Address: Lucas Precision, 13020 St. Clair Avenue, Cleveland, OH 44108-2033
Phone: 216.451.5588
E-mail: sales@lucasprecision.com
www.lucasprecision.com

New Table Type Horizontal Boring Mill Offer/Order

WFT 15 CNC

Reference Quote Number: 2013_WFT15Stock_D_01_1021 rev.B

Date: 7/10/23

Validity Date: **Subject to prior sales**

END CUSTOMER:

Customer name: D & G Machine Products Inc.

Contact address: 50 Eisenhower Dr, Westbrook, ME 04092
Contact person: Matt Burr

WFT 13/15 (R) CNC illustrative

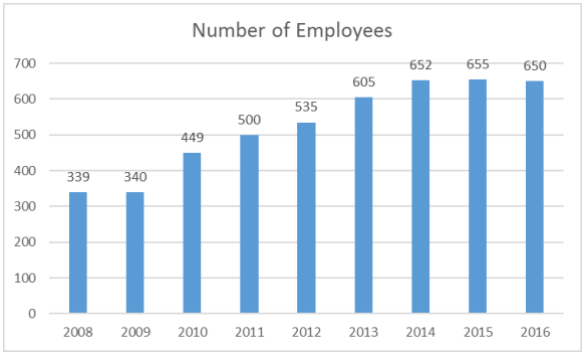
Please find our price offer of the Fermat table type boring mill **WFT 15 CNC**. Please do not hesitate to aks if you have any questions.

Jakub Sebor, President
Tel.: +1 (216) 296-7832, E-Mail: jakubs@lucasprecision.com

INTRODUCTION

The FERMAT Company is a professional manufacturer of horizontal milling and boring machines in the Czech Republic. The horizontal milling and boring machines by FERMAT provide the possibility to choose a machine tool with a spindle diameter from 100 to 160 mm. Thanks to a modular manufacturing system, we supply our customers with reliable machines produced and configured according to their needs. Our boring mills, their accessories and components are machined and assembled at FERMAT, or are supplied by renowned world-wide respected companies (SKF, NSK, INA, Siemens, Heidenhain, Schneider, etc.).

FERMAT has won a leading position for itself in the European market of manufacturers of these machines during the last decade, in which its dynamic growth occured. The average production of FERMAT is around 100 machines a year. We offer reliable machines to our clients, which present top solutions asserting themselves in the environment of different applications in today's industry, not only in the domestic market, but also, globally. The modular manufacturing system, experienced designers and technicians, systematization of work, standardization, and an accurate record keeping of particular groups/subgroups/components of the machines at FERMAT guarantee our customers a delivery of a machine of high quality and performance.



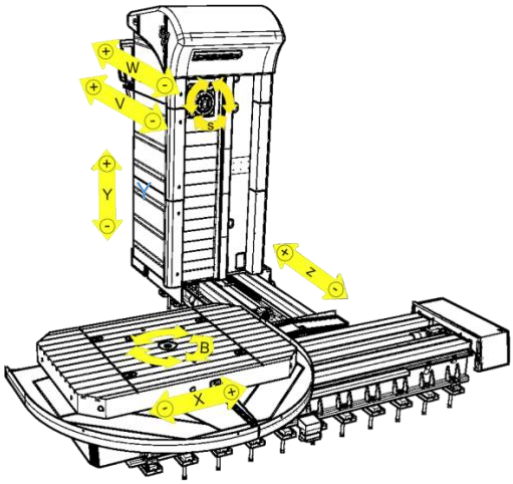
"There are many features of the FERMAT machine that allowed us to improve our efficiency. Value for the money was an important consideration and Fermat machines are excellent value for the money. The features of the machine, for example: large box ways, planetary gearboxes between the servo motor and 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

WFT 13 CNC, Precision Boring Company, USA

BASIC DESCRIPTION OF THE MACHINE

The WFT 13R CNC horizontal boring mill is a continuously controlled table type milling and boring machine with a travelling spindle for the W axis, a longitudinally movable column base for the Z axis, and a table movable in a crosswise way for efficient machining of workpieces of up to 20 Tons on the X axis.

