



## SPECIALIZING IN PRECISION HORIZONTAL BORING MILLS



[www.fermatmachinery.com](http://www.fermatmachinery.com)

# About Fermat

ABOUT FERMAT



With sales and service facilities in six different countries and production facilities in the Czech Republic, FERMAT is right now one of the leading suppliers of horizontal boring mills. The company has almost 400 employees and achieved an annual turnover of 57 million Euro in 2008 and 46 million Euro in 2009.

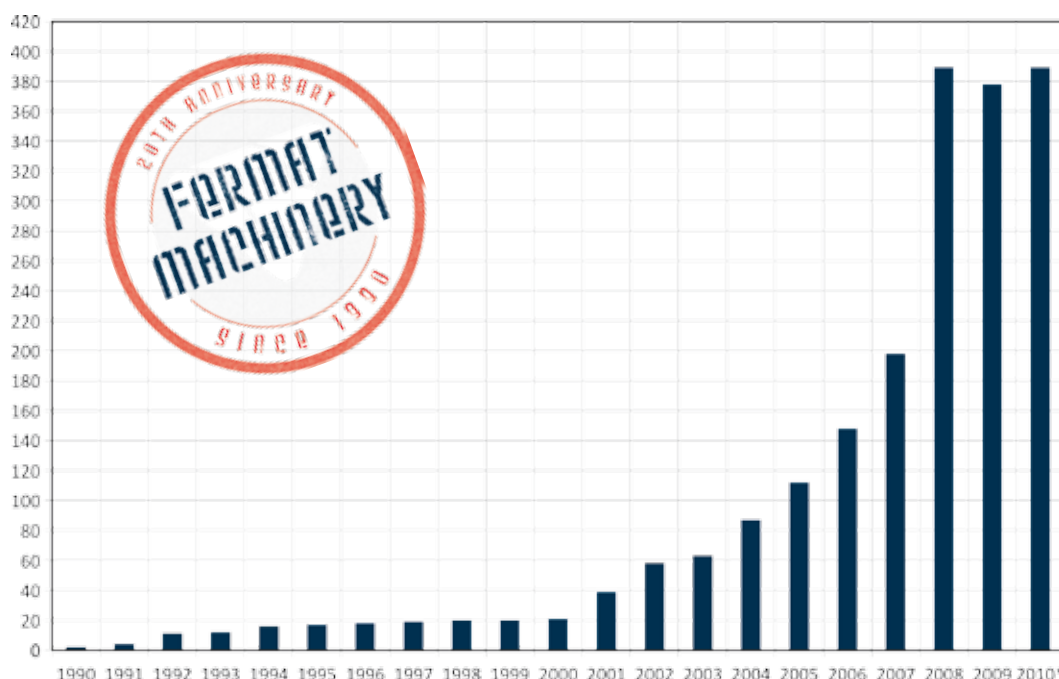
FERMAT was established in 1990 as a company specializing mainly in retrofitted machines. After successful growth over the

following years, FERMAT decided to invest its significant experience gained while modernizing used Horizontal Boring Mills into the development and subsequent manufacture of its own high-end professional product - Horizontal Boring Mill. Stressing the quality of high-performance, live spindle and precision handwork in general, FERMAT offers a reliable machine that represents 'Best Value' in today's competitive global machine tool industry. At the

same time, our valued clients also benefit from very competitive prices and short delivery terms.

FERMAT facilities are located in various parts of the Czech Republic and in Slovakia. Overall, our company operates in modern production, retro-fit, and repair centers measuring more than 20,000 m<sup>2</sup> (215,230 sq. ft.). Our largest production sites can be found in Brno and Prague.

## Number of Employees



Floor Type - WRF 130, 150 and 160 CNC



12 - 13

Table Type - WRFT 130, 150 and 160 CNC



24 - 25

Floor Type - WRF Mill CNC



14

Table Type - WFT 13 CNC



26 - 27

Floor Type - WF 13 CNC



15

Table Type - WFC 13 (12, 11) CNC



28

# Production Facilities

Brno, Czech Republic

90 minutes from Vienna Airport, 120 minutes from Prague Airport, 10 minutes from Brno Airport



4 800 m<sup>2</sup>

**20T**



Brno, Czech Republic



1 800 m<sup>2</sup>



# Production Facilities

Prague, Czech Republic

30 minutes from Prague Airport



5 300 m<sup>2</sup>

50T



## Other Production Facilities:

Knižčí les, Neslovice, Czech Republic – 2 000 m<sup>2</sup>  
Prakovce, Slovakia – 1 100 m<sup>2</sup>

Liberec, Czech Republic



1 900 m<sup>2</sup>

# Machine Accuracy

## MACHINE ACCURACY

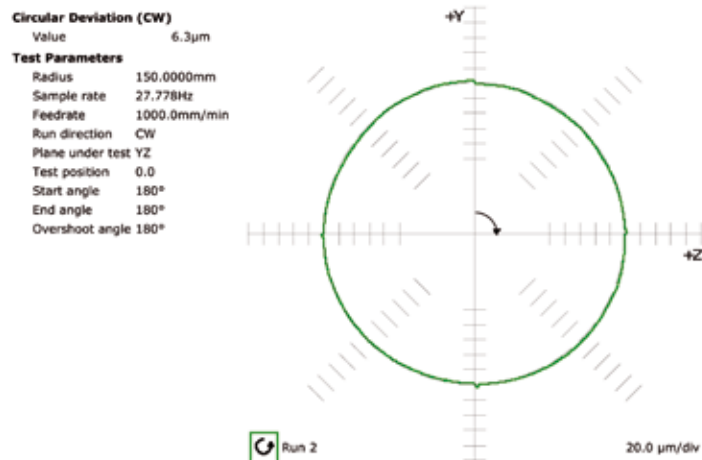
Fermat HBM are especially designed and assembled in order to achieve high precision. Usually, our machines match two times higher precision than other machines available on the market.

### Circular Interpolation Ballbar Test

Plane XY	0.01mm
Plane XZ	0.01mm
Plane YZ	0.01mm

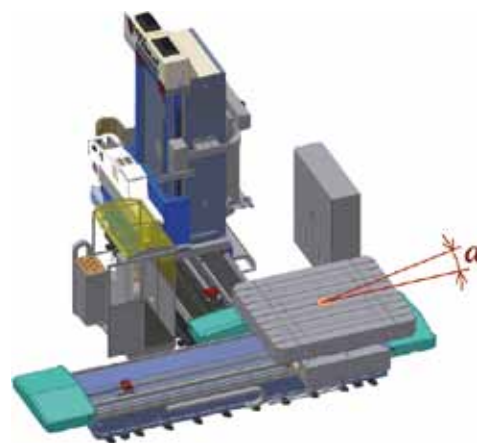
**ISO 230-4:1996(E) Roudness**  
**YZ 360stup 150mm calibrated 20090422-171942**  
 Operator: Cech  
 Date: 2009-Apr-22 17:19:42

**RENISHAW**  
 Machine: WRF 130 SWEDEN  
 Instrument: QC10 ballbar



### Table Positioning Precision

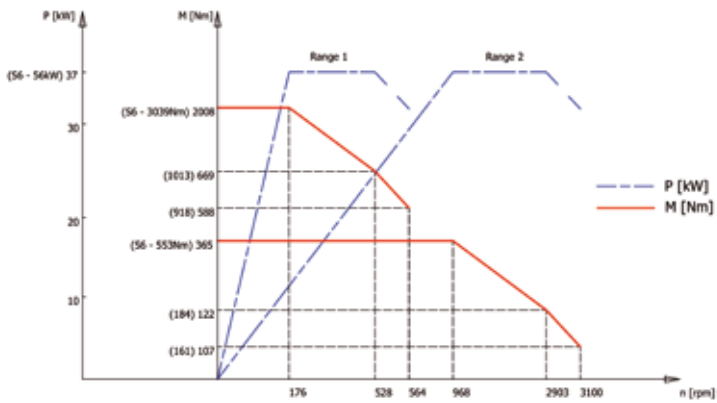
Positioning Accuracy	0.01mm/1000mm
Repeatable Positioning Accuracy	0.005mm/1000mm



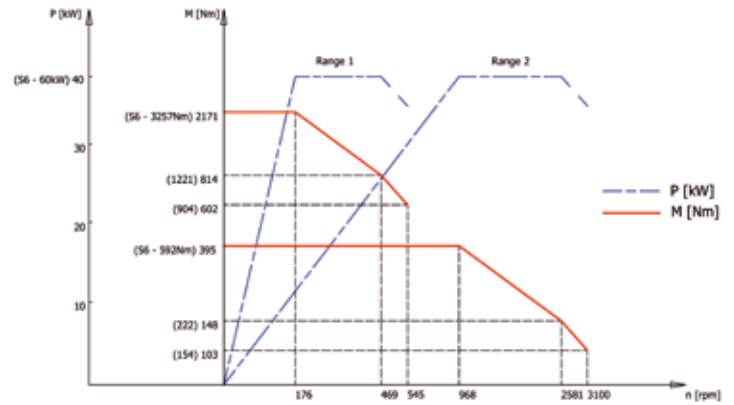
## FERMAT KEY SOLUTIONS FOR THE BEST PRECISION

- Top results for circular interpolation
- CNC rotary table with the highest accuracy and high excentric load capacity
- Powerful main spindle motor with high torque for heavy chip removal
- Wide rigid column for efficient vibration absorption
- Sophisticated headstock compensation system with thermal control
- Fully covered design for dust protection and long life time
- Heavy duty guide ways for the most precise positioning
- Modular concept for demanding turn-key projects
- Most advanced series of different CNC controls

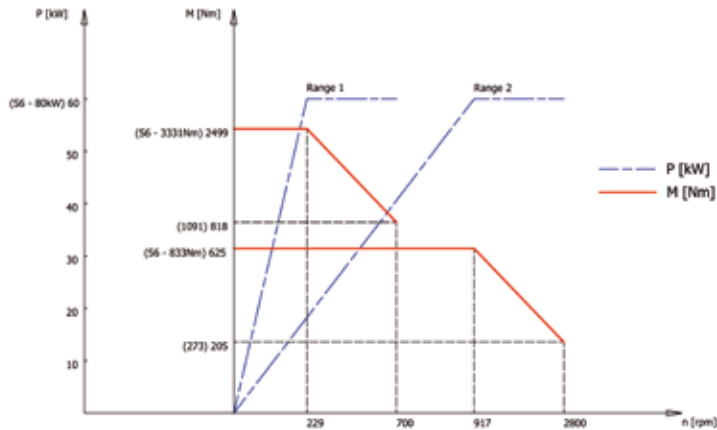
# Machining Possibilities



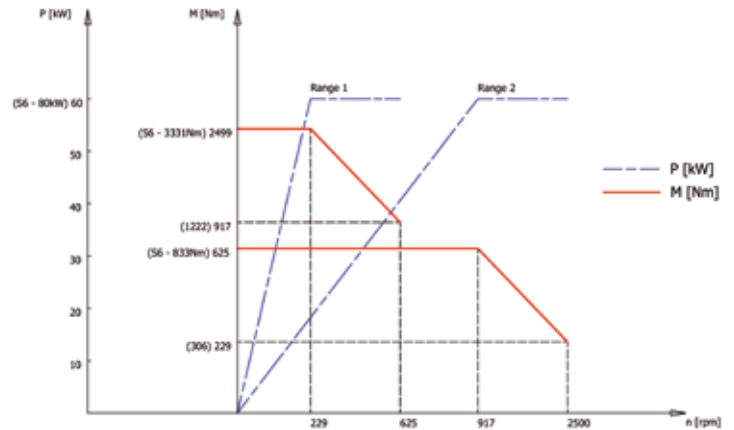
**Motor Siemens**  
 $P_H(S1) = 37 \text{ kW}$ ;  $P_H(S6) = 56 \text{ kW}$   
 $M_H(S1) = 235,5 \text{ Nm}$ ;  $M_H(S6) = 357 \text{ Nm}$   
 $i_1 = 8,525$   
 $i_2 = 1,55$  For machines with spindle diameter 130 mm (5.1 in) - 37 kW, Heidenhain/ Siemens



**Motor Fanuc**  
 $P_H(S1) = 40 \text{ kW}$ ;  $P_H(S6) = 60 \text{ kW}$   
 $M_H(S1) = 255 \text{ Nm}$ ;  $M_H(S6) = 382 \text{ Nm}$   
 $i_1 = 8,525$   
 $i_2 = 1,550$  For machines with spindle diameter 130 mm (5.1 in) - 40 kW, Fanuc



**Motor Siemens**  
 $P_H(S1) = 60 \text{ kW}$ ;  $P_H(S6) = 80 \text{ kW}$   
 $M_H(S1) = 458 \text{ Nm}$ ;  $M_H(S6) = 611 \text{ Nm}$   
 $i_1 = 5,45$   
 $i_2 = 1,36$  For machines with spindle diameter 150 mm (5.9 in) - 60 kW, Heidenhain/ Siemens



**Motor Siemens**  
 $P_H(S1) = 60 \text{ kW}$ ;  $P_H(S6) = 80 \text{ kW}$   
 $M_H(S1) = 458 \text{ Nm}$ ;  $M_H(S6) = 611 \text{ Nm}$   
 $i_1 = 5,45$   
 $i_2 = 1,36$  For machines with spindle diameter 160 mm (6.3 in) - 60 kW, Heidenhain/ Siemens



## Horizontal Boring and Milling Machines – Floor Type

One of the main characteristics of the FERMAT floor type horizontal boring and milling machines is their powerful milling and drilling chip removal (even with top Y-axis stroke) and higher precision than is offered by other machines available on the market. Their large variation of selectable parameters is combined with its broad range

of operating functions. Their main feature is a modular concept that allows great production variability and rapid set-up through the use of peripheral tools and accessories.

