TECHNICAL DATA
HORIZONTAL BORING- AND MILLING MACHINE

manufacturer	**FPT CASTEL**
type	**RED**
built	**2012**
control	**SINUMERIK 840 D Solution Line**

Working hours		
„Power ON”	ca. 15.040	h
„Program run“	ca. 5.433	h
working hours D’Andrea UT5	ca. 288	h
working hours NC-milling head	ca. 1.443	h

Working area		
X-Axis, lateral movement table	4.000	mm
Y-Axis, vertical movement spindle unit	3.000	mm
Z-Axis, longitudinal movement column	2.500	mm
W-Axis, movement quill	900	mm
B-Axis, rotary movement table	360	Grad
B-Axis, number of positions	360.000 x 0,001°	

Machining unit		
Ø quill	150	mm
Fixed spindle throat, length	280	mm
Smallest distance, front edge of spindle to table centre (2.000/2.500)	162/+88	mm
Lowest position above table surface	0	mm
Spindle taper (short taper acc. to DIN 69871)	ISO 50	BIG PLUS, Form AD
Spindle power max.	55	kW
Max. torque at spindle	2.917	Nm
Spindle speed, continuously variable	5-3.000	Min-1

NC – rotary table

- Table top made of cast Meehanite GB/GC 300 in double-walled design, thermally stabilized.
- The table rotates on a bearing ring with integrated hydrostatic pressure pockets. This creates an effective hydrostatic bearing, which ensures maximum sliding and eliminates the stick-slip effect, even under the greatest load. In the middle of the table are a double row radial roller bearing and an axial ball bearing for preloading the hydrostatic bearing ring. In this design, the system achieves maximum rigidity, highest load capacity and maximum suppleness.
- Drive of the table top by cogwheel and preloaded double pinions.
- Gearbox in oil bath, driven by SIEMENS AC motor, 45 Nm.
- Table clamping system with automatic compensation, pressure 90 bar.
- Measuring system - high-precision rotary encoder made by HEIDENHAIN.

Clamping surface	2.000 x 2.500	mm
Max. turning speed	1,5	Min-1
table load (max.150mm outside table center)	25.000	kg
T-slot width	28	mm
T-slot distance	200	mm
Number of positions	360.000 x 0,001°	

Max. travel speed		
Max. Feed range for X-, Y-, Z- Axis	20.000	mm/min
Max. Feed range for W- Axis	10.000	mm/min
B-Axis	1,5	min-1

Tool magazine		
Type	Chain magazine	
Number of tools	60	
max. tool-Ø adjacent slots occupied	125	mm
max. tool-Ø adjacent slots free	230	mm
max. tool length	600	mm
max. tool weight	20	kg

Face turning head D'Ándrea, UT5

Electronic unscrewing and planing head, Mod. UT5-630, controlled by the U-axis of the machine. Used for boring and drilling, tapping, radii production by interpolation with other axes of the machine.

Face plate diameter	630	mm	lateral flattened
Stroke tool slide	200	mm	
max. turn off-Ø	1.250	mm	
max. speed	250	mm	
max. feed power	500	daN	
Manual tool change			

Universal-milling head TUPC

Automatic infinitely variable 2-axis milling head.
A special system allows the milling head to be positioned steplessly in both axes with a resolution of 0.001°. The swivelling of the two axes is controlled by the CNC.

Tool taper DIN 69871	ISO 50	BIG PLUS, Form AD
max. power	30	kW
max. torque	1200	Nm

Automatic head changing system for 2 heads

Automatic head changing system for 2 heads and cover plate for the drilling spindle, integrated on the left side of the machine stand. Vertically mounted, movable magazine with 3 places for automatic loading and unloading of the NC milling head and the D'Andrea Plan turning head.

Moveable control panel

Movable control panel with motorised transverse and hydraulic vertical movement.
Vertical travel 2,000 mm, transverse travel 1,000 mm.

Enclosure

Complete enclosure (without roof) of the machine working area, height 3,500 mm. The chip conveyor is located between machine bed and column, ejection left.
The cabin is equipped with two sliding doors at the front of the table (each with an opening of 2,000 mm for a total opening of 4,000 mm) and two doors at the rear (one on the left and one on the right of the upright). All doors are monitored by door limit switches.

Numerical control SINUMERIK 840 D Solution Line

- NCU 730.2 Basic, CNC user memory with 3Mbyte
- PCU 50.3 with:

Intel Pentium M Mobile 2 GHz/1Gbyte
Hard disk 40 GB
Integrated graphics 2D/3D
Operating system Windows XP ProEmbSys
2 Ethernet 10/100 Mbit/s
4 USB 2.0
1 PROFIBUS/MPI interface
Operator interface HMI advanced
Control panel with color display 15", 1024x768 pixel
Manual control panel with visualization of the values Mod. HT 2
Option DNC

Coolant equipment

Internal high-pressure cooling by the tool with paper filter and adjustment by potentiometer. Device for transferring the coolant for the NC milling head.
- External coolant supply 28l/min - 4 bar
- Internal coolant supply 28l/min - 40 bar
- Tank capacity 1.200 l

The flow rate can be adjusted by means of a potentiometer or JOG keys.