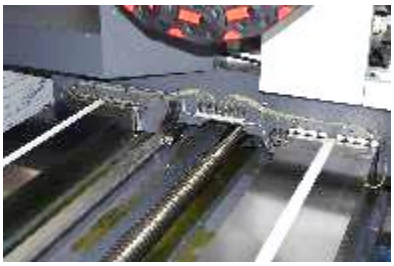


Axis system of WFT 13R CNC - informative

A consistent control of the machine is provided by a CNC system according to the customer's choice (HEIDENHAIN iTNC 640, SIEMENS 840D SL or FANUC 31i B) with an English dialogue. A standard is the control of linear axes X, Y, Z, W, rotary coordinates for the positioning of the table (B axis) and the work spindle rotation (C axis). The control panel on a rotary bracket is equipped with a color 15'' screen. Standard equipment includes a portable control console – a hand wheel (type according to the CNC system including a possibility of wireless transmission).

Standard operator's safetz shield with integrated panel }customiyed solution]

The main framework of the machine (the longitudinal and cross-wise beds, slides and the column base) are made of cast iron GG30 with the addition of Cr and Cu; the functional surfaces of all the ways of the box guides is hardened (56 HRC) and ground. The width of the box ways on the X and Z axes is always 300 mm and the span of their outer edges is 1200 mm. The width of the box ways on the Y axis is 180 (in the front) and 130 (in the back) mm and the span of their outer edges is, again, 1200 mm. The headstock slide is moved in a vertical direction upon the box ways of the frame.



Specific Box Ways – X Axis (on the Left), Z Axis (in the Middle), Y Axis (on the Right) with Way Lubrication

The headstock is of a prism shape, the framework of the headstock is made from cast iron GGG60. The work spindle with the clamping spindle taper SK50 (the clamping is made according to the customer's wish: ISO/BT/CAT) is nitrided and machined with an exceptionally high accuracy (0,005 mm tolerance). It is placed in high precision angular ball bearings of the spindle. The bearings of the main seating of the spindle are grease packed. The spindle bearings are thermally stabilized by an oil bath through a separate cooling aggregate. The spindle is equipped with automatic clamping of the tools utilizing disk springs with a multiplier of clamping power, the release of the tool is provided by a hydraulic cylinder.

The headstock is equipped with a digitally controlled modern AC servomotor (SIEMENS for HEIDENHAIN or SIEMENS control system and FANUC for FANUC control system) for the spindle with continuous regulation of speed. The torque is transferred to the spindle through a two speed planetary gearbox. The gear change is controlled automatically according to the programmed revolutions of the spindle. The work spindle travel on the W axis of 730 mm is provided by a servomotor and a ball screw, supported by the linear guides of the housing. The measuring of the revolutions of the spindle will be provided by a rotary encoder. A standard is that the WFT 13 machine is equipped with a spindle support sleeve of the length of 250 mm.

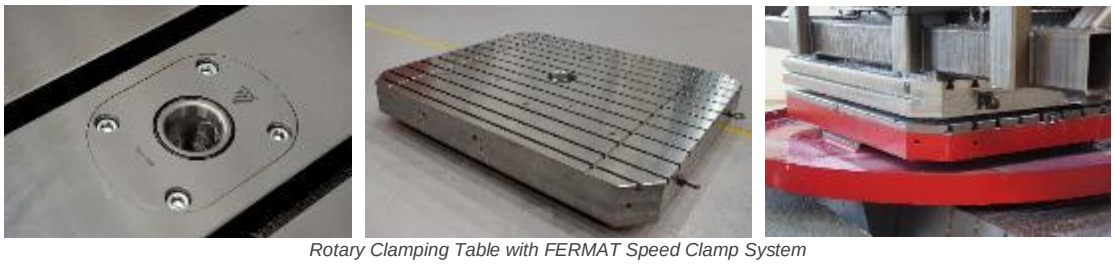
Headstock V130 – Pre-installation and Installation on the Machine … illustrative

