FERMAT

SPECIALIZING IN PRECISION

HORIZONTAL BORING MILLS

www.fermatmachinery.com

FERMAT

WRF 160 Heavy CNC

for D&S Machine Service Inc., USA

Parameters: X=27 000 (1 062.99") | Y=5 000 (196.85") | Z=1 500 (59.05") | W=1 000 (39.37") | Rotary Table=T 50, 3 500 x 3 500 (137.79 x 137.79")
CTS =20 | ATC=60 | UHAmi30 | PHA 37/2,5 st

Content:

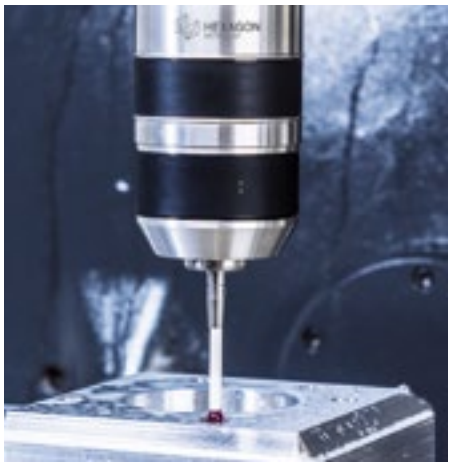
Fermat Fast Facts

650

Number of employees

2

largest consumer of Heidenhain and Fanuc in local market



67€ mil.

Annual sales in 2014

1901

Oldest member of FERMAT Group (Lucas)

8

Branches in Czech Republic

100+

Annual production/sold machines

1

Micron (1 µm) is the most accurate production machine in our machining shop

5

Soccer fields would fit in the floor space of FERMAT Production facilities

About Fermat

FERMAT Company is a renowned Czech manufacturer of machine tools with a focus on Horizontal Boring and Milling machines. The history of the oldest Fermat member in the Czech Republic dates back to 1902 when Mr. Frantisek Wawerka started his first business and built a new factory specializing in the production of lathes & drilling machines. Over a one hundred year long tradition in machine tool production places the company among dominant Machine Tool Manufacturers in the European as well as the worldwide market.

Fermat horizontal boring machines allow CNC machining with a spindle diameter from 100 to 160 mm | 3.94"-6.30". Thanks to our modular production system we supply our customers with reliable and flexible machines. Our components and accessories are produced directly within Fermat or delivered by world-renowned companies (SKF, Thyssen Krupp, Siemens, Rittall etc.). This kind of production provides our customers with better service, fast delivery time and high quality.

Production

Fermat's annual production is over 100 machines. Thanks to this number we do guarantee customers reliable, convenient and the most standardized design table or floor boring machines with fast delivery. The modular system of production, along with experienced engineers and technicians, allows Fermat to supply machines according to our customer's needs whether in standard or special design. This flexibility and innovation is our guarantee for future success!

Production Facilities

Fermat occupies 33 200 m^2 (357 362 sq ft) production and assembly halls. The most important centers are situated in Prague and Brno (Prague 5 300 m^2/57 049 sq ft; Brno 4 800 m^2 / 51 667 sq ft + 3 600 m^2 / 38 750 sq ft + 3 700 m^2 / 39 826 sq ft). The company sales soared despite the recent economic crisis. In the same period Fermat acquired several traditional manufacturers like Pressl Company in Pilsen and Strojtos Lipnik to increase the production facilities.

Worldwide Sales and Distribution

Based in the heart of Europe, Fermat is one of the leading suppliers of machine tools - horizontal boring machines (both table/floor type machines) in Central Europe. The company celebrated achievements not only in European markets, but also in Canada, USA, Russia, India, China and South America, exporting to more than 40 countries worldwide. Fermat is constantly growing and increasing its market share and participates in main International Fairs around the world including EMO- the leading International Trade Fair for the machine tool industry and IMTS - the largest machine tool exhibition for the North American market.


Lipnik Plant 1920


Brno Plant 2006


Fermat Assembly Shop


Prague Machining Shop

Fermat Production Plants

Czech Republic

Prague-Brno 2hrs
Brno-Lipnik 1hr
Prague-Liberec 1hr
Prague-Rokycany 1hr

PRAGUE

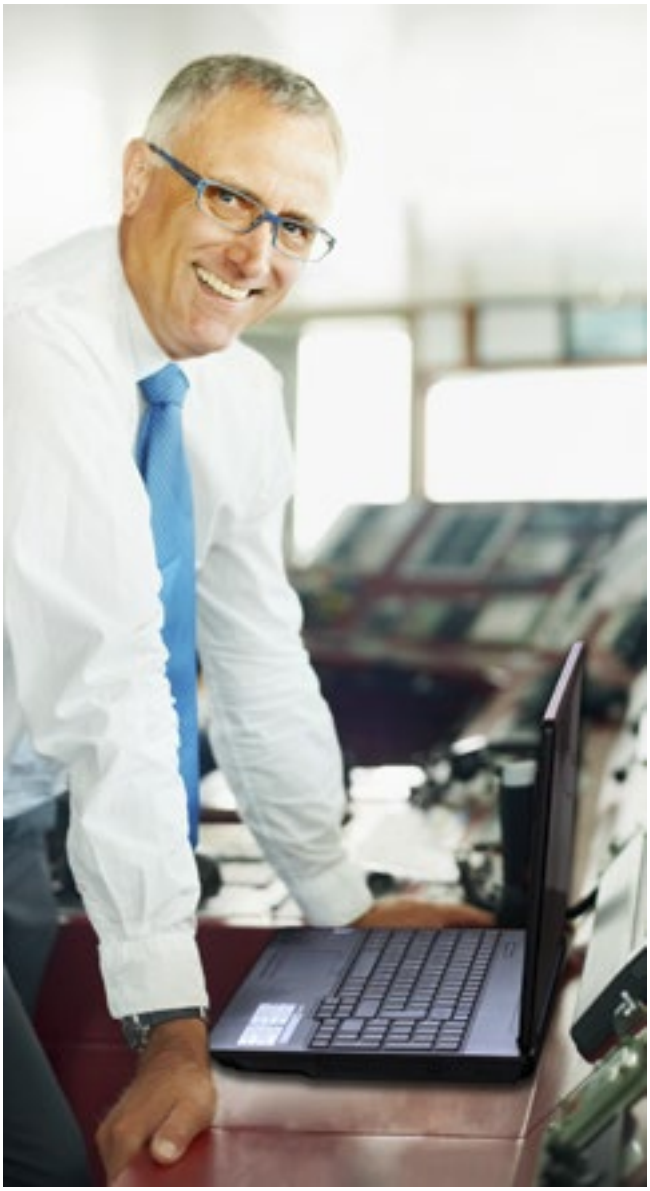
BRNO

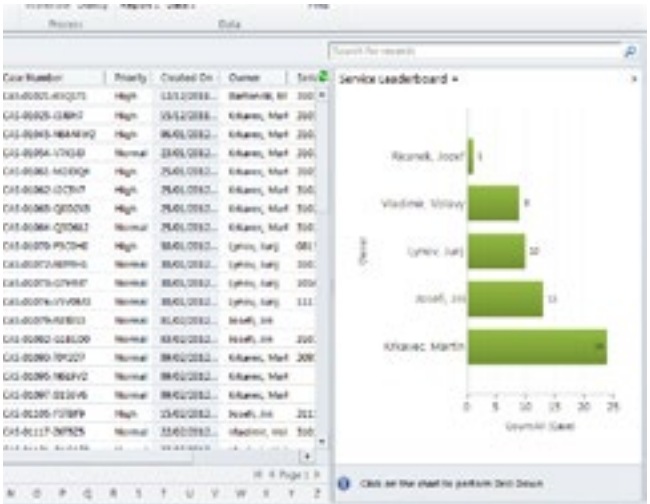
LIPNIK

LIBEREC

ROKYCANY

Customer Service





Microsoft Service Data Preview

Machine Remote Diagnostic

All FERMAT machines are equipped with machine remote diagnostics. This feature provides customers with quick on-line problem solving analysis of their machine by skilled FERMAT Service Technicians. Machine problems such as programming difficulties, electronic and mechanical error messages can be diagnosed and in most cases solved. Main advantages of remote diagnostics are:

- The quickest possible way to detect a failure at the machine
- Very short time between the message about a failure and the first on-line contact with the customer
- Immediate consultation with the customer whether a spare part is necessary
- Efficiency of PLC problem solution is approx 80%
- Machine data backup, statistics are later used to improve the Customer Service.

Service Policies

First-class customer service is one of our most significant company qualities. People in Fermat know that the quality of maintenance services significantly affects customer satisfaction. Therefore, the Service Center continuously tries to improve the services and information management of service cases. For this purpose we instituted the following service policies:

- Overview and quick reaction times
- Automatic registration of all service cases
- Remote diagnostics
- Linguistic diversity of employees at the Customer Service Center
- Large stock of spare parts in EU, U.S., Canada, India, China
- Library of solutions for Frequently Asked Questions or problems
- Classification, Monitoring and analysis of all service cases

These are the main advantages of the service system at Fermat. After reporting a new service case our service support will automatically process its administration. Responsible service workers are immediately assigned to the individual service request.

Customer Service Hours

With Fermat, you can connect with customer service during hours Mon-Fri 7.30 a.m - 4.30 p.m. EST.

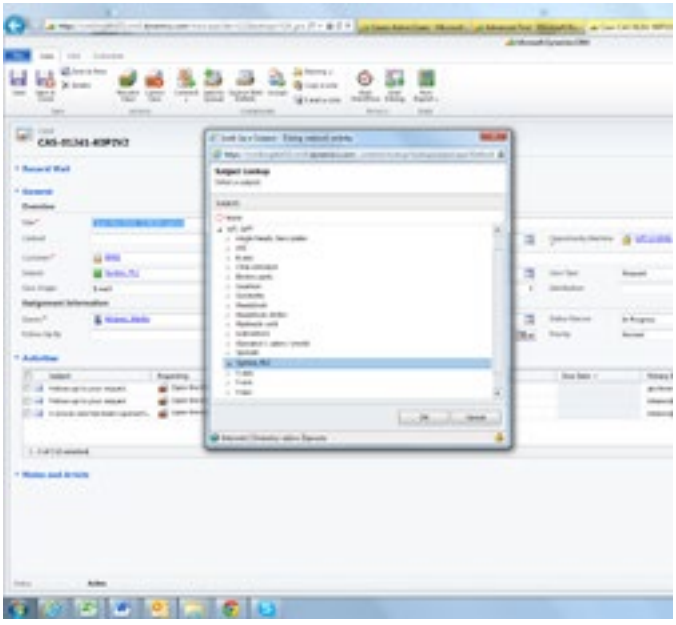
Microsoft Dynamics System Supports Customer Service

A step forward, according to Service Manager for Germany, Mr. Josefi, was an implementation of Microsoft Dynamics Information System. All service cases are automatically registered in the service database together with the time schedule of the particular case and a responsible person. This system allows better management and communication with the customers. "As soon as the case gets recorded under the system, we immediately send our responsible technician with the necessary equipment or spare parts to the customer", says Mr. Krkavec, the Head of Fermat Service Center. Fermat has large stocks of spare parts in Europe, U.S., Canada, India and China so our customers do not have extended waiting times. After resolving a service case, a final report is sent to the customer and feedback monitoring is saved to be helpful for our internal statistics.

Library Service and Monitoring

Documented service events are regularly reported to Production and Design Departments. These statistics are used to improve the design of machines.

Our knowledge database is well maintained and every new problem leads to solution entries.



Classification of service problems

U.S. service team

International service team

FERMAT Stock – spare parts

Table Type Horizontal Boring Mills

"There are many features of the FERMAT machine that allowed us to improve our efficiency. Value for the money was an important consideration and Fermat machines are excellent value for the money. The features of the machine, for example: large box ways, planetary gear boxes between the servo motor and each of the ball screws, choice of CNC controls and well known, high quality purchased components all influenced my decision to purchase Fermat WFT 13 CNC machine. Sales support from the Fermat Factory as well as from the local dealer was excellent, the company responded with information quickly any time it was needed."

Jerry Decker,
President of Precision Boring Company, USA

Horizontal Boring and Milling Machines – Table Type

WFC 10, WFT 11, WFT 13 and WRFT 130 represent the table type of horizontal boring mills. Chief machine characteristics are a powerful milling and drilling chip removal rate (even with top Y-axis stroke) and higher precision than other machines available on the market. A modular concept allows great operational variability in configurations, built according to the client's requirements. Modern control systems provide very easy operation of the machine and many useful functions for the user. Horizontal Boring Mills WRFT offer 5 linear axes travel (X, Y, Z, V, W) and 1 rotary axis (B) while WFT and WFC adopt the movement on 5 total 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 (with the exception of the WFC model) and the workpieces are clamped on a rotary table that travels in the X-axis.

Our Products

WFT 13
See page 12

WFT 11
See page 18

WRFT 130
See page 20

WFC 10
See page 24

WFT 13 CNC

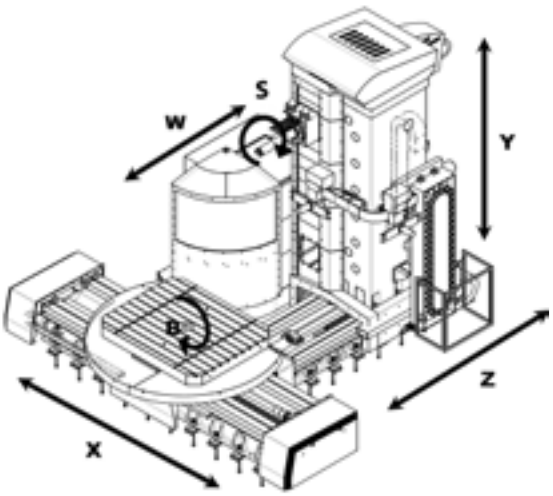
Horizontal Boring Mill WFT 13 CNC represents the newest technology and concept of table type horizontal borers that are currently on the market. Thanks to the powerful headstock, high axial forces and the most precise table in its category, Fermat´s WFT 13 can fulfill the needs of the most demanding customers.

The accuracy and reliability of this machine type is proven by years of use and hundreds of installed machines. Annually, over 80 pieces of FERMAT WFT 13 are sold worldwide. The machine allows efficient processing of large and heavy workpieces while utilizing high precision and quality of operation.

WFT 13 CNC is optionally equipped with the Automatic Tool Changer (ATC) or the Automatic Pallet Changer System (APC) and with different kinds of Manual or Automatic Milling Heads.

Machine Configurations

- WFT 13 Basic machine on box guideways
- WFT 13 R Machine on box guideways with ram travel 700 mm | 27.60"
- WFT 13 Linear Machine on linear guideways
- WFT 15 R Machine on box guideways with ram travel 700 mm | 27.60", 150 mm | 5.91" spindle diameter



Technical parameters		WFT 13	WFT 15
Diameter of Spindle	mm | in	130 | 5.12"	150 | 5.91"
Taper of Spindle		ISO-50 / BT-50 | CAT-50	
Range of Spindle speed	rpm	3 000/4 000	
Rated Power of Main Engine S1/S6	kW | HP	up to 53/64 | 71/86	
Travel Table X	mm | in	2 000 / 3 000 / 4 000 / 5 000 | 78.74"/118.11"/157.48"/196.85"	
Headstock Vertical Travel Y	mm | in	2 000 / 2 500 / 3 000 / 3 500 | 78.74" /98.43"/118.11"/137.80"	
Longitudinal Travel Z	mm | in	1 500 / 2 000 | 59.05"/ 78.74"	2 100 / 3 300 | 82.68"/ 129.92"
Extension Spindle Travel W	mm | in	730 | 28.74"	1 000 | 39.37"
Longitudinal Headstock Travel V (WFT 13R)	mm | in	700 | 27.60"	
Operating Feed X, Y, Z, W, (V)	mm/min | in min	max. 8 000 | 315"	
Operating Feed B	rpm	max. 2	
Rapid Traverse X, Y	mm/min | in min	12 000 / 28 000 * | 472.44" /1002.36" *	
Rapid Traverse Z / W	mm/min | in min	10 000 | 393.70"	
Max. Table Load	kg | lb	see page 43	
Table Dimensions	mm | in	see page 43	

* For WFT Linear

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.

Drives

Digitally controlled AC servomotors for all CNCs can control 5 or more axes position data of the machine at the same time. The motors are directly linked to the ball screws, which limits backlash and a higher rigidity between the drive and the ball screw is reached. Therefore it is possible to achieve very precise linear, circular and spiral interpolation. The drives on the machine are supplied by renowned manufacturers such as Heidenhain, Siemens, Fanuc, Fagor, Harmonic Drive, Stöber etc.

Rotary Table

The rotary table has outstanding positioning precision (4" arc i.e. 0.010 mm / 1 000 mm radius). There is no slip-stick during the positioning of the table. Due to a simple design and assembled components, FERMAT tables require minimum maintenance and adjustments during their lifetime.