The machine moves in 3 or 4 different axes (X, Y, Z and W for borers). An additional B and/or V-axis is added when the machine is equipped

with the rotary table. Several clamping plates can be joined together, or in combination with a Rotary Table to achieve specialized configurations easily and quickly.

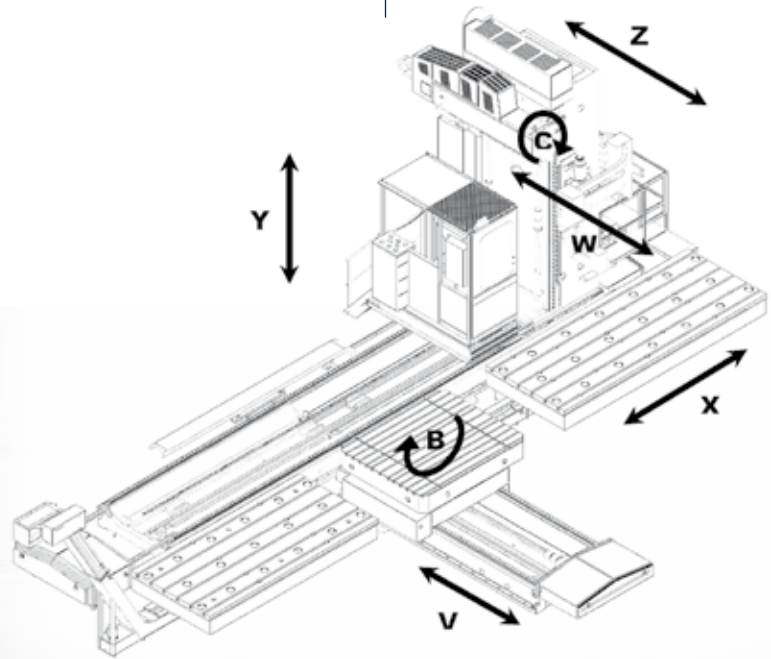
The basic model of the machine comes with Heidenhain, Fanuc or Siemens controls and drives.



Work pieces can be clamped either on the additional rotary table, on the clamping plates, or using both these possibilities.

The main working purpose of the machines is chip removal from spacious and heavy steel, cast steel, or cast iron work pieces. The machine's technology allows its wide utilization

in milling, boring, reaming, and threading processes. FERMAT machines stand out thanks to their capacity to achieve higher precision than their competitors.



# Basic Technical Specification

## METRIC SYSTEM

Headstock		WF 13	WRF 130	WRF 150	WRF 160	WRF Mill
Spindle Diameter	mm	Ø130	Ø130	Ø150	Ø160	Depends on accessory
Spindle Taper		ISO 50	ISO 50	ISO 50	ISO 50 or 60 *	ISO 50
Tool Standard *		DIN 69871, CAT 50, BT 50	DIN 69871, CAT 50, BT 50	DIN 69871, CAT 50, BT 50	DIN 69871, CAT 50, BT 50	DIN 69871, CAT 50, BT 50
Spindle RPM *	RPM	10 – 3 100	10 – 3 100	10 – 2 800	10 – 2 500	10 – 4 000
Spindle Motor Power (S1/S6–40%) *	kW	37/56 Heidenhain 40/60 Fanuc 37/56 Siemens	37/56 Heidenhain 40/60 Fanuc 37/56 Siemens	60/80	60/80	37/56
Maximum Spindle Torque (S1/S6–40%) *	Nm	2 008/3 039 * Heidenhain 2 171/3 257 * Fanuc 2 008/3 039 * Siemens	2 008/3 039 * Heidenhain 2 171/3 257 * Fanuc 2 008/3 039 * Siemens	2 500/3 331 *	2 500/3 331 *	1 200 *
Ram Dimension (with Covers)	mm	400x465	430x490	460x500	460x500	400x500
Control System						
CNC Control System *		Heidenhain iTNC 530 Fanuc 31i Siemens 840D	Heidenhain iTNC 530 Fanuc 31i Siemens 840D	Heidenhain iTNC 530 Fanuc 31i Siemens 840D	Heidenhain iTNC 530 Fanuc 31i Siemens 840D	Heidenhain iTNC 530 Fanuc 31i Siemens 840D
Working Ranges						
Horizontal Column Travel (X-axis) *	mm	1 500 – 8 600	2 400 – 28 100	2 400 – 28 100	2 400 – 28 100	2 400 – 28 100
Vertical Headstock Travel (Y-axis) *	mm	1 700, 2 000, 2 500, 3 000, 3 500	2 000, 2 500, 3 000, 3 500, 4 000, 4 500, 5 000, 5 500, 6 000	2 000, 2 500, 3 000, 3 500, 4 000, 4 500, 5 000, 5 500, 6 000	2 000, 2 500, 3 000, 3 500, 4 000, 4 500, 5 000, 5 500, 6 000	2 000, 2 500, 3 000, 3 500, 4 000, 4 500, 5 000, 5 500, 6 000
Ram Travel (Z-axis) *	mm	–	900 *	1 000 *	1 000 *	1 500 *
Spindle Travel (W-axis)	mm	730	730	1 000	1 000	–
Operation Travel All Axes	mm/min	1 – 8 000	1 – 10 000	1 – 10 000	1 – 10 000	1 – 10 000
Rapid Travel X-axis	mm/min	10 000	20 000	20 000	20 000	20 000
Rapid Travel Y-axis	mm/min	12 000	15 000	15 000	15 000	15 000
Rapid Travel W-axis, Z-axis	mm/min	10 000, no Z-axis	10 000	8 000	8 000	no W-axis, 10 000
Max. Axial Force X-axis, Y-axis	kN	20	25	40	40	25
Max. Axial Force W-axis, Z-axis	kN	20, no Z-axis	30	40	40	no W-axis, 30
Positioning Accuracy X, Y, Z, W	mm	±0.01	±0.01	±0.01	±0.01	±0.01
Repeatable Positioning Accuracy X, Y, Z, W	mm	±0.005	±0.005	±0.005	±0.005	±0.005
Automatic Tool Changer (Optional)						
Tool Changer Storage Capacity *	Pc.	20, 32, 40 *	20, 32, 40, 60, 90 *	20, 32, 40, 60, 90 *	20, 32, 40, 60, 90 *	20, 32, 40, 60, 90 *
Cooling System (Optional)						
Low Pressure Cooling – Coolant Pressure	bar	4	4	4	4	4
Low Pressure Cooling – Max. Incoming Volume	l/min	60	60	60	60	60
Low Pressure Cooling – Coolant Tank	l	550	2 000	2 000	2 000	2 000
High Pressure Cooling – Coolant Pressure *	bar	10, 20, 30 *	20, 30, 50 *	20, 30, 50 *	20, 30, 50 *	20, 30, 50 *
High Pressure Cooling – Max. Incoming Volume *	l/min	30, 20, 37 *	20, 37, 62 *	20, 37, 62 *	20, 37, 62 *	20, 37, 62 *
High Pressure Cooling – Coolant Tank	l	150	180	180	180	180
Electricity						
Maximum Power Consumption	kVA	80	85	99	99	85

\* can be adjusted to customer's requirements

# Basic Technical Specification

## INCH SYSTEM

Headstock		WF 13	WRF 130	WRF 150	WRF 160	WRF Mill
Spindle Diameter	in	Ø5.12	Ø5.12	Ø5.90	Ø6.30	Depends on accessory
Spindle Taper		ISO 50	ISO 50	ISO 50	ISO 50 or 60 *	ISO 50
Tool Standard *		DIN 69871, CAT 50, BT 50	DIN 69871, CAT 50, BT 50	DIN 69871, CAT 50, BT 50	DIN 69871, CAT 50, BT 50	DIN 69871, CAT 50, BT 50
Spindle RPM *	RPM	10 – 3,100	10 – 3,100	10 – 2,800	10 – 2,500	10 – 4,000
Spindle Motor Power (S1/S6–40%) *	HP	50/75 Heidenhain 54/80 Fanuc 50/75 Siemens	50/75 Heidenhain 54/80 Fanuc 50/75 Siemens	80/107	80/107	50/75
Maximum Spindle Torque (S1/S6–40%) *	ft.lb	1,481/2,242 * Heidenhain 1,601/2,402 * Fanuc 1,481/2,242 * Siemens	1,481/2,242 * Heidenhain 1,601/2,402 * Fanuc 1,481/2,242 * Siemens	1,843/2,455 *	1,843/2,455 *	884 *
Ram Dimension (with Covers)	in	15.75x18.30	16.93x16.93	18.90x18.90	18.90x18.90	15.75x19.69
Control System						
CNC Control System *		Heidenhain iTNC 530 Fanuc 31i Siemens 840D	Heidenhain iTNC 530 Fanuc 31i Siemens 840D	Heidenhain iTNC 530 Fanuc 31i Siemens 840D	Heidenhain iTNC 530 Fanuc 31i Siemens 840D	Heidenhain iTNC 530 Fanuc 31i Siemens 840D
Working Ranges						
Horizontal Column Travel (X-axis) *	in	59.1 - 338.6	94.5 – 1,106.3	94.5 – 1,106.3	94.5 – 1,106.3	94.5 – 1,106.3
Vertical Headstock Travel (Y-axis) *	in	66.92, 78.7, 98.4, 118.1, 137.8	78.7, 98.4, 118.1, 137.8, 157.5, 177.2, 196.8, 216.5, 236.2	78.7, 98.4, 118.1, 137.8, 157.5, 177.2, 196.8, 216.5, 236.2	78.7, 98.4, 118.1, 137.8, 157.5, 177.2, 196.8, 216.5, 236.2	78.7, 98.4, 118.1, 137.8, 157.5, 177.2, 196.8, 216.5, 236.2
Ram Travel (Z-axis) *	in	–	35.4 *	39.4 *	39.4 *	59.1 *
Spindle Travel (W-axis)	in	28.7	28.7	39.4	39.4	–
Operation Travel All Axes	in/min	0.04 – 315	0.04 – 393.7	0.04 – 393.7	0.04 – 393.7	0.04 – 393.7
Rapid Travel X-axis	in/min	393.7	787.4	787.4	787.4	787.4
Rapid Travel Y-axis	in/min	472.4	590.5	590.5	590.5	590.5
Rapid Travel W-axis, Z-axis	in/min	393.7, no Z-axis	393.7	315	315	no W-axis, 393.7
Max. Axial Force X-axis, Y-axis	lbf	4,496	5,620	8,992	8,992	5,620
Max. Axial Force W-axis, Z-axis	lbf	4,496, no Z-axis	6,744	8,992	8,992	no W-axis, 6,744
Positioning Accuracy X, Y, Z, W	in	±0.0004	±0.0004	±0.0004	±0.0004	±0.0004
Repeatable Positioning Accuracy X, Y, Z, W	in	±0.0002	±0.0002	±0.0002	±0.0002	±0.0002
Automatic Tool Changer (Optional)						
Tool Changer Storage Capacity *	Pc.	20, 32, 40 *	20, 32, 40, 60, 90 *	20, 32, 40, 60, 90 *	20, 32, 40, 60, 90 *	20, 32, 40, 60, 90 *
Cooling System (Optional)						
Low Pressure Cooling – Coolant Pressure	PSI	58	58	58	58	58
Low Pressure Cooling – Max. Incoming Volume	gal/min	15.85	15.85	15.85	15.85	15.85
Low Pressure Cooling – Coolant Tank	gal	145	528	528	528	528
High Pressure Cooling – Coolant Pressure *	PSI	290, 435.1, 725.2	290, 435.1, 725.2	290, 435.1, 725.2	290, 435.1, 725.2	290, 435.1, 725.2
High Pressure Cooling – Max. Incoming Volume *	gal/min	5.3, 9.8, 16.4	5.3, 9.8, 16.4	5.3, 9.8, 16.4	5.3, 9.8, 16.4	5.3, 9.8, 16.4
High Pressure Cooling – Coolant Tank *	gal	39.6	47.5	47.5	47.5	47.5
Electricity						
Maximum Power Consumption	kVa	80	85	99	99	85

\* can be adjusted to customer's requirements

subject to change without notice



## Headstock

The headstock contains a ram travel drive, a live spindle and a two-speed gearbox, which is guided automatically by spindle revolutions. A modern AC motor is used to control the fluency of revolutions. The cast is made from special ductile iron.



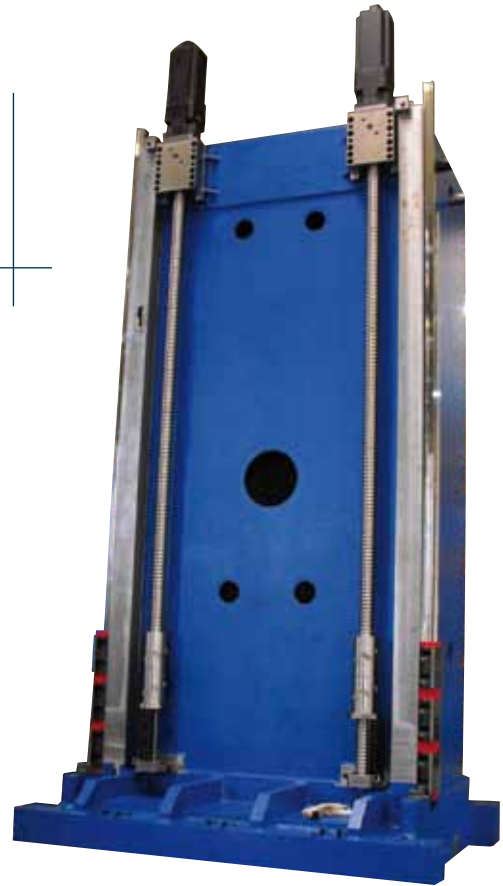
## Ram (Z-axis)

To achieve the best features of the ram ductile iron, a whole complex of annealing methods have been applied. Higher accuracy of the ram axis is achieved by two ball screws (the so-called Gantry Axis) and two Linear Positioning Scales. Thanks to this, maximum safety with high precision and quality productions can be consistently ensured.