Headstock V130 – travelling ram V=700 mm … illustrative, optional aacessory

The rotary clamping table with a clamping plate of standard dimensions according to the customer's choice (1600 mm x 1800 mm / 1800 mm x 2200 mm / 1800 mm x 2600 mm / 2000 mm x 2400 mm / 2000 mm x 3000 mm) with full rotation of 360° is equipped with a hydraulic clamping mechanism to keep the table from turning during machining with four clamps as standard. The slides and the clamping plate of the table are castings. The clamping plate is placed on a special large cross antifriction bearing of a diameter of 1250 mm. The rotary movement of the rotary table is provided by two servomotors with the Master-Slave function enabling contour machining on the B axis for positioning that is backlash-free. The motor torque is transferred through the pinion gears to the gear box, which is placed on the bearing on which the table rotates. The B axis (the rotary positioning of the table) is equipped with a Heidenhain angle encoder with an integral bearing for measuring of the work table turning with an increment of 0,001°.

Rotary Table – B Axis Drive, Two Servomotors in the Master-Slave Function (in the Middle) and a Cross Bearing Installation (on the Right)

It is possible to equip the rotary tables with a FERMAT Speed Clamp system, a system of unitary clamping to zero points. The clamping of the device on the table is provided by built in modules which always provide a quick and definite mechanical clamping through springs and pneumatic unclamping by connecting an external air supply.



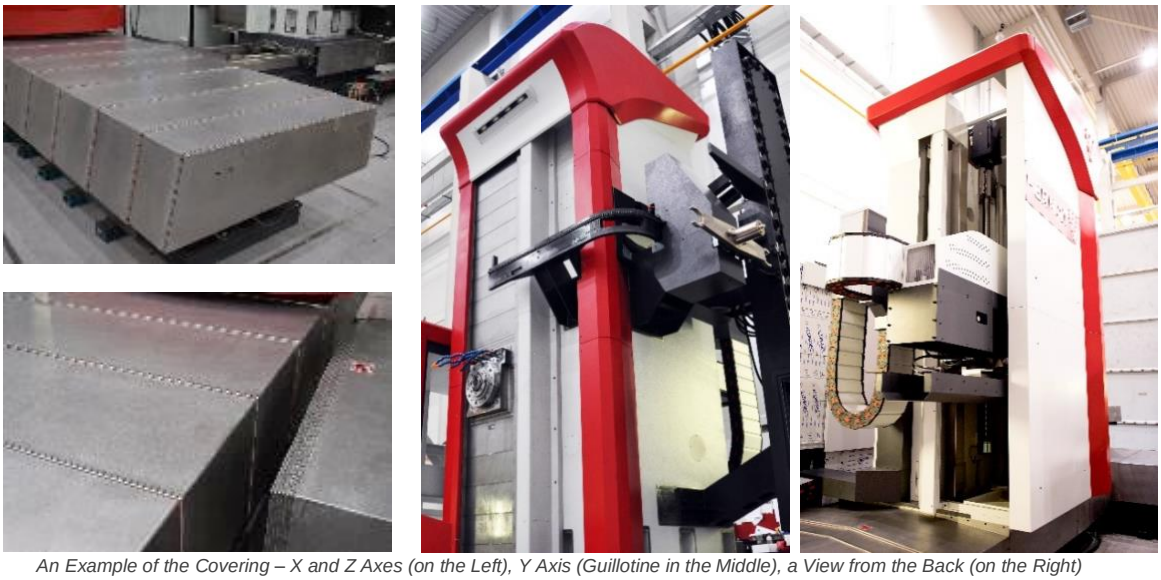
Rotary Clamping Table with FERMAT Speed Clamp System

The travel of the rotary table on the X axis, the column slide on the Z axis and the slides for the headstock on Y axis on box ways is provided by servomotors and ball screws of the diameter of 80 mm (the transfer of the torque from the servomotor to the ball screws is through planetary gearboxes. The servomotor of the vertical Y axis is equipped with a mechanical brake. Separate HEIDENHAIN AC servodrives on all axes, controlled digitally, provide the means for linear, circular, and helical interpolation.