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

The rotary movement is achieved through 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.

Beds

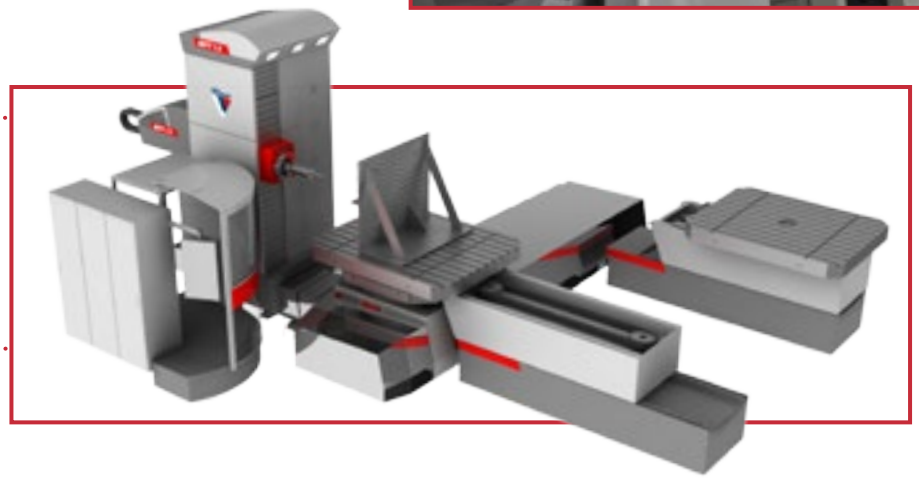
The longitudinal and transversal bed of the machine is made of grey cast iron which is stabilized through annealing. It was designed in order to absorb the maximum amount of vibrations that are created during cutting.

Ram

Optional ram travel
700 mm | 27.60"

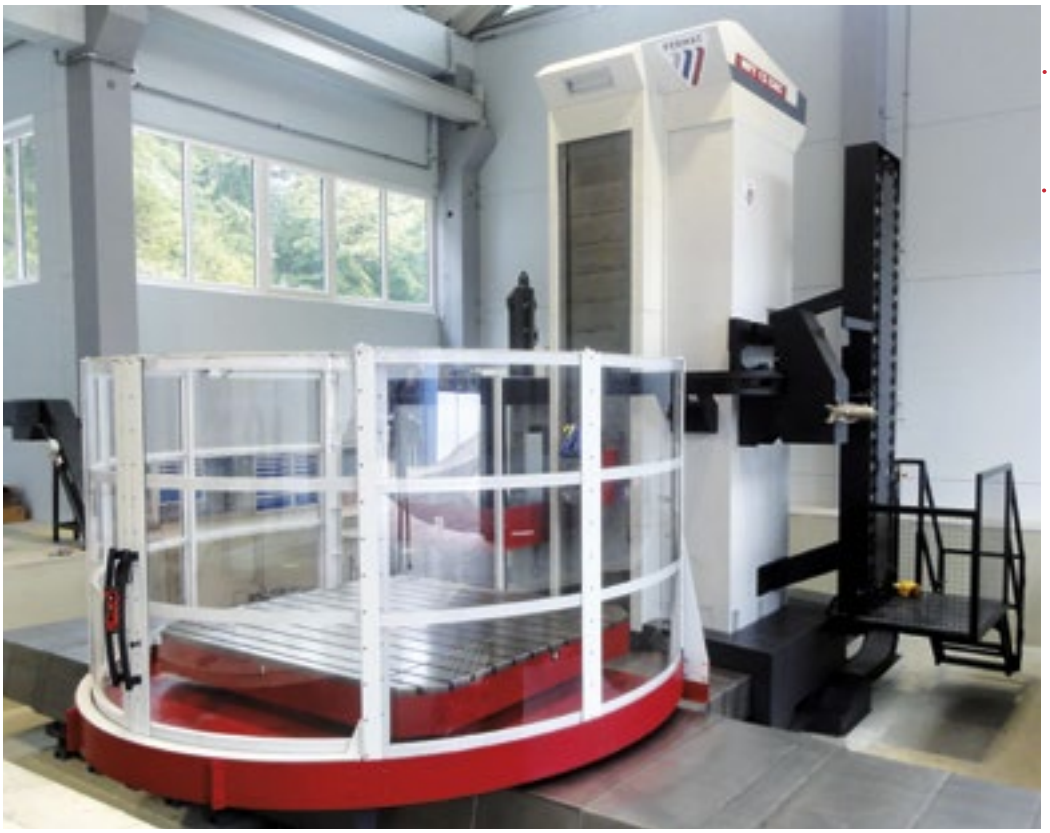
Pallet System

The automatic pallet system has 2 to 5 pallet shuttle system. For more details see page 49.



WFT 13 CNC

Robotic Tool Changer – WFT 13 R CNC

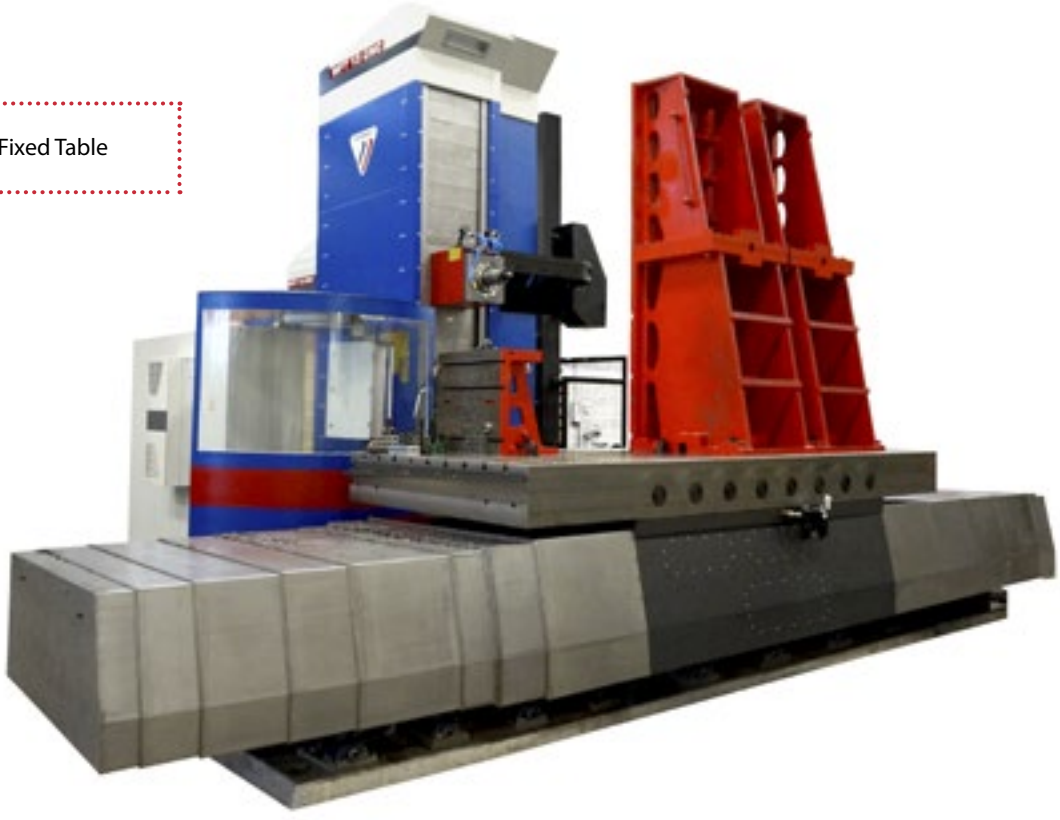


WFT 13 CNC
with Table Cover

WFT 13 CNC

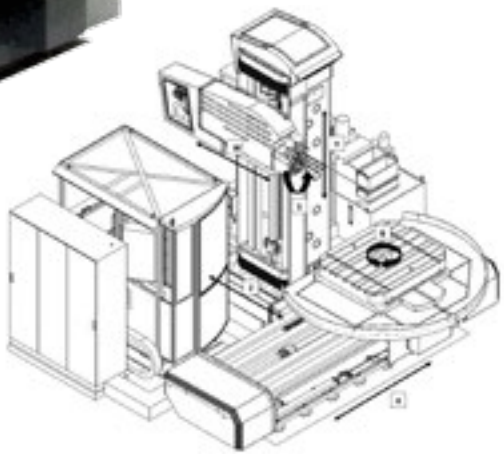
WFT 13 CNC with KUKA Robot and new Pickup Station for Milling Heads

WFT 13 CNC with Fixed Table



WFT 11 CNC

Horizontal Boring Mill WFT 11 CNC is a smaller version of Fermat´s best-selling machine, the WFT 13 CNC. The ball screw of the Y Axis (diameter of 63 mm | 2.48"), its rigid column made of grey cast iron, and its powerful spindle with a diameter of 110 mm | 4.33" exemplifies the quality of this machine. The high accuracy of WFT 11 is supported by the use of reliable components such as linear scales or monitoring and stabilizing temperature systems. Moreover high positioning precision is achieved by two servos on the B axis that prevent backlash of the rotary table as part of the standard configuration.



Machine Configuration

- WFT 11 - basic machine on box guideways

Technical parameters		WFT 11
Diameter of Spindle	mm | in	110 | 4.33"
Taper of Spindle		ISO-50 / BT-50 | CAT-50
Range of Spindle Speed	rpm	max. 3 000
Rated Power of Main Engine S1/S6	kW | HP	17/25, 22/33 | 23/34, 30/44
Travel Table X	mm | in	2 000 / 3 000 | 78.74" / 118.11"
Headstock Vertical Travel Y	mm | in	1 250 / 1 700 / 2 000 | 49.21" / 66.93" / 78.74"
Longitudinal Travel Z	mm | in	1 250 | 49.21"
Extension Spindle Travel W	mm | in	730 | 28.74"
Operating Feed X, Y, Z, W	mm.min | in min	max. 4 000 | 157.48"
Operating Feed B	rpm	max. 2
Rapid Traverse X, Y, Z a W	mm.min | in min	8 000 | 315"
Max.Table Load	kg | lb	see page 43
Table Dimensions	mm | in	see page 43

WFT 11 CNC

WFT 11 with Robotic Tool Changer&Table Cover

WFT 11 CNC with Safety Fence

WRFT 130 CNC

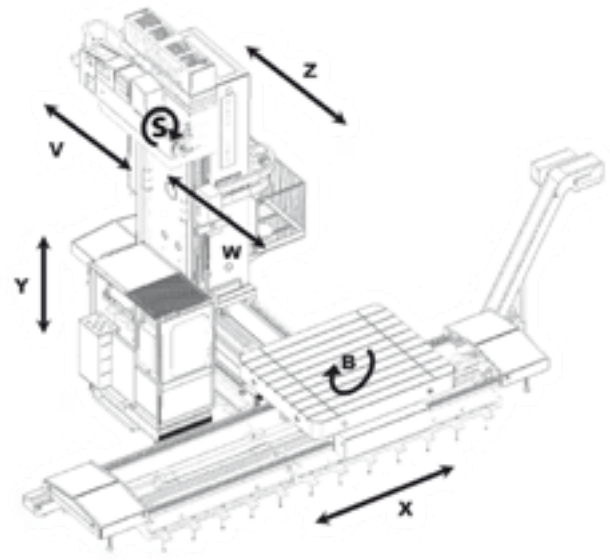
The horizontal milling and boring machines WRFT represent the newest technology and concept of large table type horizontal borers with ram travel and movable spindle. WRFT machines are being used mostly during powerful machining of big and heavy workpieces up to 50 000 kg | 110 231 lb.

WRFT construction is based on incorporation of components from the WRF Floor Type Series but with the placement of beds in a "T" configuration resulting in a table-type machine with horizontal table travel (X-Axis), CNC rotary table (B-Axis) and longitudinal column travel (Z-Axis). On the guideways of the column, the headstock travels vertically (Y-Axis) with its horizontal ram travel (V-Axis) and movable spindle (W-Axis).

Machine configuration:

- basic machine on linear guideways with spindle diameter 130 mm | 5.19" and ram travel 900 mm | 35.43"

WRFT 130 is optionally equipped with the Automatic Tool Changer (ATC) or the Automatic Pallet Changer System (APC) and with different kinds of Manual or Automatic Milling Heads.

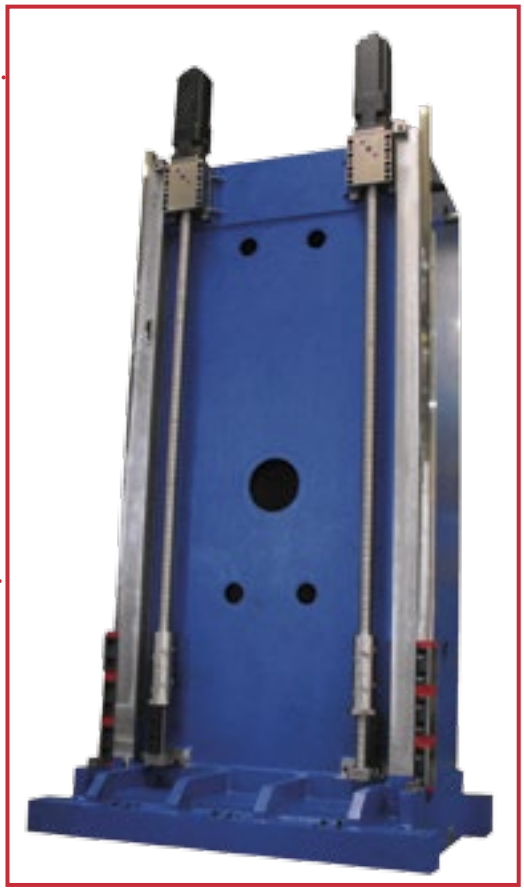


Technical parameters		WRFT 130
Diameter of Spindle	mm | in	130 (150, 160) | 5.12" (5.90", 6.30")
Taper of Spindle		ISO-50 / BT-50 | CAT-50
Range of Spindle Speed	rpm	max. 3 000 (2 800, 2 500)
Rated Power of Main Engine S1/S6	kW | HP	37 / 56 (51 / 77, 60 / 80) | 50 / 75 (68 / 103, 80 / 107)
Travel Table X	mm | in	2 400 – 6 100 | 94.49"-240.18"
Headstock Vertical Travel Y	mm | in	2 000 / 2 500 / 3 000 / 3 500 / 4 000 | 78.74" / 98.43" / 118.11" / 137.80" / 157.48"
Longitudinal Travel Z	mm | in	900 / 2 800 / 2100 / 3 300 / 3900 | 35.44" / 110.24" / 82.68" / 129.92" / 153.54"
Extension Spindle Travel W	mm | in	730 (1000) | 28.74" (39.37")
Ram Travel V	mm | in	900 (1 000, 1 200) | 35.43" (39.37", 47.24")
Operating Feed X,Y,Z,W	mm | in	max. 10 000 | 394.00"
Rapid Traverse X, Y, Z	mm.min | in min	15 000 | 590.55"
Rapid Traverse V, W	mm.min | in min	10 000 | 393.70"
Max. Table Load	kg | lb	see page 43
Table Dimensions	mm | in	see page 43

