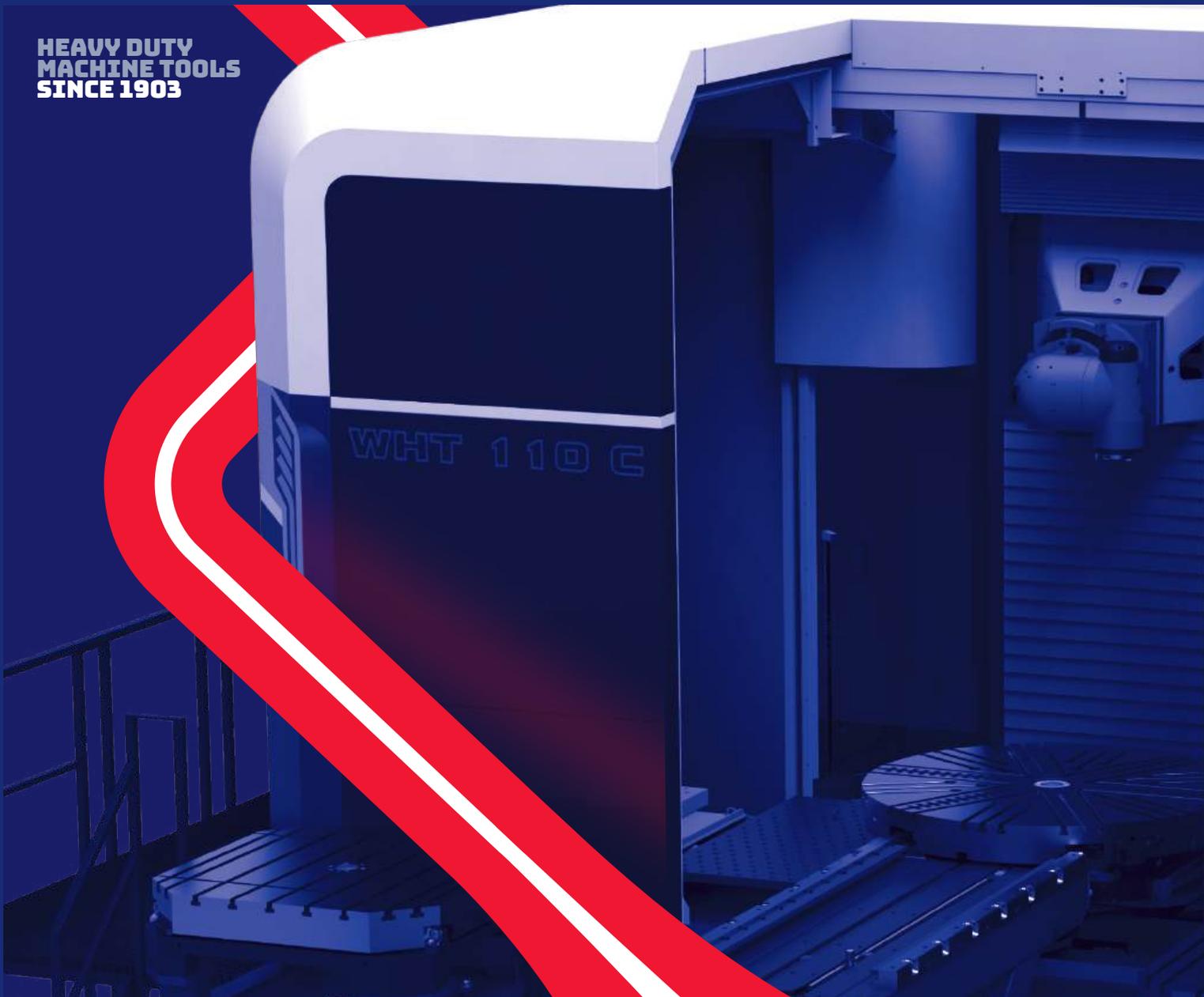


**HEAVY DUTY
MACHINE TOOLS
SINCE 1903**



PRODUCTION PROGRAMME

HORIZONTAL MACHINING CENTERS

HORIZONTAL BORING MILLS

PORTAL MILLING MACHINES



**VARNSDORF
TOS**

1903

The company
was established

53,7

Milion EUR was the annual
turnover of the company
for the year 2022

30

Football pitches
would fit on the land
of TOS VARNSDORF a.s.

