

HBM110XT

CNC Horizontal Boring Mill



STANDARD FEATURES

- Fanuc 32*i*-MB CNC control
- 10.4" LCD Color Display
- Manual Guide *i*
- 60 Pocket Double Arm Automatic Tool Changer
- 3000 RPM 50 Taper Spindle
- Powerful 30/25 HP Spindle Motor
- Rugged Two Speed Geared Head
- B-Axis Simultaneous 360,000 Position Rotary Table
- Locking Pins Every 90 Degrees
- Table Mounted Chip Auger and Chip Conveyor Chip Removal System
- Automatic Lubrication
- Spindle Extension Sleeve
- Remote Handwheel
- Spindle Oil Chiller
- Hydraulic System
- Flood Coolant System
- 700 psi Coolant Through Spindle
- Table Chip/Coolant Guarding
- Work Light
- Rigid Tap
- Spindle Orientation
- Cycle End and Warning Light
- Auto Power Off Function
- Ethernet Connection
- RS-232 Interface

Table-Type Horizontal Boring & Milling Center



Table-Type Horizontal Boring & Milling Center is equipped with rotary table with large bearing surface for heavy loading capacity and hydraulic clamping system enables heavy duty cutting.



The table guard has been updated to folding-door type guard for easy access and space saving.

Specification

Item	Model	Capacity
Table		
Table size		1250mmx1500mm (std)
Table height		1120mm
T-slot (Dim/pitch/No.)		22mmH8x150mmx7
Max. table load		5 tonnes
Table index		1°(std)/0.001°(opt)
Rotary table positioning accuracy		15 seconds
Rotary table repeatability accuracy		4 seconds
Rotary table encoder accuracy		±5 seconds
Travel		
X axis (std)		2200mm
Y axis (std)		1600mm
Z axis (std)		1600mm
W1 axis (Quill)		550mm
Spindle nose to table center (standard Z travel & table size)		120mm~1720mm
Spindle		
Spindle taper		ISO 50
Transmission		Gear
Spindle speed		35~3000rpm
Spindle output		15kW/18.5kW (std)
Spindle torque		740Nm/863Nm (std)
Spindle step		2 step
Quill diameter (W axis)		110mm
Spindle bearing I/D		150mm
Axes Transmission		
X axis ballscrew		Ø55mmxP12xC3
Y axis ballscrew		Ø55mmxP12xC3
Z axis ballscrew		Ø55mmxP12xC3
W axis ballscrew		Ø40mmxP5xC3

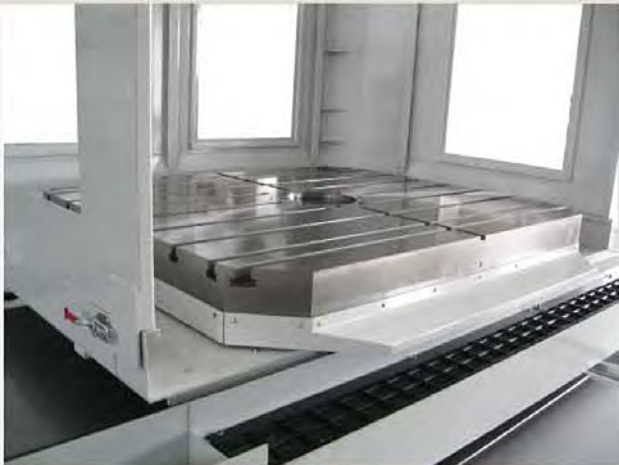
Item	Model	Capacity
Motor Output		
Axes motor (X/Y/Z/B/W)		22/38/22/22/12 Nm
Hydraulic motor		3.75 kW
Coolant motor		0.85kW/1.29kW(50/60Hz)
Lubrication pump motor		25W
Guide Way		
X axis guide way type		Box way
X axis guide distance		700mm
Y axis guide way type		Box way
Y axis guide distance		540mm
Z axis guide way type		Box way
Z axis guide distance		1000mm
Axes Feed Rate		
X/Y/Z/W rapid feed		12/12/12/6 m/min
X/Y/Z/W cutting feed		10/10/10/6 m/min
B axis cutting feed		5.5(1°)/2(0.001°)rpm
ATC System (Opt)		
ATC type		Arm
No. of tool		28/60
Tool shank type		BT/CAT/DIN #50
Tool changing time (T-T)		9 seconds
Max. tool diameter		125mm
Max. tool dia. w/ next tool empty		250mm
Max. tool length		300mm/500mm
Max. tool weight		25kg
Max. loading weight		420kg/900kg
Dimension		
Length		7750mm
Width		4715mm
Height		3700mm
Weight		22500kg

