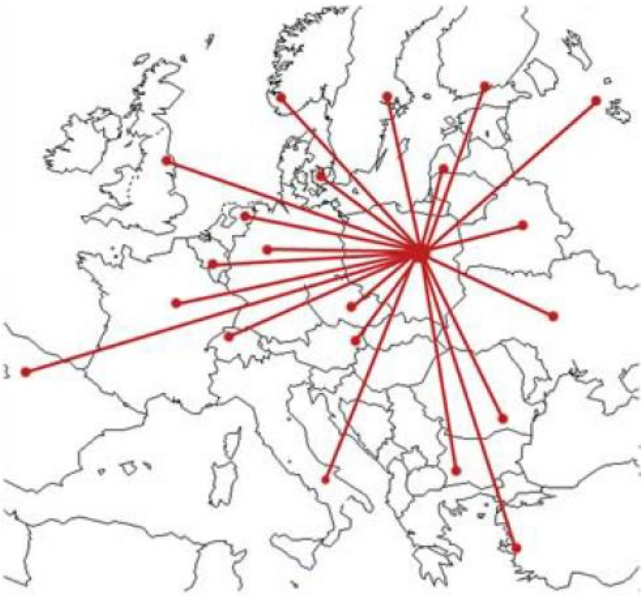
Fabryka Obrabiarek Precyzyjnych AVIA S.A. Warsaw, Poland (Machine Tool Factory AVIA S.A.) was founded in 1902 and is one from the oldest Polish industrial plants. For the past 70 years, AVIA has been one of the leading Polish manufacturers of high-quality, precision machine tools. Today, our brand is widely recognized in Europe, especially in Germany, where we have over 4,500 installations.

The presence of machine tools manufactured by us in demanding and industrialized markets ensures constant and continuous growth of production and increases the competitiveness of our customers. Proven AVIA machine solutions, depending on favourable prices, are also successfully featured in emerging markets in Eastern Europe.

At present, AVIA offers in its product line Vertical machining centres 3, 4 and 5-axis, CNC and Manual universal milling machines and CNC inclined bed lathes. AVIA is also a manufacturer of key components for machine tools such as: spindles or precision ball screws. We supply ball screws to some of the world's leading machine tool manufacturers.



Assembly line AVIA – Manual Universal Milling Machines - 1970



New machine designs are based on our own development and research department. The unique combination of very talented young engineers and very experienced designers who have worked at AVIA for many years ensures an ideal environment for development and research processes. Design proposals are created by computer systems such as:

- Solid Modelling Design (CAD-3D),
- Finite Element Method optimization,
- Computer Aided Manufacturing (CAM).

Our goal is not only to develop the latest technologies and deliver them to customers, but also to provide adequate training, service and maintenance of machines, as well as the availability of spare parts for many years after the machine has been handed over.

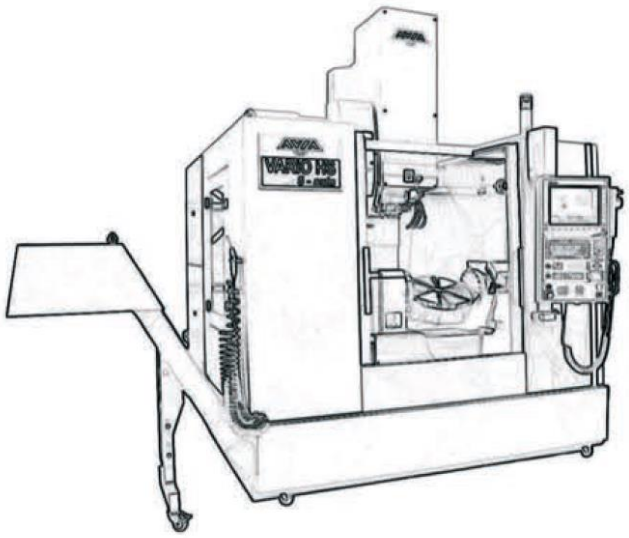
Company management and production:

**FABRYKA OBRABIAREK PRECYZYJNYCH AVIA S. A.**
Siedlecka 47
03-768 Warsaw
Poland
+48 22 818 62 11
market@avia.com.pl
www.avia.com.pl

Sales representation

**PILART stroje a.s.**
Ericha Roučky 2499/11
678 01 Blansko
Czech Republic
+420 739 510 561
info@avia-cnc.cz
www.avia-cnc.cz

# DISCOVER WIDE RANGE OF PRECISION VERTICAL MACHINING CENTRES OF AVIA

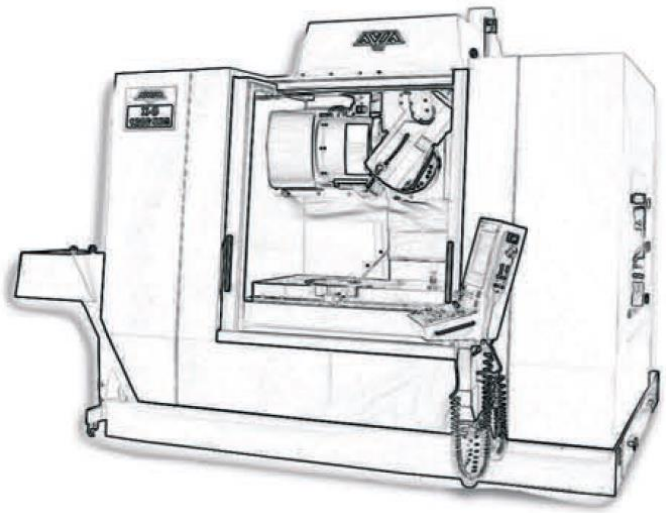


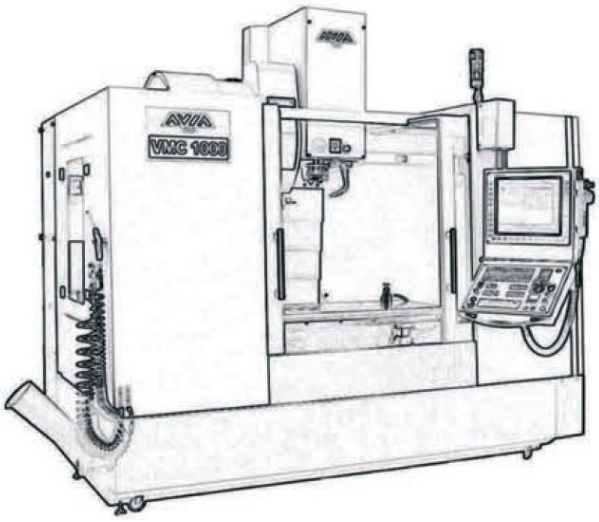
## 5-AXIS MACHINING CENTRES VARIO & VARIO HS SERIES

- continuous 5-axis machining solution
- rotary tilting table with a diameter of 450 mm
- table load 400 kg (incl. clamping) for large workpieces
- Directly driven rotary (A) and rotary (C) axes by a torque motor for peak dynamics
- wide selection of spindles from 10,000 to 24,000 rpm.
- acceleration in X / Y / Z axes up to 1G
- rapid traverse 42 m / min
- processing time of one block 0.5 ms, for CAM

## 5-AXIS MACHINING CENTRES X-5 SERIES

- the most versatile 5-axis machining centre for you
- continuously tilting head with a powerful motor spindle
- large diameter of the built-in rotary table 500/630 mm
- Heidenhain precision encoders ± 5 arc. sec. built-in rotary axes centres for highest accuracy
- large machining space allows machining of larger dimensions
- 5-axis continuous machining of medium-sized workpieces or 4-axis machining of large workpieces
- maximum load of the heavy workbench
- processing time of one block 0.5 ms