418

Is the number
of employees

19 951

Machines sold
between 1941 and 2022

7

Subsidiaries
companies around
the world

0,01

Machine accuracy
in the order of hundreds
of a millimeter

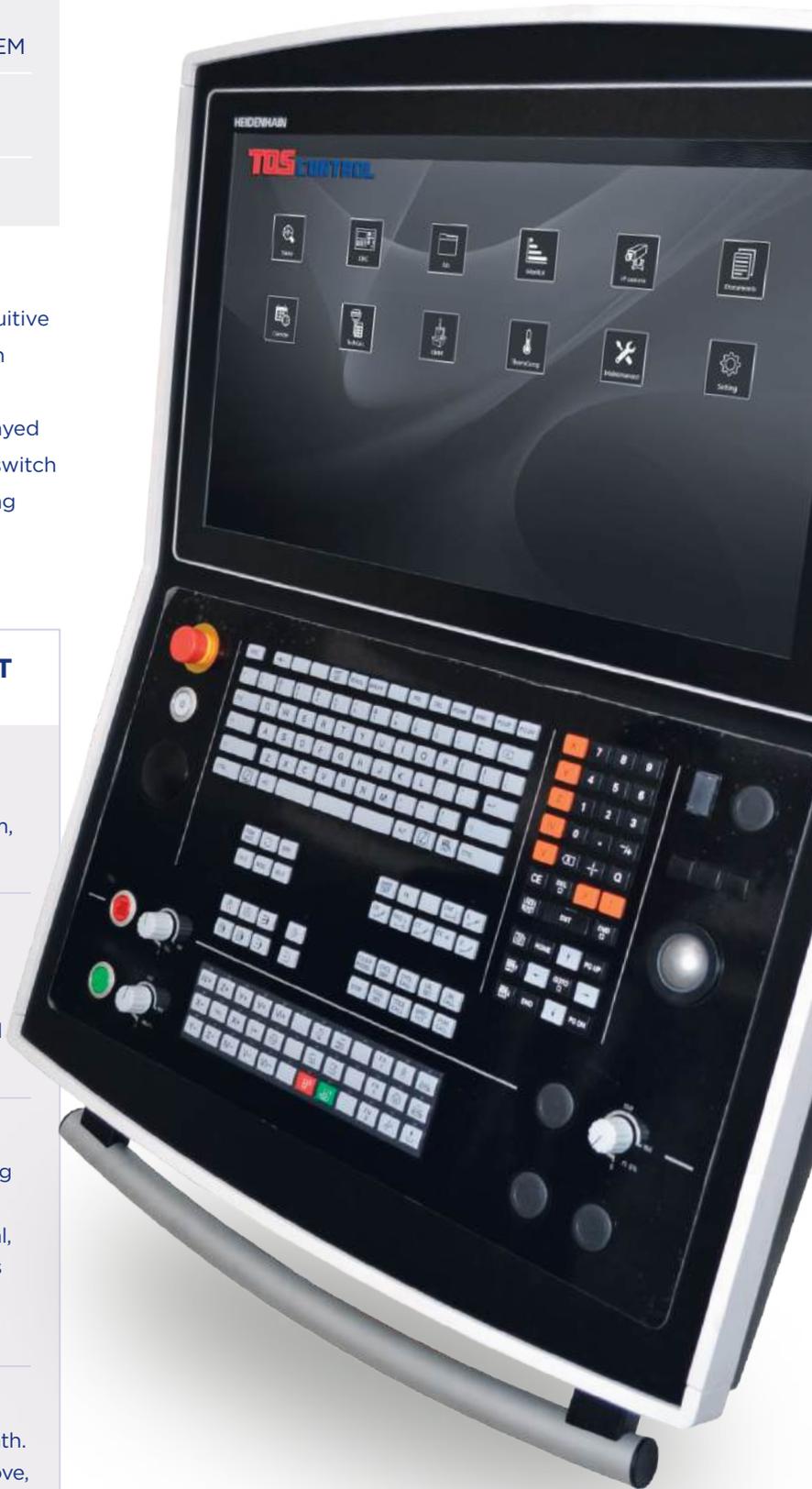


TOScontrol

MAIN ADVANTAGES OF THE SYSTEM

- ➔ ON-LINE DATA EXCHANGE WITH ERP SYSTEM
- ➔ SPECIALIZED APPS FOR EXTENSION OF FUNCTIONALITIES
- ➔ USER-FRIENDLY CONTROLS

TOScontrol is a set of applications and functions for advanced machine management. For easy and intuitive operation, the system consists of a default screen with icons for each application (similar to mobile device operating systems). The applications are clearly displayed on the machine's control panel and the operator can switch between them easily. The solution also includes, among other things, user account management. **TOScontrol** is part of the standard equipment of all machines.