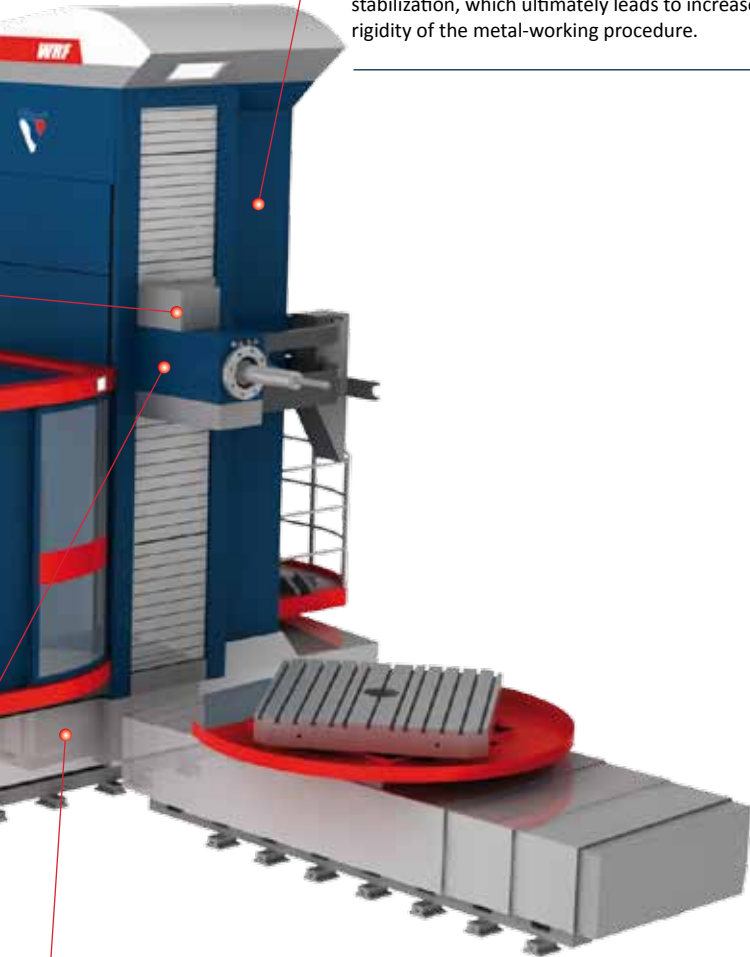
# Floor Type - WRF 130, 150, 160 CNC

## Column (Y-axis)

FERMAT developed a unique construction of the column (single piece design of the column and the slide, two ball screws for 130 mm spindle diameter or three for 150 and 160 mm spindle diameter, no counterweight). Maximum rigidity and firmness of such a unison is achieved through the process of thermal stabilization, which ultimately leads to increased precision and rigidity of the metal-working procedure.



FLOOR TYPE



## Bed

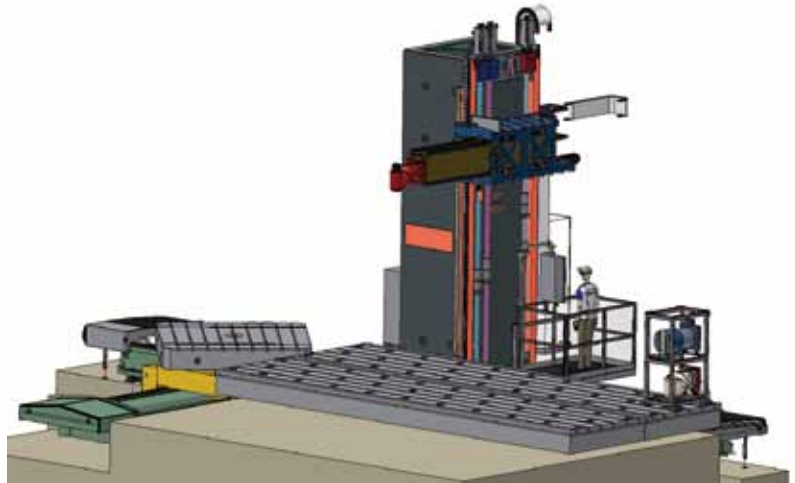
The bed of the machine is made of grey cast iron, and is stabilized through annealing. It was constructed in order to absorb the maximum amount of vibrations which are created during the cutting process. It features heavy duty Schneberger (INA, THK) linear guide ways, further contributing to the precision and rigidity of the machine.



# Floor Type - WRF MILL

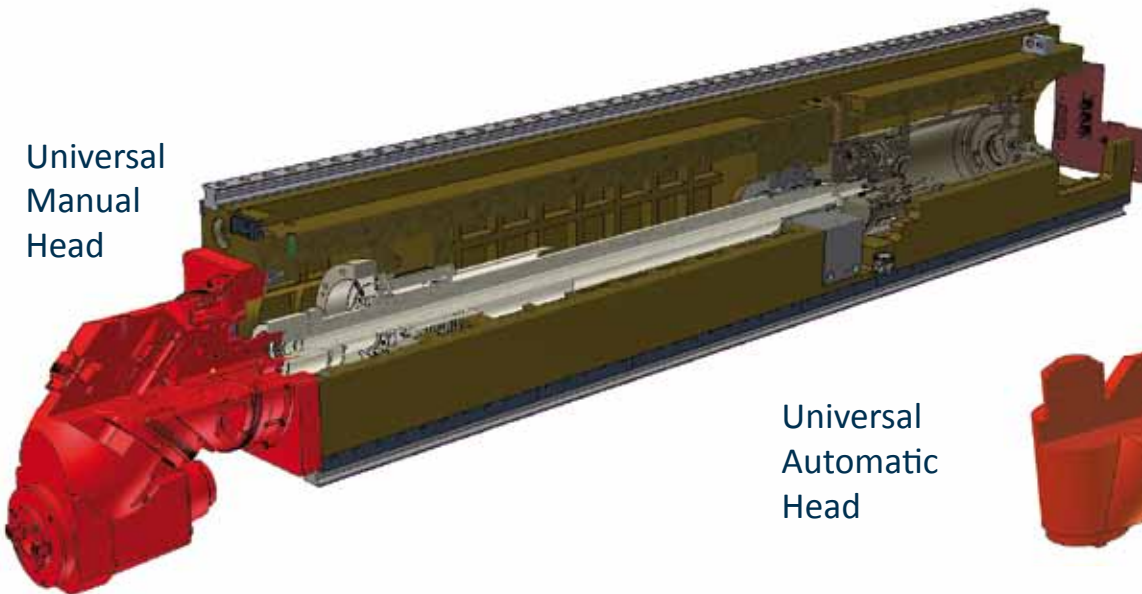
## WRF Mill CNC

WRF Mill CNC is a milling machine similar to FERMAT heavy duty floor type horizontal boring machine. The major difference is the ram travel that is 1 500 mm (59 in). The headstock is not equipped with a travelling spindle. The ram deflection is compensated mechanically by torsion bars and electronically by the control system. The headstock provides an adjustable mounting platform for a variety of attachments, such as automatic angle heads or face plates.

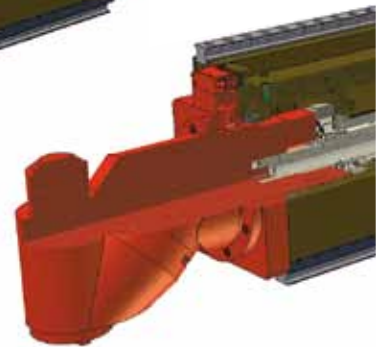


FLOOR TYPE

Universal Manual Head



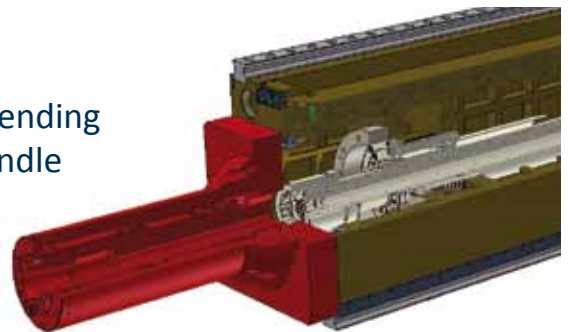
Universal Automatic Head



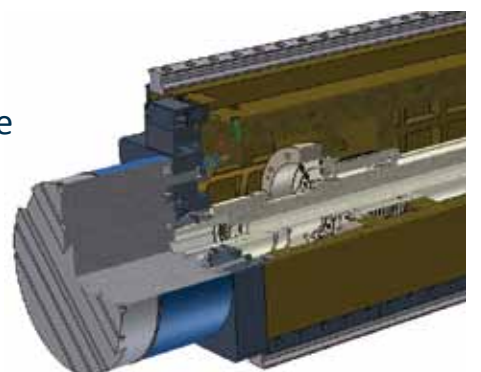
Front of the Headstock



Extending Spindle



Face Plate



## Column

The column is made of grey cast iron. Maximum rigidity and firmness of the column is achieved through the process of annealing, which also leads to precision and rigidity in metal-working procedures in production.

## Headstock

The headstock of WF 13 CNC is equipped with a live spindle with travel 730 mm (28.7 in) and no ram stroke.

## Beds

The bed of the machine is made of grey cast iron which is stabilized through annealing. It was constructed in order to absorb the maximum amount of vibrations that are created during cutting.

# Rotary table T15, T20, T25, T40, T50

## Rotary Table

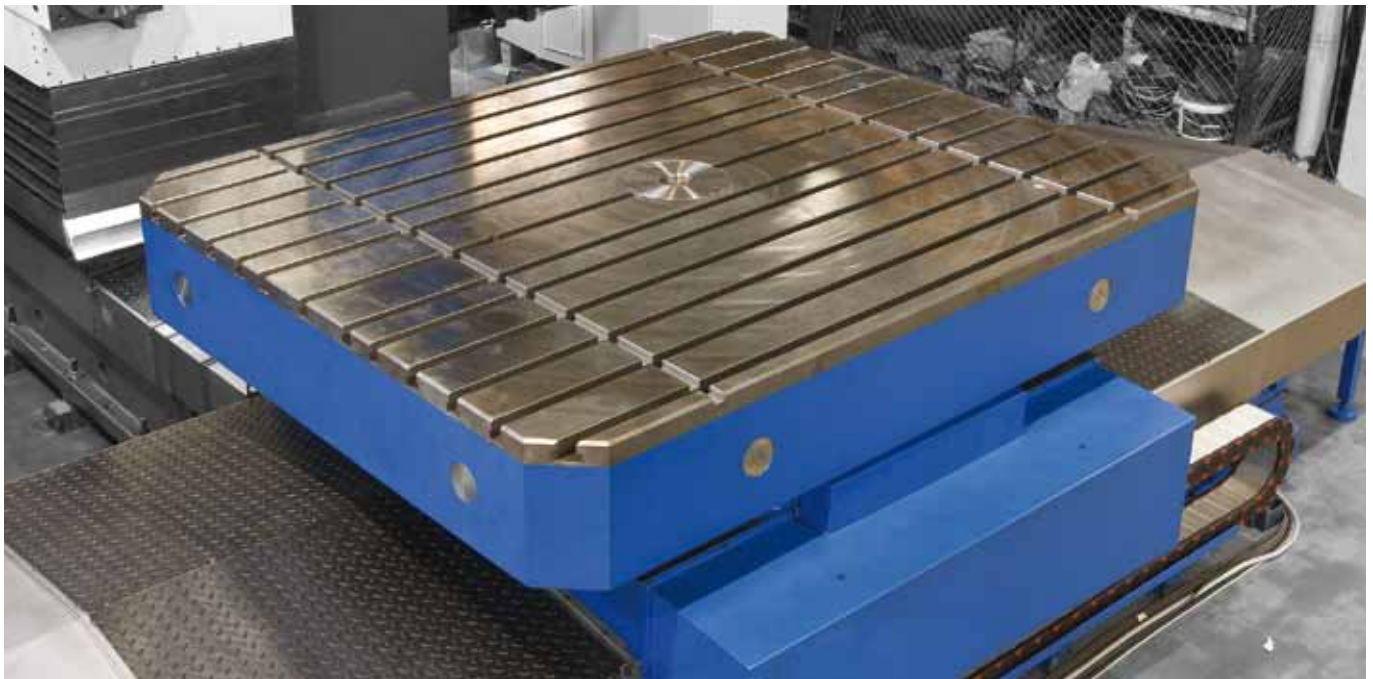
All the tables have outstanding positioning precision (4" arc i.e. 0,010 mm/ 1 000 mm radius) and high excentric load as a standard. There is no slip-stick during the positioning of the table. Due to simple design and assembled components, FERMAT tables require minimum maintenance and adjustments during their life time.

The rotary table consists of bed, slide, and

rotary clamping plate. The slide enables the rotary clamping plate to move in the V-axis. The clamping plate is fitted onto a cross roller taper bearing that secures high load capacity with minimal passive resistance. In order to achieve precision in work pieces, the rotary table is hydraulically clamped at eight points (T25, T40, T50) or four points (T15, T20) to avoid rotation

during the working process.