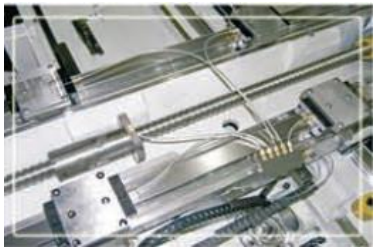




## VERTICAL MACHINING CENTRES VMC & VMC HS V SERIES

- world class CNC control HEIDENHAIN and SIEMENS
- processing time of one block 0.5 ms
- wide selection of spindles from 15,000 to 24,000 rpm.
- acceleration in X / Y / Z axes up to 1G
- rapid traverse 42 m / min
- positioning accuracy +/- 0.004 mm
- very rigid construction thanks to components that exceed the required standards from reliable suppliers
- the maximum permissible table load on the market
- rich standard equipment with useful accessories
- high accuracy and dynamics
- the best solution for HMS machining (HS series)


High-performance machining of hardened



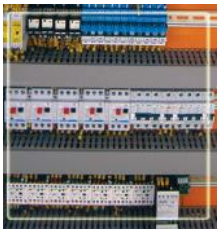
Central lubrication of roller guide and precision ball screws

Unlimited possibilities of continuous 5-axis machining on AVIA machines

Stainless steel protective covers

45 mm wide linear roller guide

FESTO central air for easy maintenance

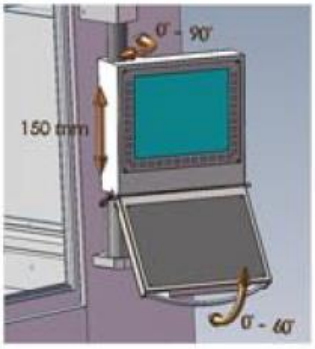


Electrical components from well-known European manufacturers are easily available

# DISCOVER VERTICAL MACHINING CENTRES DESIGNER TO YOUR NEEDS

## HEIDENHAIN TNC 640 HSCI

- most modern and reliable CNC control
- 21 GB SSDR space for all CNC programs
- processing time of one block 0.5 ms
- 19 "display for convenient control and programming
- High resolution 3D representation of the workpiece
    - control panel settings
    - height adjustment 150 mm
    - keyboard angle setting 0 - 60 st.
    - panel rotation setting 0 - 90 st.





## AUTOMATIC TOOL CHANGER

- 30 / 50 tool positions in standard design,
- a reliable solution tested on hundreds of machines
- Quick change time 2.8 with tool - tool

## IMPROVED ACCURACY AND DYNAMICS

- rapid traverse up to 42 m / min. shortens the time delay
- positioning accuracy up to +/- 0.004 mm
- repeatable accuracy up to 0.004 mm
- VMC series equipped with a spindle of 15,000 rpm
- VMC HS, VARIO and X-5 series equipped with electric spindle up to 24,000 rpm

Class C3 precision ball screws from AVIA. Double pre-tensioned nuts anchored at both ends for maximum accuracy and rigidity

## RELIABLE KEY COMPONENTS

Precisely balanced (G0,4) spindle bearings made by AVIA are used for a long time, without failures at very high speeds and torques. Spindles from well-known suppliers.

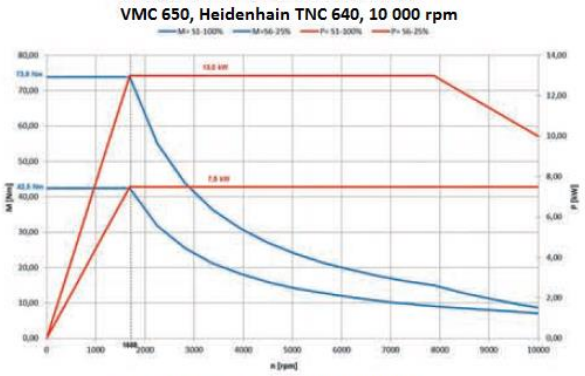
Available versions:
- 15,000 rpm direct drive
- 10,000 rpm electric spindle
- 18,000 rpm electric spindle
- 24,000 rpm electric spindle

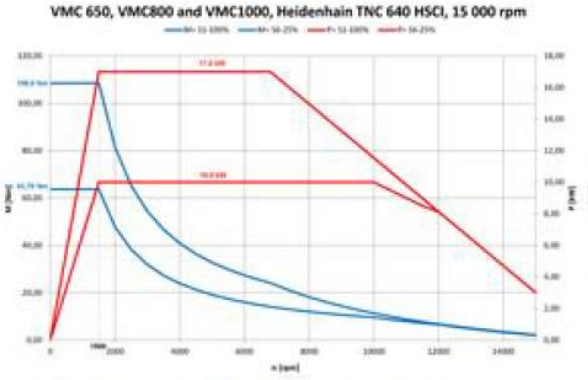
# VMC SERIES

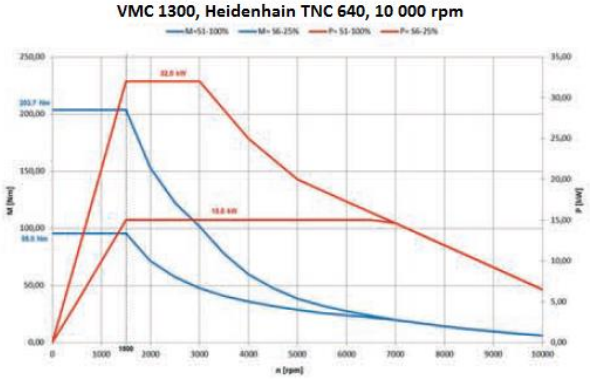
## for demanding applications

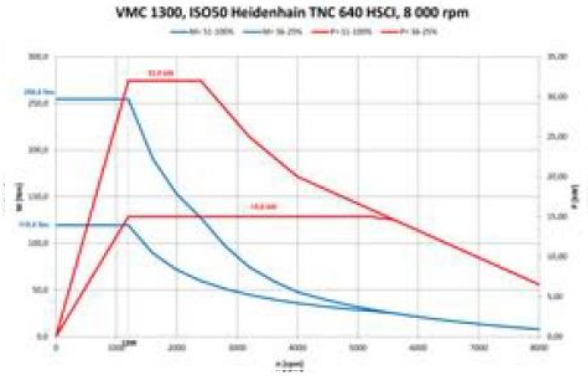

## VMC SERIES

- very rigid construction, thanks to components from reliable suppliers that exceed the required standards
- large workspace with the largest table load capacity on the market
- reliable CNC systems from world-class suppliers: HEIDENHAIN TNC 640, SIEMENS SINUMERIK 840D, FANUC 0i-MF
- extremely rich basic standard equipment with very useful equipment
- high accuracy and dynamics
- the widest range of uses, according to the requirements of a modern workshop