STANDARD MACHINE EQUIPMENT



STATUS SCREEN

Clearly displays basic information about the machine (coordinates, program, alarms, logged in user, etc.).



CNC CONTROL SYSTEM

Displays the standard control system screen supplemented by a sidebar with a button for returning to the TOS Control default screen.



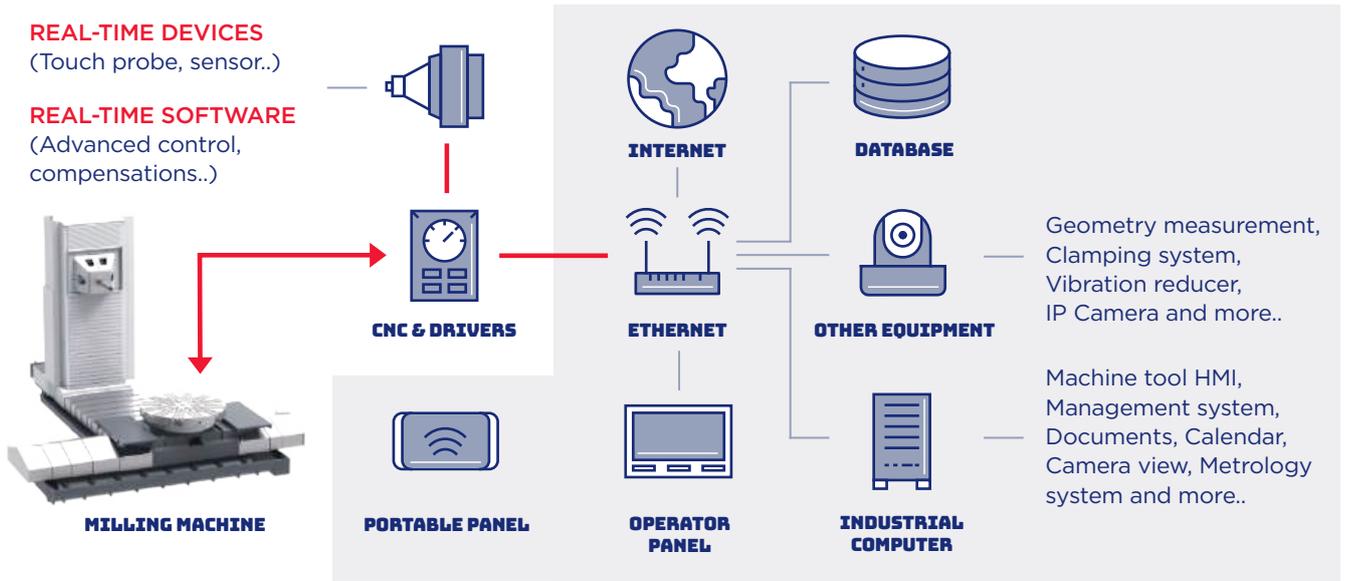
DOCUMENTATION

This is an application enabling the reading and management of PDF documents (e.g. operating instructions, repair manual, etc.), including the creation of user rights and the creation of tabs and notes in documents.



CALENDAR

Standard calendar view - day, week, month. Event/ service event - add, change, remove, remind. All data stored in the local database.



OPTION APPLICATIONS

Not included in standard TOS equipment.



IP CAMERA

The application enables control of one or more motorised cameras located on any part of the machine. Data from the camera can also be used to facilitate machine operation.



INSPECTION AND COMPENSATION

This is metrological software integrated into the control system, which together with the touch probe allows the work-piece to be measured accurately and directly on the machine making it possible to perform the automatic compensation of errors and program debugging.



JOB – WORK ADMINISTRATOR

Displays the work order view and the overview of operations directly on the machine tool control panel, which is linked to the ERP system. It is also possible to add other documents into the application, e.g., operation description, photographs, tables of NC programs.