*Specifications are subject to change without notice.



Spindle & Gear Box

- 110mm quill diameter with travel 550mm for deep-hole boring and milling.
- Spindle construction with 2pcs NN bearings at front and rear, and 3pcs angular contact bearings in the middle.
- The main headstock supporting part is made of grade GGG iron casting. Spindle and sleeve are made of chrome alloyed steel which performs a great reliability.
- The spindle and quill are driven by the servo unit and lubricated by sintered bronze to ensure durability and longevity.
- A two-speed gear box, featuring two big ratios (1:6 for rough operation; 1:2 for normal work). Speed step shifts automatically according to the spindle speed setting.



Rotary Table

- Large diameter supporting bearing surface and high indexing accuracy rotary table are provided for heavy loading capacity.
- Three-piece Hirth couplings transmission and clamping for precise positioning every 1 degree standard table and multi-pitch worm gear for transmission system offers 0.001 degree variable positioning (option).
- Generous dimension of the hydraulic clamping system enables the capability for heavy cutting.
- Integrated chip auger located below the cutting areas for easy chip removal.



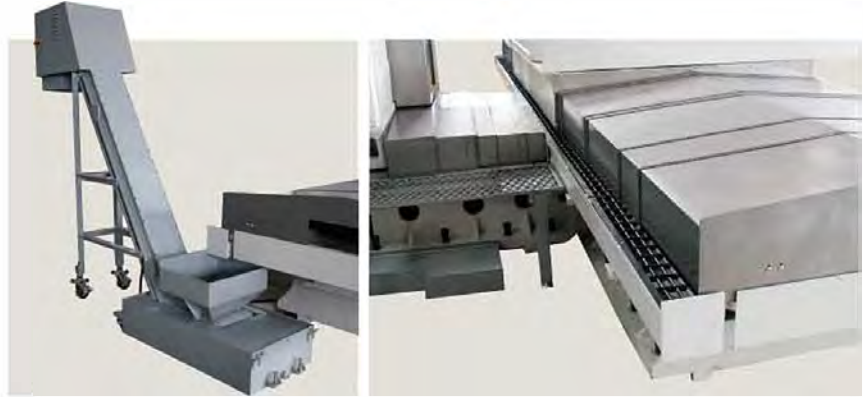
Bed & Axes

- All major structural components are made of Meehanite licensed casting iron with stress released to ensure maximum stability and rigidity.
- Two additional X support ways of the bed structure ensure accuracy and rigid support for the large longitudinal travel.
- All bearing surfaces with Turcite B.
- The box way design on X, Y, and Z axes--harden and ground box ways offer great heavy loading capacity and high reliability.
- For absolute positioning accuracy, the linear scale is provided for three axes (option).



High Precision Ballscrews

- C3 class ballscrews with double nuts are applied on X/Y/Z/W axes which offer high axis accuracy and less deforming under axial force.
- All the ballscrew nuts are preloaded to ensure less tension deforming. Ballscrews are patented for thermal compensation.
- The ballscrew supporter is offered as standard when the axis travel is up to three meters (or above) to prevent the ballscrew deformation and ensure smooth axis travel.



Chip Arrangement

- Machine is equipped with chip auger for easy chip collection.
- Floor chip conveyor is available if required.

