

MOBILE COLUMN MILLING MACHINE FPT VERUS



TECHNICAL DATA

CNC Heidenhain Tnc 530I

X column longitudinal travel:	6.000 mm
Z ram transversal travel:	1.250 mm
Y ram vertical travel:	2.000 mm
Spindle attachment cone:	ISO 50
Maximum spindle rotation speed:	7.000 rpm

Machine equipped with:

- TUPCG bi-rotary head
- Through-tool cooling
- 40-position chain tool magazine (vertical/horiz change)
- 1,000x1,000mm rotary table with continuous positioning
- Stolle surface 2,000x7,000mm h 300mm
- 700mm ISO50 horizontal nose
- Semi-automatic head change via head holder turret
- 1200-liter coolant tank with flow rate 28 l/min and 20 bar pressure
- 1400 mm high perimeter safety fence

- Various tools
- No. 03 squares
- Instruction manuals and CE declaration

Year of construction: 2008

DETAILED DESCRIPTION OF EQUIPMENT

Heidenhain TNC530I S.P. Numerical Control

15.1" TFT Monitor; Graphical user interface

Heidenhain optical scale measurement systems

Interpolation capacity: up to 9 axes

Interpolation type: linear, circular, helical

Block cycle time (BCT): minimum 0.5 ms

ASCII program coding language

ISO, Heidenhain programming language

Storage unit: Hard disk = 6GB

FLEXK on-board machine programming

Axis control techniques: Jerk, Look-Ahead, digital filters

Integrated cycles for piece measurement and tool measurement

Data transmission interfaces: RS232 at 115200 baud, RS422 at 115200 baud, Ethernet 100Base T (for use on 10Mb networks a speed reducer is required, to be paid by the customer)

Axis control: algorithm for High Speed Cutting (HSC)

Fixed rotary table arrangement (removable fixing)

Rotary table table surface dimensions 1000x1000mm, continuous positioning

- Cast iron rotary axis base, generously sized, on which the table guide system housing is reported.
- Cast iron table structure.
- Support for the rotation of the table surface with preloaded axial radial roller bearings.
- Bearing diameter (internal/external): 395/525 mm.
- The movement is achieved by a worm screw – helical crown pair.
- AC SIEMENS digital rotation motor.
- Table locking system with hydraulic disc brake with annular cylinder.
- The measuring system is directed on the rotation axis with Heidenhain RON285C-18000 encoder.
- Transmission organs appropriately sized and of high precision to guarantee them against high torsional movements.
- The table is pressurized to guarantee the seal against liquids and dust.
- Table surface shape: square.
- Table top dimensions: 1,000x1,000 mm
- Positioning type: continuous
- Maximum resolution in seconds: +-5"
- Maximum rotation speed: 4.5 rpm
- Maximum weight allowed on the table: 6,000 kg
- Maximum tilting moment: 28,000 Nm
- Maximum tangential torque: 14,500 Nm
- T-slots: 7 T-slots mm 18 DIN 650 with 125 mm interaxis

Semi-automatic accessory change

System that allows the semi-automatic change of the milling heads, complete with automatic connection of the services (hydraulic, electronic and measurement systems) between the ram and the milling head.

The heads are fixed to the sled manually.

Universal head with continuous positioning

Equipped with a special system that allows the two axes to be continuously positioned with thousandth resolution with rotation of the two bases controlled and managed by the CNC. The structure is made of spheroidal cast iron. Complete with automatic tool locking and rigid tapping. Tool cone ISO 50 DIN 69871, Shank DIN 69872.

Predisposition for the application of the spindle extension.

Horizontal nose long type 1:1 ratio

700 mm spindle extension, with ISO 50, with internal cooling circuit, automatic tool locking, 1:1 ratio, complete with cradle for loading/unloading the accessory.

Chain tool magazine 40 places ISO50

Chain magazine placed on the left side of the upright, covered for operator protection, with arm for changing the tool in both vertical and horizontal position and with automatic tool preparation. "Fixed place" management.

- Cone ISO 50 DIN 69871
- Max. tool diameter with adjacent free places 230 mm
- Max. tool diameter with adjacent occupied places 125 mm
- Max. tool length 400 mm
- Max. tool weight 20 kg
- Max. weight of the tools on the chain 400 Kg

ATC configuration with 40 stations.

Chip conveyor with exit on the right side.

High pressure external/internal tool lubricant/coolant complete with paper filter and potentiometer adjustment.

System for the passage of the lubricant/coolant also inside the tool on the universal heads and extensions.