Installation data

Operating voltage	3~ 400/230 V
frequency	50 Hz

Technical features and standard equipment

CASTEL RED is a transverse travelling column boring machine with a table that can be moved in longitudinal direction.
The CASTEL RED offers, like all horizontal FPT machines, practical advantages such as

- - Maximum flexibility thanks to the wide range of available accessories.
- - Easier operator access to the working area.
- - Better chip disposal.

Machine structure: stability and accuracy

- The structure of CASTEL is made of an electro-welded steel structure and integrates the upright and the cross slide in a single element. Between the four symmetrical vertical guideways, the spindle unit moves vertically.
- - The column achieves the necessary rigidity to ensure accuracy and alignment and to prevent deformation during heavy roughing operations. The special symmetrical structure has a high vibration damping capacity and ensures high thermal stability.
- The column bed, which can be moved in a transverse direction, is made of an electro-welded steel structure. It is provided with hardened and ground guideways of large dimensions. The three guideways ensure high rigidity and accuracy.
- - The longitudinally movable stator bed consists of an electro-welded steel construction. The feed is on two linear guides, which enable a prompt, dynamic response and ensure high positioning accuracy.
- The rotary slide table base is made of cast iron, computer designed, therefore optimally dimensioned and appropriately ribbed to ensure maximum rigidity.
- - The structural dimensioning, positioning and the shape of the ribbing were determined by FEM calculations. All components were tested statically and dynamically according to the qualification plan.

All components are stabilized after rough machining to avoid internal tensions.

- The milling head is integrated into the structure of the vertical guideways to increase resistance to deflection.
- The table and machine anchoring has been designed to ensure perfect rigidity, accuracy and lasting stability of the machine geometry.

Guide ways

- The guideways and the base surfaces of the stand, stand and table beds are hardened and ground. The slideways are dimensioned to achieve maximum stability and accuracy.
- The Y- and Z-axes are moved on preloaded roller slides, the X-axis is moved on linear guides and preloaded roller slides. This allows fast dynamic response and ensures high positioning accuracy.

Axis shifting

- The machine axes are moved by means of ground and hardened precision ball screws with preloaded ball screw nuts to minimize play and to achieve low friction when positioning on all axes.
- The axis movement is by brushless AC drives.
- The standard axis designation is: X = longitudinal travel, Y = vertical travel, Z = transverse travel (column); W = drilling spindle

Weight balancing system

- The hydraulic counterbalance system on the milling head reduces inertia effects to a minimum, resulting in good positioning accuracy and smooth contouring

Milling head (spindle holder head)

- The head is made of stabilized Meehanite cast GB/300 and moves within the stand on 4 guideways. The adjustment system used provides accuracy and rigidity for any type of application.

Spindle motor

- The **AC Brushless SIEMENS** spindle drive (55 kW) is continuously variable with a two-stage ZF gearbox

Spindle

- ISO 50 **BIG PLUS** spindle mount with automatic tool clamping. The axis of the drilling spindle is **900** mm and the diameter is **150** mm. The surface is completely nitrided.
- The use of self-lubricating bushes (with oil backflow) and the forced circulation of the oil in the areas of high heat generation ensure maximum thermal stability.

Cooling and lubrication system

- The cooling system cools the oil circulating around the spindle, the bearings and the gearbox for thermal stability of the head and spindle.
- This effective cooling system of the bearings allows 3000 rpm (option)
- PLC control of the drilling spindle temperature. This system allows better control of the powerful cooling system and compensation of thermal expansion.

Coolant system for the tool

- Coolant system for the tool with 1,200 litre coolant tank, pump with 4 bar pressure, delivery rate 28 litres/min.

Steel telescopic covers

- Steel telescopic covers for horizontal, transverse and vertical guideways to prevent water and chips from entering.

Konfiguration

Basic machine with X = 4,000 mm, Y = 3,000 mm, Z = 2,500 mm, W = 900 mm
CNC-control SINUMERIK 840 D Solution Line
table clamping surface 2.000 x 2.500 mm, 25.000 kg
Quill Ø 150 mm, ISO 50 BIG PLUS
55 kW, 3,000 min-1, 2-stage ZF gearbox (NEW)
60-fold tool changer
Boring and facing head D'ANDREA, UT5-630S
Universal milling head -stepless -, TUPC
Autom. head change system
Control panel on movable platform
Complete housing without roof
Coolant system with coolant trough spindle and chip conveyor