MACHINE MONITOR

An integrated system for monitoring the history of machine tool use. This system displays the time axis of basic machine states, e.g., ready, production, production slowdown, error, off, etc.

UPCOMING APPLICATIONS

Apps we are currently developing.



TECHNOLOGICAL CALCULATOR

A technology consultant for a selected tool that facilitates the selection and control of cutting conditions and provides optimal utilisation of the tool properties.



THERMAL COMPENSATION

This is an application that depicts a virtual model of the machine tool's thermal behaviour and comparison of previously measured thermal deformation with the current thermal conditions of the machine. Based on this comparison, the application compensates the actual thermal deformation of the machine.



PREDICTIVE MAINTENANCE

Expands the machine monitor application to enable service intervention prediction to decrease maintenance costs and prolong machine operation.



PORTAL MILLING MACHINES

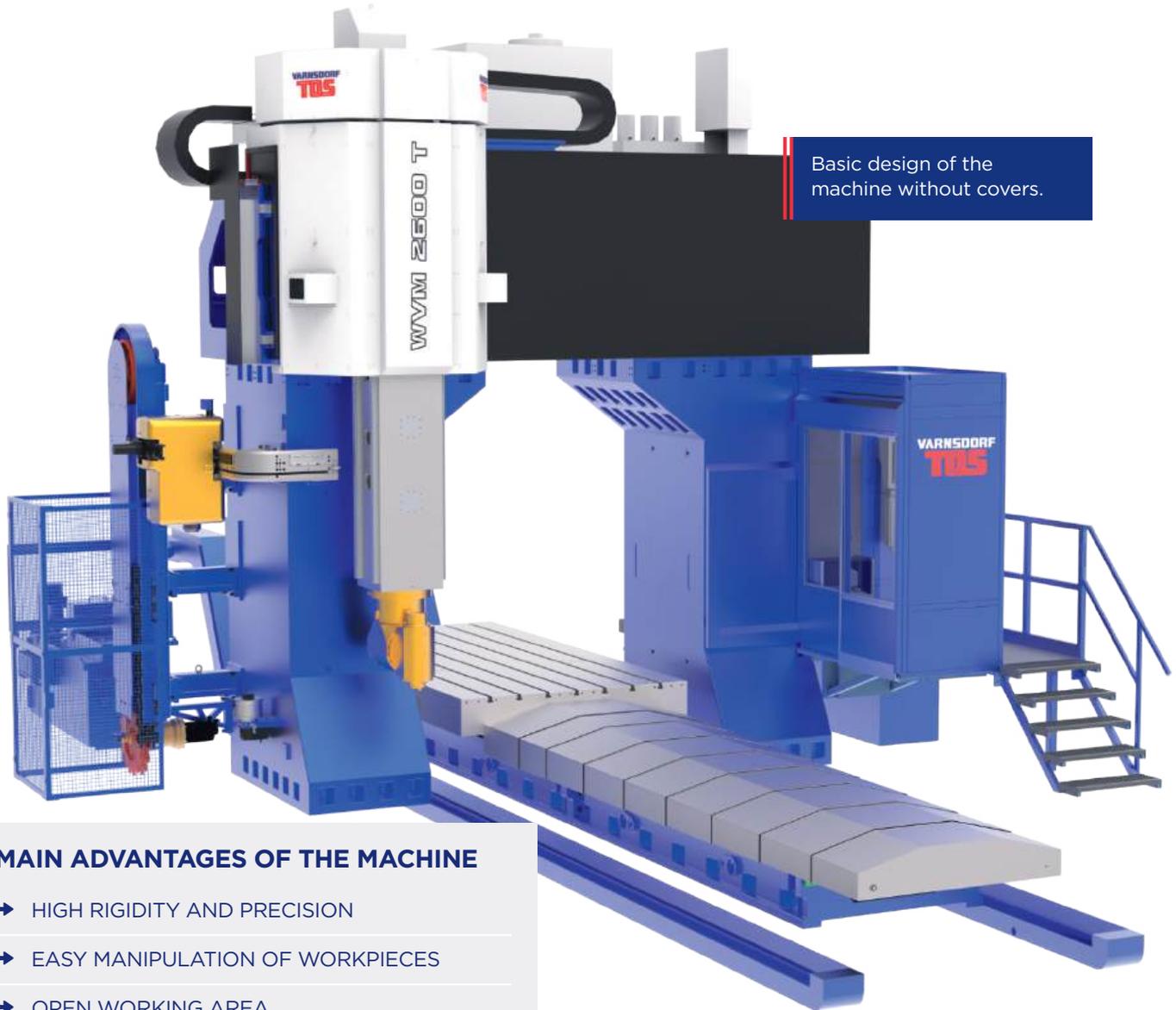
WVM 2600/3600 T

- expand production program to machines with a vertical axis of spindle
- versatile machines (like current horizontal machines), but are intended for "orthodox" customers (who for some reason prefer portal machines) who want a machine with a vertical axis of spindle - machining from the top
- high frame rigidity (closed sturdy portal) and excellent precision
- particularly suitable for the production of large rotating parts a rotary table and a vertical RAM (with a milling head/adapter) may be used
- open work space facilitates handling of workpieces by a crane