| Technical Data | | VMC 650 V | VMC 800 V | VMC 1000 V | VMC 1300 | |
|---|---|---|---|---|---|---|
| **TABLE:** | | | | | | |
| Table size | mm | 800 x 540 | 1000 x 540 | 1200 x 540 | 1500 x 710 | |
| T-slots: number / size / height | mm | 5 / 18 / 100 | 5 / 18 / 100 | 5 / 18 / 100 | 5 / 18 / 125 | |
| Load capacity of the table | kg | 700 | 850 | 1000 | 1500 | |
| **TRAVELS:** | | | | | | |
| Longitudinal X | mm | 650 | 800 | 1000 | 1300 | |
| Transverse Y | mm | 600 | 600 | 600 | 700 | |
| Vertical Z | mm | 620 | 620 | 620 | 670 | |
| **SPINDLE:** | | | | | belt | direct |
| Spindle speed | rpm | 15 000 | 15 000 | 15 000 | 10 000 | 15 000 |
| Spindle taper | | ISO 40 | ISO 40 | ISO 40 | ISO 40 | ISO 40 |
| Power S1 / S6 (25%) * | kW | 10 / 17 | 10 / 17 | 10 / 17 | 15/32 | 10 / 17 |
| Torque S1 / S6 (25%) * | Nm | 64 / 108 | 64 / 108 | 64 / 108 | 95/204 | 64 / 108 |
| Distance spindle table | mm | 120 – 740 | 120 – 740 | 120 – 740 | 100-770 | 100 – 720 |
| **SPINDLE ISO 50** | | | | | belt | ZF trans. |
| Spindle speed | rpm | - | - | - | 8 000 | 6 000 |
| Spindle taper | | - | - | - | ISO 50 | ISO 50 |
| Power S1 / S6 (25%) * | kW | - | - | - | 15/32 | 15/32 |
| Torque S1 / S6 (25%) * | Nm | - | - | - | 119/254 | 382/815 |
| Distance spindle table | mm | - | - | - | 100-770 | 100-770 |
| **TOOL CHANGER:** | | | | | | |
| Tool changer type | | Swing arm ATC (cam) | Swing arm ATC (cam) | Swing arm ATC (cam) | Swing arm ATC (chain) | |
| Number of tool positions | pcs | 30 | 30 | 30 | 40 | |
| Tool change time - tool | sec | 2,0 | 2,0 | 2,0 | 2,0 | |
| Max. tool diameter | mm | 85 / 130** | 85 / 130** | 85 / 130** | 75 / 130** | |
| Max. tool weight | kg | 7 | 7 | 7 | 8 | |
| Max. tool length | mm | 300 | 300 | 300 | 300 | |
| **FEEDS:** | | | | | | |
| Feed X / Y / Z | m / min. | 0 - 35 / 35 / 35 | 0 - 35 / 35 / 35 | 0 - 35 / 35 / 35 | 0 - 24 / 24 / 24 | |
| Rapid feed | m / min. | 35 / 35 /35 | 35 / 35 /35 | 35 / 35 /35 | 24 / 24 / 24 | |
| **CNC SYSTEM:** | | | | | | |
| Standard | HEIDENHAIN TNC 620 HSCI / SIEMENS SINUMERIK 828 | | | | | |
| Optional | HEIDENHAIN TNC 640 HSCI 19 / SIEMENS SINUMERIK 840D | | | | | |
| **GENERAL INFORMATION:** | | | | | | |
| Positioning accuracy *** | mm | ± 0,004 | ± 0,004 | ±0,004 | ± 0,005 | |
| Repeatable accuracy *** | mm | 0,004 | 0,004 | 0,004 | 0,005 | |
| Total power consumption | kVA | 25 | 27 | 27 | 45 | |
| Dimensions: L x W x H | mm | 2785 x 2650 x 2750 | 3065 x 2650 x 2750 | 3450 x 2600 x 2750 | 3550 x 3900 x 3000 | |
| Weight approx. | kg | 4400 | 4950 | 5300 | 9300 | |

* for HEIDENHAIN TNC640 / ** second pocket empty / *** acc. to PN-ISO 230-2

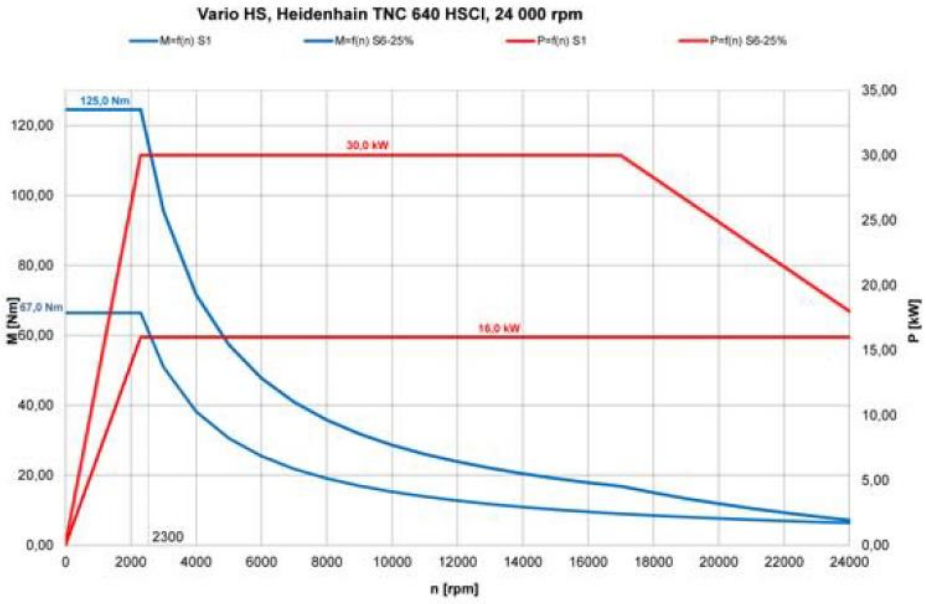
| **STANDARD:** | |
|---|---|
| Linear roller guide for all axes | Coolant gun and air gun |
| Directly controlled ball screws on all three axes | Chip flushing system |
| Automatic tool changer | Electronic hand wheel HR510 |
| Fully enclosed workspace | Worm chip conveyor |
| Ethernet, USB | Telescopic covers for all lines |
| Complete cooling system | Pulling pins 6 pieces |
| **OPTIONAL:** | |
| Heidenhain linear rulers for all three axes | Spindle thermal stabilization |
| Workpiece and tool probe | Hinge or scraper type chip conveyor |
| CTS spindle cooling (20 - 70 bar) | CAD / CAM software |
| ATS spindle cooling (5 bar) | Pallet exchange system |
| Air cooling of the tool (5bar) | Oil separator, Oil mist collection, paper, magnetic filtration |
| CNC rotary table (4th and 5th axis) | Teleservice, monitoring (industry 4.0) |

# VMC HS V SERIES

## your HSM solution


## VMC HS V SERIES

The best solution for high-speed machining thanks to:
- reliable electric spindle 24,000 rpm.
- rapid traverse 42 m / min.
- acceleration in X / Y / Z axes - 0.5 G
- acceleration in interpolation - 1 G
- fastest processing of one block - 0.5 ms



| Technical Data | | VMC 650 HS V | VMC 800 HS V | VMC 1000 HS V |
|---|---|---|---|---|
| **TABLE:** | | | | |
| Table size | mm | 800 x 540 | 1000 x 540 | 1200 x 540 |
| T-slots: number / size / height | mm | 5 / 18 / 100 | 5 / 18 / 100 | 5 / 18 / 100 |
| Load capacity of the table | kg | 700 | 850 | 1000 |
| **TRAVELS:** | | | | |
| Longitudinal X | mm | 650 | 800 | 1000 |
| Transverse Y | mm | 600 | 600 | 600 |
| Vertical Z | mm | 620 | 620 | 620 |
| **ELECTROSPINDLE:** | | | | |
| Spindle speed | rpm | 24 000 | 24 000 | 24 000 |
| Spindle taper | | HSK63A | HSK63A | HSK63A |
| Power S1 / S6 (25%) * | kW | 16 / 30 | 16 / 30 | 16 / 30 |
| Torque S1 / S6 (25%) * | Nm | 67 / 125 | 67 / 125 | 67 / 125 |
| Distance spindle table | mm | 150 – 770 | 150 – 770 | 150 – 770 |
| **TOOL CHANGER:** | | | | |
| Tool changer type | | Swing arm ATC (cam) | Swing arm ATC (cam) | Swing arm ATC (cam) |
| Number of tool positions | pcs | 30 | 30 | 30 |
| Tool change time - tool | sec. | 2,0 | 2,0 | 2,0 |
| Max. tool diameter | mm | 85 / 130** | 85 / 130** | 85 / 130** |
| Max. tool weight | kg | 7 | 7 | 7 |
| Max. tool length | mm | 300 | 300 | 300 |
| **FEEDS:** | | | | |
| Feeds X / Y / Z | m / min. | 0 – 42 / 42 / 42 | 0 – 42 / 42 / 42 | 0 – 42 / 42 / 42 |
| Rapid feeds X / Y / Z | m / min. | 42 / 42 / 42 | 42 / 42 / 42 | 42 / 42 / 42 |
| Acceleration X / Y / Z | | till 1G | till 1G | till 1G |
| **CNC SYSTEM:** | | | | |
| Standard | HEIDENHAIN | TNC 640 HSCI | TNC 640 HSCI | TNC 640 HSCI |
| Option | SIEMENS | 840D-SL | 840D-SL | 840D-SL |
| **GENERAL INFORMATION:** | | | | |
| Positioning accuracy *** | mm | ± 0,004 | ± 0,004 | ± 0,004 |
| Repeatable accuracy *** | mm | 0,004 | 0,004 | 0,004 |
| Total power consumption | kVA | 40 | 40 | 40 |
| Dimensions: L x W x H | mm | 2785 x 2650 x 2750 | 3065 x 2650 x 2750 | 3450 x 2600 x 2750 |
| Weight approx. | kg | 4400 | 5300 | 5600 |