WRFT 130 CNC

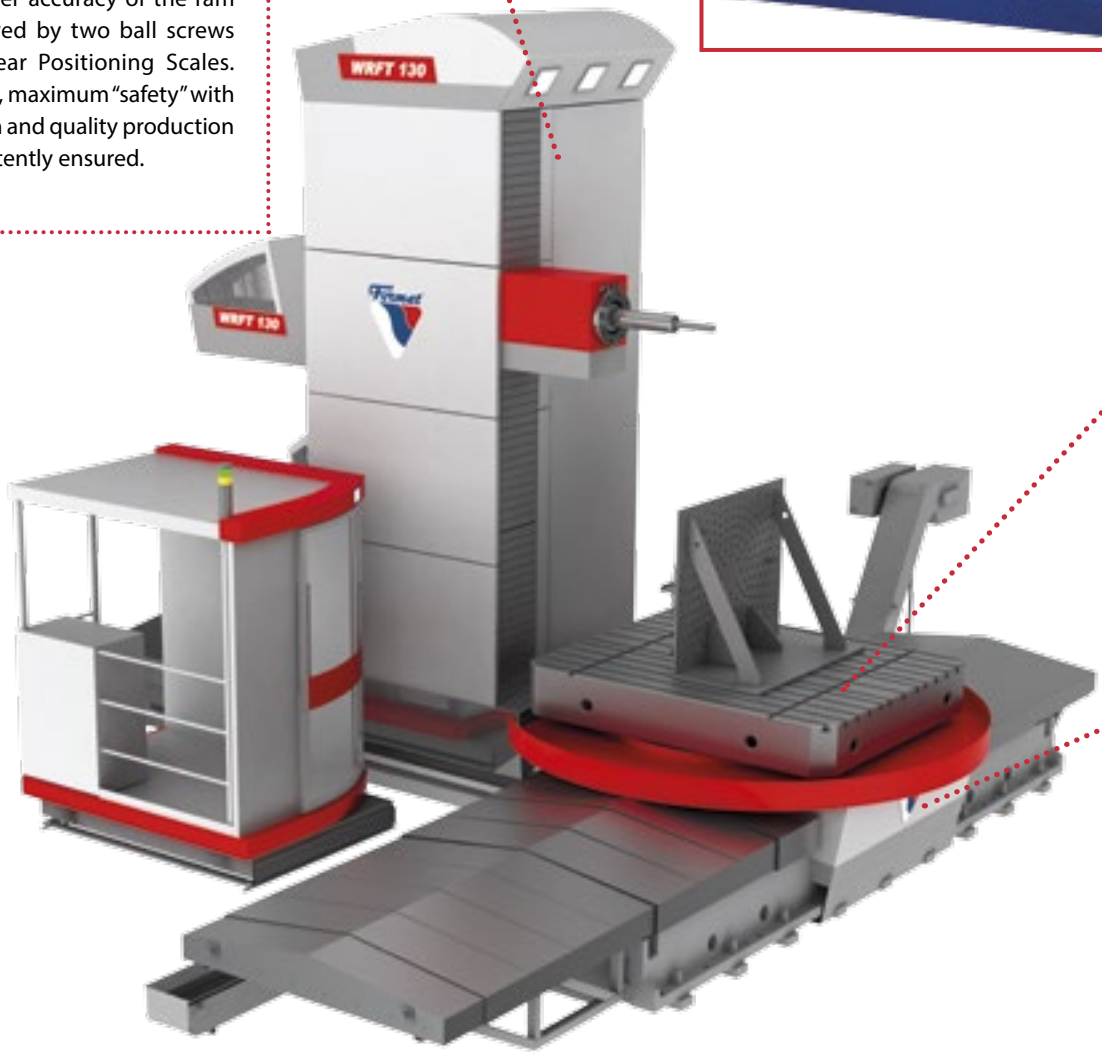
Column (Y-axis)

FERMAT developed a unique construction of the column with a single piece design of the column and the slide, two or three ball screws for 130 mm (5.12") spindle diameter or three for 150 mm (5.90") and 160 mm (6.30") spindle diameter, and no counter-weight. Maximum rigidity and firmness of such a union is achieved through the process of thermal stabilization, which ultimately leads to increased precision and rigidity during metal-working procedures.



Ram (V-axis)

To achieve the best properties of the ductile iron ram, a complex process of annealing methods have been applied. Higher accuracy of the ram axis is achieved by two ball screws and two Linear Positioning Scales. Thanks to this, maximum "safety" with high precision and quality production can be consistently ensured.

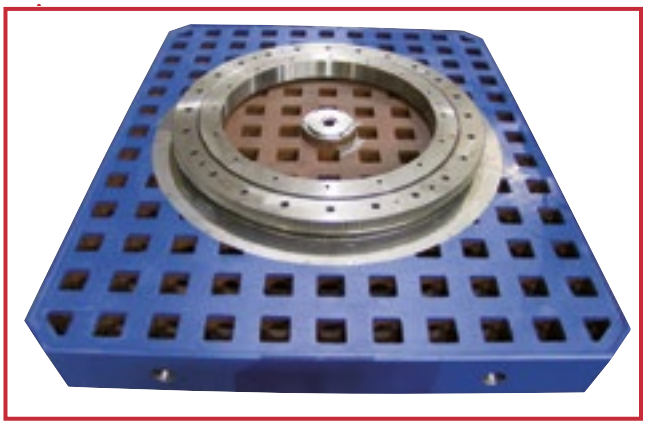


Rotary Table

The rotary table has outstanding positioning precision (4" arc sec i.e. 0.010 mm/ 1 000 mm radius). 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 lifetime.

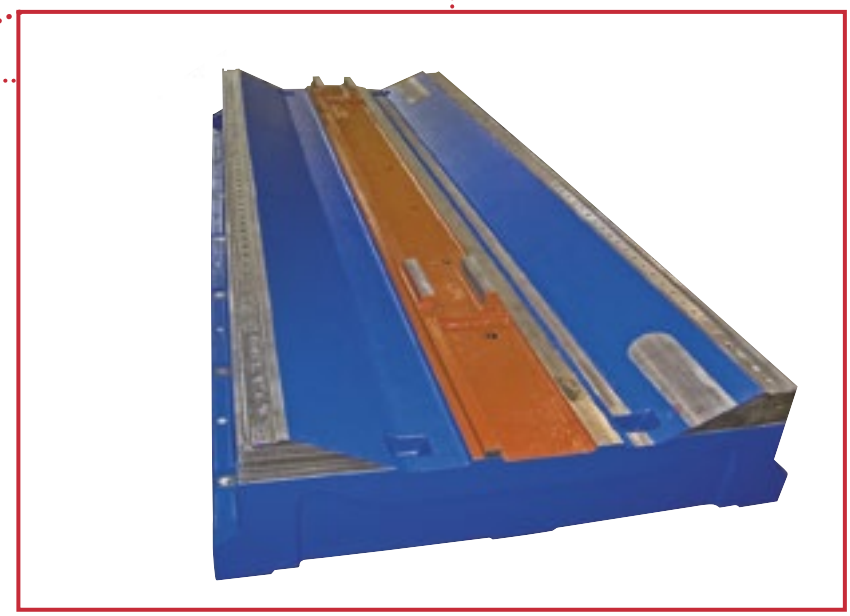
The table consists of three main parts – slide, bed and rotary clamping plate. The clamping plate is fitted onto a cross roller bearing that secures high load capacity with minimal passive resistance.

The rotary movement is achieved through two pinions, each of them having its own servomotor. The principle of its operation is often described as a Master-Slave Function. As Standard, the rotary table operates as a continuous 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.



WFC 10 CNC

The WFC 10 CNC machine is a model of horizontal boring mill equipped with a spindle diameter of 100 mm (3.94"). It is the smallest horizontal boring machine from the Fermat production suitable for machining of smaller and medium sized work pieces up to 5 000 kg (11 023 lb).

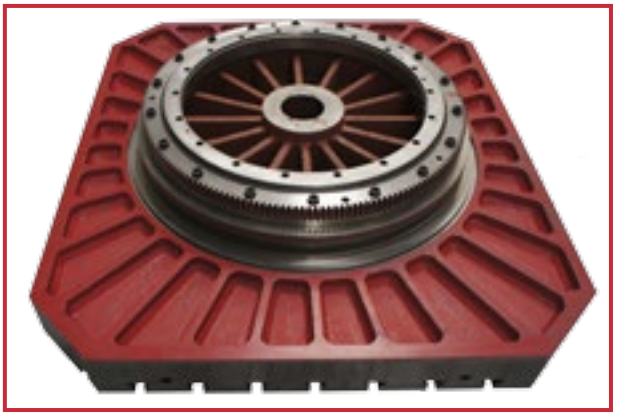
WFC 10 CNC is built in a standard configuration with a fixed column, movable spindle and crosswise movable rotary table. The combination of operator friendly, high cutting performance and lower cost makes the WFC 10 CNC very popular among our clients.

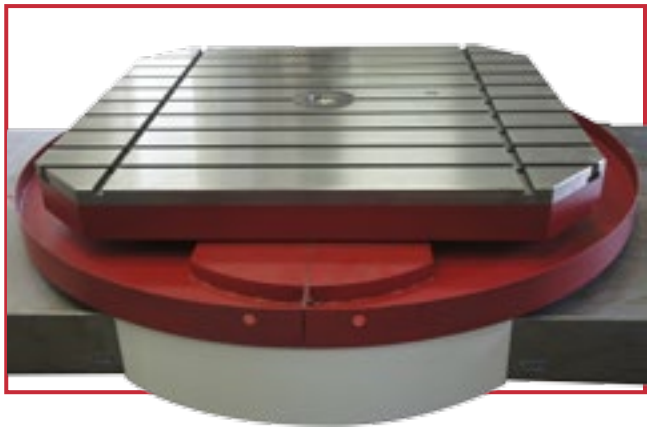
WFC 10 CNC is optionally equipped with the Automatic Tool Changer (ATC), Coolant Through Spindle, Chip Conveyor or Automatic Pallet Changer System (APC).

Machine configuration:

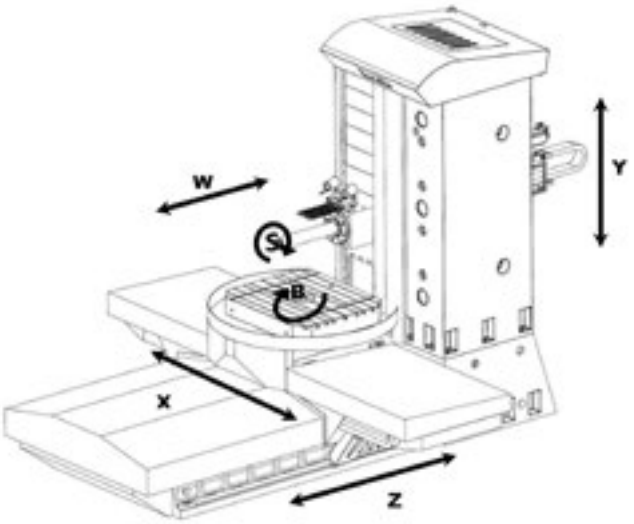
- WFC 10 CNC – Basic machine on box guide-ways with a spindle diameter of 100mm | 3.94"

Technical parameters		WFC 10
Diameter of Spindle	mm | in	100 or 110 | 3.94" or 4.33"
Taper of Spindle		ISO-50 / BT-50 | CAT-50
Range of Spindle Speed	rpm	3000 | 118.11"
Rated Power of Main Engine S1/S6	kW | HP	17/25, 22/33 | 23/36, 26/44
Travel Table X	mm | in	1 250 / 2 000 | 49.21" / 78.74"
Headstock Vertical Travel Y	mm | in	1 250 / 1 700 / 2 000 | 49.21" / 66.93" / 78.74"
Travel Table Z	mm | in	1 250 | 49.21"
Extension Spindle Travel W	mm | in	730 | 28.74"
Operating Feed X,Y,Z,W	mm.min | in min	max. 4 000 | 157.48"
Rapid Traverse X, Y, Z, W	mm.min | in min	8 000 | 314.96"
Rapid Traverse B	mm.min | in min	2
Max. Table Load	kg | lb	3 000, 5 000 | 6614, 11 023
Table Dimensions	mm | in	1 000x1 120 / 1 250x1 400 / 1 250x1 800 39.37"x44.09" / 47.24"x55.12" / 47.24"x70.87"





New Model 2016



Floor Type Horizontal Boring Mills

Though at Nordmark, we use over 23 large, new European CNC boring and milling machines, in the past 5 years we have equipped our plants exclusively with FERMAT CNC boring mills. We own 6 machines, and we have found them to be excellent and price effective. In the few instances when we have had to call FERMAT's service department, they have responded quickly and professionally, and FERMAT's technicians have always helped in designing smart, cost-saving solutions.
Over the years, FERMAT has developed many special technologies for powerful, high-precision machining of heavy components, many of which we currently use in our windmill production, such as a tilting ram and a tilting table, an automatic universal micro-indexing head, an automatic right-angle head, and a robotic tool changer.

Michael Jacobsen,
President of Nordmark Maskinfabrik A/S,
Denmark

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 at the top of the Y axis stroke) and higher precision than is offered by other machines available on the market. The large variation of selectable parameters is combined with its broad range of operating functions. The main feature is a modular concept that allows greater production variables and rapid set-up through the use of peripheral tools and accessories.

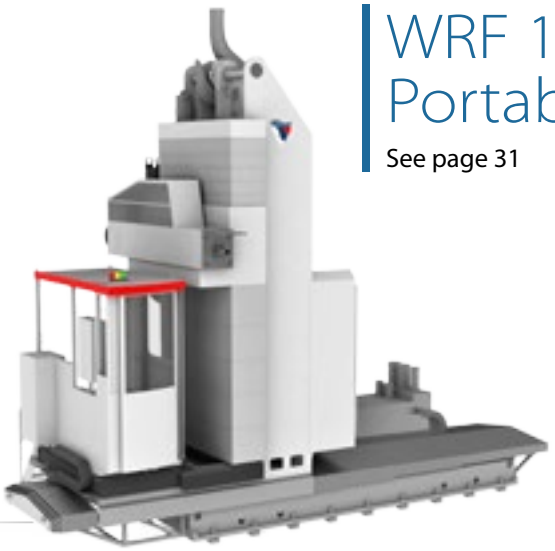
The machine moves in 3 or 4 different axes (X, Y, Z and W for borers). An additional B and/or V-axis is added when the machine is equipped with a rotary table. Several clamping plates can be joined together, or in combination with a rotary table to achieve specialized configurations easily and quickly.

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 large and heavy steel, cast steel, or cast iron work pieces. The machine's technology allows a wide utilization in milling, boring, reaming, and threading processes. FERMAT machines stand out thanks to their capacity to achieve higher precision than their competitors.