WVM 2600/3600 T

Basic design of the machine without covers.



MAIN ADVANTAGES OF THE MACHINE

- ➔ HIGH RIGIDITY AND PRECISION
- ➔ EASY MANIPULATION OF WORKPIECES
- ➔ OPEN WORKING AREA
- ➔ VERTICAL WORK AXIS OF SPINDLE
- ➔ TABLE LENGTH UP TO 10 m

Vertical machining centers of the **WVM 2600/3600 T** series are designed as a unified series of machines for universal machining of steel and cast iron parts especially in the general engineering segment. Thanks to its unique construction of a solid portal with a mobile headstock (Y), a vertically traveling RAM (Z) and a sliding table (X), the machines stand out with high precision and stiffness. The high installed output of the machine (53 kW) is especially designed for force and productive machining.

The machines can be equipped with different types of milling heads, which are automatically placed and thus enable even further extension of the technological possibilities of the machine. Machines can be supplemented by other types of accessories to increase machine efficiency, such as cooling system or tool change system.

Machine control is managed from the operators platform installed on the side of one of racks, and the machines can also be equipped with the covers around the table axis (X) to minimise chip flashing and fluid splashing.

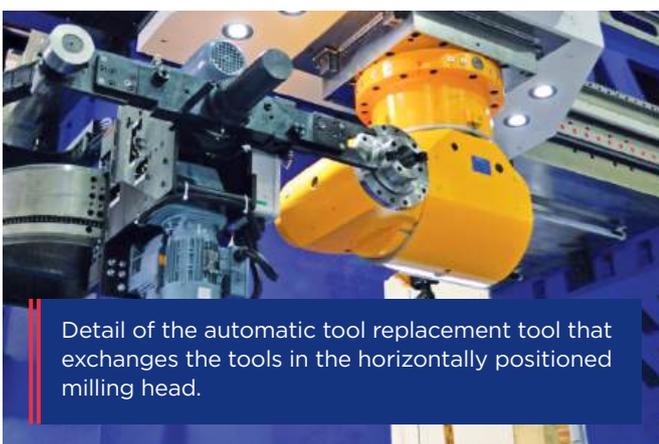
Total view of the machine with the horizontal travelling headstock and vertically traversing quill.



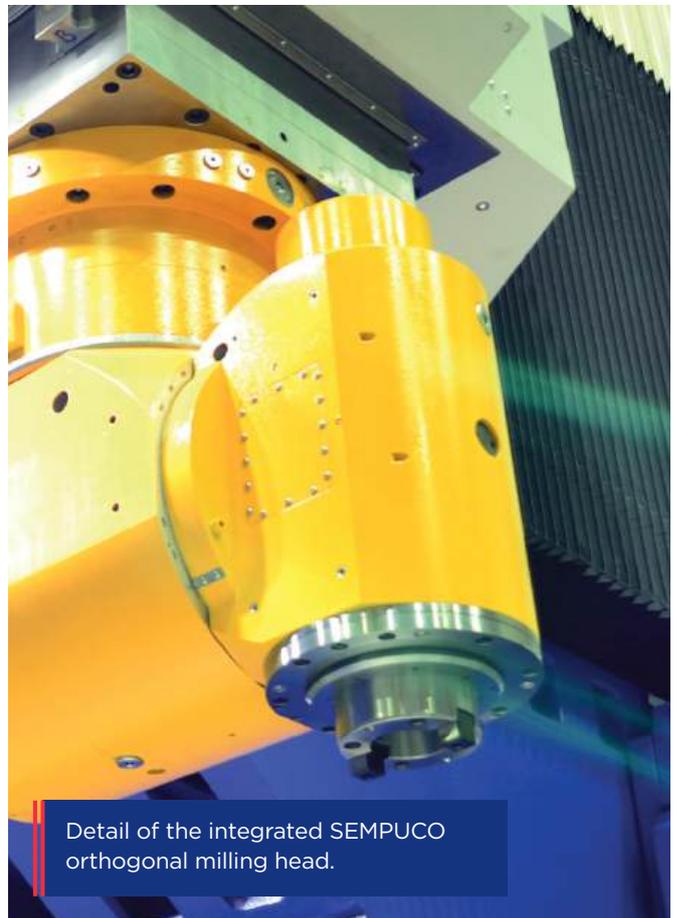
View of the orthogonal 2 axis automatically indexed milling head.