An Example of Placing of the Ball Screw on the X and Y Axes

Lubrication of the box ways and ball screw nuts is performed with a way oil lubrication from a separate aggregate. Feed gearboxes have permanent oil filling with a long lifespan. The gearbox of the spindle drive is lubricated and cooled with an oil bath provided by the cooling aggregate. For the lubricated areas that are equipped with automatic dispensers, the oil amount is set automatically according to the distance travelled in a specific axis.

The covering of the box ways on the X and Z axes is carried out through telescopic covers. The covering of the Y axis is carried out through a guillotine in the front (the back side is open). This proven system of covering ensures the needed protection of all functional spaces and specific axes components.



An Example of the Covering – X and Z Axes (on the Left), Y Axis (Guillotine in the Middle), a View from the Back (on the Right)

X, Y, Z coordinates are equipped with Heidenhain or Fagor linear optoelectronic position encoders with a possibility of air purge of the scales with compressed air. Normal shop air requires additional filtering for this use.



A Linear Scale on the Axis (on the Left), an Illustrative Picture of a Heidenhain Scale; Fagor is Also an Option (in the Middle), a Unit for Filtration of the Air for the Blow - Offered as an Option (on the Right)

Electrical control components are placed in the distribution enclosure. There are modular controllers of axis drives and spindle drive, the CNC control system, power supply units, and switching components and fuses for the machine mounted on the electric panel. The electrical equipment conforms with ČSN EN 60204-1, CSA and UL norms. The work light is placed on the headstock and the column top. An air-conditioned electric switchboard is standard.



An Example of an Electric cabinet: an Overall View with the Air Conditioning (on the Left), Drives (in the Middle) and Electric Wiring (on the Right)

Coolant sent to the machine tool is provided by a self-contained unit housing the tanks, pumps, and filtration. The low pressure external flood coolant is maintained at 6 bar. It is possible to install a high-pressure cooling through the center of the spindle for cooling through the tool on a machine with an outlet pressure of 10-50 bar (with magnetic separator) or max 70 bar (with paper filtration) from the aggregate according to the choice and need of the customer.


The Unit for Filtration of the Cooling Liquid (two different types)

A standard operator's shield is immovable, open for entering in the back and with a control panel for operating and programming the machine. According to the travel on the Y and Z axes, it is possible as an option to choose a cabin with travels on both axes.

illustrative pictures: fixed shield opened from the back, no travel (left), movable cabin (right)