* for HEIDENHAIN TNC640 / ** second pocket empty / *** acc. to PN-ISO 230-2

**STANDARD:**

- Linear roller guide for all axes
- Directly controlled ball screws on all three axes
- Automatic tool changer
- Fully enclosed workspace
- Lighting system with lamp
- Ethernet, USB
- Spindle thermal stabilization
- Complete cooling system
- Coolant gun and air gun
- Chip flushing system
- Electronic handwheel
- Worm chip conveyor
- Telescopic covers for all lines
- Pulling pins 6 pieces
- Instructions for use and programming

**OPTION:**

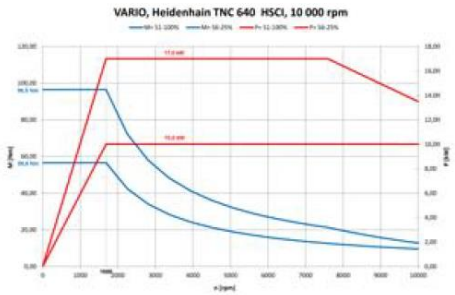
- Heidenhain linear scales for all three axes
- Workpiece and tool probe
- CTS spindle cooling (20 - 70 bar)
- ATS spindle cooling (5 bar)
- Air cooling of the tool (5bar)
- CNC rotary table (4th and 5th axis)
- Hinge or scraper type chip conveyor
- CAD / CAM software
- Pallet exchange system
- Paper or magnetic - paper filter
- Oil separator
- Oil mist collection
- others on request

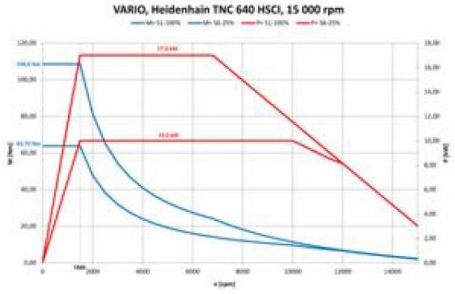
# VARIO SERIE

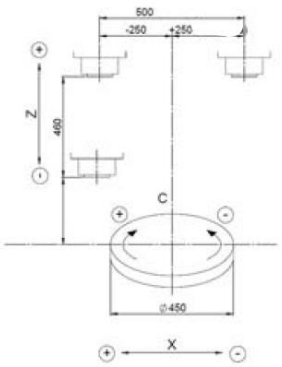
## Continuous 5-axis Machining solution

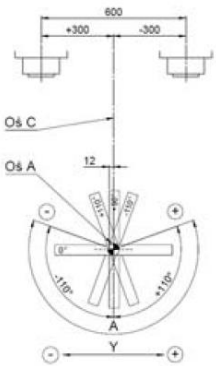

## VARIO SERIES

The ideal solution for 5-axis continuous machining thanks to:
- rotary and tilting table diameter 450 mm with a load capacity of 400 kg
- directly driven tilted (A) and rotary (C) axes by a torque motor for peak dynamics
- precise Heidenhain encoders ± 5 arc. sec. built-in centres of rotary axes for the highest accuracy
- wide selection of spindles from 10,000 to 24,000 rpm. for different machining requirements
- acceleration in X / Y / Z axes up to 0.5 G, rapid traverse 42 m / min for maximum productivity
- processing time of one block 0.5 ms,



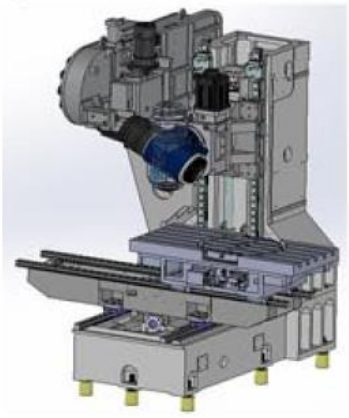
| Technical Data | | VARIO 5-axis | VARIO 5 HS 5-axis |
|---|---|---|---|
| **TABLE:** | | | |
| Table size | mm | Ø 450 | Ø 450 |
| T-slots: number / size / height | mm | 6 / 14 / 60° | 6 / 14 / 60° |
| Load capacity of the table | kg | 400 | 400 |
| Distance spindle table | mm | 288 | 288 |
| **POJEZDY:** | | | |
| Longitudinal X | mm | 500 (580) | 500 (580) |
| Transverse Y | mm | 600 | 600 |
| Vertical Z | mm | 460 | 460 |
| Tilt (A) | deg. | +110° / -110° | +110° / -110° |
| Rotation (C) | deg. | 360° | 360° |
| **STANDARD SPINDLE:** | | **Belt drive** | **Electro spindle** |
| Spindle speed | rpm | 10 000 | 24 000 |
| Spindle taper | | ISO 40 | HSK63A |
| Power S1 / S6 (25%) * | kW | 10 / 17 | 16/30 |
| Torque S1 / S6 (25%) * | Nm | 56 / 96 | 67/125 |
| Distance spindle table | mm | 115 – 575 | 110-570 |
| Distance spindle table to tilting axis | mm | 127 – 587 | 122-582 |
| **OPTION SPINDLE:** | | **Belt drive** | **Electro spindle** |
| Spindle speed | rpm | 15 000 | 18 000 |
| Spindle taper | | ISO 40 | HSK63A |
| Power S1 / S6 (25%) * | kW | 10 / 17 | 25/43 |
| Torque S1 / S6 (25%) * | Nm | 64 / 108 | 86/120 |
| Distance spindle table | mm | 115 – 575 | 110-570 |
| Distance spindle table to tilting axis | mm | 127 – 587 | 122-582 |
| **TOOL CHANGER:** | | | |
| Tool changer type | | Swing arm ATC (cam) | |
| Number of tool positions | pcs | 30 | 30 |
| Tool change time - tool | sec | 2,0 | 2,0 |
| Max. tool diameter | mm | 85 / 130** | 85 / 130** |
| Max. tool weight | kg | 7 | 7 |
| Max. tool length | mm | 300 | 300 |
| **FEEDS:** | | | |
| Feeds X / Y / Z | m / min. | 0 – 42 / 42 / 42 | 0 – 42 / 42 / 42 |
| Rapid feeds X / Y / Z | m / min. | 42 / 42 / 42 | 42 / 42 / 42 |
| Speed of tilting and rotary (A/C) axes | rpm. | 60 / 120 | 60 / 120 |
| Continuous torque for tilting and rotary (A/C) axes | Nm | 685/231 | 685/231 |
| Clamping torque for tilting and rotary (A/C) axes | Nm | 2500/1250 | 2500/1250 |
| **CNC SYSTEM:** | | | |
| Standard | HEIDENHAIN | TNC 640 HSCI; 19" TFT | TNC 640 HSCI; 19" TFT |
| **GENERAL INFORMATION:** | | | |
| Positioning accuracy *** | mm | ± 0,005 | ± 0,005 |
| Repeatable accuracy *** | mm | 0,005 | 0,005 |
| Positioning accuracy of rotary axes*** | sec. | ±5“ | ±5“ |
| Repeatable accuracy of rotary axes *** | sec. | 2“ | 2“ |
| Total power consumption | kVA | 35 | 45 |
| Dimensions: L x W x H | mm | 3065 x 2650 x 2750 | 3065 x 2650 x 2750 |
| Weight approx. | kg | 5300 | 5300 |