Pressured Lubrication System



- Automatic lubrication system uses pressure-released type lubricator; oil volume is controlled by distribution metered values.
- Oil is supplied according to the lubrication oil demand of the sliding surface and the ballscrew.
- Oil level detector unit is provided.
- Alarm will be shown on the screen when the oil shortage. Sealed type spindle bearings are lubricated by grease.



Measuring System

- The X, Y, and Z axes are equipped with absolute linear scale.
- W axis is measured by the axis servo motor.
- The rotary table is integrated with rotary encoder, providing resolution 0.001mm.

SPECIFICATIONS

CAPACITY:

X axis travel	78.7" (2000 mm)
Y axis travel	66.9" (1700 mm)
Z axis travel	55.1" (1400 mm)
W axis travel	21.6" (550 mm)
With spindle extension sleeve	11.5" (290 mm)
B axis – Contouring	360,000 Positions

TABLE:

Table size	59 x 49" (1500 x 1250 mm)
Table Height	51" (1290 mm)
Table load capacity	11,000 lb (5000 kg)
T-Slot size	0.87" (22 mm)
Table clamping system	Hydraulic
Table clamping force	5700 ft-lb (800 kg-M)
Locking Pins	90° Positions

SPINDLE:

Distance from spindle nose to table center	0 – 55.1" (0 - 1400 mm)
Distance from table top to spindle center	0 - 66.9" (0 - 1700 mm)
Boring Spindle Diameter	4.3" (110 mm)
Spindle taper	ISO No. 50
Spindle speed	3000 RPM
AC spindle motor	30/25 HP (22/18.5 kW)
Spindle Transmission	Two Range Geared - Automatic Shift
Gear ratio (High) - 2:1	35 - 3000 RPM
Gear ratio (Low) - 6:1	35 - 1100 RPM
Spindle torque	636 ft-lb (863N.m)

AUTOMATIC TOOL CHANGER:

Number of tools	60
Tool shank	CT50
Pull stud	ANSI Retention Knob 50 Taper
Max. tool diameter	4.9"(1125 mm)
With empty adjacent pockets	10"(250 mm)
Max. tool length	15.7" (400 mm)
Max. tool weight	55 lb (25 kg)
Tool change time	16 Sec

MOTION:

X, Y/ Z / W axis rapid traverse rate	590/470/393 IPM (15/12/10 m/min)
Ball Screw Dia/Pitch X, Y,Z	55 mm / 12 mm
Ball Screw Dia/Pitch W	40 mm / 5 mm
B axis rapid traverse rate	2.5 RPM
Max. cutting feedrate X, Y, Z, W	200 IPM (5000 mm/min)
Max. cutting feedrate B	2.5 RPM
Positioning accuracy X, Y, Z, W	±0.00059" (±0.015 mm)
Repeatability X, Y, Z, W	0.00047" (0.012mm)
Positioning accuracy B	± 15 Sec
Repeatability B	5 Sec
Axis thrust force (continuous) X, Z / Y / W	3500/4600/3300 lb (1600/2100/1500 kg)
B axis cutting force	4600 ft-lb (640 kg-M)

GENERAL:

Machine height	159" (4030 mm)
Floor space required (W x D)	210" x 248" (5335 x 7055 mm)
Approximate machine weight	54,000 lb (24,500 kg)
Power required	57 KVA / 150 amps
Voltage required	208-240 Volts / 3 Phase
Air required	85 PSI (6 kgf/cm ²) at 4 CFM (65 L/m)

CONSTRUCTION

➤ **BASE, COLUMN AND SADDLE:**

The base, column, and saddle are composed of certified, fine-grain Meehanite cast iron, which provides very high dampening characteristics. The one piece base casting and column are stress relieved and annealed to ensure machine geometry is maintained throughout the machines life. Wide spacing of the solid box ways insures optimal support and rigidity throughout the full travel of each axis. Heavily ribbed castings provide superior rigidity and dampening for high speed machining and prevent casting deformation during aggressive milling. The mating surface of the base and column are hand scraped to optimize fit and machine geometry.