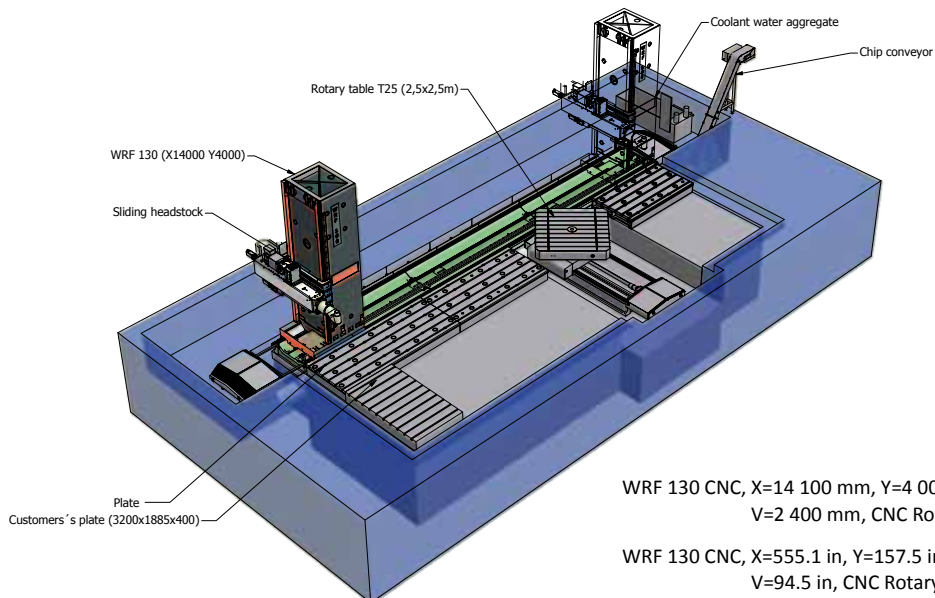
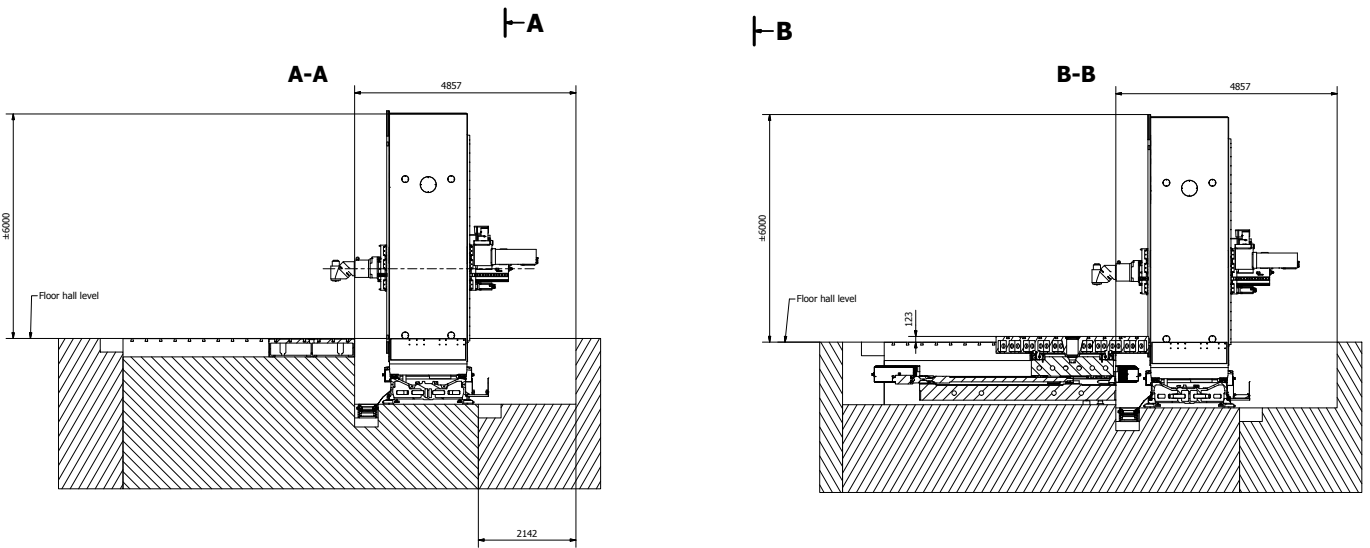
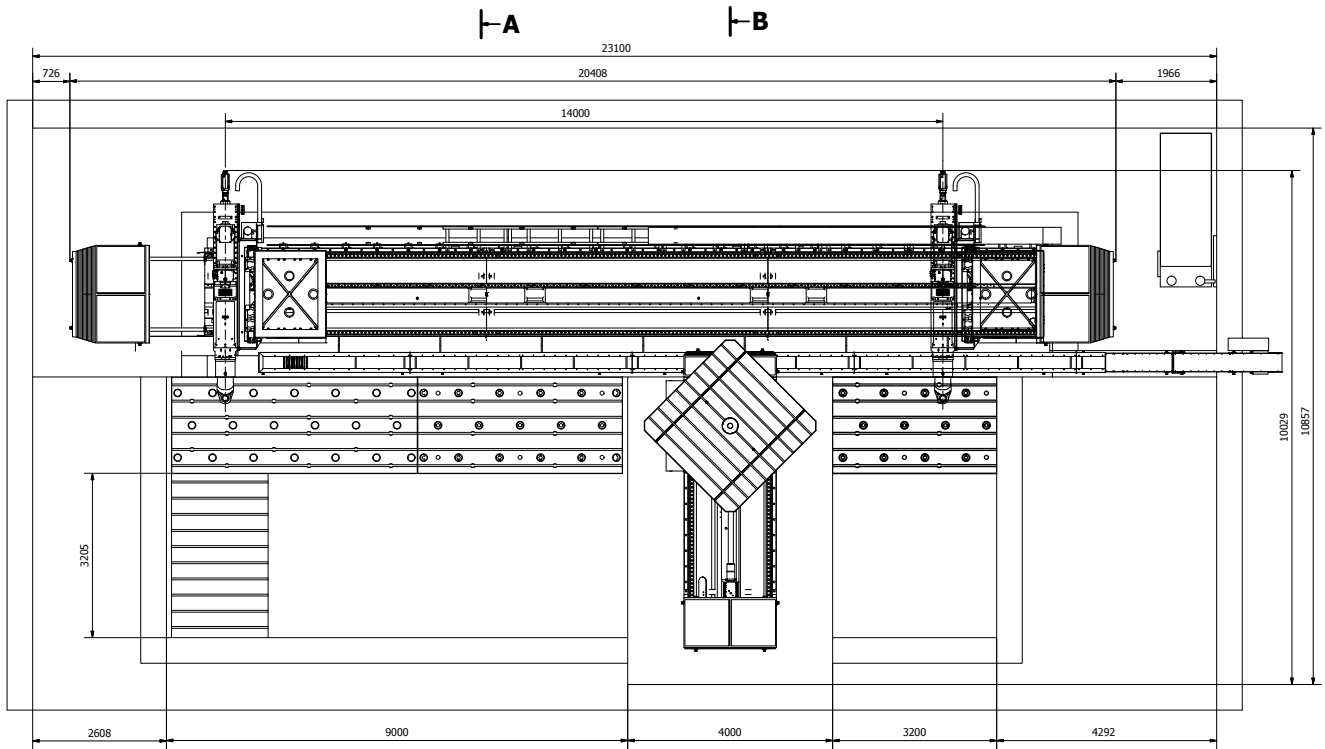
The table is governed by the control system of the machine, and there is a rotary encoder in the centre of the table that facilitates the automatic positioning in increments of 0.001°. As a standard, the rotary table operates as a continuous 4th axis.



T15, T20				
Clamping Plate Size	1 600x1 800, 1 800x2 200; 2 000x2 400	63.0x70.9, 70.9x86.6; 78.7x94.5	mm	in
Maximum Table Load	15 000; 20 000	33,069; 44,092	kg	lb
T-Slots - Size	22 H8	22 H8		
- Distance (Middle)	125 (160)	4.9 (6.3)	mm	in
V-axis Travel	1 500 – 5 000	59.1 – 196.8	mm	in
Operation Travel V-axis	1 – 8 000	0.04 – 315	mm	in
Operation Travel B-axis	0 – 2	0 – 2	RPM	RPM
Rapid Travel V-axis	10 000	393.7	mm/min	in/min

T25, T40, T 50				
Clamping Plate Size	2 000 x 2 000, 2 000 x 2 500, 2 000 x 3 000, 2 500 x 2 500, 2 500 x 3 000, 3 000 x 3 000	78.7 x 78.7, 78.7 x 98.4, 78,7 x 118.1, 98.4 x 98.4, 98.4 x 118.1, 118.1 x 118.1	mm	in
Maximum Table Load	25 000 - 50 000	55,115 - 110,231	kg	lb
T-Slots - Size	28 H8	28 H8		
- Distance (Middle)	160 (250)	6.3 (9.8)	mm	in
V-axis Travel	1 200 – 9 500	47.2 – 374	mm	in
Operation Travel V-axis	1 – 10 000	0.04 – 393.7	mm/min	in/min
Operation Travel B-axis	0 – 1,7	0 – 1.7	RPM	RPM
Rapid Travel V-axis	20 000	787.4	mm/min	in/min

# Machine Lay Out WRF 130 CNC



WRF 130 CNC, X=14 100 mm, Y=4 000 mm, Z=900 mm, W=730 mm,  
V=2 400 mm, CNC Rotary Table 2 500 x 2 500 mm

WRF 130 CNC, X=555.1 in, Y=157.5 in, Z=35.4 in, W=28.4 in,  
V=94.5 in, CNC Rotary Table 98.4 x 98.4 in

## Horizontal Boring and Milling Machines - Table Type

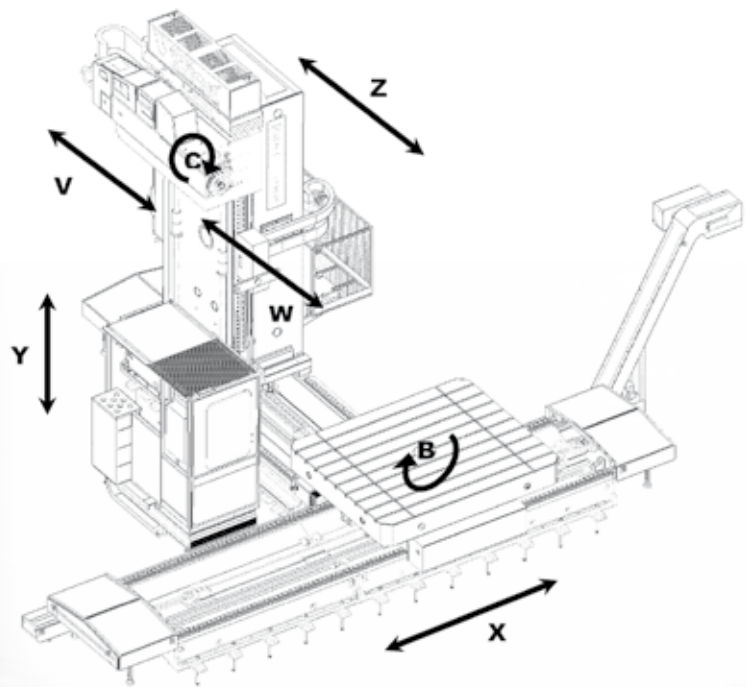
The WFT 12, 13, WFC 13 (12, 11) and WRFT 130, 150, 160 CNC represent table type FER MAT horizontal boring and milling machines. The first two types are a version with a live spindle; whereas the third type possesses also a movable ram. Among the machines' characteristics there are a powerful milling and drilling chip removal (even with top Y-axis stroke) and higher precision

than is offered by other machines available on the market.

A modular concept allows great operational variability in configurations according to the client's requirements. Modern CNC systems provide very comfortable control of the machine and many useful functions for the user. Horizontal boring machines WRFT offer 6 controlled axes

travel (X, Y, Z, V, W and B) while WFT and WFC adopts the movement on 5 different axes. Given additional optional accessories, it is possible to increase number of controlled axes. During the metal processing, the column of the machine adopts Z-axis movement and the work pieces are clamped on a rotary table that travels in the X-axis.





# Basic Technical Specification

## METRIC SYSTEM

Headstock		WFC	WFT 12
Spindle Diameter	mm	Ø130 (110*, 120*)	Ø120
Spindle Taper		ISO 50	ISO 50
Tool Standard *		DIN 69871, CAT 50, BT 50	DIN 69871, CAT 50, BT 50
Spindle RPM *	RPM	10 – 3 000 (3 400)	10 – 3 400
Spindle Motor Power (S1 / S6 – 40%) *	kW	22 *	98/156
Maximum Spindle Torque (S1 / S6 – 40%) *	Nm	1 628 *	1 100 *
Ram Dimension (with Covers)	mm	400x400	420x420
Control System			
CNC Control System *		Heidenhain iTNC 530 Fanuc 31i Siemens 840D	Heidenhain iTNC 530 Fanuc 31i Siemens 840D
Working Ranges			
Horizontal Table Travel (X-axis) *	mm	2 500	1 500, 2 000, 2 500, 3 000, 3 500, 4 000, 4 500, 5 000
Vertical Headstock Travel (Y-axis) *	mm	2 000	1 700, 2 000, 2 500, 3 000, 3 500
Column Travel (Z-axis) *	mm	–	1 200, 1 700, for Y-axis from 1 700 to 2 500 mm 1 500, 2 000 for Y-axis 3 000 and 3 500
Transversal Table Travel (Z-axis)	mm	1 650	–
Ram Travel (V-axis) *	mm	–	–
Spindle Travel (W-axis)	mm	730	730
Operation Traverse All Axes	mm/min	1 – 6 000	1 – 8 000
Rapid Travel X-axis	mm/min	10 000	12 000 *
Rapid Travel Y-axis	mm/min	10 000	12 000 *
Rapid Travel V-axis, Z-axis, W-axis	mm/min	no V-axis, 10 000, 10 000	no V-axis, 10 000, 10 000
Rapid Travel B-axis	RPM	4	2
Max. Axial Force X-axis, Y-axis	kN	20	20
Max. Axial Force V-axis, W-axis, Z-axis	kW	no V-axis, 20, 20	no V-axis, 30, 30
Positioning Accuracy X, Y, Z, W	mm	±0.01	±0.01
Repeatable Positioning Accuracy X, Y, Z, W	mm	±0.005	±0.005
Table			
Table Dimensions	mm	1 200x1 200, 1 200x1 400, 1 400x1 600, 1 600x1 600, 1 600x1 800	1 600x1 800, 1 800x2 200 or 2 000x2 200
Maximum Table Load	kg	10 000	15 000 or 20 000
T-slots – Size	mm	22 H8	22 H8 *
Automatic Tool Changer (Optional)			
Tool Changer Storage Capacity *	Pc.	20, 32, 40 *	20, 32, 40 *
Cooling System (Optional)			
Low Pressure Cooling – Coolant Pressure *	bar	4	4
Low Pressure Cooling – Max. Incoming Volume	l/min	60	60
Low Pressure Cooling – Coolant Tank	l	550	550
High Pressure Cooling – Coolant Pressure *	bar	10, 20, 30 *	10, 20, 30 *
High Pressure Cooling – Max. Incoming Volume *	l/min	30, 20, 37 *	30, 20, 37 *
High Pressure Cooling – Coolant Tank	l	200	200
Electricity			
Maximum Power Consumption	kVA	70	130