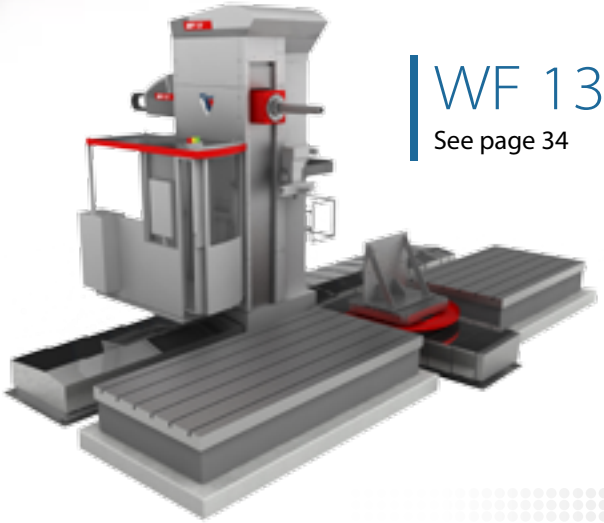
Our Products

WRF
See page 28



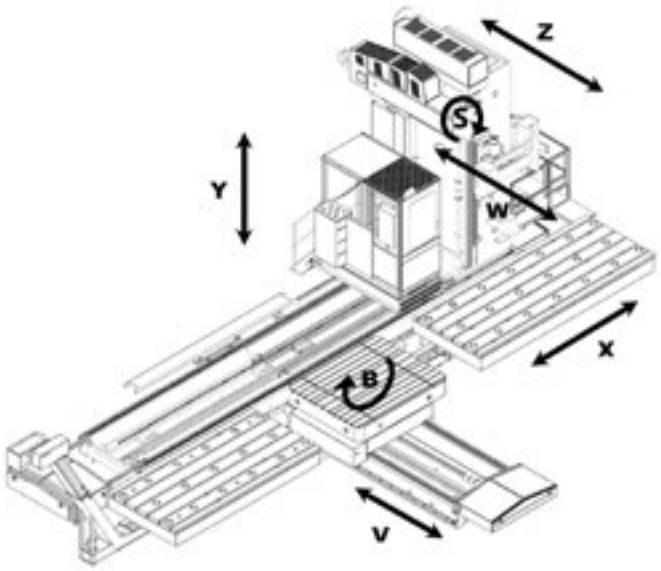
WRF 130 Portable
See page 31

WRF 160 Heavy
See page 32



WF 13
See page 34

Horizontal Boring Machines WRF Series



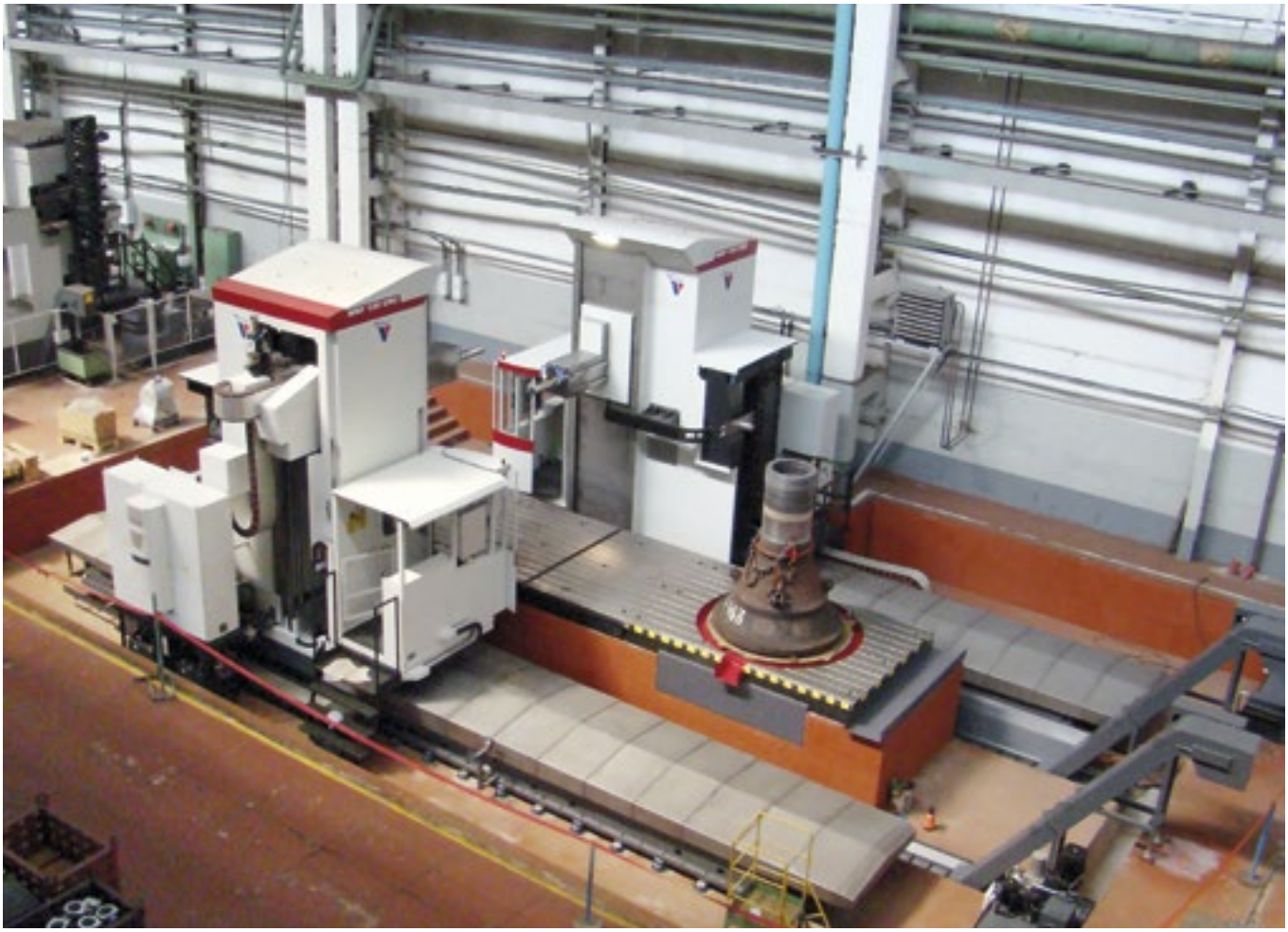
Horizontal Boring Machines WRF are the biggest representatives of FERMAT boring mill production. They are used mainly for precise and powerful machining of big and heavy work pieces from iron, cast steel and steel. Our machines are usually intended for machining of large energy parts, crane or ship parts, oil and gas equipment and similar applications.

WRF 130, 150, 160 CNC are equipped with a horizontally and vertically movable operator´s cabin. Machines can be delivered with a wide range of accessories that enhance the high technology provided.

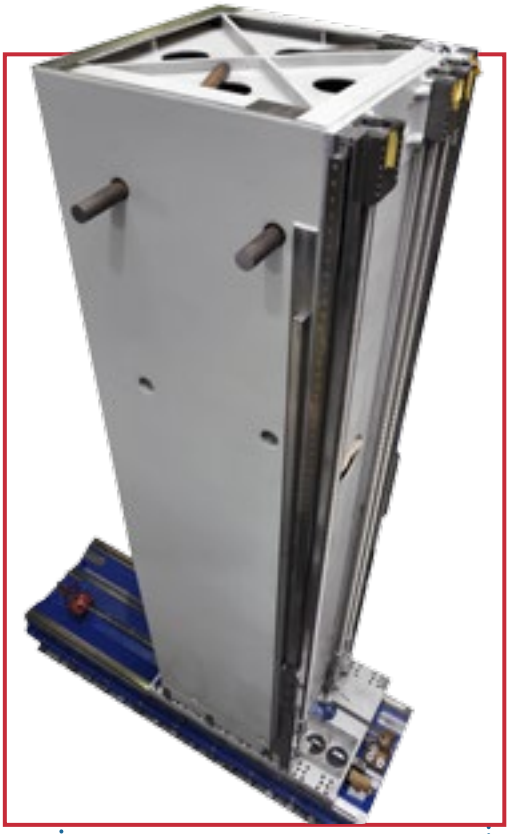
Machine configurations:

- WFR 130, 150, 160 – Basic configuration
- WRF 130 PORTABLE
- WRF 160 (H) - Machine configuration with hydrostatic X Axis
- WRF 160 Heavy, WRF 160 Heavy (H) Option: machine with box way guided ram travel 1 500 mm | 59.05" or 1 600 mm | 62.99" and spindle travel 1 000 mm | 39.37"

Technical parameters		WRF 130	WRF 150	WRF 160
Diameter of Spindle	mm | in	130 | 5.12"	150 | 5.90"	160 | 6.30"
Taper of Spindle		ISO-50 / BT-50 | CAT-50	ISO-50 (60) / BT-50(60) | CAT-50 (60)	
Range of Spindle Speed	rpm	10-3 000	10-2 800	10-2 500
Rated Power of Main Engine S1/S6	kW | HP	37/56 | 40/60	51/77 | 68/103	60/80 | 80/107
Cross Travel X	mm | in	2 400-28 100 | 94.49"-1 106"		
Headstock Vertical Travel Y	mm | in	2 000-6 000 | 78.74"-236.22"		
Ram Travel Z	mm | in	900 | 35.43"	1 000 (1 200) | 39.37" (47.24")	
Extension Spindle Travel W	mm | in	730 | 28.74"	1 000 | 39.37"	
Longitudinal Travel Table V	mm | in	0 - 9 500 | 0-374.02"		
Operating Feed X,Y, Z, W	mm | in	max. 8 000 | 315"		
Rapid Traverse X / Y	mm.min | in min	20 000 / 15 000 | 787.40" / 590.51"		
Rapid Traverse Z a W	mm.min | in min	10 000 | 393.70"		
Max. Table Load	kg | lb	see page 43		
Table Dimensions	mm | in	see page 43		



WRF Series



Ram (Z-axis)

To achieve the best features of the ductile iron ram, a complex process of annealing methods have been applied. Higher accuracy of the ram axis is achieved by two ball screws and two linear positioning scales. Thanks to this, maximum safety with high precision and quality production can be consistently ensured.

Headstock

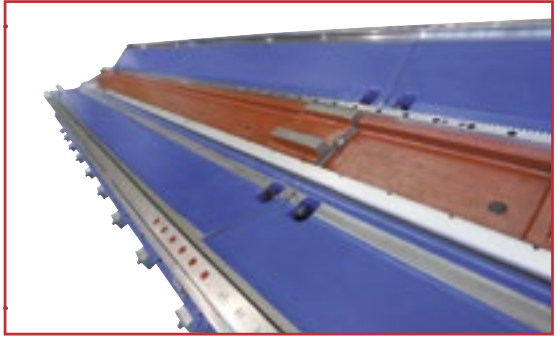
The headstock is comprised of a ram travel drive, a live spindle and a two-speed gearbox, which is shifted automatically by spindle rpm. A modern AC spindle motor is used to provide the torque, horsepower and maintain the correct rpm. The casting is made from special ductile iron.

Column (Y-axis)

FERMAT developed a unique construction of the column with a single piece design of the column and the slide, two or three ball screws for 130 mm (5.12") spindle diameter or three for 150 mm (5.90") and 160 mm (6.30") spindle diameter, and no counterweight. Maximum rigidity and firmness of such a union is achieved through the process of thermal stabilization, which ultimately leads to increased precision and rigidity during metal-working procedures.

Beds

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



WRF 160 CNC

WRF 130 CNC Portable

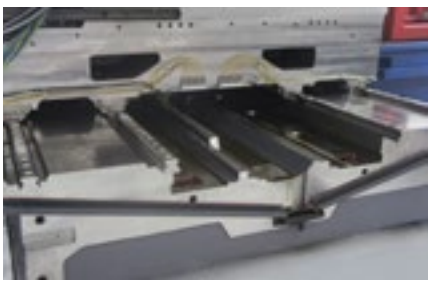
The portable horizontal boring WRF 130 CNC allows an easy transfer of the machine outside a permanent base to the desired location. This is used while machining large parts, which cannot be transferred easily, such as parts for the construction of large energy parts, ships, etc. In this design the column has a supporting/lifting rod at the top for moving the machine within the plant. The power cables and coolant hoses are equipped with couplings for easy re-connection. Similarly, anchoring and balancing the machine is designed to facilitate the alignment geometry in place. WRF 130 portable is equipped with a horizontally and vertically movable operator's enclosure. Technological possibilities of the machine can be further enhanced by accessories offered with all WRF 130 CNC machines.

WRF 160 Heavy / z 1500

Heavy duty execution of floor type boring mill with ram stroke 1 500 mm (59.06"), 1 000 mm (39.37") spindle stroke with 160 mm (6.30") spindle diameter represents the newest technology and concept of floor-type horizontal boring mills that are currently on the global marketplace. The powerful closed designed headstock consists of a movable slide ram (Z-Axis) and a movable live spindle (W-Axis).

Technical parameters		WRF 160 Heavy / z 1500
Diameter of Spindle	mm | in	160 | 6.30"
Taper of Spindle		ISO-50/BT-50 | CAT-50
Range of Spindle Speed	rpm	10-2 500
Rated Power of Main Engine S1/S6	kW | HP	74/91 | 99/122
Cross Travel X	mm | in	2 400-28 100 | 94.49"-1106.3"
Headstock Vertical Travel Y	mm | in	2 000-5 000 | 78.74"-196.85"
Ram Travel Z	mm | in	1 500 | 59.06"
Extension Spindle Travel W	mm | in	1 000 | 39.37"
Longitudinal Travel Table V	mm | in	see page 43
Operating Feed X, Y, Y, W	mm | in	1-8 000 | 39.37"-314.96"
Rapid Traverse X	mm.min | in min	20 000 | 787.40"
Rapid Traverse Y	mm.min | in min	15 000 | 590.55"
Rapid Traverse Z a W	mm.min | in min	8 000 | 314.96"
Max. Table Load	kg | lb	see page 43
Table Dimensions	mm | in	see page 43

X-Axis Hydrostatic guideways

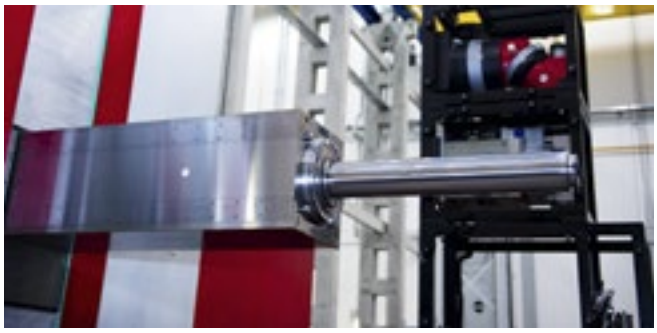


X- Axis – 4x Linear roller guideways

Rotary table - 4x Linear roller guideways

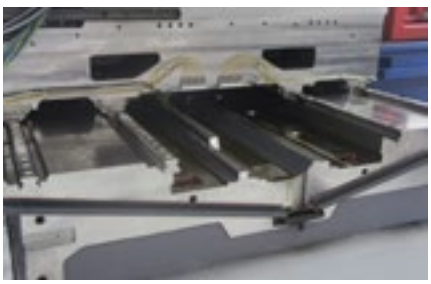
WRF 160 Heavy / z 1600

Our WRF 160 heavy duty floor-type boring mill with ram travel of 1 600 mm (62.99"), spindle travel of 1 000 mm (39.37"), and spindle diameter of 160 mm (6.30") represents the newest technological concept in floor-type horizontal boring mills on the global market. Its powerful, closed-designed headstock provides excellent machining potential of large workpieces with its extendable ram (Z axis) and extendable live spindle (W axis). The 1 600 mm ram is fully-enclosed between two columns, giving it maximum geometric stability, precision and power. The vertical travel of the headstock can be from 6 000 to 10 000 mm.



Technical parameters		WRF 160 Heavy / z 1600
Diameter of Spindle	mm | in	160 | 6.30"
Taper of Spindle		ISO-50/BT-50 | CAT-50
Range of Spindle Speed	rpm	10-2 500
Rated Power of Main Engine S1/S6	kW | HP	74/91 | 99/122
Cross Travel X	mm | in	2 400-28 100 | 94.49-1106.3"
Headstock Vertical Travel Y	mm | in	2 000-10 000 | 78.74"-393.7"
Ram Travel Z	mm | in	1 600 | 62.99"
Extension Spindle Travel W	mm | in	1 000 | 39.37"
Longitudinal Travel Table V	mm | in	see page 43
Operating Feed X, Y, Y, W	mm | in	1-8 000 | 39.37"-314.96"
Rapid Traverse X	mm.min | in min	20 000 | 787.40"
Rapid Traverse Y	mm.min | in min	18 000 | 708.66"
Rapid Traverse Z a W	mm.min | in min	12 000 | 472.44"
Max. Table Load	kg | lb	see page 43
Table Dimensions	mm | in	see page 43

X-Axis Hydrostatic guideways



X- Axis – 4x Linear roller guideways

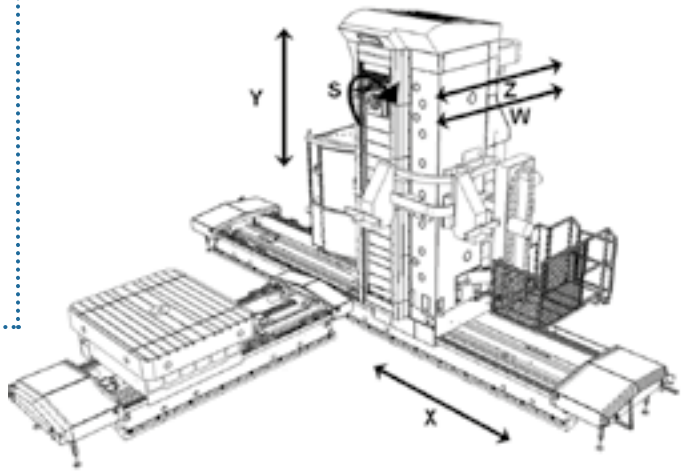
Rotary tilting table 0-10°

WF 13 CNC

A Floor type horizontal boring mill WF type is designed for precise and highly efficient coordinate boring, drilling, milling, and cutting of threads of big and heavy work pieces up from cast iron, cast steel and steel. The machine can be equipped with floor plates and/or rotary table(s) according to machining requirements. As with all Fermat Boring Mills a wide range of accessories can be added that considerably enhance the machine's versatility.