➤ **WAY SURFACES:**

The axes are square box ways hardened to a minimum of HRC50 and ground with turcite on all axes. Z axis utilizes additionally 55 mm linear guide ways attached to the one piece base casting for outside support of the oversized saddle. Linear guide way technology allows heavier table capacities and maintains machine precision under any table load. The Z axis box and guide ways are spaced to eliminate table pitch and deformation. The square box way surfaces on X & Y axes utilize gibbs with easy adjustment to maximize rigidity and maintain geometry throughout the life of the machine tool.

➤ **SPINDLE:**

The 3000 rpm spindle uses cylindrical roller spindle bearings that require no maintenance. The spindle and sleeve are made from high grade chrome steel hardened to HRC55 - 58, then ground to a precision fit to insure maximum cutting rigidity. The spindle oil chiller maintains proper lubrication while eliminating spindle growth due to thermal expansion, further insuring part accuracy and extending the spindle life.

➤ **GEARED HEAD STOCK:**

The automatic shifting, integral two range geared spindle offers both speed and power for a variety of work. With a 6:1 gear ratio in low range spindle torque of 636 ft-lb will handle your toughest machining applications. The 2:1 high range gearing still offers considerable torque along with the spindle speeds for higher material removal rates. The combination of speed and power offer the most flexibility for the varying shop applications encountered.

➤ **TABLE:**

The heavily ribbed Meehanite cast table is hardened to HB 180 - 220 and ground for accuracy. Running on turcite with an inner and outer oil feed system allows for a table capacity of up to 11,000 lb. Seven 22 mm (0.87") T-Slots with 150 mm (5.9") spacing offers flexible fixture or work piece mounting on the table surface. A dual, direct drive worm gear system with 180:1 ratio using a Heidenhain rotary encoder mounted to the table shaft offers smooth and accurate machining with the B axis. Locking pins located in the 90° quadrants provide additional accuracy in an indexing application.

➤ **BALL SCREWS AND AXIS DRIVES:**

Each axis is driven using a grade C3 precision ground ball screw. Each of the axes ball screws are pre-tensioned to allow fast feedrates and high axis thrust loads. Each ball screw is supported on each end using angular contact thrust bearings and is perfectly centered between the way surfaces. The X, Y, Z & W axis ball screws are direct belt driven using AC servo type drive motors for smooth axes acceleration.

➤ **AUTOMATIC TOOL CHANGER:**

The 60 pocket double arm ATC provides fast and reliable tool changes with little to no maintenance. Tools can be staged in an ATC wait position prior to the tool change command further increasing the speed of the tool change sequence.

➤ **FLOOD COOLANT SYSTEM:**

A dedicated flood pump provides high volume coolant to the machine tool for general machining applications. Coolant is recirculated through the machine tool utilizing an 80 gallon return tank. An oil skimmer is included to help remove oil contaminants and extend the life of the flood coolant, reducing the frequency of replacing coolant.

➤ **COOLANT THROUGH SPINDLE:**

Utilizing a high quality rotary union, the through spindle coolant system is capable of 700 psi making easy work of deep hole drilling and heavy machining where coolant directly at the tool is required. The CTS system adds a 118 gallon auxiliary coolant tank with a transfer pump from the main coolant tank. To insure the life of the rotary union, the 5 HP pump system has a replaceable 11 micron filter cartridge.

➤ **TABLE CHIP GUARD:**

A table mounted chip guard helps contain chips and coolant in the machining area. The table guard allows for large opening doors and side panels for easy part load and unload, and in extreme cases with large parts the table chip guard is easily removable.

➤ **CHIP REMOVAL:**

A single, table mounted chip auger is used to carry chips away from the table area. Auger chute exits into a belt type chip conveyor system to carry chips away from the machine tool.

➤ **LUBRICATION:**

Automatic lubrication is provided to the way surfaces and ball screws with oil to eliminate wear. Way oil is delivered by metered valves, which precisely control the volume. A low oil-level alarm warns the user preventing possible damage to the way surfaces and ball screws.

➤ **REMOTE HANDWHEEL:**

The axes can be moved with the remote hand wheel to ease setup and set work coordinates. The remote handwheel can move the axis in increments of 1, 10, or 100. The side button can be used to set the work coordinate for the selected axis.