* for HEIDENHAIN TNC640 / ** second pocket empty / *** acc. to PN-ISO 230-2

| **STANDARD:** | |
|---|---|
| Linear roller guide for all three axes | Complete cooling system |
| Directly controlled ball screws on all three axes | Chip flushing system |
| Automatic tool changer | Chip conveyor |
| Fully enclosed workspace | Coolant gun and air gun |
| Lighting system with lamps | Software option 1 + 2 TNC 640 HSCI |
| Ethernet, USB | Telescopic covers for all lines |
| Electronic handwheel | Pull-out pins 6 pieces for ISO 40 spindle |
| Thermal stabilization of the spindle and the rotary and tilting table | Instructions for use and programming |
| **OPTION:** | |
| Heidenhain linear rulers for all three axes | Air cooling of the tool (5bar) |
| Workpiece and tool probe | Hinge or scraper type chip conveyor |
| CTS spindle cooling (20 - 70 bar) | CAD / CAM software |
| ATS spindle cooling (5 bar) | More on request |

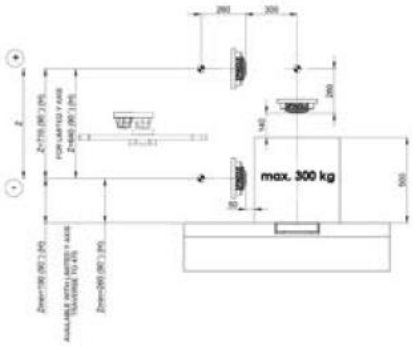
# X-5 SERIES

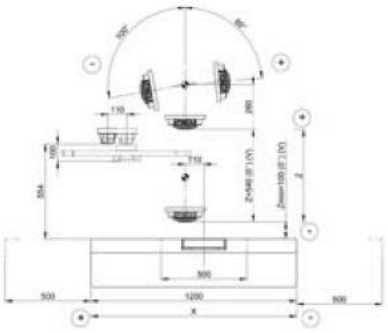
## universal 5-axis machining centres with swivel head and rotary table

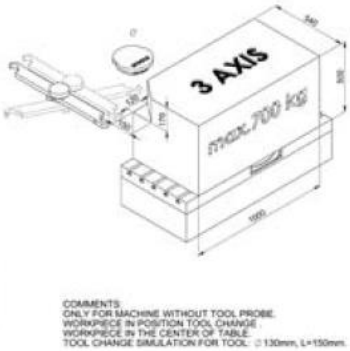



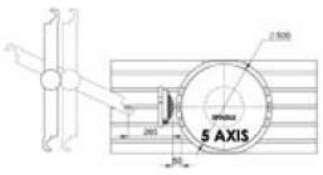
### X-5 SERIES

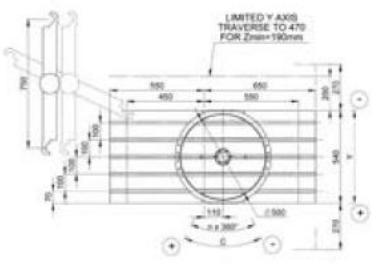
The most versatile 5-axis machining centre for your operation
- continuously controlled rotating head with a powerful electric spindle
- large diameter of the built-in rotary table 500 mm
- precise Heidenhain encoders +/- 5 arc.sec. built into rotary axes for the highest accuracy
- spacious work surface allows machining of large workpieces
- 5-axis machining of medium-sized workpieces or 4-axis machining of large workpieces
- heavy duty workbench
- processing time of one block 0.5 ms, for CAM created by 5-axis programming

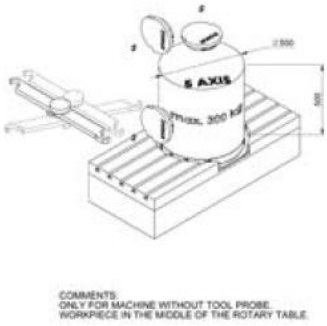




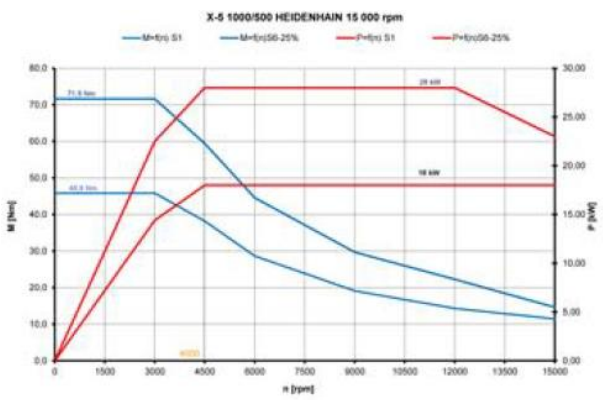



| Technická Data | | X-5 1000/500 |
|---|---|---|
| **TABLE:** | | |
| Table size | mm | 1200 x 540 / Ø 500 |
| T-slots: number / size / height | mm | 5 / 18 / 100 |
| Load capacity of the table / rotary | kg | 700 / 300 |
| **TRAVELS:** | | |
| Longitudinal X | mm | 1000 |
| Transverse Y | mm | 540 |
| Vertical Z | mm | 540 (V) / 640 (H) |
| Swivel head (B) | deg. | +110 / -85° |
| Rotary table (C, or A) | deg. | 360° vertical axis (C) |
| Distance spindle table | mm | 100 – 640 |
| Distance spindle table to tilting 90 deg | mm | 260 – 900 |
| **ELECTRO SPINDLE 15 000 RPM** | | |
| Spindle speed | rpm | 15 000 |
| Spindle taper | | ISO 40 |
| Power S1 / S6 (25%) * | kW | 18/28 |
| Torque S1 / S6 (25%) * | Nm | 45/71 |
| **TOOL CHANGER:** | | |
| Tool changer type | | Swing arm ATC (chain) |
| Number of tool positions | pcs | 40 |
| Max. tool diameter | mm | 76 / 127 ** |
| Max. tool length | mm | 300 |
| Max. tool weight | kg | 7 |
| **FEEDS:** | | |
| Feeds X / Y / Z | m / min. | 0 – 35 / 35 / 35 |
| Rapid feeds X / Y/ Z | m / min. | 35 / 35 / 35 |
| Speed of B and C (A) | rpm. | 30 / 100 |
| Continuous torque for tilting and rotary (A/C) axes | Nm | 520 / 231 |
| Clamping torque for tilting and rotary (A/C) axes | Nm | 1500 / 1250 |
| **CNC SYSTEM:** | | |
| Standard | HEIDENHAIN | TNC 640 HSCI; 19"TFT |
| **GENERAL INFORMATION:** | | |
| Positioning accuracy *** | mm | ± 0,005 |
| Repeatable accuracy *** | mm | 0,005 |
| Positioning accuracy of rotary axes*** | sec. | ± 5" |
| Total power consumption | kVA | 50 |
| Dimensions: L x W x H | mm | 3065 x 2650 x 2750 |
| Weight approx. | kg | 5 500 |

* for HEIDENHAIN TNC640 / ** second pocket empty / *** acc. to PN-ISO 230-2

| **STANDARD:** | |
|---|---|
| Heidenhain rulers for all 3 axes and encoders for rotary axes | Thermal stabilization of the spindle and rotary table |
| Roller linear guide for all three axes | Complete cooling system |
| Directly controlled ball screws on all three axes | Chip flushing system |
| Automatic tool changer | Conveyor system for chip evacuation |
| Fully enclosed workspace | Coolant gun and air gun |
| Lighting system with lamps | Option 1 + 2 software for TNC 640 |
| Ethernet, USB and RS 232 port | Telescopic covers for all lines |
| Electronic handwheel | Instructions for use and programming |
| **OPTION:** | |
| CTS spindle centre cooling (20 - 70 bar) | Tool probe |
| Air cooling of the tool (5bar) | Workpiece probe |
| Cooling of the tool with oil mist | CAD / CAM software |
| Dynamic Collision Control (DCM) | More on request |