GENERAL BASIC SPECIFICATIONS OF THE MACHINE

	Parameter	
	Metric	**Imperial**
Headstock V130		
Spindle Taper	SK50	
Tool Standard	ISO 50 / CAT 50 / BT 50	
Working Range of the Axes		
Max. Feedrate All Axes	8 000 mm/min	**314.96 in/min**
Max. Radip Feed X Axis, Y Axis	12 000 mm/min	**472.44 in/min**
Max. Rapid Feed Z Axis, W Axis	8 500 / 10 000 mm/min	**334.64 / 393.7 in/min**
Max. Axial Force X Axis, Y Axis	25 kN	**5 620 lbf**
Max. Axial Force Z Axis, W Axis	28 kN	**6 294 lbf**
Accuracy and Repeatability of the Positioning	According to VDI/DGQ 3441	
X, Y, Z Axes Ball Screw Diameter	80 mm	**3.149“**
W-axis Ball Screw Diameter	63 mm	**2.48“**
Measuring Device of the X, Y and Z Axes	Electro-optical Linear	
Measuring Device of the B Axis	Electro-optical Angular	
Measuring Device of the W Axis	Internal Motor Encoder (Electro-optical Linear as an Option)	
Measuring Device of the Spindle (C Axis)	Magnetic Direct Rotary Encoder	
Rotary Table		
Clamping T-Slots Size	22H8 (central), the rest 22H12	
Number of Slots	11/2 pc	
Max. Range of Working Feeds on the B Axis	0-2 rpm	
Fast Feed B Axis	2 rpm	
Hydraulic and Pneumatic System		
Nominal Pressure in the Hydraulic Aggregate/Max. Pressure	90 / 100-110 bar	**1 305 / 1 450-1595 psi**
Nominal Pressure in the Lubrication Aggregate	3 Mpa	**435.11 psi**
Tool Clamping Force	24 ± 15% kN	**5 395 lbf**
Tool Clamping System	Mechanical – Disk Springs (Unclamped Hydraulically)	

Electricity		
Total Installed Load	**107**	kVA
Operating Voltage	**3 x 400**	V
Current	**160**	A
Electrical system network	**3L + PE**	
Connection Terminal	**WDU 70/35**	
\Operating Voltage Allowance	**± 10**	%
Control Low Voltage	**24**	V
Operating Voltage Frequency	**50 / 60**	Hz
Max. Noise Level at Operator’s Location LAeq (at 80% RPM and Feed Rate)	**80**	dB
Max. Noise Level at Operator’s Location	**80**	dB
Operating Climate	normal	
Spindle Drive	a.c. asynchronous	
Feed Drive	a.c. synchronous	

PRICE OFFER AND MACHINE SPECIFICATION

Machine model	FERMAT WFT 15 CNC
X / Y / Z / W (axes travels)	3 000 / 2 000 / 1 500 / 800 mm **118.1" / 78.7" / 59" / 31.4"**
Spindle Diameter	150 mm / **5.9"** **2 800 RPM, 2 210 Nm / 1 630 ft-force-lb**
Spindle Main Motor Power (S1)	**Fanuc** 37 kW / **50 hp**
Spindle Taper	**CAT 50 (SK 50 Taper)**
CNC Control System	**Fanuc Fermat** Fanuc HMOP Type B 19" screen
Linear Scales	**Heidenhain**, optical absolute X, Y, Z
CNC Rotary Table	**T20**, 1 800 x 2 200 mm / **70.8" x 86.6"** **with max.** 20 tons / **44 000 lb. load** - on a large heavy duty Cross Roller Bearing, with Two Pinions and Two Servomotors (Master-Slave); with Electro-optical Angular Masuring and an Encoder for the B Axis (Heidenhain RCN 2310) T-Slots: 22H8 (Center) 22H12 (all others)
Standard Accessories, Units	Air-conditioned Electric Switchboard UL-Certified execution Automatic System of Slide Guideways Lubrication Hydraulic Unit Cooling Unit for Thermal Stabilization of Spindle Bearings Tranformer required – Not included
Coolant System	**High Pressure with max. 1 019 psi** output pressure of the unit (coolant through spindle) **Low Pressure with max. 89 psi** output pressure of the unit (outside coolant system) 900 l reservoir
Chip Conveyor	Chip Conveyor, Belt Type with Coolant Return Pump incl.
Probes	**Option**
Tool Changer	**40 tools**
Service	**Remote Diagnostics** – Prepared in the Electric Switchboard (the Connection is Carried Out by the Customer); a Warranty service must
Work Lighting	In the Operator's Cabin, Spotlight on the Cabin, Upper Lighting from the Upper Cover of the Column Base (to be discussed)
Operator's Safety	**Stationary Operator's Safety Cabin**

1.1. Documentation

In English, CE, TÜV and Electrorvision certificates, Operator's and Service Manual, Control System Documentation (According to the CNC).