➤ **PCMCIA CARD READER:**

The Fanuc 32i-MB CNC control is equipped with an operator panel mounted PCMCIA card slot. This PCMCIA card and slot provide a solution for easy program transfer to and from the CNC program storage memory. Programs exceeding the CNC's memory capacity can be drip fed from PCMCIA card as well, enabling large program execution.

➤ **ETHERNET CONNECTION:**

An RJ45 Ethernet or Network Port is provided on the side of the operator station allowing simple and fast data exchange between the CNC control and your local network. Programs, tool offset information or control/machine parameters can easily be transferred through the Ethernet connection.

➤ **FOUNDATION REQUIREMENTS:**

Machine geometry and accuracies cannot be guaranteed unless the machine is placed on a proper foundation. Consult Milltronics for recommended foundation requirements.

STANDARD EQUIPMENT

- Fanuc 32i-MB CNC Control
- 10.4" Color LCD Display
- Manual Guide *i*
- 3000 RPM Spindle
- Two Range Geared Head Stock
- Spindle Oil Chiller
- Hydraulic Unit
- 30/25 HP (22/18.5 kW) spindle motor
- Full Contouring B axis, 360,000 positions w/90° Locking Pin Locators
- Rigid Tap
- 60 pocket Automatic Tool Changer
- Feedrate and Spindle speed Overrides
- Remote Handwheel
- Edit Protection Key Switch
- One Piece Certified Meehanite Cast Iron Base
- Fully Hardened and Ground 59 x 49" Table
- Hardened and Ground Box Ways on all Axes
- Additional 55 mm Linear Guide Ways on Z Axis
- AC Servo motors
- 55 mm Ball screws on X, Y, and Z axes
- 40 mm Ball screw on W Axis
- Double Anchored, Pre-tensioned Ball screws
- Matched AC Servo Amplifiers on All Axes
- Automatic Metered Lubrication System
- Telescopic Metal Way Covers
- Table Mounted Chip Auger Empties to Belt type Chip Conveyor
- Flood Coolant System with 80 gallon Tank
- 700 PSI Coolant Through Spindle with Auxiliary 118 Gallon Tank
- Table Mounted Chip Guard with Oversized Access Doors
- Coolant Tank Oil Skimmer
- Work Light
- Instruction Manual, Parts List, and Electrical Drawings
- Operator and Maintenance Manuals

OPTIONAL ACCESSORIES:

Milling Head Attachments:

Right Angle Milling Head

Universal Manual Milling Head

Facing Head (*W Axis controlled*)

Probing:

5173-1

Renishaw OMI-2T interface including the Renishaw OMP40-2 Optical Spindle probe w/ macros and the Renishaw OTS contact tool setter w/ macros

5163

Renishaw OMI-2T interface including the Renishaw OMP40-2 Optical Spindle probe w/ macros

5167

Renishaw OMI-2T interface including the Renishaw OTS contact tool setter w/ macros

5174

Renishaw NC4-F300 non-contact laser tool setter

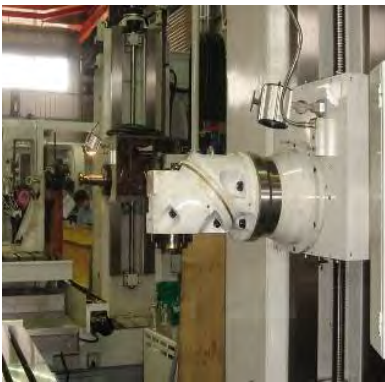
Right Angle Milling Head



Facing Head



Universal Milling Head



Fanuc 32i-MB CNC Control Features

The Fanuc 32i-MB CNC Control utilizes the latest in CNC technology to offer the highest levels of reliability, operator convenience and ease of use, along with the power and high speed you have come to expect from a Fanuc controlled machine tool.