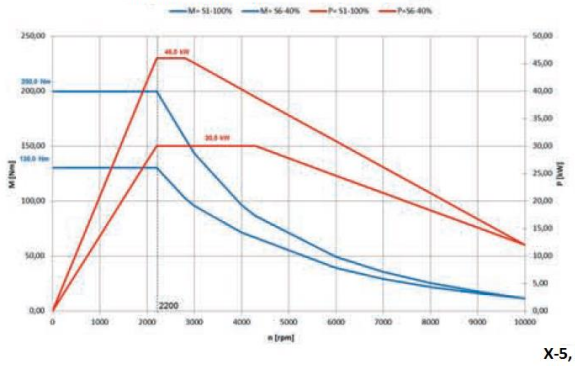
# X-5 SERIES

## universal 5-axis machining centres with swivel head and rotary table

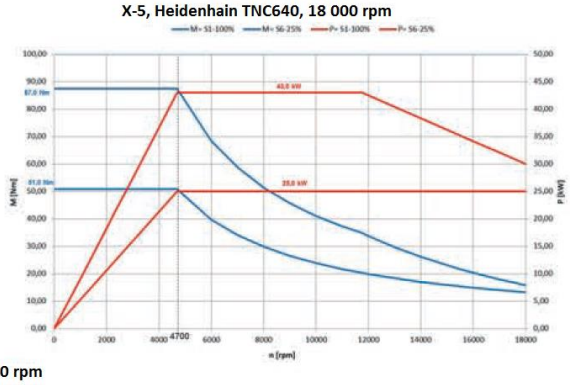

## X-5 SERIES

The most versatile 5-axis machining centre for your operation
- continuously controlled rotating head with powerful motor spindles
- large diameter of the built-in rotary table 630 mm, or 400 mm with a horizontal axis
- precise Heidenhain encoders +/- 5 arc. sec. built-in centres of rotary axes for the highest accuracy
- spacious work surface allows machining of large workpieces
- 5-axis machining of medium-sized workpieces or 4-axis machining of large workpieces
- heavy duty worktable, maximum load
- processing time of one block 0.5 ms, for CAM created by 5-axis programming
- possibility of turning - machining for the most versatile X-5 MILLturn

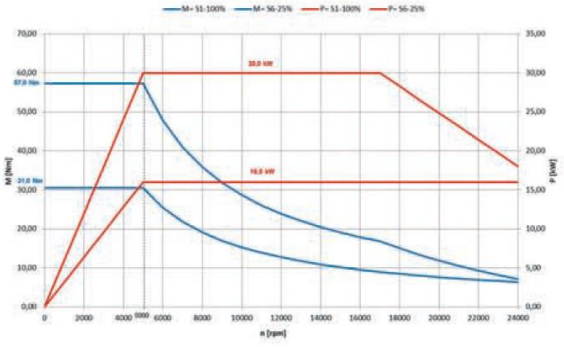
X-5, Heidenhain TNC640, 18 000 rpm



X-5, Heidenhain TNC640, 18 000 rpm



X-5, Heidenhain TNC640, 24 000 rpm

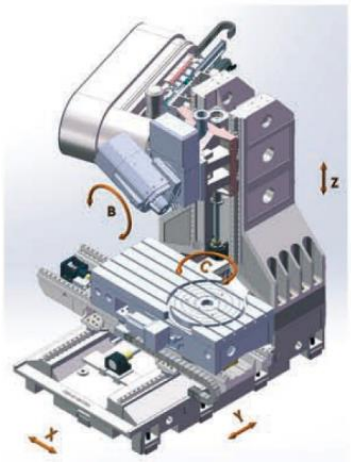


| Technical Data | | X-5 1300/630 | X-5 1300/400 Blademaker | X-5 MILLturn |
|---|---|---|---|---|
| **TABLE:** | | | | |
| Table size | mm | 1500 x 710 / Ø 630 | 1500 x 710 / Ø 400 | 1500 x 710 / Ø 630 |
| T-slots: number / size / height | mm | 5 / 18 / 125 | 5 / 18 / 125 | 5 / 18 / 125 |
| Load capacity of the table / rotary | kg | 1000 / 700 | 1000 / 400 | 1000 / 500 |
| **TRAVELS:** | | | | |
| Longitudinal X | mm | 1300 | 1300 | 1300 |
| Transverse Y | mm | 700 | 700 | 700 |
| Vertical Z | mm | 710 | 810 | 710 |
| Swivel head (B) | deg. | +115 / -85° | +115 / -85° | +115 / -85° |
| Rotary table (C, or A) | deg. | 360° | 360° | 360° |
| Distance spindle table | mm | 90 – 800 | 219 – 929 | 90 – 800 |
| Distance spindle table to tilting 90 deg | mm | 260 – 970 | 389 – 1099 | 260 – 970 |
| **ELECTROSPINDLE 18 000 rpm** | | | | |
| Spindle speed | rpm. | 18 000 | 18 000 | 18 000 |
| Spindle taper | | HSK63A | HSK63A | HSK63A |
| Power S1 / S6 (25%) * | kW | 25 / 43 | 25 / 43 | 25 / 43 |
| Torque S1 / S6 (25%) * | Nm | 86 / 146 | 86 / 146 | 86 / 146 |
| **ELECTROSPINDLE 10 000 rpm – Option** | | | | |
| Spindle speed | rpm. | 10 000 | 10 000 | 10 000 |
| Spindle taper | | HSK63A | HSK63A | HSK63A |
| Power S1 / S6 (25%) * | kW | 30 / 46 | 30 / 46 | 30 / 46 |
| Torque S1 / S6 (25%) * | Nm | 130 / 200 | 130 / 200 | 130 / 200 |
| **ELECTROSPINDLE 24 000 rpm – Option** | | | | |
| Spindle speed | rpm. | 24 000 | 24 000 | 24 000 |
| Spindle taper | | HSK63A | HSK63A | HSK63A |
| Power S1 / S6 (25%) * | kW | 16 / 30 | 16 / 30 | 16 / 30 |
| Torque S1 / S6 (25%) * | Nm | 67 / 125 | 67 / 125 | 67 / 125 |
| **TOOL CHANGER:** | | | | |
| Tool changer type | | | swing arm ATC (chain) | |
| Number of tool positions | pcs | 40 | 40 | 40 |
| Max. tool diameter | mm | 75 / 150** | 75 / 150** | 75 / 150** |
| Max. tool length | kg | 8 | 8 | 8 |
| Max. tool weight | mm | 300 | 300 | 300 |
| **FEEDS:** | | | | |
| Feeds X / Y / Z | m / min. | 0 – 24 / 24 / 24 | 0 – 24 / 24 / 24 | 0 – 24 / 24 / 24 |
| Rapid feeds X / Y/ Z | m / min. | 24 / 24 / 24 | 24 / 24 / 24 | 24 / 24 / 24 |
| Speed of B and C (A) | rpm. | 33,3 / 25 | 33,3 / 16,7 (A) | 33,3 / 500 |
| Continuous torque for tilting and rotary (A/C) axes | Nm | 1 500 / 1 800 (C) | 1 500 / 800 (A) | 1 500 / 1 800 (C) |
| Clamping torque for tilting and rotary (A/C) axes | Nm | 3 000 / 4 500 (C) | 3 000 / 2 000 (A) | 3 000 / 4 500 (C) |
| **CNC SYSTEM:** | | | | |
| Standard | HEIDENHAIN | TNC 640 HSCI; 19"TFT | TNC 640 HSCI; 19"TFT | TNC 640 HSCI; 19"TFT |
| Option | SIEMENS | 840D SL 19" | 840D SL 19" | - |
| **GENERAL INFORMATION:** | | | | |
| Positioning accuracy *** | mm | ± 0,005 | ± 0,005 | ± 0,005 |
| Repeatable accuracy *** | mm | 0,005 | 0,005 | 0,005 |
| Positioning accuracy of rotary axes*** | sec. | ± 5" | ± 5" | ± 5" |
| Total power consumption | kVA | 65 | 65 | 65 |
| Dimensions: L x W x H | mm | 3500 x 4100 x 3200 | 3500 x 4100 x 3200 | 3500 x 4100 x 3200 |
| Weight approx. | kg | 12 800 | 12 800 | 12 800 |