\* can be adjusted to customer's requirements

# Basic Technical Specification

WFT 13	WRFT 130	WRFT 150	WRFT 160
Ø130	Ø130	Ø150	Ø160
ISO 50	ISO 50	ISO 50 or 60 *	ISO 50 or 60 *
DIN 69871, CAT 50, BT 50	DIN 69871, CAT 50, BT 50	DIN 69871, CAT 50, BT 50	DIN 69871, CAT 50, BT 50
10 – 3 100	10 – 3 100	10 – 2 800	10 – 2 500
37/56 Heidenhain 40/60 Fanuc 37/56 Siemens	37/56 Heidenhain 40/60 Fanuc 37/56 Siemens	60/80	60/80
2 008/3 039 * Heidenhain 2 171/3 257 * Fanuc 2 008/3 039 * Siemens	2 008/3 039 * Heidenhain 2 171/3 257 * Fanuc 2 008/3 039 * Siemens	2 500/3 331 *	2 500/3 331 *
400x465	430x490	460x500	460x500
Heidenhain iTNC 530 Fanuc 31i Siemens 840D	Heidenhain iTNC 530 Fanuc 31i Siemens 840D	Heidenhain iTNC 530 Fanuc 31i Siemens 840D	Heidenhain iTNC 530 Fanuc 31i Siemens 840D
1 500, 2 000, 2 500, 3 000, 3 500, 4 000, 4 500, 5 000	2 400 – 9 500	2 400 – 9 500	2 400 – 9 500
1 700, 2 000, 2 500, 3 000, 3 500	2 000, 2 500, 3 000, 3 500, 4 000, 4 500, 5 000, 5 500, 6 000	2 000, 2 500, 3 000, 3 500, 4 000, 4 500, 5 000, 5 500, 6 000	2 000, 2 500, 3 000, 3 500, 4 000, 4 500, 5 000, 5 500, 6 000
1 200, 1 700, for Y-axis from 1 700 to 2 500 mm 1 500, 2 000 for Y-axis 3 000 and 3 500	2 100 – 3 900	2 100 – 3 900	2 100 – 3 900
–	–	–	–
–	900 *	1 000 *	1 000 *
730	730	1 000	1 000
1 – 8 000	1 – 10 000	1 – 10 000	1 – 10 000
12 000 *	15 000 *	15 000 *	15 000 *
12 000 *	15 000	15 000	15 000
no V-axis, 10 000, 10 000	10 000	8 000	8 000
2	1,8	1,8	1,8
20	25	40	40
no V-axis, 30, 30	30	40	40
±0.01	±0.01	±0.01	±0.01
±0.005	±0.005	±0.005	±0.005
1 600x1 800, 1 800x2 200 or 2 000x2 400	2 000x2 000, 2 000x2 500, 2 000x3 000, 2 500x2 500, 2 500x3 000, 3 000x3 000	2 000x2 000, 2 000x2 500, 2 000x3 000, 2 500x2 500, 2 500x3 000, 3 000x3 000	2 000x2 000, 2 000x2 500, 2 000x3 000, 2 500x2 500, 2 500x3 000, 3 000x3 000
15 000 or 20 000	25 000, 40 000, 50 000	25 000, 40 000, 50 000	25 000, 40 000, 50 000
22 H8 *	28 H8	28 H8	28 H8
20, 32, 40 *	20, 32, 40, 60, 90 *	20, 32, 40, 60, 90 *	20, 32, 40, 60, 90 *
4	4	4	4
60	60	60	60
550	1 600	1 600	1 600
10, 20, 30 *	20, 30, 50 *	20, 30, 50 *	20, 30, 50 *
30, 20, 37 *	20, 37, 62 *	20, 37, 62 *	20, 37, 62 *
200	180	180	180
80	115	124	124



# Basic Technical Specification

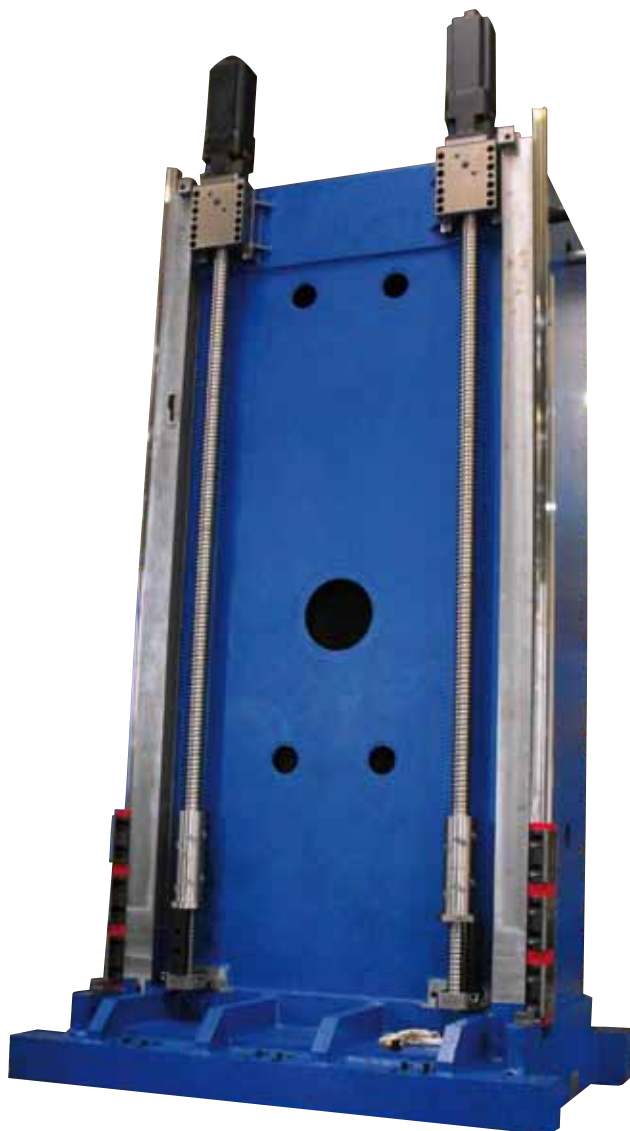
## INCH SYSTEM

Headstock		WFC	WFT 12
Spindle Diameter	in	Ø5.12 (4.33*, 4.72*)	Ø4.72
Spindle Taper		ISO 50	ISO 50
Tool Standard *		DIN 69871, CAT 50, BT 50	DIN 69871, CAT 50, BT 50
Spindle RPM *	RPM	10 – 3,000 (3,400)	10 – 3,400
Spindle Motor Power (S1 / S6 – 40%) *	HP	29.5	98/156
Maximum Spindle Torque (S1 / S6 – 40%) *	ft.lb	1,200	811
Ram Dimension (with Covers)	in	15.75x15.75	16.54x16.54
Control System			
CNC Control System *		Heidenhain iTNC 530 Fanuc 31i Siemens 840D	Heidenhain iTNC 530 Fanuc 31i Siemens 840D
Working Ranges			
Horizontal Table Travel (X-axis) *	in	98.4	59.1, 78.7, 98.4, 118.1, 137.8, 157.5, 177.2, 196.8
Vertical Headstock Travel (Y-axis) *	in	78.7	66.9, 78.7, 98.4
Column Travel (Z-axis) *	in	–	47.2, 66.9 for Y-axis from 66.9 to 98.4 in, 59.0, 78.7 for Y-axis 118.1 and 137.8
Transversal Table Travel (Z-axis)	in	65	–
Ram Travel (V-axis) *	in	–	–
Spindle Travel (W-axis)	in	28.7	28.7
Operation Travel All Axes	in/min	0.04 – 236.2	0.04 – 315
Rapid Travel X-axis *	in/min	393.7	472.4
Rapid Travel Y-axis *	in/min	393.7	472.4
Rapid Travel V-axis, Z-axis, W-axis	in/min	no V-axis, 393.7, 393.7	no V-axis, 393.7, 393.7
Rapid Travel B-axis	RPM	4	2
Max. Axial Force X-axis, Y-axis	lbf	4,496	4,496
Max. Axial Force V-axis, W-axis, Z-axis	lbf	no V-axis, 4,496, 4,496,	no V-axis, 6,744, 6,744
Positioning Accuracy X, Y, Z, W	in	±0.0004	±0.0004
Repeatable Positioning Accuracy X, Y, Z, W	in	±0.0002	±0.0002
Table			
Table Dimensions	in	47.24x47.24, 47.24x55.12, 55.12x62.99, 62.99x62.99, 63.00x70.87	63.00x70.87, 70.87x86.61 or 78.74x94.50
Maximum Table Load	lb	33,069 or 44,092	33,069 or 44,092
T-slots – Size	mm	22 H8	22 H8 *
Automatic Tool Changer (Optional)			
Tool Changer Storage Capacity *	Pc.	20, 32, 40 *	20, 32, 40 *
Cooling System (Optional)			
Low Pressure Cooling – Coolant Pressure	PSI	58	58
Low Pressure Cooling – Max. Incoming Volume	gal/min	15.85	15.85
Low Pressure Cooling – Coolant Tank	gal	423	145
High Pressure Cooling – Coolant Pressure *	PSI	290, 435.1, 725.2	290, 435.1, 725.2
High Pressure Cooling – Max. Incoming Volume *	gal/min	5.3, 9.8, 16.4	5.3, 9.8, 16.4
High Pressure Cooling – Coolant Tank	gal	40	40
Electricity			
Maximum Power Consumption	kVA	70	130

\* can be adjusted to customer's requirements

# Basic Technical Specification

WFT 13	WRFT 130	WRFT 150	WRFT 160
Ø5.12	Ø5.12	Ø5.90	Ø6.30
ISO 50	ISO 50	ISO 50 or 60 *	ISO 50 or 60 *
DIN 69871, CAT 50, BT 50	DIN 69871, CAT 50, BT 50	DIN 69871, CAT 50, BT 50	DIN 69871, CAT 50, BT 50
10 – 3,100	10 – 3,100	10 – 2,500	10 – 2,500
50/75 Heidenhain 54/80 Fanuc 50/75 Siemens	50/75 Heidenhain 54/80 Fanuc 50/75 Siemens	80/107	80/107
1,481/2,242 * Heidenhain 1,601/2,402 * Fanuc 1,481/2,242 * Siemens	1,481/2,242 * Heidenhain 1,601/2,402 * Fanuc 1,481/2,242 * Siemens	1,843/2,455	1,843/2,455
15.75x18.30	16.93x16.93	18.90x18.90	18.90x18.90
Heidenhain iTNC 530 Fanuc 31i Siemens 840D	Heidenhain iTNC 530 Fanuc 31i Siemens 840D	Heidenhain iTNC 530 Fanuc 31i Siemens 840D	Heidenhain iTNC 530 Fanuc 31i Siemens 840D
59.1, 78.7, 98.4, 118.1, 137.8, 157.5, 177.2, 196.8	94.5 – 374.0	94.5 – 374.0	94.5 – 374.0
66.9, 78.7, 98.4, 118.1, 137.8	78.7, 98.4, 118.1, 137.8, 157.5, 177.2, 196.8, 216.5, 236.2	78.7, 98.4, 118.1, 137.8, 157.5, 177.2, 196.8, 216.5, 236.2	78.7, 98.4, 118.1, 137.8, 157.5, 177.2, 196.8, 216.5, 236.2
47.2, 66.9 for Y-axis from 66.9 to 98.4 in, 59.0, 78.7 for Y-axis 118.1 and 137.8	82.7 – 153.5	82.7 – 153.5	82.7 – 153.5
–	–	–	–
–	35.4 *	39.4 *	39.4 *
28.7	28.7	39.4	39.4
0.04 – 315	0.04 – 393.7	0.04 – 393.7	0.04 – 393.7
472.4	787.4	787.4	787.4
472.4	590.5	590.5	590.5
no V-axis, 393.7, 393.7	393.7	393.7	393.7
2	1.8	1.8	1.8
4,496	5,620	8,992	8,992
no V-axis, 6,744, 6,744	6,744	8,992	8,992
±0.0004	±0.0004	±0.0004	±0.0004
±0.0002	±0.0002	±0.0002	±0.0002
63.00x70.87, 70.87x86.61 or 78.74x94.50	78.74x78.74, 78.74x98.43, 78.74x118.11, 98.43x98.43, 98.43x118.11, 118.11x118.11	78.74x78.74, 78.74x98.43, 78.74x118.11, 98.43x98.43, 98.43x118.11, 118.11x118.11	78.74x78.74, 78.74x98.43, 78.74x118.11, 98.43x98.43, 98.43x118.11, 118.11x118.11
33,069 or 44,092	45,032	45,032	45,032
22 H8 *	28 H8	28 H8	28 H8
20, 32, 40 *	20, 32, 40, 60, 90 *	20, 32, 40, 60, 90 *	20, 32, 40, 60, 90 *
58	58	58	58
15.85	15.85	15.85	15.85
145	423	423	423
290, 435.1, 725.2	290, 435.1, 725.2	290, 435.1, 725.2	290, 435.1, 725.2
5.3, 9.8, 16.4	5.3, 9.8, 16.4	5.3, 9.8, 16.4	5.3, 9.8, 16.4
40	47.5	47.5	47.5
80	115	124	124



## Column (Y-axis)

FERMAT developed a unique construction of the column (single piece design of the column and the slide, two ball screws for 130 mm spindle diameter or three for 150 and 160 mm spindle diameter, no counterweight). Maximum rigidity and firmness of such a unison is achieved through the process of thermal stabilization, which ultimately leads to increased precision and rigidity of the metal-working procedure.