Machine Configurations:

- WF 13 Basic Machine with movable spindle 130 mm (5.12") [110mm (4.33") spindle as an option]
- WF 13 R Machine with ram travel 700 mm | 27.60"
- WF 15 R Machine with ram travel 700 mm | 27.60" and spindle diameter 150 mm | 5.90"

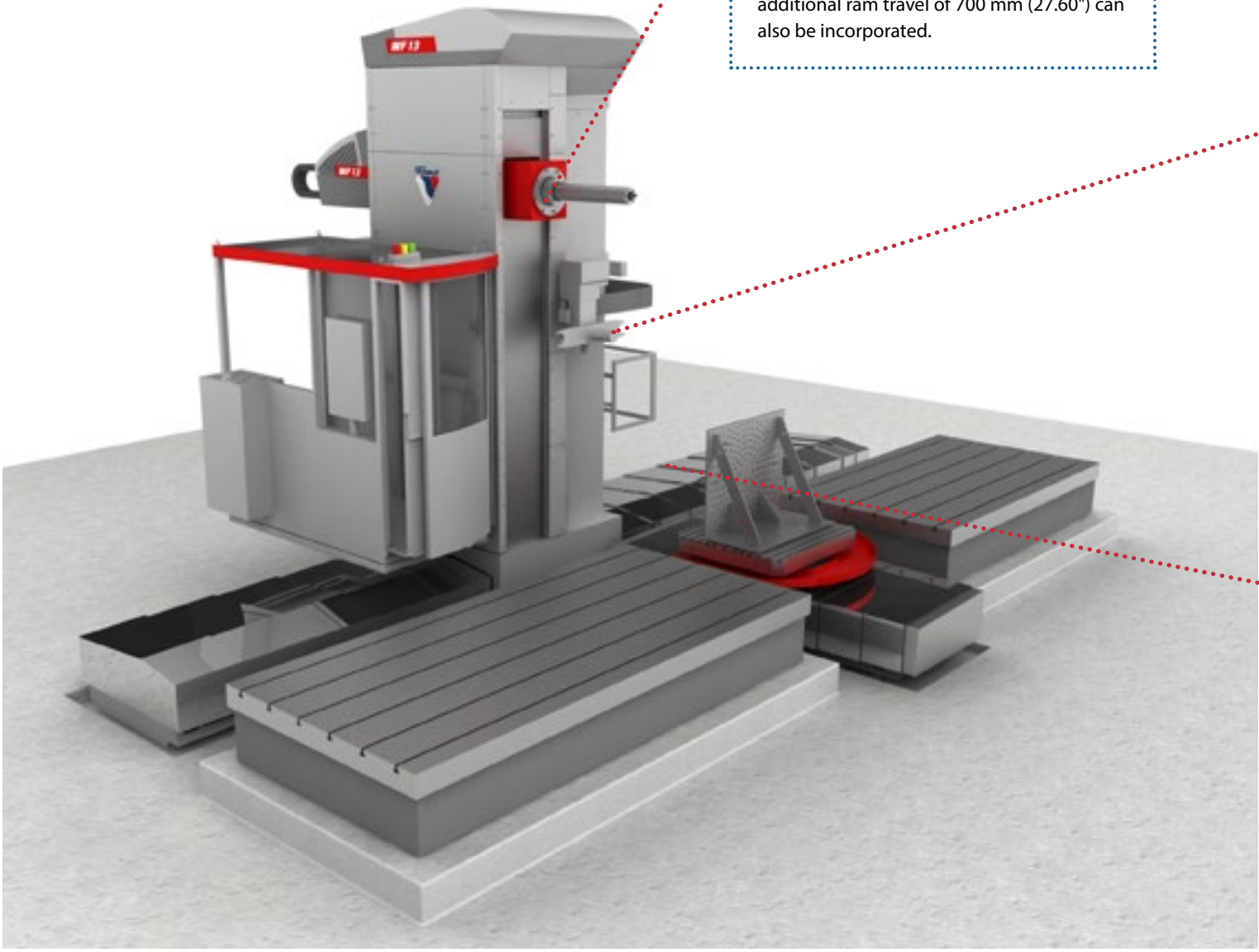


Technical parameters		WF 13	WF 15
Diameter of Spindle	mm | in	130 | 5.12"	150 | 5.90"
Taper of Spindle		ISO- 50 / BT-50 | CAT-50	
Range of Spindle Speed	rpm	max. 3 000	
Rated Power of Main Engine S1/S6	kW | HP	up to 53/64 | 71/86	
Travel Column X	mm | in	4 000 - 22 000 | 157.48" - 866.14"	
Headstock Vertical Travel Y	mm | in	2 000 / 2 500 / 3 000 / 3 500 | 78.74" / 98.46" / 118.11" / 137.80"	
Longitudinal Travel Z (WF 13 CNC)	mm | in	700 | 27.60"	
Extension Spindle Travel W	mm | in	730 | 28.74"	
Operating Feed X, Y	mm.min | in min	max. 8 000 | 314.96"	
Operating Feed W, Z	mm.min | in min	max. 6 000 | 236.2"	
Rapid Traverse X / Y	mm.min | in min	20 000 / 12 000 | 787.40" / 472.44"	
Rapid Traverse Z, W	mm.min | in min	10 000 | 393.70"	
Max. Table Load	kg | lb	see page 43	
Table Dimensions	mm | in	see page 43	

WF 13 CNC

Headstock

The headstock of WF 13 CNC is equipped with a live spindle with travel 730 mm (28.74") and additional ram travel of 700 mm (27.60") can also be incorporated.



Column

The column is made of grey cast iron. Maximum rigidity and firmness of the column is achieved through the process of annealing, which maximizes highest precision and machining results. Box guideways are hardened.

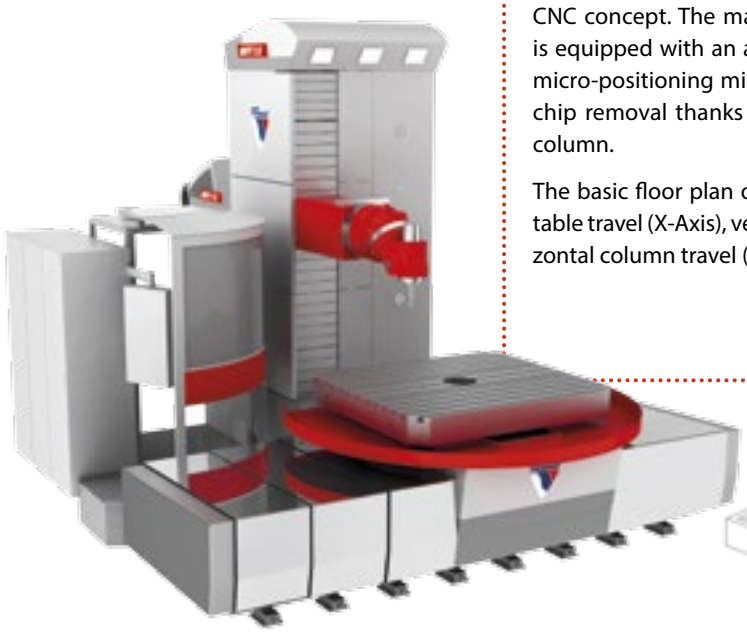
Beds

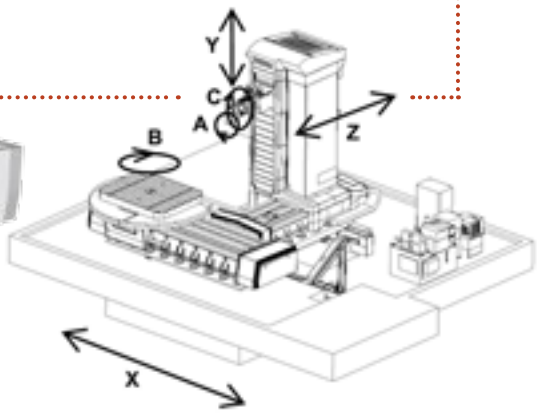
The bed of the machine is made of grey cast iron which is stabilized through annealing. It was designed in order to absorb the maximum amount of vibrations that are created during cutting. It features heavy duty linear guideways.

Universal Milling Machine WFT MILL

WFT Mill is an universal milling machine based on WFT 13 CNC concept. The machine comes without a live spindle, it is equipped with an automatic head with 2.5° indexing or a micro-positioning milling head .001°. WFT Mill allows heavy chip removal thanks to its powerful headstock and a wide column.

The basic floor plan of WFT Mill CNC machines is horizontal table travel (X-Axis), vertical headstock travel (Y-Axis) and horizontal column travel (Z-Axis).





Technical parameters		WFT Mill
Taper of Spindle		ISO-50 / BT-50 | CAT-50
Range of Spindle speed	rpm	10-3 000
Rated Power of Main Engine S1/S6	kW | HP	37/56 | 50/75
Travel Table X	mm | in	2 000 / 3 000 / 4 000 / 5 000 78.74" / 118.11" / 157.48" / 196.85"
Headstock Vertical Travel Y	mm | in	2 000 / 2 500 / 3 000 / 3 500 78.74" /98.43"/118.11"/137.80"
Longitudinal Travel Z	mm | in	1 500 / 2 000 | 59.05"/ 78.74"
Ram Travel V*	mm | in	700 | 27.60"
Operating Feed X, Y, Z	mm.min | in min	1-8 000 | 0.04"-315"
Rapid Traverse X / Y / Z	mm.min | in min	12 000 / 28 000 | 472.44" / 1002.36"
Rapid Traverse B	rpm	see page 43
Max. Table Load	kg | lb	see page 43
Table Dimensions	mm | in	see page 43

*optional

Universal Micro-indexing Milling Head
UHAmi 30

Universal Automatic Head
UHA 30

Gantry Multitask Center

The innovative Fermat Gantry Multitask Center is designed for multiple operations and machining of large work pieces in one setup.

All vertical surfaces are machined by a powerful 160mm | 6.3" spindle with a stroke of 1000mm | 39.37". In addition the ram will stoke 1600mm | 62.99" and has a massive 74kW | 99hp spindle motor.

Horizontal machining is performed by a heavy duty automatic head with 60kW/80hp and 2500 Nm. The head does continuous milling or may be positioned and hydraulically clamped. All head changes are accomplished automatically.

A Rotary table can be incorporated into the main table as a live axis with rotary positioning for OD and ID turning.

The following options are available with the Multitask Center:

- Powerful grinding heads for way grinding with an advanced coolant flushing system.
- High Speed CNC continuous head with up to 15,000 rpm, commonly used for machining of aluminum or composite materials.
- Laser hardening
- Robotic ATC
- High Speed automatic grinding head for OD and ID grinding

Technical parameters		Gantry Multitask Center
Diameter of Spindle	mm | in	160 | 6.30"
Taper of Spindle		ISO-50 / BT-50 | CAT-50
Range of Spindle speed	rpm	max. 2 500
Rated Power of Main Engine S1	kW | HP	74 | 99.25"
Longitudinal Travel X	mm | in	10 000 -50 000 | 393.70"-1969"
Cross Travel Y	mm | in	4 300 / 5 300 / 6 300 / 7 300 | 169.29" /208.66"/248.03"/287.40"
Width between Colums	mm | in	3 200 / 4 200 / 5 200 / 6 200 | 125.98" /165.35"/204.72"/244.09"
Longitudinal Travel Z	mm | in	1 600 | 62.99"
Travel W	mm | in	1 000| 39.37"
Rapid Traverse X, Y	mm/min^{-1} | in min	40 000 | 1575 *

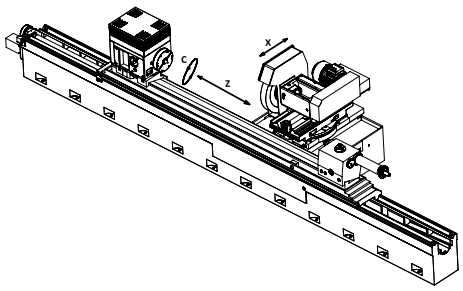
Grinding machines BHC and BHCR

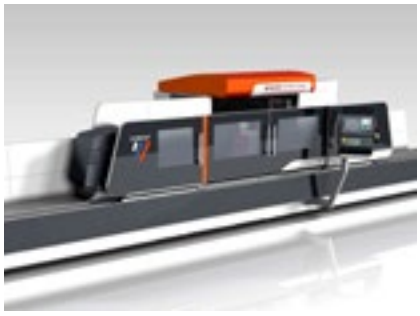
BHC/BHCR (HD) CNC are fully CNC-controlled centre grinders designed for grinding cylindrical and conical external surfaces or, with equipment for internal grinding, for grinding of internal surfaces with the recess or traverse grinding method. Grinding of face surfaces can be performed by the side of the grinding wheel or its circumferential surface with inclined drive headstock. BHC/BHCR (HD) CNC grinder can be of use particularly in the piece and series production for grinding workpieces weighing up to 4 000/5 000 kg. On these machines customers typically achive an accuracy of 0.004 mm, the machine in an increased accuracy up to 0.002 mm. The standard version of the machine is equipped with a control system Siemens 840 D sl. The machine meets CE standards and is supplied with basic equipment and a guarantee of 1 year.

The machines are additionally equipped and designed according to specific needs of the customer and taking into account the materials grinded or the selected machining technology.

Technical parameters		BHC / BHC HD	BHCR / BHCR HD
Swing Ø	mm | in	630 / 850 / 1 000 | 24.8" / 33.5" / 39.2"	
Distance between centers	mm | in	2 000 / 3 000 / 4 000 / 5 000 / 6 000 | 78.7" / 118.1" / 157.5" / 196.8" / 236.2"	
Max. weight of workpiece in centres	kg | lb	4 000 / 5 000 * | 8 800 / 11 023*	
Max. weight of workpiece flying (incl. clamp)	kg | lb	300 / 400 * | 660 / 880 *	
Maximum speed of X, Z axis	$mm.min^{-1}$ | in min	10 | 393.7"	
Grinding wheel dimensions (Ø x width x Ø bore)	mm | in	Ø 750 x 100 x Ø 305 | Ø 29.5" x 3.9" x Ø12"	
Grinding wheel circumferential speed	m/s	10-50	
Wheel head swivel	°	+30 /–10	-
Wheel head swivel – B axis	°	-	+45/-225
Maximum number of spindles	-	1+1	3
Wheel head motor power	kW | HP	17 / 18,5 | 22 / 25	18,5 | 25
Work head swivel	°	0 -90 / 0 *	
Work head spindle taper bore	-	Morse 6 ISO 296-1991	
Work head spindle nose	-	A 2-6 ISO 702-1-1992	
Tailstock barrel taper bore	-	Morse 6 ISO 296-1991	
Cross motion of tailstock centre - cylindricity correction	mm | in	± 0,8 | 0.031"	
Machine length	mm | in	7 600 / 9 700 / 12 310 / 14 800 / 17 500 | 300" / 383" / 486" / 584" / 691"	
Machine width	mm | in	4 350 | 171.3"	
Machine height	mm | in	2 888 | 113.7"	
Machine weight	kg | lb	15 800 / 17 500 / 18 500 / 20 500 / 22 500 | 34 760 / 38 500 / 40 700 / 45 100 / 49 500	16 900 / 18 900 / 21 500 / 23 500 / 26 500 | 37 260 / 41 667 / 47 400 / 51 810 / 58 425
Control system	-	Siemens 840D sl / B&R	Siemens 840D sl

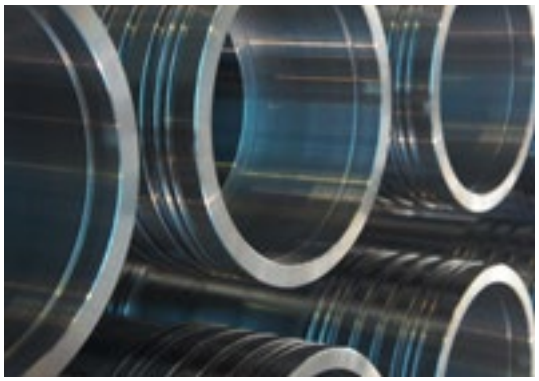
* HD option

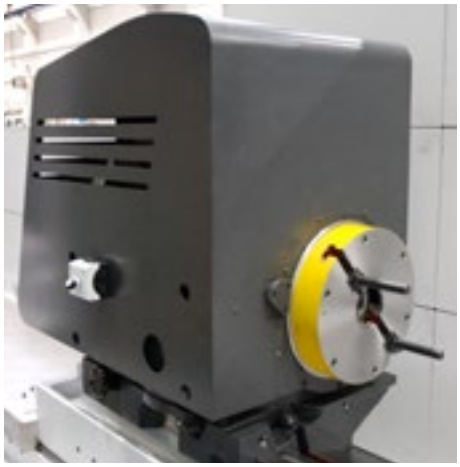




FERMAT PRAGUE

FERMAT Machine Tool



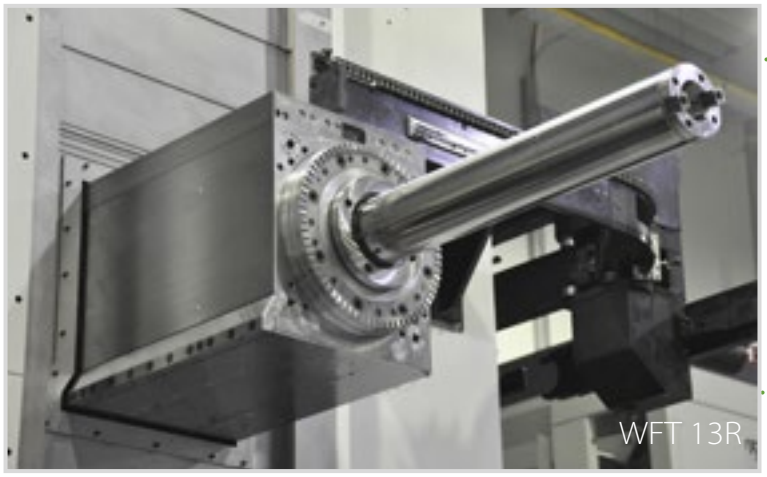


Machine Components

Headstock 100,110,130,150,160

The WRF, WF, WFT, WFC and WRFT series are equipped with a standard boring mill 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 a servo drive. The two-speed automatic gear-box gives enough torque for heavy metal chip removal and for powerful high-speed drilling. FERMAT machines are also capable of high-performance manufacturing


WRF 160


WFT 13R

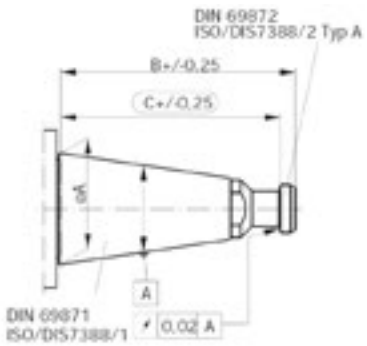
due to the spindle axial force of 40,000 Nm. In WRF and WRFT series, two Y-axis ball screws with two scales control slide ram deflections. The third ballscrew in the torque position that is constantly pushing the headstock body upwards is added for 150 and 160 mm | 5.91" and 6.30" headstock. The upper part features heavy duty INA roller linear guideways, further contributing to the precision and rigidity of the machine.