Detail of the automatic tool replacement tool that exchanges the tools in the horizontally positioned milling head.



Detail of the integrated SEMPUCO orthogonal milling head.



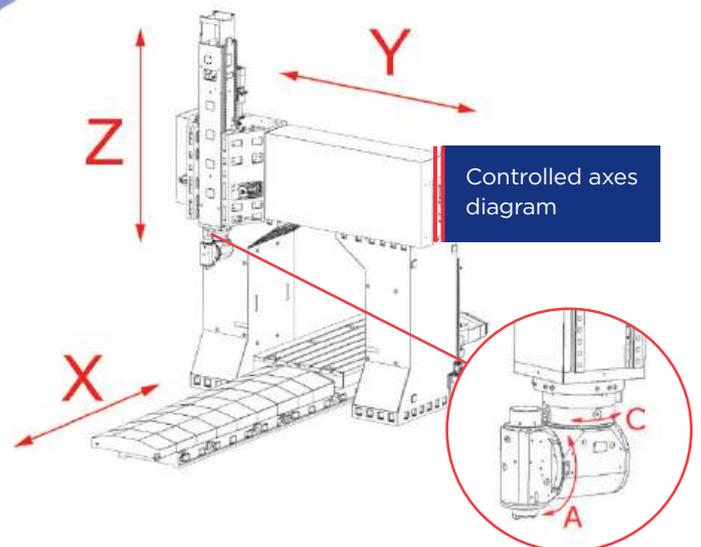


WVM 2600/3600 T

MACHINE CONFIGURATION

- + machine with integrated milling head
- + machine equipped with automatic tool exchanger
- + machine equipped with special accessory exchanger
- + wide range of work table designs

Basic design of the machine with covers.