## Ram (Z-axis)

To achieve the best features of the ram ductile iron, a whole complex of annealing methods have been applied. Higher accuracy of the ram axis is achieved by two ball screws (the so-called Gantry Axis) and two Linear Positioning Scales. Thanks to this, maximum safety with high precision and quality productions can be consistently ensured.

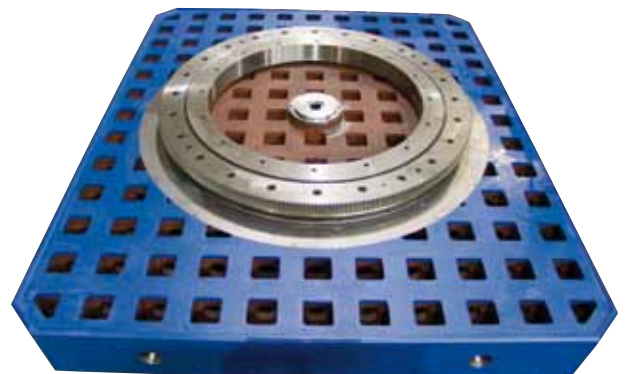
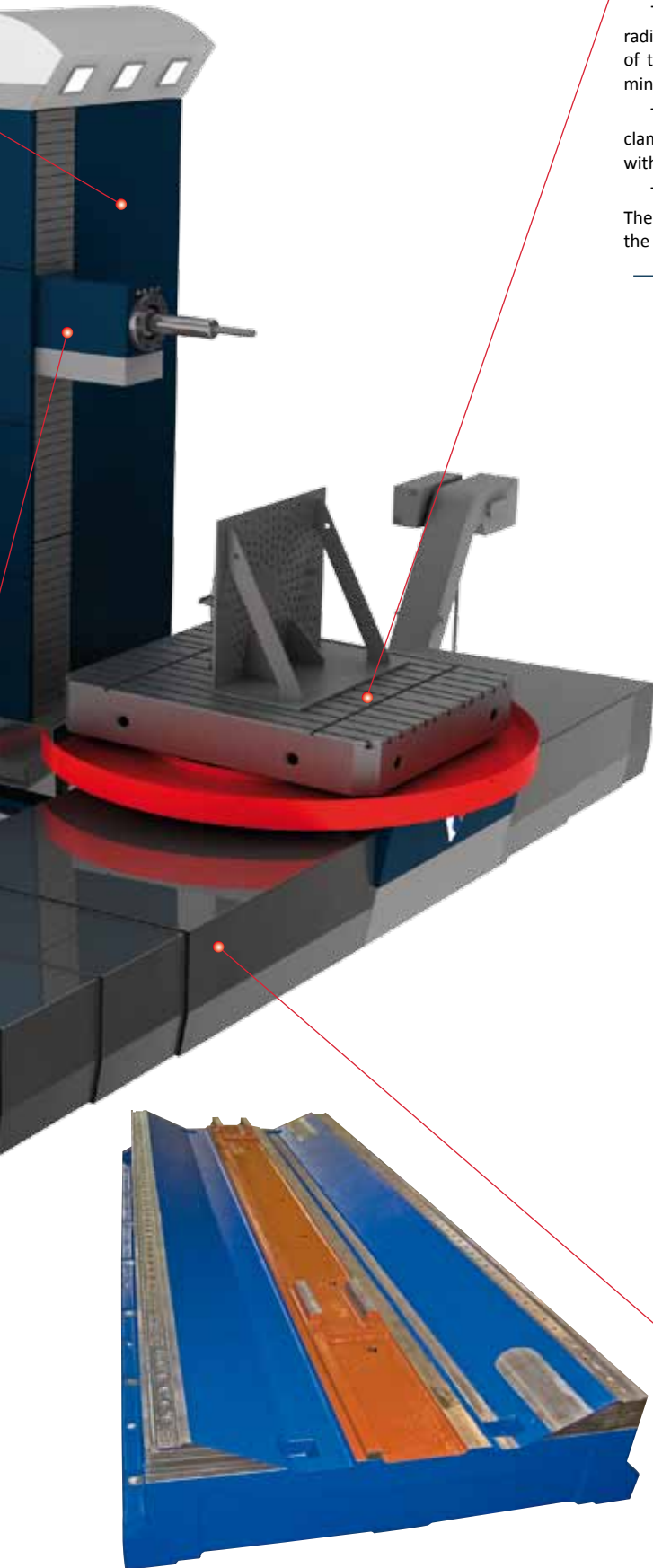
# Table Type - WRFT 130, 150, 160 CNC

## Rotary Table

The rotary table has outstanding positioning precision ( $4''$  arc sec i.e.  $0,010\text{ mm}/1000\text{ mm}$  radius) and high excentric load as a standard. There is no slip-stick during the positioning of the table. Due to simple desing and assembled components, FERMAT tables require minimum maintenance and adjustments during their life time.

The table consists of three main parts – slide, bed and rotary clamping plate. The clamping plate is fitted onto a cross roller taper bearing that secures high load capacity with minimal passive resistance.

The rotary movement is secured by two pinions, each of them having its own servomotor. The principle of its operation is often described as a Master-Slave Function. As a standard, the rotary table operates as a continous 4th axis.



## Beds

The longitudinal and transversal bed of the machine is made of grey cast iron which is stabilized through annealing. It was constructed in order to absorb the maximum amount of vibrations that are created during cutting.

# Table Type - WFT 13 CNC

## Rotary Table

The rotary table has outstanding positioning precision (4" arc i.e. 0,010 mm/1000 mm radius) and high excentric load as a standard. There is no slip-stick during the positioning of the table. Due to simple desing and assembled components, FERMAT tables require minimum maintenance and adjustments during their life time.

The rotary table consists of three main parts – slide, bed and rotary clamping plate. The clamping plate is fitted to a cross roller taper bearing that secures high load capacity with minimal passive resistance.

The rotary movement is secured by two pinions, each of them having its own servomotor. The principle of its operation is often described as a Master-Slave Function. As a standard, the rotary table operates as a continuous 4th axis.



## Pallet System

The automatic pallet system has two pallets with clamping plates 1 600 x 1 800 mm (63 x 71 in) or 1 800 x 2 200 mm (71 x 86.6 in). Maximum load of each clamping plate is 15 000 kg (33,069 lb). The time of the pallet exchange is up to 120 seconds.

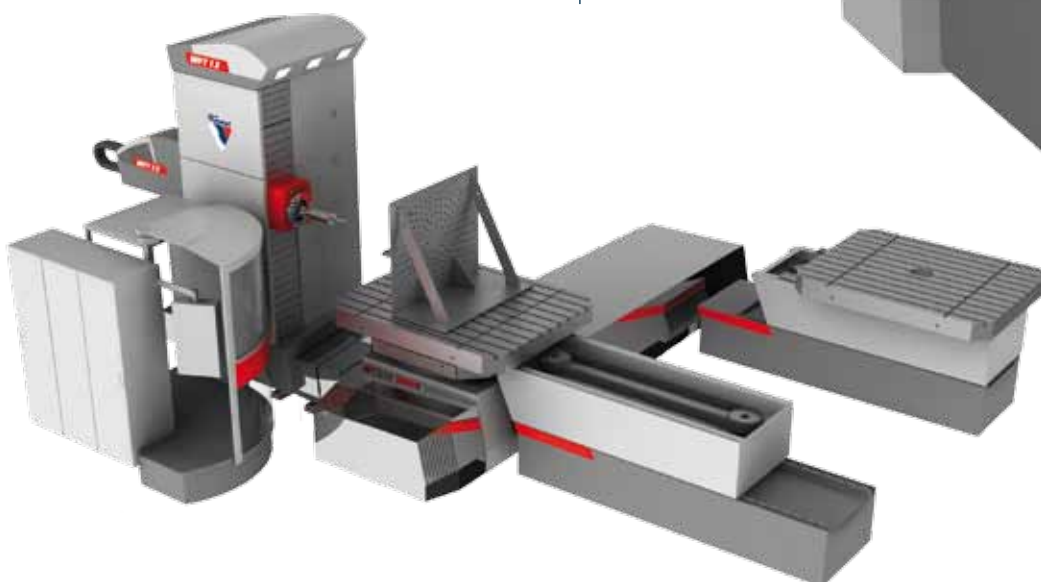
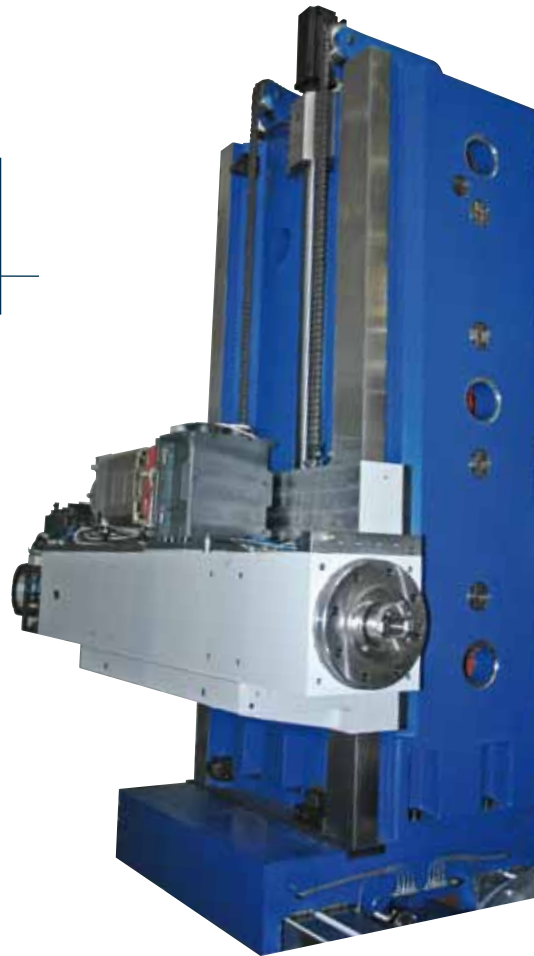


TABLE TYPE

# Table Type - WFT 13 CNC

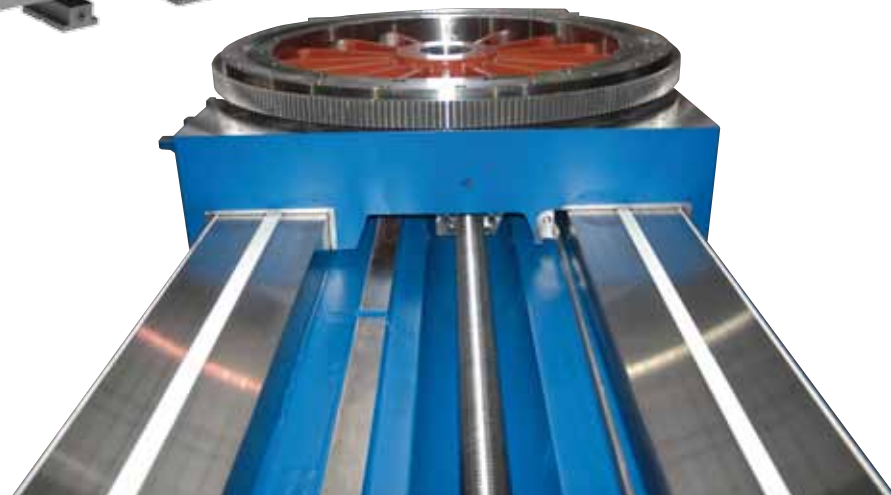
## Column

The column is made of grey cast iron. Maximum rigidity and firmness of the column is achieved through the process of annealing which also leads to precision and rigidity in metal-working procedures in production.



## Beds

The longitudinal and transversal bed of the machine is made of grey cast iron which is stabilized through annealing. It was constructed in order to absorb the maximum amount of vibrations that are created during cutting.



# Table type - WFC 13 (11, 12) CNC

## Column and Beds

Horizontal Boring Mills WFC 13 (12, 11) represents the newest technology and proven concept of table type horizontal borers that are currently on the market. This concept is based on fixed column which provides absolute firmness necessary for precise machining and two crossed horizontal beds for table (X and Z axes). Both beds and column are made of grey cast iron which is stabilized through annealing to absorb the maximum of vibrations caused by cutting.



## Headstock

Headstock of WFC 13 CNC is equipped with a live spindle of 130 mm in diameter. FERMAT can optionally provide this machine with spindle diameter 110 or 120 mm (WFC 11 and WFC 12 CNC).

## Rotary Table

The table consists of slide, bed and rotary clamping plate. High load capacity and minimal passive resistance is secured by cross roller taper bearing under the clamping plate.