* for HEIDENHAIN TNC640 / ** second pocket empty / *** acc. to PN-ISO 230-2

| **STANDARD:** | |
|---|---|
| Heidenhain rulers for all 3 axes and encoders for rotary axes | Thermal stabilization of the spindle and rotary table |
| Roller linear guide for all three axes | Complete cooling system |
| Directly controlled ball screws on all three axes | Chip flushing system |
| Automatic tool changer | Conveyor system for chip evacuation |
| Fully enclosed workspace | Coolant gun and air gun |
| Lighting system with lamps | Option 1 + 2 software for TNC 640 |
| Ethernet, USB and RS 232 port | Telescopic covers for all lines |
| Electronic handwheel | Instructions for use and programming |
| **OPTION:** | |
| CTS spindle centre cooling (20 - 70 bar) | Tool probe |
| Air cooling of the tool (5bar) | Workpiece probe |
| Cooling of the tool with oil mist | CAD / CAM software |

# DISCOVER BASIC VERSIONS OF MACHINE SERIES X-5



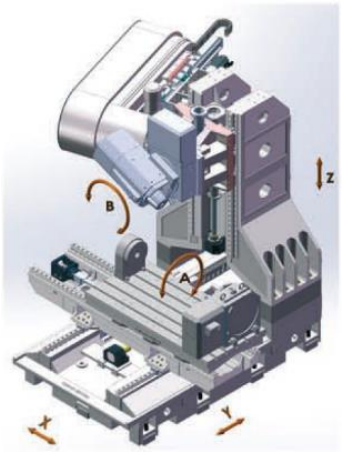

## X-5 1300/630

4 axis solves the rotation of a large rotary table with a diameter of 630 mm built into a straight table 1500x710 mm

The 5th axis is provided by a continuously controlled tilting head with a built-in electric spindle. Tilt range +115 / -85st.

This solution increases the versatility of using this machining centre. 4-axis machining of large workpieces and 5-axis machining of medium-sized workpieces on one machine.

This machine is ideally suited for machining complicated workpieces as well as mold making.




## X-5 1300/400 BLADEMAKER

4 axis solves the rotation of a large rotary table with a diameter of 400 mm (horizontal axis) mounted on a flat table 1500x710 mm

The 5th axis is provided by a continuously controlled tilting head with a built-in electric spindle. Tilt range +115 / -85st.

This model is made for processing blade-shaped workpieces for various types of turbines

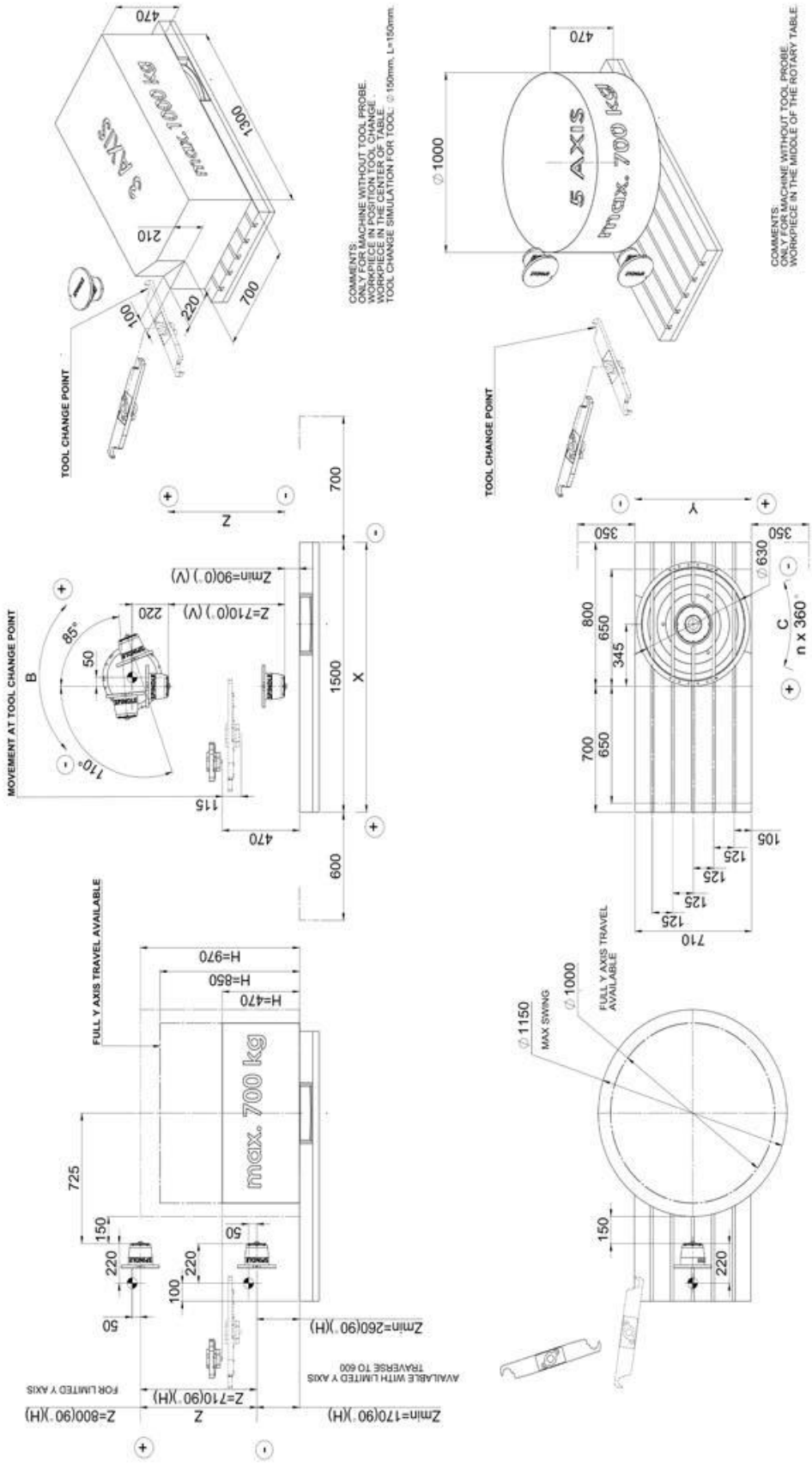
The machine can also be used for 4-axis machining of large molds as well as press tools if the rotary table is removed from a straight table.

## X-5 MILLturn

### FOR MILLING AND TURNING

CNC swivel head with electric spindle 18,000 rpm with built-in brakes and mechanical lock in three positions for the B axis as standard.
CNC rotary table (C axis) with a diameter of 630 mm driven by a torque motor with a maximum speed of 500 rpm.