TECHNICAL PARAMETERS

HEADSTOCK	WVM 2600 T		WVM 3600 T				
END OF THE RAM BY AN INTERFACE FOR APPLICATION OF TECHNOLOGICAL ACCESSORIES							
RAM size	mm (in)	500 x 500 (19.6850 x 19.6850)					
Main motor speed range	RPM	10-5,000					
Max. power of the main motor (S1)	kW (HP)	53 (72.1)					
Max. torque on driving shaft (S1)	Nm (ft lb)	1,375 (1,014.1)					
RAM stroke Z	mm (in)	1,500 (59.0551)					
Headstock vertical travel Y	mm (in)	3,200 (125.9843)			4,200 (165.3543)		
- with APC and ATC system	mm (in)	4,900 (192.9134)			5,900 (232.2835)		
HEADSTOCK WITH INTEGRATED ORTHOGONAL MILLING HEAD							
Spindle taper		ISO 50					
Max. spindle speed range	RPM	5,000					
Max. transmitted power	kW (HP)	40 (53.6)					
Max. torque on spindle	Nm (ft lb)	1,200 (885)					
Basic positioning increment of both dividing planes	°	1					
A-axis rotation range	°	±180					
C-axis rotation range	°	±180					
WORK TABLE FOR WVM 2600 T							
Table longitudinal traverse X	mm (in)	4,000, 5,000, 6,000, 7,000, 9,000, (157.4803, 196.8503, 236.2204, 275.5905, 354.3307)					
Distance between the columns	mm (in)	2,600 (102.3622)					
Width of table clamping area	mm (in)	2,000 (78.7401)					
Length of the table clamping area	mm (in)	3,000 (118.1102)	4,000 (157.4803)	5,000 (196.8503)	6,000 (236.2204)	8,000 (314.9606)	-
Maximum workpiece weight	tonnes (tons)	16 (17.6)	20 (22)	24 (26.5)	28 (30.9)	36 (39.7)	-
Size of the clamping T-slots	mm (in)	28H8 (1.1023)					
Spacing of the clamping T-slots	mm (in)	250 (9.8425)					
WORK TABLE FOR WVM 3600 T							
Table longitudinal traverse X	mm (in)	4,000, 5,000, 6,000, 7,000, 9,000, 11,000 (157.4803, 196.8503, 236.2204, 275.5905, 354.3307, 433.0708)					
Distance between the columns	mm (in)	3,600 (141.7322)					
Width of table clamping area	mm (in)	3,000 (118.1102)					
Length of the table clamping area	mm (in)	3,000 (118.1102)	4,000 (157.4803)	5,000 (196.8503)	6,000 (236.2204)	8,000 (314.9606)	10,000 (22,046.2)
Maximum workpiece weight	tonnes (tons)	20 (22)	24 (26.5)	28 (30.9)	32 (35.3)	40 (44.1)	40 (44.1)
Size of the clamping T-slots	mm (in)	28H8 (1.1023)					
Spacing of the clamping T-slots	mm (in)	250 (9.8425)					
FEEDS							
Range of feeds (working and rapid traverse) - X, Y, Z	mm/min (ipm)	1-25,000 (0.0393-984.2519)					
Max. traverse forces in the X, Y, Z, W axes	kN (lbf)	20 (4,496.2)					
AUTOMATIC TOOL CHANGE (ATC)							
Number of storage sites - chain type magazine	pcs	60, 80, 120					
Tool change time	s	20					



WVM 2600/3600 T

X, Y, Z AXES DRIVES

The drives of all linear axes are equipped with separate electric regulating actuators. The Z axis is driven via a ball screw with pre-loaded nuts. The X and Y axes are driven via a rack and two pre-loaded pinion gears controlled by a Master & Slave system.



MACHINE FRAME

The frame consists of a bed with a travelling table, above which a transversely housed headstock moves on the crossbeam that is attached to two vertical stands. All the frame parts are designed as rigid and optimally sized castings.



GUIDING OF MOVEABLE GROUPS

Linearly traversing groups of the X, Y, and Z machine axes are guided using linear roller guides. Bed guideways are covered with telescopic steel covers. A crossbeam guideway is protected by folded fabric bellows.