TABLE TYPE

# Machining Videos Available on our website

## ■ All videos

<http://www.fermatmachinery.com/en/696-videos/>



## ■ Drilling:

<http://www.fermatmachinery.com/en/696-videos/1902-drilling.html>



## ■ Sideways Milling:

<http://www.fermatmachinery.com/en/696-videos/1903-sideways-milling.html>



## ■ Face Milling:

<http://www.fermatmachinery.com/en/696-videos/1904-face-milling.html>



## ■ High Speed Milling:

<http://www.fermatmachinery.com/en/696-videos/1905-high-speed-milling.html>



## ■ Effective Milling and Boring Holes:

<http://www.fermatmachinery.com/en/696-videos/2035-effective-milling-and-boring-holes.html>



## ■ Gear Cutting:

<http://www.fermatmachinery.com/en/696-videos/2156-gear-cutting.html>



## ■ High Speed Milling:

<http://www.fermatmachinery.com/en/696-videos/2155-high-speed-milling.html>



MACHINING PARAMETERS - SIDEWAYS MILLING										
Spindle / kW	$P_m$ [kW]	$v_c$ [m/min]	D [mm]	Speed [rpm]	Feed [mm/min]	Depth [mm]	Width [mm]	Cut. Volume [cm <sup>3</sup> /min]	Cut. Power [kW]	Cut. Torque [Nm]
130 / 37kW	56	150	100	490	900	44	55	2420	56	1091
150 / 51kW	77	157	125	400	850	60	60	3060	77	1838
150 / 60kW	80	160	125	420	900	60	65	3240	80	1818
160 / 51kW	77	160	125	410	850	70	60	3570	77	1793
160 / 60kW	80	160	125	410	800	80	60	3840	80	1863

MACHINING PARAMETERS - FACE MILLING										
Spindle / kW	$P_m$ [kW]	$v_c$ [m/min]	D [mm]	Speed [rpm]	Feed [mm/min]	Depth [mm]	Width [mm]	Cut. Volume [cm <sup>3</sup> /min]	Cut. Power [kW]	Cut. Torque [Nm]
130 / 37kW	56	160	160	450	2100	6	105	1323	56	1188
150 / 51kW	77	163	200	260	2100	7	135	1984	77	2828
150 / 37kW	80	176	225	250	2100	6,5	150	2040	80	3055
160 / 51kW	77	160	250	200	2100	6,5	160	2184	77	3676
160 / 60kW	80	190	250	250	2100	7	160	2352	80	3055

Used material: Low alloy steel (not hardened) 125 – 225 HB

# Headstock

## Headstock 130, 150, 160

The WRF, WF, WFT, WFC and WRFT series are equipped with a standard boring live spindle. The headstock provides an adjustable mounting platform for a variety of attachments such as CNC angle heads, manual angle heads, support spindle sleeves, etc.



The headstock is driven by an AC motor. The two-speed automatic gearbox gives enough torque for heavy metal chip removal and for powerful high-speed drilling.

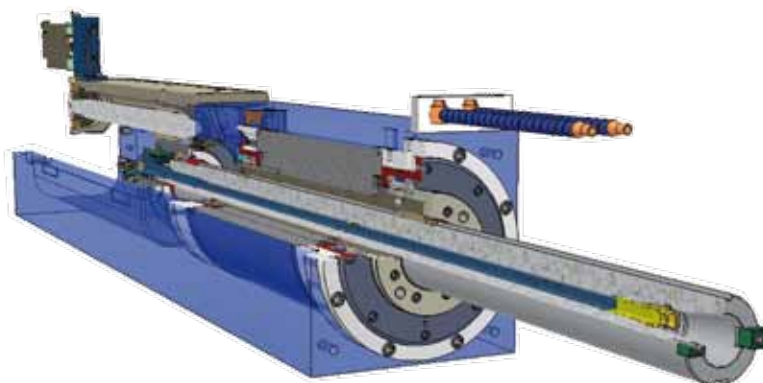
FERMAT machines are also capable of high-performance manufacturing due to the spindle axial force of 25,000 N/ 35,000 N/ 40,000 N as per basic technical specification tables.

On WRF 130 CNC and WRFT 130 CNC, two Y-axis ball screws with two Heidenhain scales control slide ram deflections. The third ball screw in the torque position that is constantly pushing the headstock body upwards is added for 150, 160 mm and Mill headstocks. The upper part features heavy duty Schneeberger (INA, THK) roller linear guide ways, further contributing to the precision and rigidity of the machine.

WFT, WF and WFC machines are equipped with one ballscrew and counterweight system, as well as box guide ways.

## Headstock EV 3400

The WFT 12 CNC is equipped with a standard boring live spindle. The headstock provides an adjustable mounting platform for a variety of attachments such as CNC angle heads, manual angle heads, spindle support sleeve, etc. Headstock EV consists of built-in direct drive motor with W-axis stroke 730 mm.



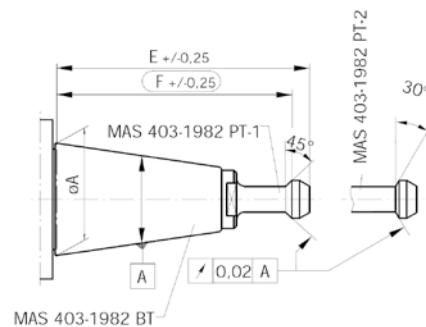
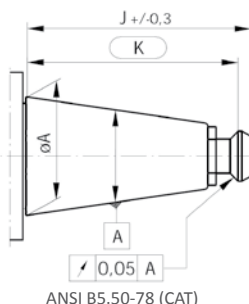
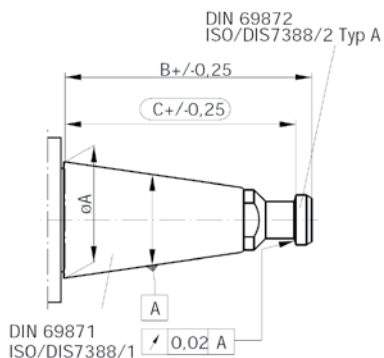
Spindle Diameter	120 mm
Spindle RPM	10 - 3400 /min
Max. Spindle Torque	1100 Nm
Spindle Taper	ISO 50 / DIN 69 871/2
Spindle Travel (W-axis)	730 mm
Ram Dimension	420 x 420 mm

## Tool Standard SK (ISO)

Tool Standard ISO	A	B +/- 0,25	C +/- 0,25
SK 40	44,45	94,25	88,25
SK 50	69,85	135,60	126,60
SK 60	107,95	201,65	191,65

Tool Standard CAT	A	J +/- 0,3	K +/- 0,3
SK 40	44,45	84,50	79,25
SK 50	69,85	127,00	119,40
SK 60	107,95	199,95	189,45

Tool Standard BT	A	E +/- 0,25	F +/- 0,25
SK 40	44,45	100,35	93,35
SK 50	69,85	146,75	136,75
SK 60	-	-	-



# Control Systems and Motors

## Control System

FERMAT machines are offered with Heidenhain iTNC 530, Fanuc 31i, or Siemens Sinumerik 840 D equipped with a 15" LCD display, an operating panel with a keyboard, and an electronic hand-wheel. As an option, our machines can be supplied with Fanuc Oi MD or Heidenhain 620 TNC with 10" LCD display.

The control system coordinates the continuity of all the axes, and also when peripheral tools are attached, such as a rotary table or a milling head.

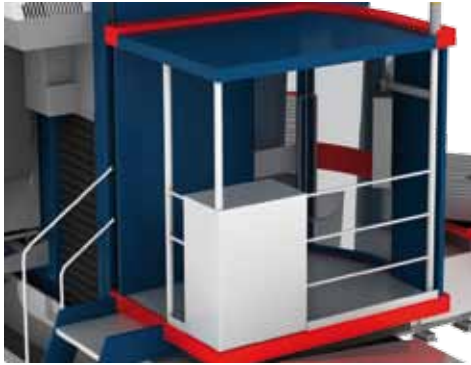


## Servomotors

There are digitally governed servomotors enabling the autonomous movement of all axes.



# Other Important Machine Components



## Operator's Platform

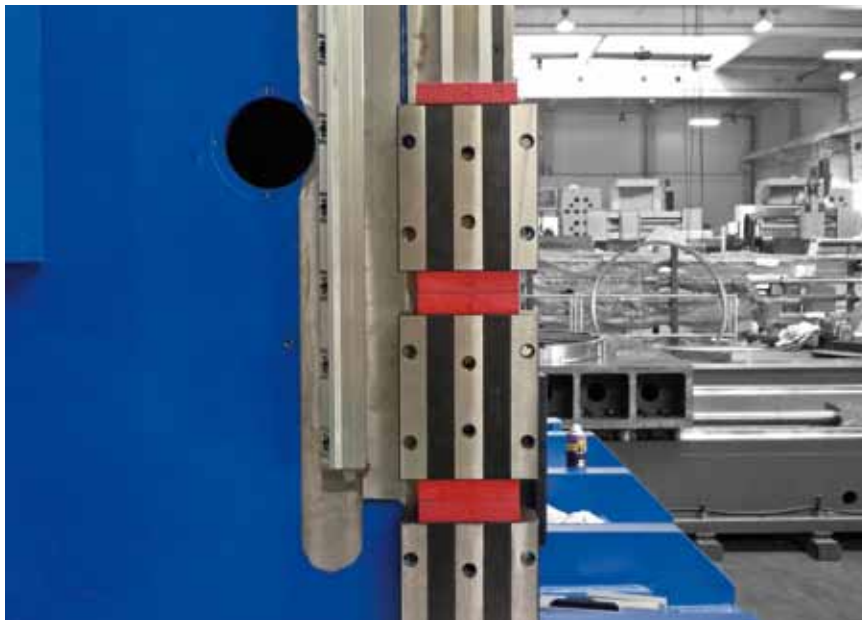
Inside the cabin, there is the Main Control Panel and a prepared storage area for machine tools. The platform is equipped with suitable protection covers and a lockable door, which is secured by electromagnetic switches.

Operator's platform on floor type machines is standardly equipped with a horizontal and vertical adjustment. For table type series, the platform is either fixed or moveable in vertical and horizontal direction.



## Hydraulic Aggregate

An integral part of the machine is a Hydraulic Aggregate used for clamping and unclamping of a tool from the spindle. On the front side, there is a liquid level gauge, with a thermometer, for visual level and temperature checks of oil in the tank.



## Linear Guide Ways

Roller linear guide ways enable a higher speed of movement and a smaller force needed for the machine's movement. This results in higher accuracy of positioning with smaller energy consumption, and longer operating life for components such as ballscrews, servomotors, etc.

This solution requires minimum maintenance and simplified, quicker eventual repairs.



## Lubrication Unit

Lubrication of linear guide ways and ball screws (X, Y, and Z-axis) is performed by a special lubrication unit.

The Central Lubrication System is designed with progressive dividers that distribute specific amounts of lubricant.

# Other Important Machine Components

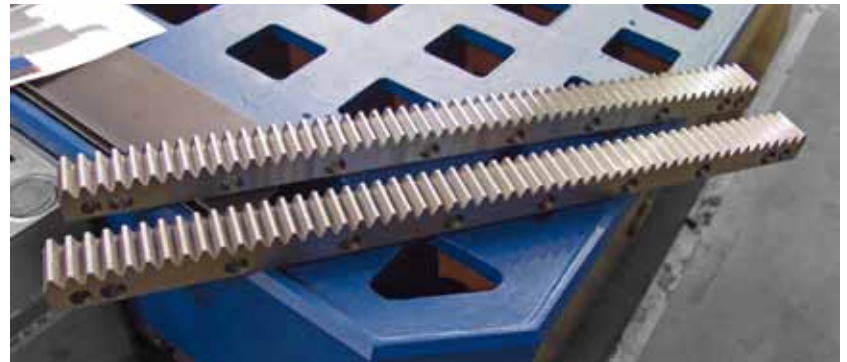


## Ballscrews

X, Y, Z, and W-axis movement is facilitated by ballscrews with the favorable characteristic of very low friction. Thanks to the precision tolerances between the nut and the screw, high rigidity and accuracy is achieved.

## Rack

Horizontal movement on X-axis longer than six meters is secured by a rack with two pinions that are in a Master-Slave relationship.



## Telescopic Covers

Guiding surfaces are covered lengthwise and crosswise with telescopic covers.

# Control Systems and Motors

## Linear Scales Heidenhain

The X, Y, Z and V axes are equipped with linear scales that ensure the accuracy of the machine.

The W-axis is measured directly from the servomotor encoder or optionally by a Heidenhain linear scale.

Measurement of spindle revolutions is performed by the rotary encoder that allows for the desired positioning of the spindle.

All final positions of the particular axes are secured by a limit switch.



## Switchboard

All the electric control elements are concentrated in a switchboard made by Rittal. All its components come from renowned manufacturers.



# Special Accessories



Work piece/ Tool Touch Probe,  
Heidenhain or Renishaw



Cooland Through Spindle 10-50 bar



Angular Clamping Plates



Chip Conveyor



#### Clamping Plates:

- 3200x1885x400 mm (125.98x74.21x15.75 in)
- 4000x1885x400 mm (157.48x74.21x15.75 in)
- 4800x1885x400 mm (188.98x74.21x15.75 in)
- 5600x1885x400 mm (220.47x74.21x15.75 in)
- 6400x1885x400 mm (251.97x74.21x15.75 in)
- 7200x1885x400 mm (283.46x74.21x15.75 in)
- 8000x1885x400 mm (314.96 x74.21x15.75 in)



Automatic Tool Changer for  
20, 32, 40, 60 or 90 tools

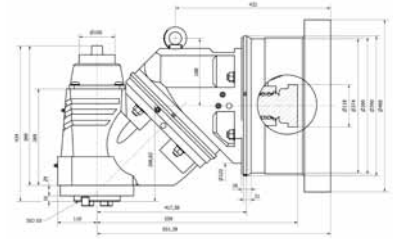
# Milling Heads, Face Plates



## UHM 30

Universal Manual Head UHM 30 – manually attached to the headstock, manual positioning, automatic tool clamping and unclamping.

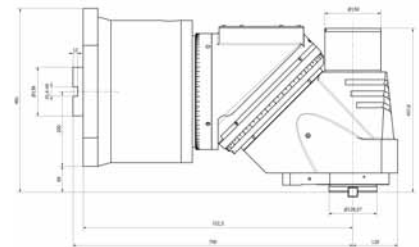
Revolutions: 3 000 RPM  
 Maximum Power: 30 kW (40 HP)  
 Maximum Torque (150 RPM): 1 600 Nm  
 Tool: ISO 50 – DIN 69871  
 Pull Stud : DIN 69872  
 Turning: any degree  
 (optionally 2,5°/ 2,5°; 1°/ 1°)  
 Coolant Through Spindle: Not Possible



## UHA 30

Universal Automatic Head UHA 30 – automatically attached to the headstock, automatic positioning, automatic tool clamping and unclamping.