Application: Shooting without the need to remove details from the machine. Perform planning, internal and external turning, chamfering and grooving directly in the machining centre. All thanks to the best components and the TNC 640 control


5 AXIS
max. 700 kg
TOOL CHANGE POINT
COMMENTS:
ONLY FOR MACHINE WITHOUT TOOL PROBE
WORKPIECE IN POSITION TOOL CHANGE
WORKPIECE IN THE CENTER OF TABLE
TOOL CHANGE SIMULATION FOR TOOL: ⌀150mm, L=150mm
MOVEMENT AT TOOL CHANGE POINT
FULL Y AXIS TRAVEL AVAILABLE
FOR LIMITED Y AXIS
AVAILABLE WITH LIMITED Y AXIS
TRAVERSE TO 600
MAX SWING
FULL Y AXIS TRAVEL AVAILABLE
COMMENTS:
ONLY FOR MACHINE WITHOUT TOOL PROBE
WORKPIECE IN THE MIDDLE OF THE ROTARY TABLE

# Discover more technological capabilities...

## Automatic measuring solutions

A selection of tool and workpiece probes are available from reliable leading suppliers:
- tool touch probes (infrared and with cable)
- automatic workpiece probes
- laser tool probes
-separate measuring stations acc. to customer requirements

## Efficient chip management

The effective chip removal system should be set according to the type of materials used and the type of chips.
The standard screw conveyor can be replaced by:
- scraper type chip conveyor
- hinge type chip conveyor

### Hinge type

### Scraper type

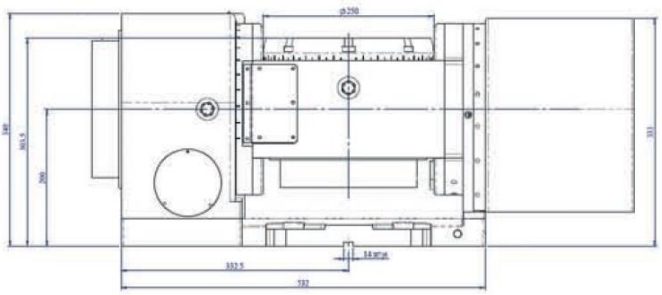
## Selection of rotary tables -4th axis

Reliable solution for demanding applications.
- 4th axis with table diameter 150 to 400 mm
- worm gear / transmission for high torque
- torque motors for high-speed and special applications (including turbine blade drive)

dia 350 mm dia 250 mm dia 200 mm torque motor table

## Rotary-tilting table 4th and 5th axis

Original equipment from AVIA expands the possibilities of Vertical Machining Centres with additional technologies and efficiency. A rotary tilting table (4th and 5th axis options) with a diameter of 200 mm can be installed along the Y axis to save working space.



# …thanks to optional equipment available with your AVIA machine tools

## Never ending options list

Spindle cooling (CTS) 20 bar or 70 bar with coolant tank.

Air-cooled spindle (ATS) and air-cooled tool (5bar)

Separation filter station with paper filter

Water curtain around the spindle for dusty material, eg graphite

Separation of oil mist from the working space with air filtration

The mechanical oil separator extends the life of the coolant

Thermal stabilization of the spindle with heatsink

Preparation of robotics and automation for serial production

CTS 20 bar or CTS 70 bar

water curtain around spindle

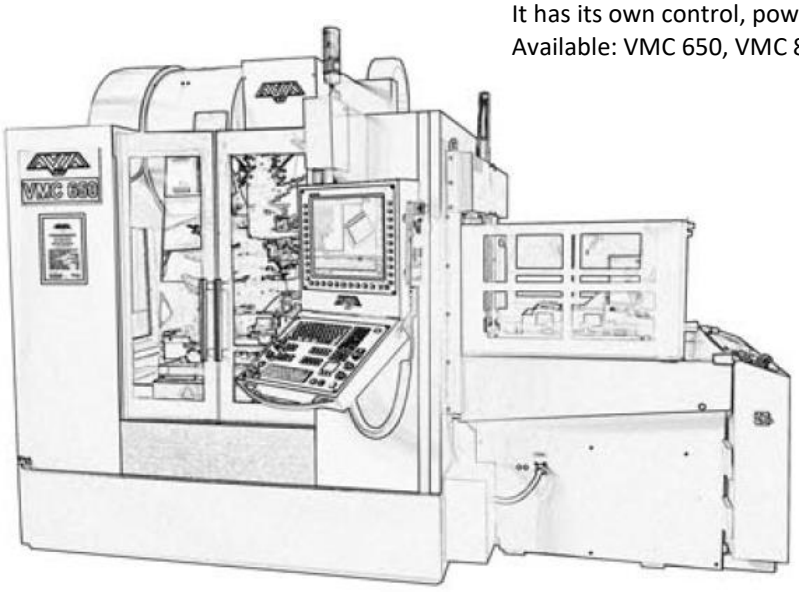
paper filter

oil mist separate

dedicated technological solutions

## Pallet changer for simplest automation

Automate your production with a reliable and fast solution.
Pallet changer can be ordered with the machine or added to your existing solution.
It has its own control, power supply and air connection.
Available: VMC 650, VMC 8000, VMC 1000



## Main technical data

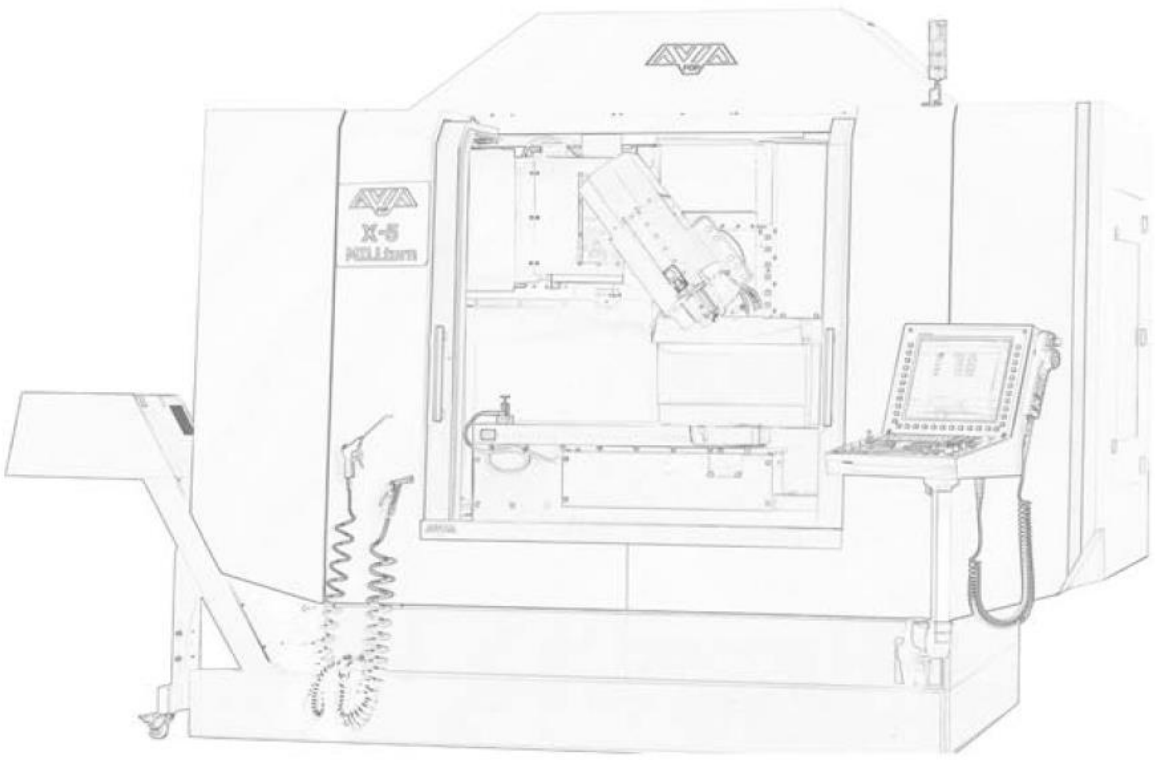
Pallet size: 800 x 490 mm

Number of pallets: 2 pieces

Pallet change time: 15 s

Load capacity: 450 kg / skin

Pallet top: tapped holes M12 - 35 pieces
optional T-slots available




Company management and production:

**FABRYKA OBRABIAREK PRECYZYJNYCH AVIA S. A.**
Ul. Siedlecka 47
03-768 Warsaw
Poland
+48 22 818 62 11
market@avia.com.pl
www.avia.com.pl

Sales representation:

**PILART stroje a.s.**
Ericha Roučky 2499/11
678 01 Blansko
Czech Republic
+420 739 510 561
info@avia-cnc.cz
www.avia-cnc.cz