1.2. Installation

Complete installation by FERMAT, including basic final instructional training for the maintenance. Anchoring Material – fixators included (but without chemical Concrete, recommended MAPEFILL).

1.3. Transport, Delivery Conditions & Packing

DAP – delivered on truck to customers premises (without rigging at customers premises)

1.4. Training (programming, technology)

5 days of training by an application engineer (for machine start, maintenance, operation, special functions, CNC programming) in English; depending on final machine configuration.

1.5. Warranty

12 months (spare parts and labor)

1.6. Delivery Time, Pre-Acceptance Date

Stock at Lucas Precision LLC (Cleveland, OH) – disassembled and ready for shipping

1.7. Price

Price of the above specified machine is **780 000 USD**.

1.8. Options

Description	Price
Renishaw RMP60 workpiece probe	10 600 USD

1.9. Payment Terms

30% advance payment in accordance with the invoice due immediately after placing the order

60% due before its shipment

10% balance payment after bilateral signature of Acceptance Handover Protocol relating to successful acceptance at buyer's installation

DOCUMENTATION, FOUNDATION, INSTALATION

Documentation

The following manuals will be supplied in language specified in Article 5.2. (1 hard copy + 1 Storage Medium):

- Standard manual for use and maintenance of the machine
- Manual for use and programming of CNC unit, according to CNC supplier's standard
- Electrical diagrams
- Mechanical assembly drawings
- Geometric Measuring Documentation

Foundation

Seller will send within 30 days after the order confirmation an informative layout drawing of the machine where the foundation block dimensions and the location of different components of the machine are indicated. Official foundation drawing must be interpreted and applied according to the civil regulations of the country where the machine is installed, based on the static and dynamic loads supplied by Seller and on the quality of the ground where the machine will be installed. The depth of the foundation needs to be determined by a soils and foundation engineer for the proposed location.

The Buyer must review in detail all dimension and features of the drawings supplied. This layout drawing must be accepted by the Buyer within 21 days of its receipt, confirming the machine layout and the location of the different components.

Within 30 days after this acceptance, Seller will send the official foundation drawing where all conditions and details are indicated to produce the foundation. An official hard copy will be sent to Buyer.

If the Buyer reuses an existing foundation, it is his responsibility to prepare the foundation for the machine installation as per Seller specifications. If the foundation is not prepared to Seller specifications, any claims to warranty that are directly affected by the geometry of the machine will be rejected.

Machine Pre-Acceptance

The Pre-Acceptance will be carried out at SELLER's premises in the Czech Republic before shipment, in as practical a manner as possible considering the local conditions at the assembly hall. Buyer is encouraged to participate at this inspection, but it is not a condition of acceptance.

The Buyer will be notified in advance of the machine availability for inspection and will receive the official version of geometrical protocols at the pre-acceptance. Travel expenses are the Buyer's responsibility.

Scope of Pre-Acceptance

- Check of machine completeness according to the order
- Check of documentation completeness
- Test of machine´s functions
- Partial geometric test

All the above performed according to Seller's standard procedures.

Buyer´s signature on Pre-Acceptance handover protocol is absolute confirmation that the machine is accepted as manufactured and no further changes can be made.

After the completion of the Pre-Acceptance protocol and fulfilling all financial obligations by the Buyer, Seller will proceed with shipment of the equipment. In case the Pre-acceptance or the consequent shipment cannot be carried out for reasons due to a Buyer change request, modifications, or other reasons, Pre-Acceptance handover protocol shall be regarded as confirmed even if not countersigned by the Buyer.

Buyer will be responsible for all consequent extra costs incurred by Seller such as storage, and will be required to remit the payments prior to shipping.