Basic Control Features

- High Resolution 10.4" TFT Color Display
- Graphic Display
- Manual Guide *i*
- PCMCIA Card Slot
- Ethernet Connection
- Self-Diagnostic Functions
- Alarm & Operation Message History Display
- 8 m/s Block Processing Speed
- RS-232 Interface
- 3 Axes Simultaneous Controlled Movement
- Program Storage Capacity 1280M (512K)

Machine Control Functions

- Backlash Compensation
- Ballscrew Pitch Error Compensation
- Smallest Programmable Increment 0.0001"
- Spindle Speed Override
- MDI - Manual Data Input
- Run Hour and Parts Counter Display
- Manual Pulse Generator
- JOG Feed

Program & Editing Features

- Number of Registered Programs (1000)
- Program Protection - Lock Out Function
- Background Editing

Motion Control Functions

- Feedrate Override
- Rapid Traverse Rate Override
- Jog Override
- Automatic Acceleration/Deceleration Control
- Feed per Minute / Feed per Revolution

Tool Control Features

- Tool Offset Pairs - 200 Total Offsets
- Tool Length Compensation
- Cutter Compensation C
- Tool Life Management

Interpolation Functions

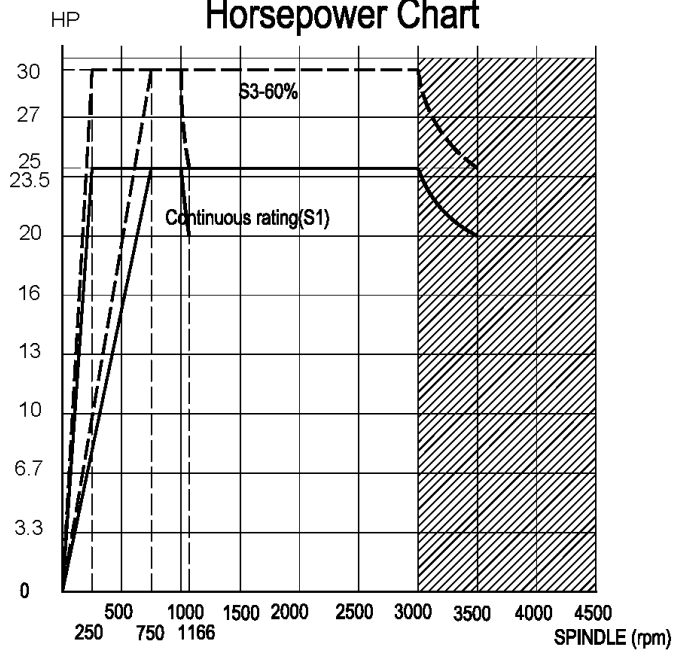
- Exact Stop
- Single Direction Positioning
- Linear Interpolation
- Circular Interpolation
- Threading, Synchronous Cutting
- 3rd & 4th Reference Position Return

Program Input Features

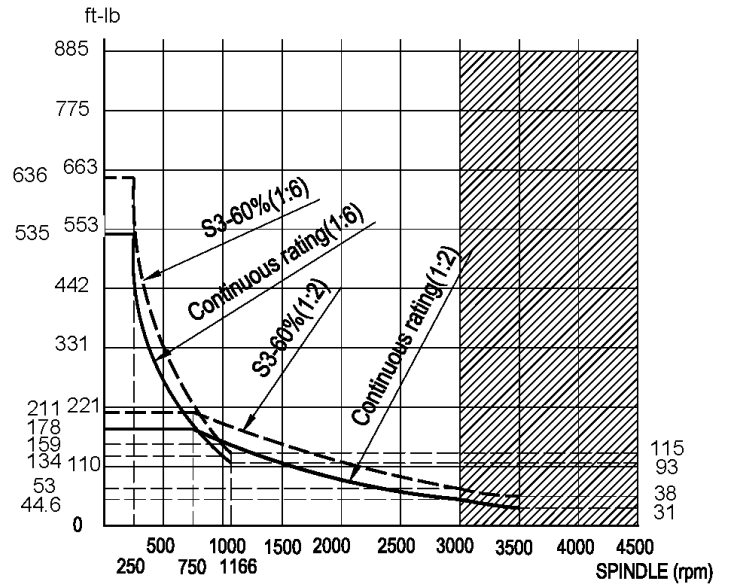
- Inch/Metric Conversion / programming
- Tape Code: EIA/ISO
- Absolute/Incremental Programming
- Program Numbering: O(32 Characters)
- Plane Selection
- Polar Coordinate Commands
- Workpiece Coordinate System (G52 - G59)
- Chamfering & Round Corner Function
- Sub Program Call
- Custom Macro B
- Additional Macro Command Variable (#100-199, & #500-999)
- Canned Cycles for Drilling & Tapping
- Scaling
- Coordinate System Rotation
- Programmable Mirror Image
- Three-Dimensional Coordinate Conversion
- Macro Executer