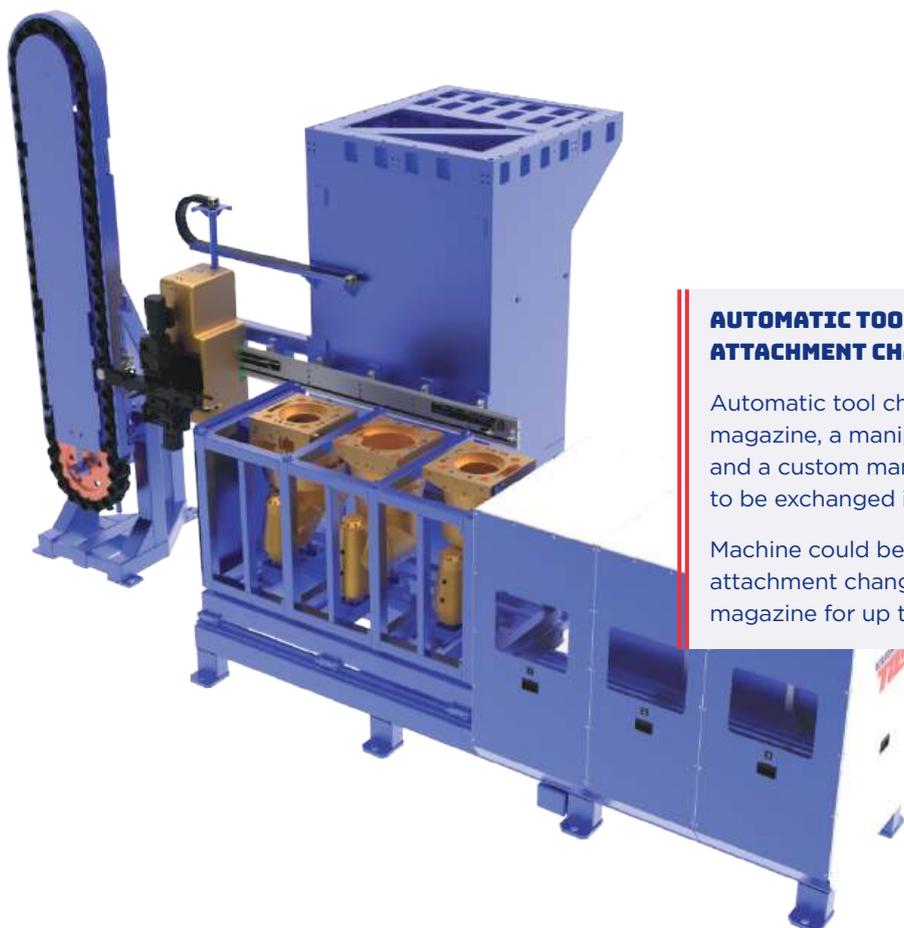


BALANCING

Ram weight is compensated hydromechanically (with a hydraulic cylinder) using a standalone hydraulic unit.

HEADSTOCK

The basic body is a rigid casting of ductile cast iron, in which a vertically traversing RAM made of cast steel is mounted. The main spindle rotation drive is transmitted from a powerful electric drive via a robust two-speed gearbox with automatic shifting.



AUTOMATIC TOOL AND TECHNOLOGICAL ATTACHMENT CHANGE

Automatic tool change consists of a chain tool magazine, a manipulator guideway on the stand, and a custom manipulator that allows the tool to be exchanged in the milling head.

Machine could be also equipped by the automatic attachment change system. It contains moveable magazine for up to 3 technological attachments.



WVM 2600/3600 T

EXAMPLES OF USAGE

HORIZONTAL MACHINING CENTERS

HORIZONTAL BORING MILLS

PORTAL MILLING MACHINES

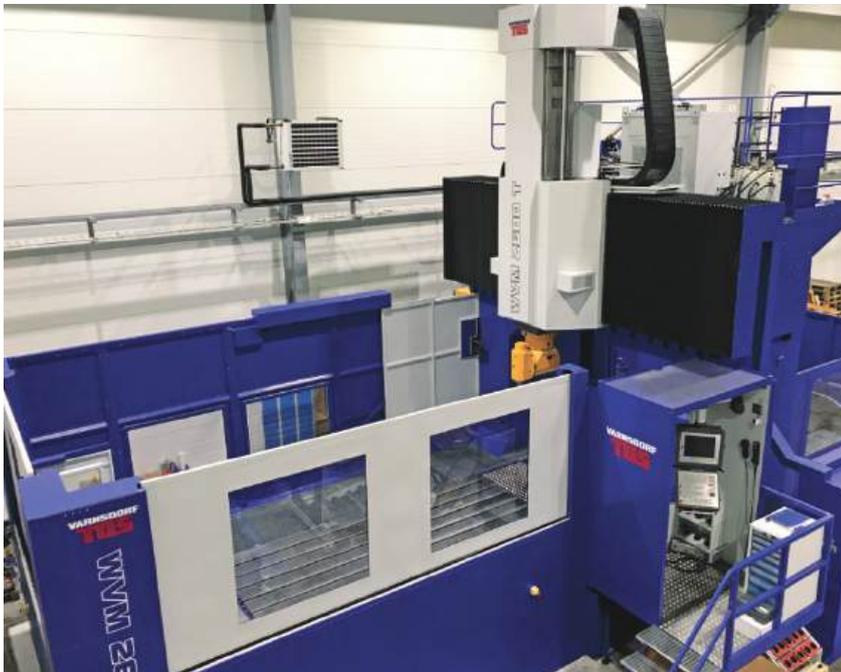
ACCESSORIES

COMPONENTS

REFERENCES



The first implementation of the WVM 2600 T machine for a Czech customer.



X = 4,500 mm (177.1653 inch)
Y = 3,200 mm (125.9842 inch)
Z = 1,500 mm (59.0551 inch)

ATC 60
Work table
= 4,000 x 2,000 mm (20 tonnes)
157.4803 x 78.7401 inch (22 tons)