Installation at Buyer's Premises

If Installation is included in machine offer, is performed by Fermat Technicians:

The Installation of the machine in the Buyer´s factory will start once following items are provided and confirmed by Buyer:

- Completeness of the machine foundation, including pre-cast holes for the foundation bolts
- Confirmation of dimensions according to the foundation plan, including photos of the machine foundation
- Supply of power, air, and data lines for construction of the machine according to the foundation plan
- Confirmation of delivery of the machine, including photos of delivered machine
- Machine installation, leveling, and alignment will not begin until a minimum of 30 (thirty) days cure for the foundation
- Installation can be realized only in a finished building with proper environmental and working conditions. Nominal temperatures must be between 18-22°C.
- Storage of the machine in the Buyer's facility must be done under roof, with proper environmental conditions, without humidity, without falling or standing water, protected from dust, sunshine and with proper temperature. Machine must be protected against loss, destruction or damage and at the disposal of Seller´s employees.
- Working schedule should be agreed before start of installation, technicians may work up to 10 (ten) hours a day Mondays to Fridays, and up to 5 (five) hours on Saturdays. The technicians may work additional hours if they choose and the Buyer facility is available.
- Buyer assistance is required during the entire installation process. The Buyer will have available maintenance technicians during the installation of the machine, for auxiliary work to be performed.

Additional Buyer Responsibility

Seller is not responsible for:

- Machine Foundation - The design, materials and the execution of the foundation.
- Any building conversion necessary for installation of the machine
- Waterproofing of the foundation or adjacent areas;
- Grouting materials or it´s installation to anchor the machine
- Covering and equipping of the supply channels or walking platforms
- Power supply lines and disconnect to the required transformer (not supplied) or from there to the machine
- Technological tools
- Training of the programmers in programming of the machine control system
- All liquids including all that is necessary for cooling systems, hydraulic units and oils. Buyer should have these ready in specified type and sufficient quantity at the beginning of installation.
- Any machining test, technology, set up, fixtures and tooling and programs
- Provide a connection at the machine for remote diagnostics for the most expedient machine service when required
- Cranes, man lifts and other hoisting equipment with the relevant operators and other materials (cables, hooks, poles, etc.) should be ready and available for Seller´s personnel whenever requested.

Machine Acceptance at Buyer´s Premises

Acceptance will be carried out immediately after completion of the installation at the Buyer's premises.

Scope of acceptance

- Inspection and Presentation of the Machine
- Check of machine completeness according to the order
- Check of documentation completeness
- Functional Tests of the Machine
- Test of all functions of the machine including all options
- Renishaw laser and Ballbar measurement
- Geometrical test on a complete machine set-up using standard ´s geometric protocols
- Signature of the Acceptance handover protocol by the Buyer
- Acceptance tests to be performed according to Seller standard procedures.

WARRANTY

Warranty according article 1.6. will start from signature of Acceptance Handover Protocol, or max. lengths of machine warranty extended by 3 months from the date of shipment, whichever is earlier.

Seller will at its sole and exclusive discretion, either replace or repair any machine or part defective in workmanship or material, at no charge to the Buyer.

Transportation charges are covered by Seller.

All warranty repairs must either be performed by Fermat Technicians, or authorized by Seller.

To obtain warranty service, Buyer should contact Seller´s Service Department in written form and include information about serial number, date of acceptance handover and description of faults with photos or other documentation. Official Service contact information is part of machine Manual.

Materials or parts alleged to be defective shall be returned to Seller, at Seller's request.

After the warranty repair or replacement of a defective part, Seller warranty for such part shall continue for ninety (90) days or for the remainder of the Original Limited Warranty, whichever is longer.