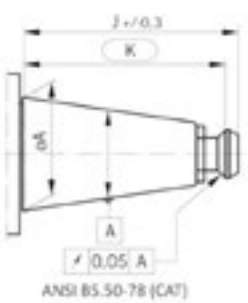
Tool Standard SK (ISO)

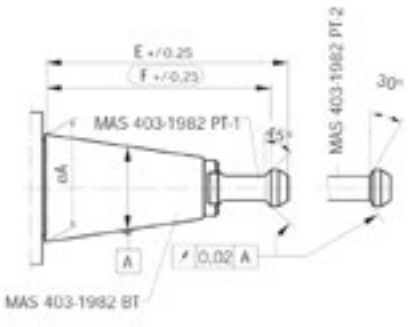
Tool Standard ISO	A	B +/- 0,25	C +/- 0,25
SK 40	44,45	94,5	88,25
SK 50	69,85	135,60	126,60
SK 60	107,95	201,65	191,65

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	-	-	-







Rotary Table

All the tables have outstanding positioning precision (4 arc sec. 0.010 mm / 1 000 mm radius). 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 lifetime.

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 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 (T10, 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.

	T10	T10	T10
Clamping Plate Size (mm | in)	1 250 x 1 400 | 49.21x55.19	1 400 x 1 600 | 55.19x62.99	1 600 x 1 600 | 62.99x62.99
Maximum Table Load (kg | lb)	10 000 | 22 046		
Table Travel (mm | in)	2 000 / 3 000 | 78.74 / 118.11		
T-Slots -Size	22H8		
Operation Travel V-Axis (mm.min | in min.)	1 - 8 000 | 0.05 - 315		
Operation Travel B-Axis (RPM)	0 - 2 | 0 -2		

	T20
Clamping Plate Size (mm | in)	1 600 x 1 800, 1 800 x 2 200, 1 800 x 2 600, 2 000 x 2 400, 2 000 x 3 000 | 62.99 x 70.87, 70.87 x 86.61, 70.87 x 102.36, 78.74 x 94.49, 78.74 x 118.11
Maximum Table Load (kg | lb)	20 000 | 44 092
Table Travel (mm | in)	2 000 - 5 000 | 78.74 - 196.85
T-Slots -Size	22H8
Operation Travel V-Axis (mm.min | in min.)	1 - 8 000 | 0.05 - 315
Operation Travel B-Axis (RPM)	0 -2 | 0 - 2

T25 / T40 /T50 / T80	T25 / T40 / T50	T100
Clamping Plate Size (mm | in)	2 000 x 2 000, 2 000 x 2 500, 2 500 x 2 500, 2 500 x 3 000, 3 000 x 3 000, 3 000 x 3 500, 3 500 x 3 500 | 78.74 x 78.74, 78.74 x 98.43, 98.43 x 98.43, 98.43 x 118.11, 118.11 x 118.11, 118.11 x 137.80, 137.80 x 137.80	3 000 x 3000, 3 000 x 3 500, 3 000 x 4000, 4 000 x 4 000 | 118.11 x 118.11, 118.11 x 137.80, 118.11 x 157.48, 157.48 x 157.48
Maximum Table Load (kg | lb)	25 000, 40 000, 50 000 | 55 115, 88 185, 110 231	10 0000 | 220 462
Table Travel (mm | in)	1 200 - 9 500 | 47.2 - 374	
T-Slots Size	28H8	
Operation Travel V-Axis (mm.min | in min.)	1 - 10 000 | 0.04 - 393.7	
Operation Travel B-Axis (RPM)	0 - 1,7 | 0 - 1.7	
Tilting angle (degrees)	0 - 10°	

Special Options
Fixed Table
Other Sizes of Clamping Plate (e.g. 2 500 x 5 000, 1 800 x 2 600 | 98.43 x 196.85, 70.87 x 102.36)
Table Cover (different heights)
Automatical Pallet Changer (APC) System
Alternative Pallet Change using Zero Point System

Control Systems

FERMAT machines are offered with Heidenhain iTNC 530, Fanuc 31i, Siemens Sinumerik 840D SL 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 0i 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.

HT2

Standard

Homp

I-pendant

HR 410

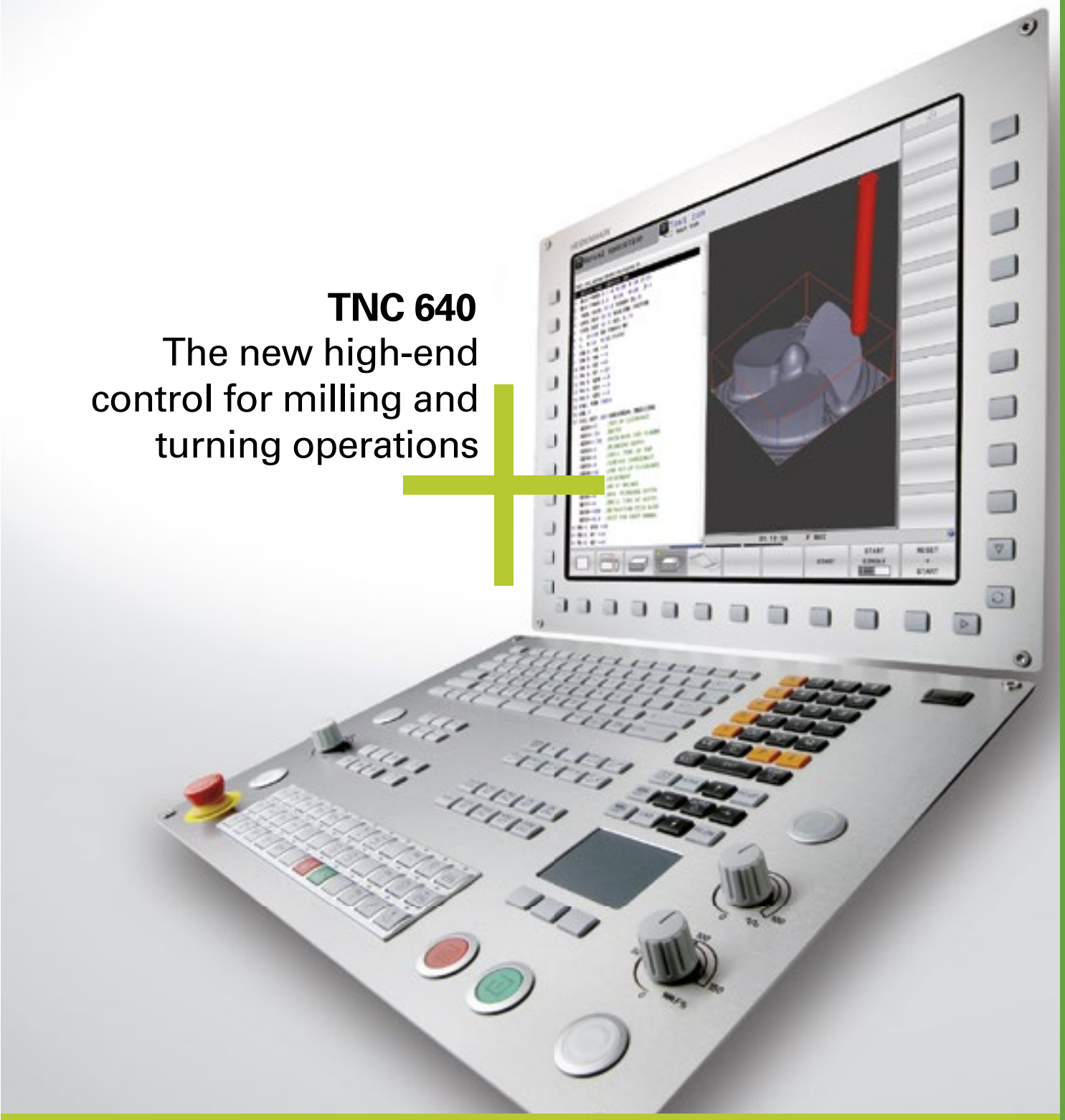
HR 520

HR 550

HEIDENHAIN

TNC 640

The new high-end control for milling and turning operations

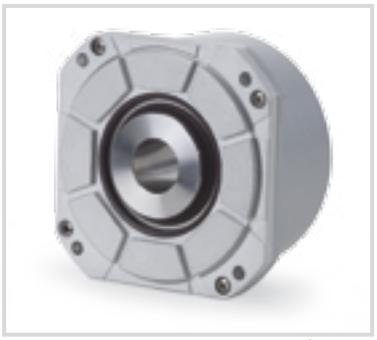


The newTNC 640: for the first time, milling and turning are combined in oneTNC. Now users can switch as desired between milling and turning—within the same NC program. Switchover is independent of the machine kinematics. It automatically takes the respective operating mode into account and without any additional action.This new simplicity is complemented by dialog-guided plain language programming, the optimized user interface, powerful programming aids as well as comprehensive cycle packets taken from amply field-proven HEIDENHAIN controls into the newTNC 640. **This is a built-in technological edge**. DR. JOHANNES HEIDENHAIN GmbH, www.heidenhain.de

Angle Encoders + Linear Encoders + Contouring Controls + Position Displays + Length Gauges + Rotary Encoders

MACHINE COMPONENTS

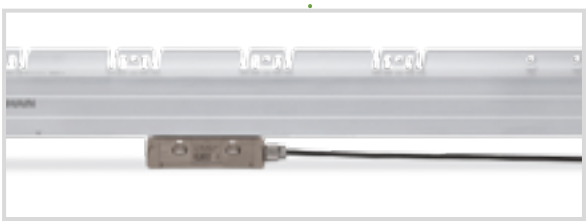
Electrical | Hydraulic | Lubrication Units



Linear Scales Heidenhain / Fagor

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 / Fagor linear scale.

Measurement of spindle revolutions is performed by the direct 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

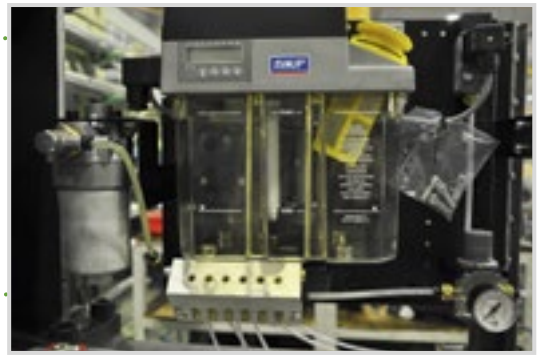
Electrical devices are mostly located in the switchboard. It includes the basic unit of the control system, components for motor drive of the axis and spindle, and other electrical features made by renowned manufacturers such as Schneider, Telemechanique and Siemens. The switchboard (UL + CSA Standard) is being cooled by a unit built in the door of the switchboard made by Rittall.

Hydraulic Aggregate

An integral part of the machine is a Hydraulic aggregate used for 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.

Lubrication Unit

Lubrication of linear guideways 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.



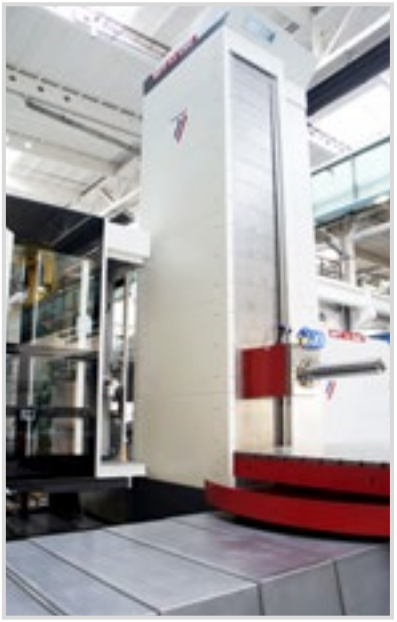
Other Components

Ball Screws

X, Y, Z, and W-axis movement is facilitated by ball screws 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 6 m | 236.22" is accomplished by a rack with two pinions that are in a Master-Slave relationship.

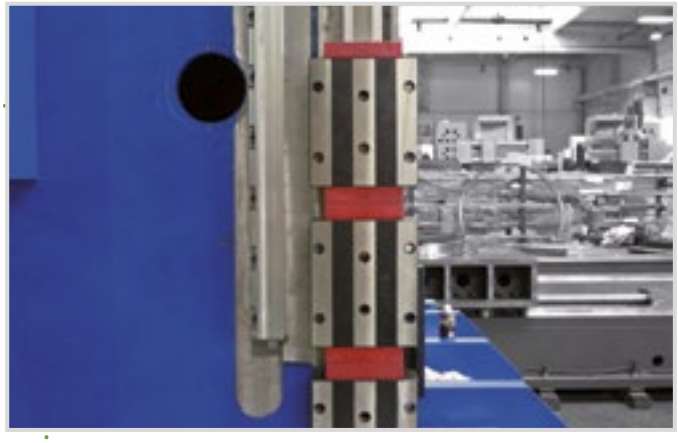


Telescopic Covers

Guiding surfaces are covered lenghtwise and crosswise with telescopic covers.

Linear Guideways

Roller linear guideways 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 ball screws, servomotors, etc. This solution requires minimum maintenance and simplified, quicker eventual repairs.



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Optimise productivity and profits...

Superior system flexibility

Unrivalled performance

Maximum security

RMP40, RLP40 and RMP40M

RMP60, RMP600 and RMP60M

RTS

...with Renishaw radio probe systems

Frequency Hopping Spread Spectrum (FHSS) technology enables use of Renishaw probes and tool setters for the widest range of machine tool applications including tool and part setting, in-process gauging and on machine verification. When used with the latest RMI-Q transmitter/receiver up to four separate Renishaw probes can be used on one machine, interference free, so you can increase productivity, profits and confidence in your manufacturing.

For more information visit www.renishaw.com/mtp or call 01453 524111

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www.renishaw.com

Accessories

Automatic Pallet Changer System:

APC

The Automatic Pallet Changer System on the machine reduces unproductive time during machining. Machining can be carried out on one pallet, while the others can be used for preparation (cleaning of table, set up of workpiece, etc). The APC system consists of two or more pallets (according to customer requirements).

Pallet Dimension:

- 1 600 x 1 800 mm/63.00 x 70.87" - maximum load 15 t/33 069 lb*
- 1 800 x 2 200 mm/70.87 x 86.61" - maximum load 15 t/33 069 lb*
- 1 200 x 1 200 mm/47.24" x 47.24" - maximum load 5 t/11 023 lb**
- 1 200 x 1 400 mm/47.24" x 55.12" - maximum load 5 t/11 023 lb**
- 1 400 x 1 600 mm/55.12" x 63.00" - maximum load 5 t/11 023 lb**

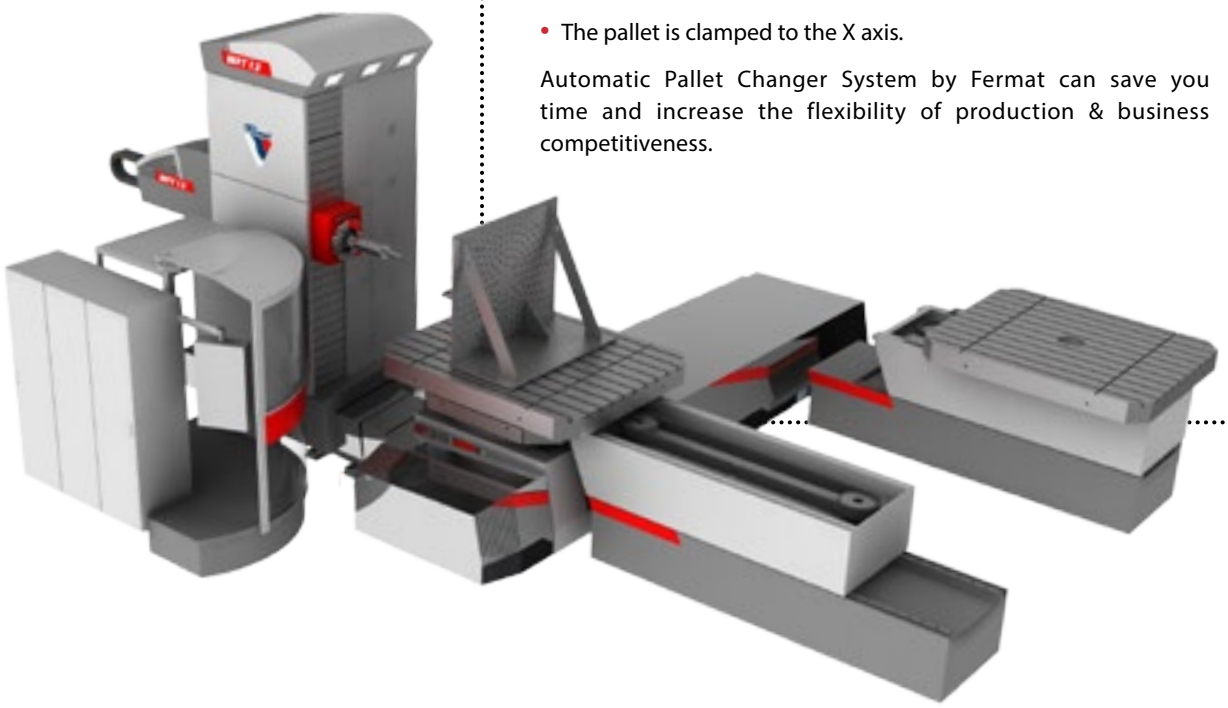
*available with 2 pallets, **available with 2 to 5 pallets

Description of Pallet Change

The pallet exchange process is performed in five phases:

- The pallet is unclamped from the X axis. The shifting slide is connected to the rotation slide on the X-axis by pins inserted into the lock.
- The pallet itself is moved by a chain, where it is pulled by the pin up to the clamping position.
- The X axis slides moves in front of the next pallet with the workpiece loaded.
- The new pallet is shifted to X axis slides, then the shifting slide retracts.
- The pallet is clamped to the X axis.