HBM110XT Torque Charts

Horsepower Chart

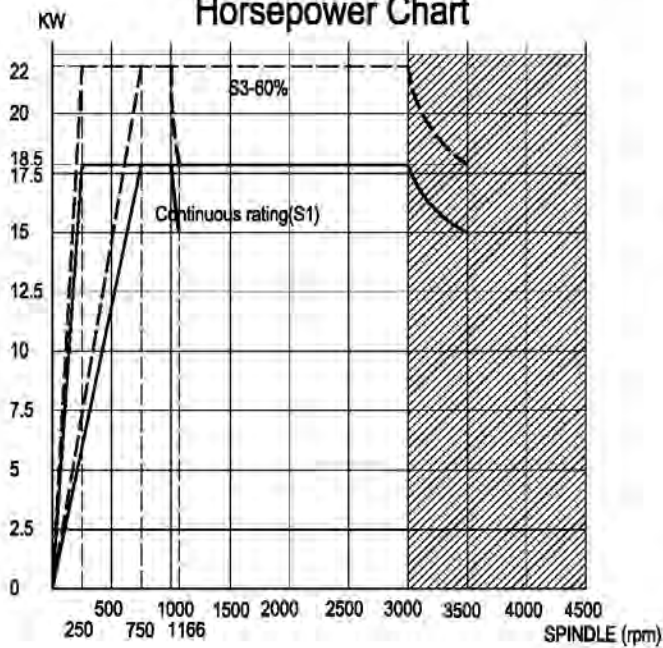


Torque Chart

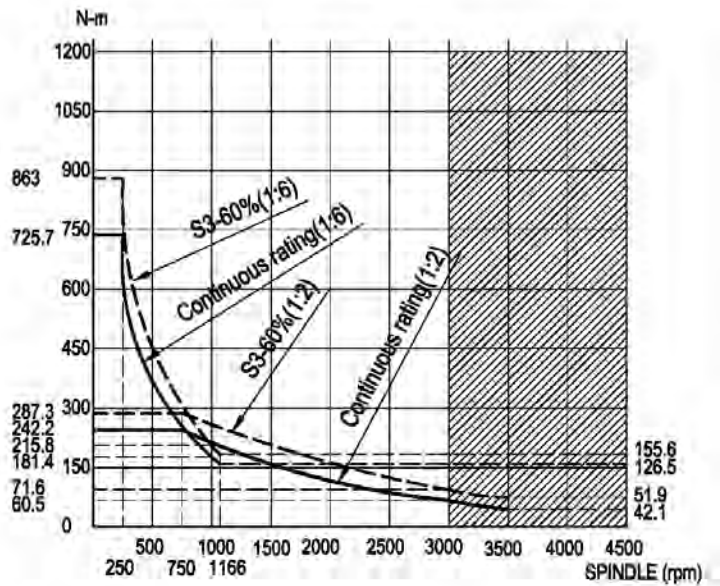


Torque / Horsepower Chart Data				
Spindle Taper	ISO	BT50	Spindle Motor	FANUC α18/7000i
	DIN	DIN 69871	Motor Output	18.5 / 22 kw
Spindle Speed	3000 RPM		Gear Ratio	1:2 / 1:6
			Pulley Ratio	-