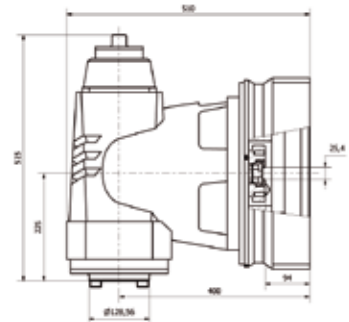
Revolutions: 3 000 RPM  
 Maximum Power: 30 kW (40 HP)  
 Maximum Torque (150 RPM): 1 600 Nm  
 Tool: ISO 50 – DIN 69871  
 Pull Stud : DIN 69872  
 Turning: 2,5°/ 2,5° (1°/ 1°)  
 Coolant Through Spindle: Standard



## PHM 37

Right Angle Manual Head PHM 37 - manually attached to the headstock, manual positioning, automatic tool clamping and unclamping.

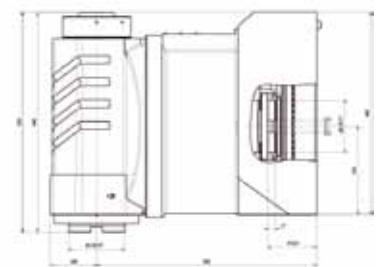
Revolutions: 3 000 RPM  
 Maximum Power: 37 kW (50 HP)  
 Maximum Torque (150 RPM): 2 000 Nm  
 Tool: ISO 50 - DIN 69871  
 Pull Stud: DIN 69872  
 Turning: any degree  
 (optionally 2,5°/1°)  
 Coolant Through Spindle: Option



## PHA 37

Right Angle Automatic Head PHA 37 - automatically attached to the headstock, automatic positioning, automatic tool clamping and unclamping.

Revolutions: 3 000 RPM  
 Maximum Power: 37 kW (50 HP)  
 Maximum Torque (187 RPM): 2 000 Nm  
 Tool: ISO 50 – DIN 69871  
 Pull Stud: DIN 69872  
 Turning: 2,5° (1°)  
 Coolant Through Spindle: Standard



# Milling Heads, Face Plates



**IFWV 1B**

Right Angle Milling Head - manual positioning, manually attached to the headstock, manual tool clamping and unclamping.

Revolutions:	10 - 2 000 RPM
Maximum Power:	10 kW (13 HP)
Maximum Torque (150 RPM):	180 Nm
Tool:	ISO 40
Turning:	0° - 360°
Coolant Through Spindle:	Not Possible



**IFWV 2B**

Right Angle Milling Head - manual positioning, manually attached to the headstock, manual tool clamping and unclamping.

Revolutions:	10 - 1 000 RPM
Maximum Power:	55 kW (74 HP)
Maximum Torque (150 RPM):	2 600 Nm
Tool:	ISO 50/60
Turning:	0° - 360°
Coolant Through Spindle:	Not Possible



**IFWV 3B**

Two Axis Orthogonal Milling Head - manual positioning, manually attached to the headstock, manual tool clamping and unclamping.

Revolutions:	10 - 1 000 RPM
Maximum Power:	55 kW (74 HP)
Maximum Torque (150 RPM):	2 600 Nm
Tool:	ISO 50/60
Turning:	0° - 360°
Coolant Through Spindle:	Not Possible



**FERMAT Face Plate FH 65**

Plate Diameter:	650 mm (19.68 in)
Positioning:	Automatic
Boring Accuracy:	0,05 mm (0.002 in)
Radial Traverse:	170 mm (6.69 in)
Maximum Boring Diameter:	1 200 mm (47.24 in)
Coolant Through Spindle:	Not Possible



**D'Andrea Face Plate UT 5-500 S**

Plate Diameter:	500 mm (19.68 in)
Positioning:	Automatic
Boring Accuracy:	0,01 mm (0.0004 in)
Radial Traverse:	160 mm (6.30 in)
Maximum Boring Diameter:	1 000 mm (3.94 in)
Coolant Through Spindle:	Standard

# Reference Machines



Czech Republic, ELFE, s.r.o., WRF 130 CNC

X = 9 200 mm	Y = 3 000 mm	Z = 900 mm	W = 730 mm	Rotary Table 2 500 x 3 000	Floor Plates 4 000 x 1 885 x 400 (2 pcs.)
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# Reference Machines



Czech Republic, VÍTKOVICE MECHANIKA, s.r.o., WRF 130 CNC

X = 8 600 mm	Y = 2 500 mm	Z = 900 mm	W = 730 mm	Floor Plates 4 800 x 1 885 x 400 (2 pcs.)
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Czech Republic, ARMATURY GROUP, a.s., WRFT 130 CNC

X = 5 500 mm	Y = 3 000 mm	Z = 900 mm	W = 730 mm	Rotary Table 2 500 x 2 000	ATC 60 pcs	CTS 15 bar
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Poland, TEJA Sp.z o.o., WFT 13 CNC

X = 2 500 mm	Y = 1 700 mm	Z = 1 200 mm	W = 730 mm	Rotary Table 1 600 x 1 800	CTS 20 bar
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Poland, ZUGIL, S.A., WRF 130 CNC

X = 15 000 mm	Y = 3 000 mm	Z = 900 mm	W = 730 mm	Rotary Table 2 000 x 2 500	Floor Plates 4 000 x 1 885 x 400 (2 pcs.), 5 600 x 1 885 x 400 (2 pcs.), 2 500 x 5 000 x 400 (1 pcs.)	Universal Milling Head VAR 5
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# Reference Machines



Slovakia, STROJE A MECHANIZMY, WRF 130 CNC

X = 6 200 mm	Y = 3 000 mm	Z = 900 mm	W = 730 mm	Rotary Table 2 500 x 3 000	Floor Plate 4 800 x 1 885 x 400 (1 pcs.)	Universal Milling Head VAR 5
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Slovakia, ALT, a.s., WRF 130 CNC

X = 8 000 mm	Y = 3 000 mm	Z = 900 mm	W = 730 mm	Rotary Table 2 500 x 3 000	Floor Plates 4 000 x 1 885 x 400 (2 pcs.)
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Finland, HOGFORS, WRF 130 CNC

X = 6 200 mm	Y = 3 000 mm	Z = 900 mm	W = 730 mm	CTS 50 bar	ATC 90 pcs.	Right-angle Automatic Milling Head PHA 37
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Slovenia, KOLDING D.O.O., WFT 13 CNC

X = 4 000 mm	Y = 2 500 mm	Z = 1 200 mm	W = 730 mm	Rotary Table 1 800 x 2 200	ATC 32 pcs	CTS 20 bar	Universal Manual Milling Head UHM 30
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REFERENCE

# Reference Machines

Hungary, NORDMETAL, WRFT 130 CNC

X = 4 200 mm	Y = 3 000 mm	Z = 900 mm	W = 730 mm	Rotary Table 2 000 x 2 500		
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Netherlands, TIMMERMANS, WRF 130 CNC

X = 8 000 mm	Y = 3 500 mm	Z = 900 mm	W = 730 mm	Rotary Table 2 500 x 3 000	CTS 30 bar	Floor Plates (2 pcs.) 4 800 x 1 885 x 400
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Canada, AD PRECISION, WFT 13 CNC

X = 2 000 mm	Y = 2 000 mm	Z = 1 200 mm	W = 730 mm	Moveable Platform		
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Italy, G.E.I. MACHINE TOOLS, s.r.l., WRF 130 CNC

X = 4 200 mm	Y = 3 000 mm	Z = 900 mm	W = 730 mm	Rotary Table 2 000 x 2 500	ATC 60 pcs.	CTS 20 bar	Multi-angle Milling Head VGCI
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China, TIANJIN JUSHENG COMPLETE EQUIPMENT CO. LTD., WRF 160 CNC

X = 8 000 mm	Y = 4 000 mm	Z = 900 mm	W = 730 mm	ATC 60 pcs.	CTS 20 bar	Universal Manual Milling Head UHM 30
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China, TIANJIN JUSHENG COMPLETE EQUIPMENT CO. LTD., WFT 13 CNC

X = 4 000 mm	Y = 2 500 mm	Z = 1 700 mm	W = 730 mm	Rotary table 1 800 x 2 200	ATC 40 pcs.	CTS 20 bar
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China, SPAM, WFT 13 CNC

X = 2 500 mm	Y = 2 000 mm	Z = 1 200 mm	W = 730 mm	Rotary Table 1 800 x 2 200	ATC 20 pcs.	CTS 20 bar
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# Reference Machines



Sweden, AXCEL COMPONENTS, WRF 130 CNC						
X = 14 100 mm	Y = 3 000 mm	Z = 900 mm	W = 730 mm	Rotary Table 2 500 x 2 500	ATC 60 pcs.	CTS 30 bar

Estonia, LOKSA SHIPYARD, WRF 130 CNC						
X = 8 000 mm	Y = 3 000 mm	Z = 900 mm	W = 730 mm	Rotary Table 2 500 x 3 000	Floor Plates 4 800 x 1 885 x 400 (2 pcs.)	ATC 60 pcs. CTS 20 bar Universal Milling Head VGCI

Turkey, ASMAS, WFT 13 CNC						
X = 2 500 mm	Y = 2 000 mm	Z = 1 200 mm	W = 730 mm	CTS 20 bar	Universal Manual Head UHM 30	Right-Angle Manual Head V3 90

Turkey, ASMAS, WFT 13 CNC						
X = 3 000 mm	Y = 2 000 mm	Z = 1 200 mm	W = 730 mm	CTS 20 bar	Universal Manual Head UHM 30	Right-Angle Manual Head V3 90

Turkey, VINÇSAN VINÇ SANAYİ VE TIC. A.S., WRF 130 CNC						
X = 20 200 mm	Y = 5 000 mm	Z = 900 mm	W = 730 mm	Rotary Table 2 000 x 2 000	ATC 40 pcs	Floor Plates (4 pcs.) 4 000 x 1 885 x 400, Universal Automatic Milling Head VGCI



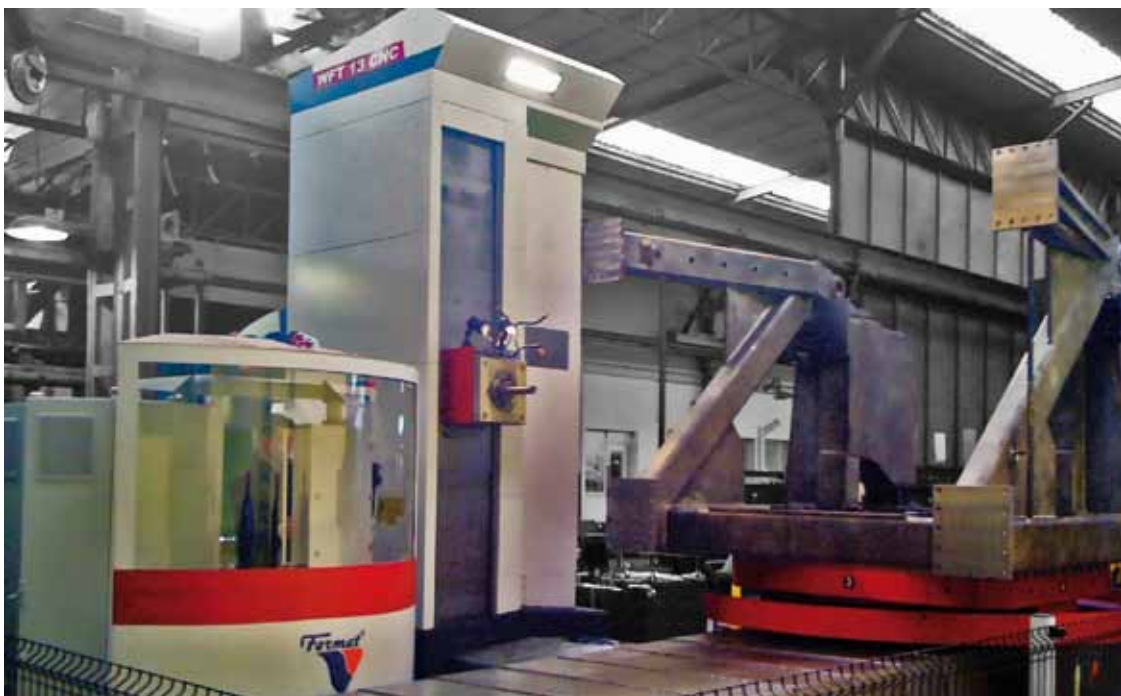
Estonia, AS E-PROFIL, WRFT 130 CNC						
X = 4 200 mm	Y = 2 500 mm	Z = 900 mm	W = 730 mm	Rotary Table 2500 x 2 000	ATC 60 pcs.	CTS 30 bar

# Reference Machines



France, MANUFACTURE DE FORAGE, WRF 130 CNC

X = 7 400 mm	Y = 2 500 mm	Z = 900 mm	W = 730 mm	Rotary Table 2 000 x 2 500	ATC 60 pcs.	CTS 30 bar
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France, SARRAZIN, WFT 13 CNC

X = 3 500 mm	Y = 2 000 mm	Z = 1 200 mm	W = 730 mm	Rotary Table 1 600 x 1 800	Universal Manual Milling Head UHM 30
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France, BARRIERE, WFT 13 CNC

X = 3 000 mm	Y = 2 000 mm	Z = 1 200 mm	W = 730 mm	Rotary Table 1 600 x 1 800
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● Production Site

● Sales and Service Centres

● Distributors/ Technical Support

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