Flow rate: 28 l/min

Max pressure: 20 bar

Tank capacity: 1200 l

The filtration of the coolant takes place in the coolant collection tank through a paper filter with automatic belt advancement and allows a filtering degree of 30 mm.

The flow of the lubricant/coolant is regulated by a potentiometer or jog keys. positioned on the control panel.

Remote control panel with display for Heidenhain CNC

Remote control panel with the following features:

HR 420 handwheel with display

- Selectable feed per revolution
- Display of operating mode
- Actual value of programmed position, feed and spindle speed

- Error message
- Override potentiometers for feed and spindle speed
- Selection of axes via keys and softkeys
- Keys for continuous movement of axes
- Emergency stop button
- Confirm actual position
- Fixing with magnet
- Deadman's buttons (CE standards)
- Emergency

TECHNICAL STRUCTURE DESCRIPTION

The monoblock upright with the integrated longitudinal carriage, guarantee the greatest rigidity, the best dynamic responses, superior power, the best precision, easier use by the operator in all conditions.

This machine is characterized by all its technical solutions, and above all thanks to its particular morphology, it does not need to be embedded on the foundation, compacting its overall dimensions to the maximum and reducing the overall spaces to the maximum and enhancing its performance.

The VERUS milling machine was created in the longitudinal mobile upright configuration, which guarantees greater flexibility and consequently, the ability to respond to a wide range of needs relating to the processing of the mold sector, mechanical processing in general, in aeronautical applications, in model making and in the construction of prototypes.

In the VERUS milling machine, the elimination of the pit for the machine's installation greatly facilitates all access for operators during the loading and unloading phases of the pieces, with any means, during the tooling and processing checks, and during the general cleaning operations of the work area.

The VERUS structure stands out from other products for the symmetry of the guide systems with respect to the movement axes and the thermosymmetry in the transverse/vertical plane.

The parts that make up the structure, with the exception of the slide, have been made of electro-welded steel, appropriately studied and formulated according to the morphology of the pieces, their use, and their functionality.

All the parts are statically and dynamically tested to verify their sizing and are stabilized in order to avoid internal tensions.

The variable section upright, strongly ribbed, has the rigidity necessary to resist the bending stresses due to the machining and inertia. Furthermore, thanks to the particular configuration of the lowered structure, it was possible to make the spindle axis reach a lower vertical position very close to the work surface and in some cases even below it.

The innovative sled is built in special cast iron and has a rectangular section structure with variable section in the longitudinal direction, with special ribs on the internal edges located in the transverse plane. This configuration allows for maximum optimization of rigidity.

The ram is designed to house the milling heads complete with their own services such as lubrication, cooling system, cone blowing system, coolant, etc.

The balancing of the vertical-transversal group is hydraulic with nitrogen accumulators, and is achieved by two telescopic hydraulic cylinders connected directly to the carriage without any type of transmission. This system allows for a high dynamic response, favoring positioning precision and high sensitivity in milling and contouring operations.

Hydrodynamic compensation of the ram deformations caused by its own weight at the exit or by heads of different weights. This system uses a hydraulic device for the automatic control of the preload of the two tie rods located on the upper part of the ram.

The movement of the vertical axis occurs on 2 linear guides with 4 integrated pads.
The movement of the transverse axis occurs on 4 linear guides with 8 integrated pads.
The movement of the longitudinal axis occurs on 2 linear guides with 8 integrated pads.

The transmission of motion for the longitudinal, transverse and vertical axes occurs via tempered and ground ball screws, with double preloaded nut, in order to reduce the play (backlash) and allow positioning of the axes with a low deviation coefficient. The vertical movement uses 2 ball screws positioned symmetrically with respect to the structures.

The advancements of the axes are controlled via a digital servo-system and AC brushless motors, connected to the transmission organs by means of belts. The entire control system has been designed to ensure a high degree of precision and reliability.
The reading system on the 3 axes is direct and with high precision HEIDENHAIN scales.

The spindle motorization is of the “direct transmission” type.

The motor used is of the synchronous type with continuous speed variation, studied, designed and built by FPT, and allows to obtain a power of up to 34 kW with a torque of 830 Nm, and speeds of up to 7000 rpm.
This configuration allows to obtain very small backlashes, and reduced elasticity thus obtaining greater chip removal, less wear of the tools and less noise during milling operations. The entire spindle motorization system is designed to ensure a high degree of reliability and have a very reduced maintainability and less than conventional systems.

Cooling system with fluid circulation around the spindle, bearings, spindle motorization group and other accessories to ensure thermal stability.