Automatic Pallet Changer System by Fermat can save you time and increase the flexibility of production & business competitiveness.



Automatic Tool Changer ATC, Robots

Automatic Tool Changer for 20, 32, 40, 60, 90 or 120 tools

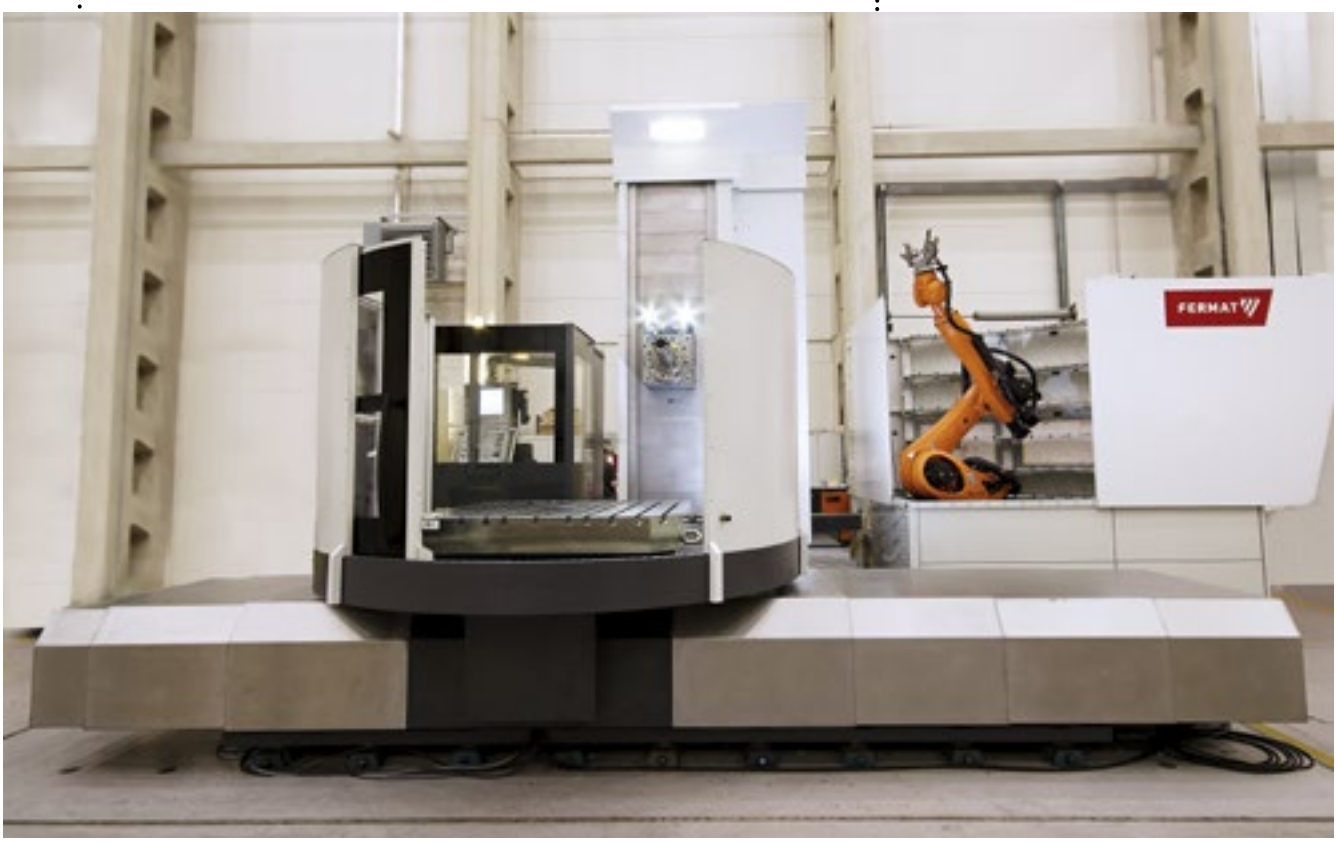
Automatic tool change is accomplished by a chain (for 20, 32, 40, 60, 90, or 120 tools). Tool changer can exchange tools into the live spindle as well as into automatic heads.

Robots

Fermat is always adapting to new requirements of the market and wishes of its customers. One of the important innovations is that our company was the first producer of Horizontal Boring Mills who substituted Automatic Tool Changers with 6-axis high tech German robots (Standard Automatic Tool Changer will still exist as an option for consumer request).

The advantage is that the robot can change tools directly into several positions, for example into milling heads, spindle support sleeves, etc. Furthermore, another benefit is low maintenance requirements or the possibility of higher weight of the tools. For example a robot has a capacity to hold the tool with weight about 75 kg|165 lb. Generally the robot is meant to bring to the consumer the luxury of fast, precise and effective tool exchange.

WFT 13 with Robotic Tool Changer (105 tools)

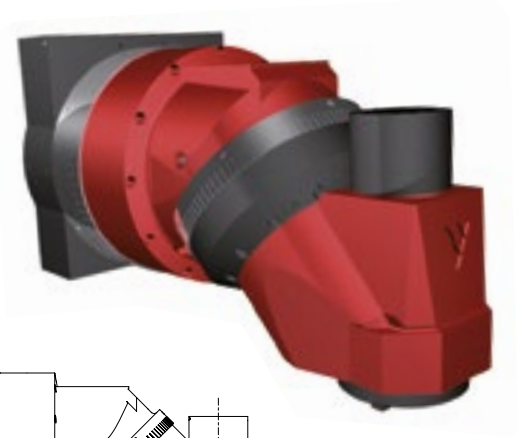


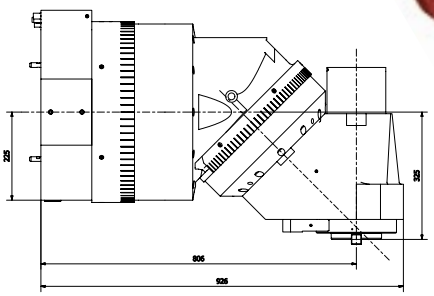
Robotic Tool Changer - Max. Capacity 210 tools

Tool Changer ATC 60

Milling and Facing Heads

Universal micro-indexing milling head - UHAmi 30

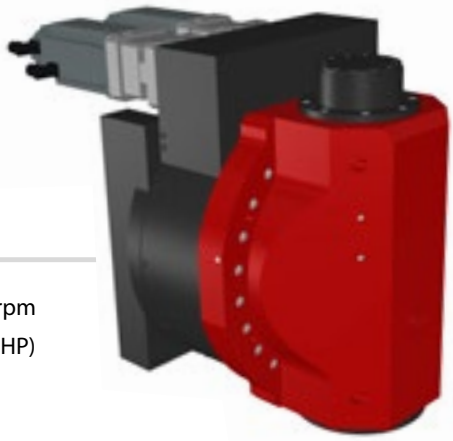




Speed: 10 - 3 000 rpm
Power: 30 kW (40 HP)
Torque: 1 600 Nm
Indexing: 0,001° / 0,001°
Clamping torque: A-Axis 3 800 Nm, C-Axis 6 500 Nm

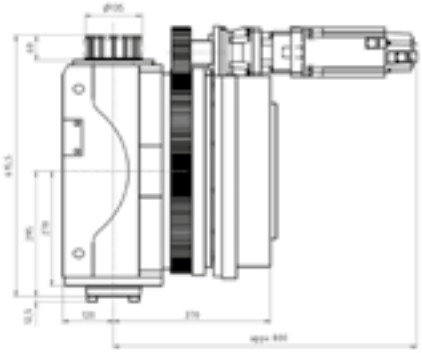
- Spindle Taper SK 50 (DIN, ANSI, MAS)
- Hydraulic tool unclamping
- Tool clamping force 20 kN
- Angle contact High precision bearings mounted on the tool-holder spindle, trio at the forward side and couple the back side
- Ground gears
- Coolant Through Spindle
- External tool cooling
- Rotary encoder at both axes
- Taper air-jet
- A axis range ± 180°

Right angle micro-indexing automatic milling head- PHAmi 60



Speed: 10- 1 700 rpm
Power: 60 kW (80 HP)
Torque: 2 500 Nm
Indexing: 0,001°
Clamping torque: C axis 10 000 Nm

- Spindle Taper SK 50 (DIN, ANSI, MAS)
- Hydraulic tool unclamping
- Tool clamping force 25±15% kN
- Ground gears
- Coolant Through Spindle / External tool cooling
- Taper air-jet
- C axis range ± 180°
- Automatic gear greasing
- Quick head positioning
- 2 servomotors and gearboxes (Master-Slave system) for head positioning
- Cross roller bearing on C axis



Spindle Support Sleeves

250 mm | 9.84"

380 mm | 14.96"

555 mm | 21.85"

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)

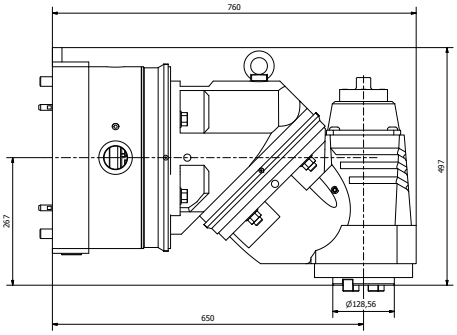
Maximum Torque (150 RPM): 1 600 Nm

Tool: ISO 50 – DIN 69871

Pull Stud: DIN 69872

Turning: any degree (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: 26 kW (35 HP)

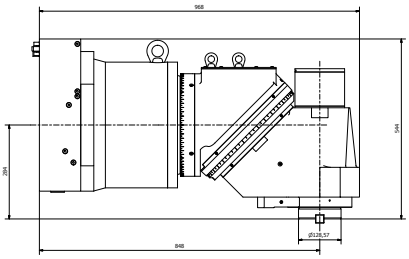
Maximum Torque (150 RPM): 1 370 Nm

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)

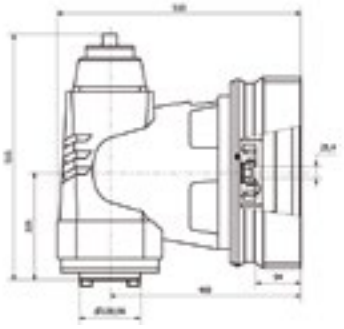
Maximum Torque (150 RPM): 2 000 Nm

Tool: ISO 50 - DIN 69871

Pull Stud: DIN 69872

Turning: any degree, 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)

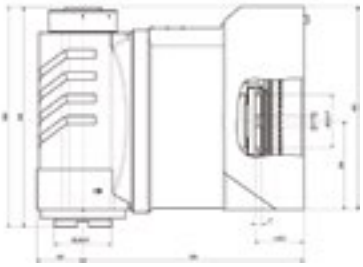
Maximum Torque (187 RPM): 2 000 Nm

Tool: ISO 50 – DIN 69871

Pull Stud: DIN 69872

Turning: 2,5° (1°)

Coolant Through Spindle: Standard



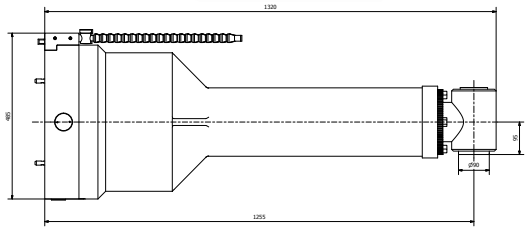
Milling and Facing Heads

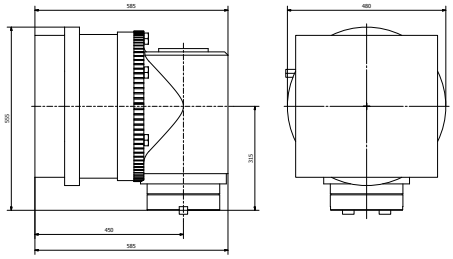
IFVW 1B

Right Angle Milling Head

Manually attached to the headstock, manual positioning, 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





IFVW 2B

Right Angle Milling Head

Manually attached to the headstock, manual positioning, manual tool clamping and unclamping.

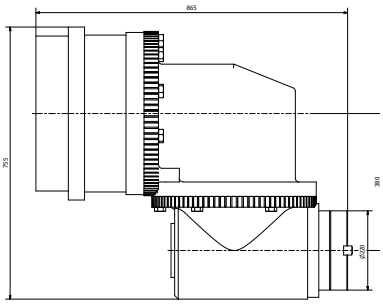
Revolutions: 10 - 1 000 rpm max.
Maximum Power: 55 kW (74 HP)
Maximum Torque (150 RPM): 2 600 Nm
Tool: ISO 50/60
Turning: 0° - 360°
Coolant Through Spindle: Not Possible

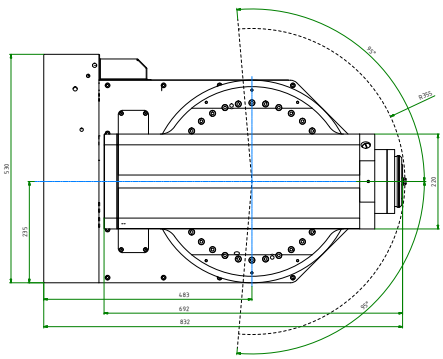
IFVW 3B

Two Axis Orthogonal Milling Head

Manually attached to the headstock, manual positioning, manual tool clamping and unclamping.

Revolutions: 10 - 1 000 rpm max.
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





E-PHAmi

Automatically or manually attached to the headstock, automatic tool clamping and unclamping.

Revolutions: 12–15.000 rpm
Maximum Power: 40,5 kW (S1)
Maximum Torque: 128,9Nm (S1)
Tool: SK 40
Coolant Through Spindle: Standard
Outside Coolant: Standard

UHM 20

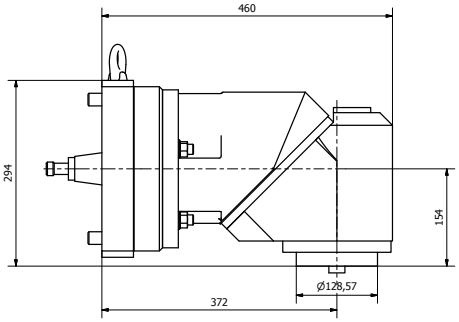
Two Axis Universal Manual Milling Head

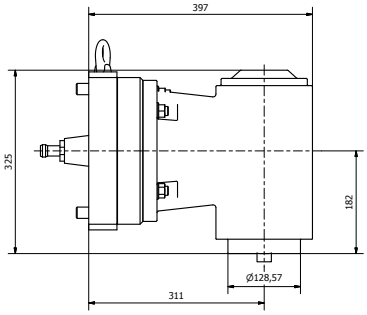
Manually attached to the headstock, manual positioning, manual tool clamping and unclamping

Revolutions: 2 000 rpm

Maximum Power: 20 kW (27HP)

Tool: SK 50 (DIN, MAS, ANSI)





PHM 20

Right Angle Manual Milling Head

Manually attached to the headstock, manual positioning, manual tool clamping and unclamping.