Horsepower Chart

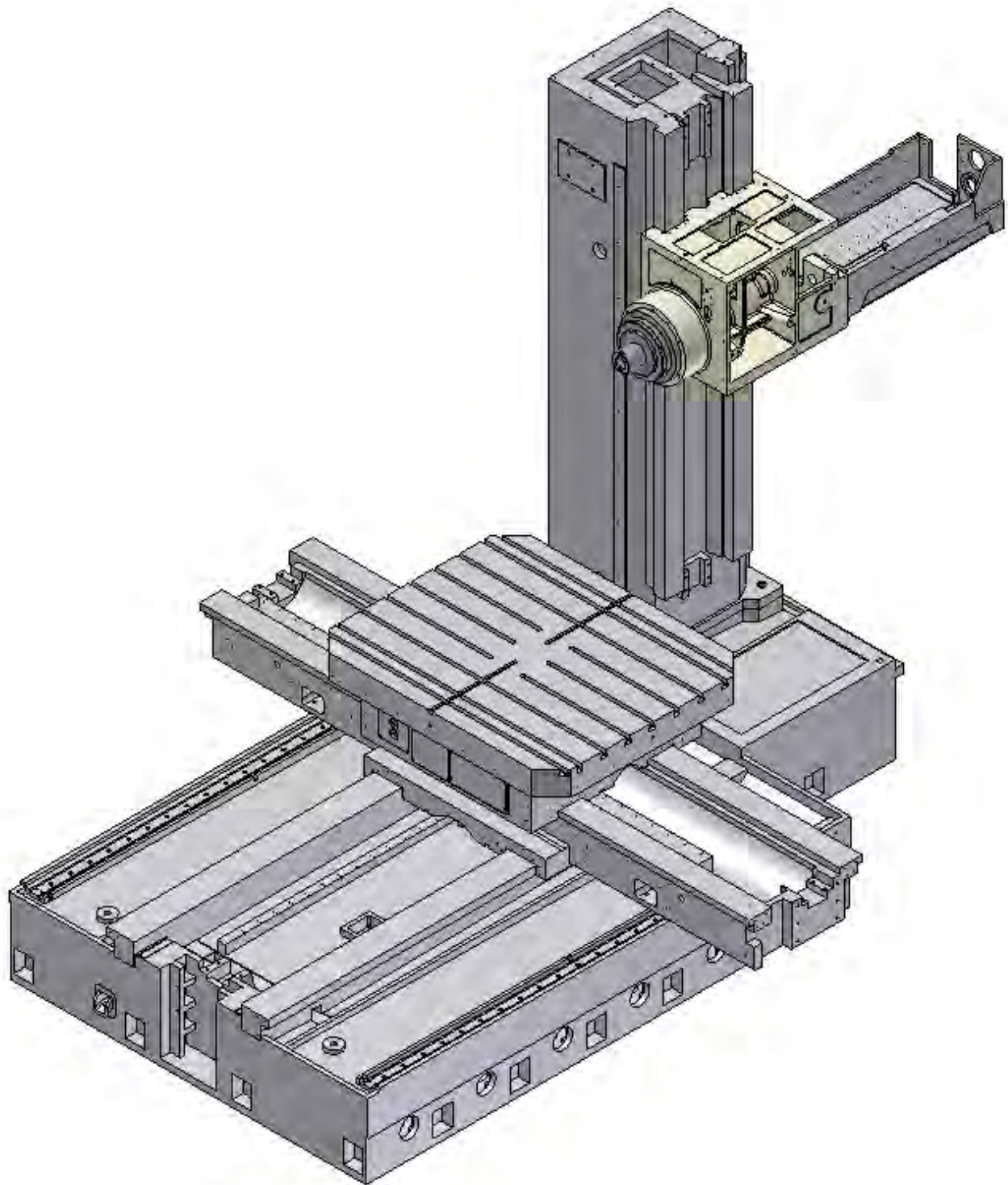


Torque Chart



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HBM110XT Design View



HBM110XT Interference Drawing