Warranty Limitations

This warranty shall remain in effect only if the machine is used and maintained in accordance with all operating and maintenance instructions set forth in the manuals and instruction sheets furnished by Seller. Seller shall have no liability to repair or replace defective parts until the Buyer has fulfilled their payment obligations. No allowance will be made for repairs or alterations made without Seller's prior written consent or approval. The limited warranty provided by Seller excludes the following:

- Damage, malfunction, or failure caused by or resulting from improper maintenance, misuse, neglect, accident or any other cause beyond the control of Seller
- Damage, malfunction, or failure caused by modification of the machine (mechanical or electrical) without written authorization by Seller.
- Damage, malfunction or failure caused by installation or use of accessories or peripherals not purchased through or authorized in writing by Seller.
- Paint, batteries, filters, fluids, fuses, light bulbs, or any commonly expendable item.
- Damage, malfunction, or failure caused by common wear or force majeure
- Parameters, functions or performance which are not specified in the machine offer or other technical documentation

COMMERCIAL TERMS

Terms of the Offer

The offer is non-binding and is subject to confirmation as well as prior sale. In case of order placement, our confirmation of the order constitutes the final sales contract. Dependent on further engineering developments of our products, we reserve the right to change technical details of the equipment supplied.

In case the installation and/or final Acceptance/handing over of the equipment is delayed for reasons due to the Buyer, such as delay or non-conformity of foundations, or any other reason, the Buyer will be responsible for all the consequent extra costs incurred by Seller. In that instance, balance payment will be requested 30 days after machine arrival to the Buyer's location.

Seller does not accept any penalty in the case of delay in deliveries due to delayed incoming payments.

Retention of Title

The ownership of the goods will be transferred to Buyer after full payment of the contract.

Force Majeure

Seller is not liable for failure to perform the party's obligation if such failure is as a result of Acts of God (including fire, flood, earthquake, storm, hurricane or other natural disaster), war, invasion, act of foreign enemies, hostilities (regardless of whether war is declared), civil war, rebellion, revolution, insurrection, military or usurped power or confiscation, terrorist activities, nationalization, government sanction, blockage, embargo, labor dispute, strike, lockout or interruption, or failure of electricity or telephone service.

Storage

In case the shipment of the goods (partial or complete), once ready for shipment, cannot be carried out for reasons not due to Seller, Seller shall be authorized, provided due notification to the Buyer, to proceed with the storage of the said goods at full Buyer risks and costs. Should storage be required, it is necessary that a short-term insurance policy should be obtained by the Buyer.

All the consequent extra costs incurred by Seller for storage, including any eventual transport or insurance costs, shall be invoiced to the Buyer and paid from him within 30 days from date of invoice.

With respect to the contract obligations of Seller, the said storage will have the same effect as the shipment of the goods.

Legal Warning of Confidentiality

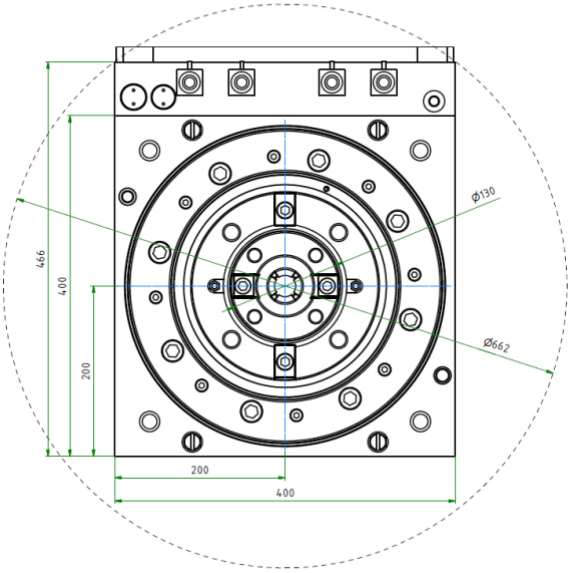
This document contains confidential and proprietary information subject to professional secrecy, which is not allowed to be divulged by law.

Distribution, copying or use of this document, or any attachments for whatever purpose, is prohibited by law.

REFERENCE – WFT 13/WFT 13R/WFT 15 CNC

ATTACHMENT

Attachment 1 – Front View of the Headstock



WFT 13 / WFT 15 WFT 13R