Revolutions: 2 000 rpm

Maximum Power: 20 kW (27HP)

Tool: SK 50 (DIN, MAS, ANSI)

OHM 20

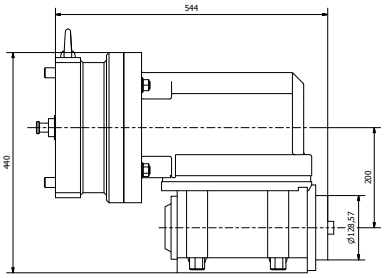
Two Axis Orthogonal Manual Milling Head

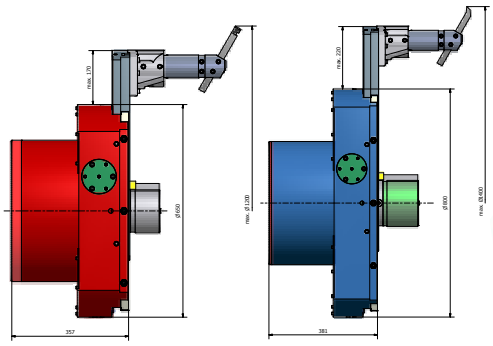
Manually attached to the headstock, manual positioning, manual tool clamping and unclamping.

Revolutions: 2 000 rpm

Maximum Power: 20 kW (27HP)

Tool: SK 50 (DIN, MAS, ANSI)





Automatic Facing Head FH 65/80

Plate Diameter: 650/800 mm | 19.68"/31.50"

Positioning: Automatic

Boring Accuracy: 0,05 mm | 0.002"

Radial Traverse: 170/220 mm | 6.69"/8.66"

Maximum Boring Diameter:
1200/1400 mm | 47.24"/55.19"

Coolant Through Spindle: Not Possible

D´Andrea Facing Head UT 5-500 S(UT 5-630, UT5-800)

Plate Diameter: 500/600/800 mm | 19.68"/23.62"/31.50"

Positioning: Automatic

Boring Accuracy: 0,01 mm | 0.0004"

Radial Traverse: 160/200/250 mm | 6.30"/7.87"/9.84"

Maximum Boring Diameter: 1 000/1 250/1 440 mm | 39.37"/49.21"/56.69"

Coolant Through Spindle: Standard

Operator's Shields & Platforms

Operator's Safety Screen (Shield)

The operator shield has a safety glass door protecting the Operator against flying chips and coolant splash. The door is monitored by electromagnetic switches.

Operator Movable Platform

Inside the cabin, there is a 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 monitored 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 movable in vertical and horizontal direction.

Vertical move [mm]	Horizontal move [mm]
1 300	550
1 600	
1 600	750
1 600	1 500
2 300	
2 300	750
2 300	1 500

Table & Workplace Enclosures

Workspace enclosure

C type cover

Plexi table cover

HEIDENHAIN

All-Around Protected Touch Probe

The TS 460 touch probe from HEIDENHAIN helps you in workpiece setup and measurement in the machine tool's working space. One innovation is the mechanical collision protection between the touch probe and taper shank: in the event of a light collision of the TS with the workpiece, the adapter allows the touch probe to yield. At the same time, the control stops the probing process. Neither the probe nor the machine suffers damage. At the same time, the collision protection adapter also functions as a thermal decoupler, protecting the touch probe from excessive heating through the spindle during very long or intensive probing processes.

HEIDENHAIN s.r.o., 10200 Prague 10, Czech Republic, Telephone +420 272 658 131, www.heidenhain.cz

Other Accessories

Pick Up Station for Milling and Facing Heads

A Pick-up Station is an accessory for automatic loading CNC milling heads and facing heads. It provides multiple stations for loading and storing the attachments for automatic pick up by the machine according to the customer´s needs.

Coolant System

The standard configuration of the machine contains flood coolant for tool cooling by outside supply of the coolant liquid at 4 - 6 bars. It is also possible to choose through the spindle coolant 10, 20, 30 and 50 bars. The coolant system can be equipped with oil skimmer.

Work Piece / Tool Touch Probe, Heidenhain or M&H

Coolant Through Spindle 10-50 bar

Angular Clamping Plates

Clamping Plates

3200x1885x400 mm (125.98"x74.21"x15.75")

4000x1885x400 mm (157.48"x74.21"x15.75")

4800x1885x400 mm (188.98"x74.21"x15.75")

5600x1885x400 mm (220.47"x74.21"x15.75")

6400x1885x400 mm (251.97"x74.21"x15.75")

7200x1885x400 mm (283.46"x74.21"x15.75")

8000x1885x400 mm (314.96"x74.21"x15.75")

Chip Conveyor

Upon customer request, it is possible to equip the machine with a belt type chip conveyor. Its length and height can be adjusted upon customer's demand, including the movable collecting reservoir.

References

Canada
TIGERCAT INDUSTRIES INC.

WFT 13 CNC (5 pcs)
X=3 000 mm
Y=3 500 / 3 000 mm
Z=1 500 mm
W=730 mm
Rotary Table 1 600x1 800 mm/2 000x 2 400 mm
CTS 20 bar
ATC 40
New design operators movable cabin

OTHER FERMAT MACHINES
WFT 13 R CNC | X=3 000 mm | Y=3 500 mm | Z=1 500 mm | W=730 mm | Rotary Table 2 000 x 2 400 mm | CTS 20 bar | ATC 60
WFC 10 CNC | X=2 000 mm | Y=1 700 mm | Z=1 250 mm | W=730 mm | Rotary Table 1 250 x 1 400 mm | CTS 20 bar | ATC 20

Belgium
VANHOUTTE

WFT 13 CNC
X=4 000 mm
Y=3 500 mm
Z=2 500 mm
W=730 mm
Rotary Table 1 800 x 2 200 mm
CTS 30 bar
ATC 40
Milling Heads OHM 20, UHAmi 30, Face plate FH 65, Robotic Tool Change, Pick up Station

Mexico
HYMSA HYDRAULICA Y MECANICA, S.A. de C.V.

WFT 13 CNC (4 pcs)
X=3 000 mm/3 500 mm
Y=2 000 mm/2 500 mm
Z=1 700 mm
W=730 mm
Rotary Table 1 800x2 200 mm
ATC 40 (60)

USA
PRECISION BORING
COMPANY

WFT 13 CNC
X=3 500 mm
Y=2 000 mm
Z=1 700mm
W=730 mm
Rotary Table 1 800x2 200mm
CTS 20 bar
ATC 40

OTHER FERMAT MACHINES
WFT 13 L CNC HIGHSPEED | X=2 500 mm | Y=2 000 mm | Z=1 500 mm | W=730 mm | Rotary Table 1 600x1 800 mm | CTS 20 bar | ATC 40, BUC E 85/4000 CNC

Denmark
NORDMARK, MASKINFABRIK A/S

2x WRF 160 HEAVY CNC
X=17 000 mm
Y=8 000 mm
Z=1 500 mm
W=1 000 mm
Rotary Table 3 000x4 000 mm, 3 000x3 000 mm tilting
CTS 50 bar
ATC 105
Milling Head PHAmi 60, PHA 37, Automatic pick up

7 x Fermat Machines

OTHER FERMAT MACHINES
2x WRF 160 CNC | X=13 500 / 8 600 mm | Y=4 100 / 5000 mm | Z=1 100 / 1 000 mm | W=1 000 mm | Rotary Table 2 500x3 500 mm | CTS 30 / 50 bar | ATC 60 / ATC Robotic 105 | PHA 37 2,5°

WRF 160 CNC HEAVY | X= 8 900 mm | Y= 7 300 mm | Z=1 500 mm | W=1 000 mm | Rotary Table 3 000x4 000 mm | CTS 50 bar | ATC Robotic 90 | UHAmi 30 | PHA 37, PHAmi 60

2x WRF 150 CNC | X= 10 500 / 6 200 mm | Y= 5 000 / 4 000 mm | Z=1 200 mm | W=1 000 mm, Rotary Table 2 500x2 500 / 3 000x3 000 mm | CTS 30 bar | ATC 90 | UHAmi 30, UHA 30 | 1x Tilting Headstock | PHA 37, PHAmi 60

Belorussia
BelAZ

WRF 130 DUO CNC
X=2x 10 500 mm
Y=2x 2 500 mm
Z=2x 900 mm
W=2x 730 mm
Rotary Table Ø 2 000
2x CTS 50 bar
2x ATC 40
2x UHA 30

OTHER FERMAT MACHINES
WFT 13 R CNC, APC | X=2 000 mm | Y=2 000 mm | Z=1 500 mm | W=730 mm Rotary Table 1 600x1 800 mm | CTS 50 bar | ATC 60 | D'Andrea UT 5/5000S

Germany
HYDREMA A/S

WFT 15 CNC
X=3 000 mm
Y=2 000 mm
Z=2 400 mm
W=730 mm
Rotary Table 1 800 x 2 200 mm, Speed clamp system
CTS 20 bar
ATC 60

3 x Fermat Machines

Czech Republic
HOPAX s.r.o.

WRF 130 CNC
X=12 900 mm
Y=3 500 mm
Z=900 mm
W=730 mm
Turning Table Ø 2 000 mm
CTS 4 bar
UHM 30

OTHER FERMAT MACHINES
WFT 13 L CNC | X=3 000 mm | Y=2 500 mm| Z=1 200 mm | W=730 mm | Rotary Table 2 000x2 400 mm | CTS 20 bar | PHM 37
WRF 160 CNC | X=14 100mm | Y=6000 mm | Z=1 200mm | W= 1 000mm | Floor plates | CTS 30 bar | UHM 30

Slovenia
KOLDING d.o.o.

WFC 10 CNC
X=2 000 mm
Y=1 250 mm
Z=1 250 mm
W=730 mm
Rotary Table 1 200x1 400 mm
CTS 50 bar

2x Fermat Machines

OTHER FERMAT MACHINES
WFT 13 CNC (2pcs) | X=4 000 mm | Y=2 500 mm | Z=1 700 mm | W=730 mm | Rotary Table 1 800x2 200 mm | CTS 20 bar, ATC 32, UHM, Angular Clamping Plate 800x1000x2150, 2 servomotors

USA
CMI HEAVY INDUSTRIES

WFT 13 CNC
X=4 000 mm
Y=3 000 mm
Z=1 500 mm
W=730 mm
Rotary Table 1 800 x 2 200 mm
CTS 20 bar
ATC 40

Brazil
FAY IND.

WRF 160 CNC
X=8 600 mm
Y=5 000 mm
Z=1 200 mm
W=1 000 mm
Rotary Table 3 000x3 000 mm
CTS 50 bar
VGCI, FH 80, IFVW 1B

Netherlands
DE WAAL BV

WFT 13 R CNC
X=3 000 mm
Y=2 000 mm
Z=2 000 mm
W=730 mm
Rotary Table 1 800x2 200 mm
CTS 20 bar
ATC 32
ram 600mm, UHM 30

Slovakia
STROJE A MECHANIZMY a.s.

WRF 160 CNC
X=8 000 mm
Y=5 000 mm
Z=1 200 mm
W=1 000 mm
V=2 400 mm
Rotary Table 2 500 x3 500 mm
CTS 50 bar
ATC 60
UHM 30 Floor plates 4 000x1 885x400 mm

2 x Fermat Machines

Switzerland
BRUHIN AND DIETHELM AG

WFT 13R CNC
X=3 000 mm
Y=2 000 mm
Z=3 000 mm
W=600 mm
Rotary Table 1 600x1 800 mm
CTS 50 bar
UHA 30
Robotic Tool Changer 180

OTHER FERMAT MACHINES
WRF 130 CNC | X=4 900 mm | Y=3 000 mm | Z=900 mm | W=730 mm | Rotary Table 2 500x3 000 mm | CTS 40 bar | ATC 90 | VGCI, Pick up, Spindle Support Sleeve 380, 550mm

India
VEEKAY ENGINEERING

WFT 13 CNC
X=4 000 mm
Y=2 500 mm
Z=1 700 mm
W=730 mm
Rotary Table 1 600x1 800 mm
ATC 32
UHM, D´Andrea UT 5-500

Morocco
PROMINOX S.A

WRF 160 CNC
X=11 700 mm
Y=6 000 mm
Z=1 200 mm
W=1 000 mm
Rotary Table 2 500x3 000 mm
CTS 50 bar
ATC 60
UHM 30

5 x Fermat Machines

China
TIANJIN ZHONGZHONG
SCIENCE & TECHNOLOGY CO. LTD.

WFT 13 CNC
X=3 000 mm
Y=2 000 mm
Z=1 700/1 200 mm
W=730 mm
Rotary Table 1 800x2 200 mm

France
FAURE PERE ET FILS

WRF 130 CNC
X=6 200 mm
Y=3 000 mm
Z=900 mm
W=730 mm
Rotary Table 2 000x2 400 mm
CTS 20 bar
UHM 30 with automatic clamping

2 x Fermat Machines

OTHER FERMAT MACHINES
WRF 160 CNC | X=12 300 mm | Y=6 000 mm | Z=1 200 mm | W=1 000 mm | Rotary Table 2 500x3 500 mm | CTS 20 | UHM 30 with automatic clamping

USA
D&S Machine Service Inc

WRF 160 Heavy CNC
X=27 000 mm
Y=5 000 mm
Z=1 500mm
W=1 000 mm
Rotary Table T 50, 3 500 x 3 500
CTS 20 bar
ATC 60
UHAmi30
PHA 37

Austria
Ressenig Fahrzeugbau GmbH

WFT 13 CNC
X=5 000 mm
Y=3 000 mm
Z=2 000 mm
W= 730 mm
Rotary Table 2 000 x 2 400 mm
ATC 60
UHM 30

Germany
BMA AG

WFT 11 CNC
X=2 000 mm
Y=1 700 mm
Z=1 250 mm
W= 730 mm
Rotary Table 1 400 x 1 600 mm
CTS 20 bar
Robotic Tool Change
OHM 20

FERMAT

WFT 13 CNC

for RAVEN, a.s., Slovakia

Parameters: X=5 000 mm (196.85") | Y=2 500 mm (98.43") | Z=2 000 (78.74"), W=730 (28.74") | Rotary Table = 1 800 x 2 600 (70.87x102.36")
CTS 4+20 | ATC 32 | PHM 20

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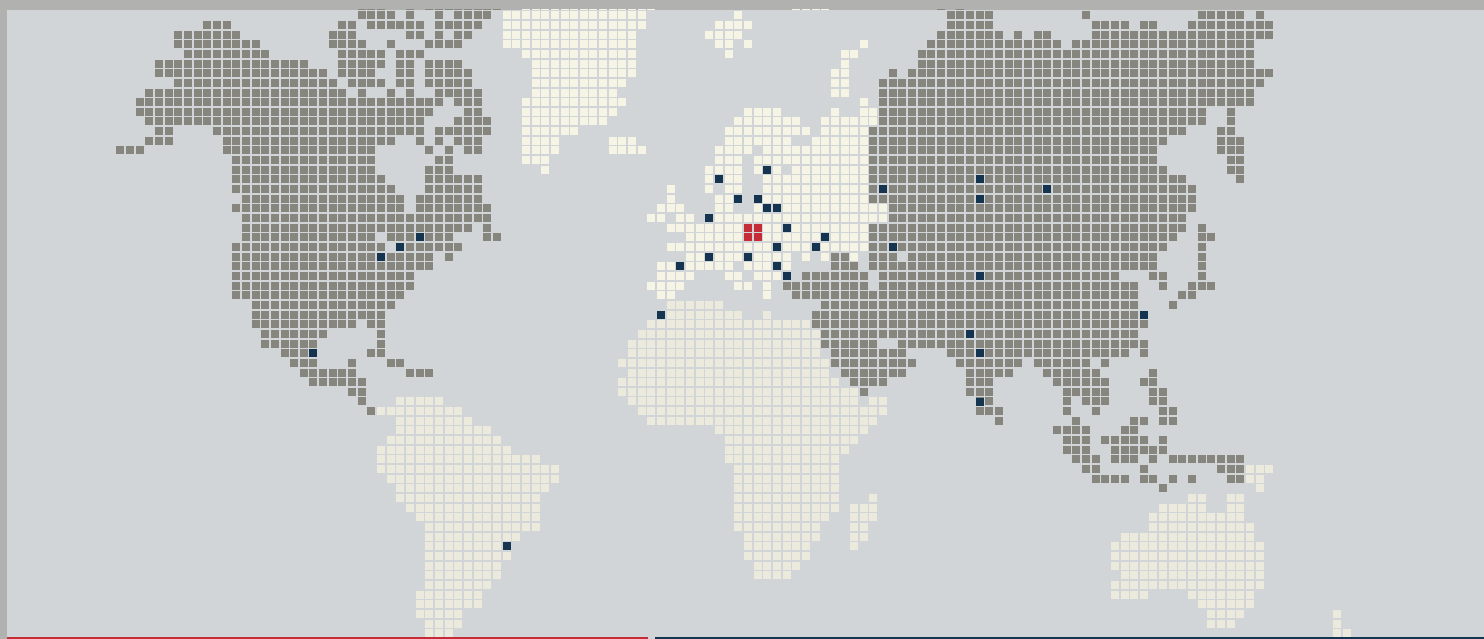

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