UA2090 Ti

5 Axis Vertical Machining Center

Designed for Machining of Titanium and Hard Alloy Components

All specifications are subject to change without prior notice
Verification of technical changes may be confirmed after receipt of order

Designed and built by Wele Mechatronic in Taiwan, this machining center is sold and serviced exclusively by JTEKT Toyoda Americas Corp. and our exclusive representatives in the Americas.

Stroke	**Unit**	**Specifications**
X Axis Travel (Table Movement)	mm (in)	2,000 (78.7)
Y Axis Travel (Table Movement)	mm (in)	900 (35.4)
Z Axis Travel (Head Stock Movement)	mm (in)	700 (27.5)
Distance Between Table and Spindle Nose in Vertical Position	mm (in)	80-780 (3.1-30.7)

Table	**Unit**	**Specifications**
Clamping Area	mm (in)	2,150 x 900 (84.6 x 35.4)
Maximum Table Load	kg (lb)	2,200 (4,850)

A & B Axes Head	**Unit**	**Specifications**
A Axis (Swiveling Range)	deg	± 30
A Axis (Torque)	Nm (ft-lbs)	4,950 (3,650)
B Axis (Rotating Range)	deg	± 30
B Axis (Torque)	Nm (ft-lbs)	7,960 (5,871)
Pivot Point Distance (Nominal)	mm (in)	180 (7)

Spindle with 8,000 RPM	**Unit**	**Specifications**
Spindle Power (Cont. / 30 min.)	Kw (hp)	22/25 (30/35)
Spindle Speed	rpm	0-8,000
Spindle Bearing Diameter	mm (in)	110 (4.3)
Maximum Torque at spindle 100% Duty	Nm (ft-lb)	1,100 (811)
*Spindle Taper Std BCV50	type	BCV50 Big Plus #50

* Use of balanced tooling is required

JTEKT Toyoda Americas Corp. recommends the use of only genuine BIG-PLUS® tooling (if applicable).The BIG-PLUS® system is licensed only to certain tool holder manufacturers, please verify the authenticity of any holders used in the spindle. Failure to use certified BIG-PLUS® certified tooling (if applicable) may void your warranty.

Feedrates	Unit	Specifications
Rapid Feedrate (X and Y Axes)	in/min	944
Rapid Feedrate (Z Axis)	in/min	708
Rapid Feedrate (A and B Axes)	rpm	6
Cutting Feedrate (X, Y & Z Axes)	mm/min (in/min)	.001-8.0 (0.00 - 315)
Cutting Feedrate (A and B Axes)	rpm	3.5

ATC BCV50	Unit	Specifications
Tool Magazine Capacity	number	30 (40 Optional)
Maximum Tool Diameter / Adjacent Pocket Empty	mm (in)	80 / 150 (3.15 / 5.91)
Maximum Tool Length	mm (in)	250 (9.8)
Maximum Tool Weight	kg (lbs)	7 (15.4)
Tool Taper	type	BCV (Big Plus) 50

Accuracy (ACC to JIS Standard)	Unit	Specifications
Positioning Accuracy in X, Y and Z Axes	mm (in)	± 0.005 / 300 (±.00019 / 11.81)
Repeatability in all X,Y,Z Axes	mm (in)	± 0.003 (± 0.0001)
Positioning Accuracy in A, B Axes	Arc Sec	±15 A, ±30 B
Repeatability Accuracy in A, B Axis	Arc Sec	±10 A, ±15 B

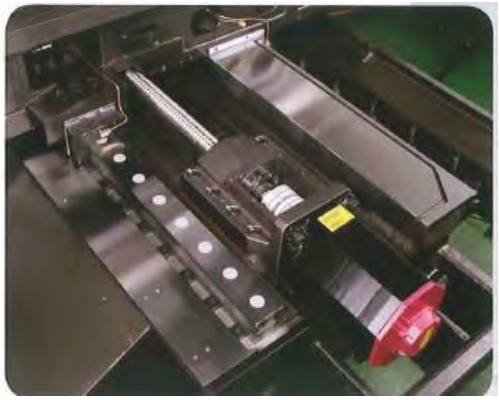
Utilities	Unit	Specifications
Spindle Lubrication	type	Oil Mist
Slide Lubrication	type	Central Oil Lubrication
Pneumatic Air Resource	bar (Psi)	6 2M3 (90-100 70 Cfm)
Power Required		220 V, 60Hz, 65 kVA

Control	Unit	Specifications
Control Type	type	Fanuc 31i B5

Dimensions and Weight	Unit	Specifications
Machine Weight - Estimate	kg (lbs)	23,000 (50,706)
Machine Length	mm (in)	5,300 (208.6)
Machine Width	mm (in)	3,300 (129.9)
Machine Height	mm (in)	3,990 (157.1)

Coolant System	Unit	Specifications
Coolant Tank	liter (gal)	420 (110)

Hybrid Box Way and
Linear Guide Construction



Y Axis

Powerfully Driven, Dual Ballscrews

Note: Machine is 220V / 3 Phase / 60 Hz. Any other voltage requires a transformer (not supplied as std.)
* Dimensions are approximate, please verify upon ordering

Control Options
AICC II upgrade from 200 block look ahead from (std) to 600 block look ahead
AICC II upgrade from 200 block look ahead from (std) to 1,000 block look ahead
Upgrade to 2,048 Kbyte (5,120M) Memory in Lieu of Std.

Toyoda Standard Machine Functions:

Standard Functions	Description
1st PMC Path	Basic Instruction: 25n sec / step Max. step Number Ladder: 64,000 112,000
2nd Reference Position Return	
3rd / 4th Reference Position Return	
Absolute / Incremental Programming	Combined use in the Same Block
Absolute Position Detection	
Actual Cutting Feedrate Display	
Addition of Custom Macro Common Variables	#100 - #199, #500 - #999
Addition of Workpiece Coordinate System	48 Pairs
AI Contour Control I	Look Ahead Block Number is Max. 30
Alarm Display	
Alarm History Display	
Ambient Relative Humidity (*10)	Stand Alone Type Control Unit At Operating: 0º ~ 55º C At Non Operating: -20º ~ -60º C Normally: 75% RH or less (No Dew or Frost Allowed) Short Term (within one month): 95% RH or less (No Dew or Frost Allowed)
Ambient Temperature of Unit (*10)	LCD Mounted Type Control Unit, Display Unit for Stand Alone Type Control Unit At Operating: 0º ~ 58º C At Non Operating: -20º ~ -60º C
Automatic Acceleration / Deceleration	Rapid Traverse: Linear Cutting Feed: Exponential Linear
Automatic Coordinate System Setting	
Automatic Operation (Memory Operation)	
Auxiliary Function	M8 Digit
Auxiliary Function Lock	
Axis Control by PMC	Maximum 16 axes (Not available on Cs Axis)
Axis Names	Basic Three Axes are X, Y and Z. Additional Axes are Optional from U, V, W, A, B and C,
Axis Name Expansion	Maximum 3 Characters
Axis Synchronous Control	Maximum 6 Pairs

Toyoda Standard Machine Functions (Continued):

Standard Functions	Description
Backlash Compensation	
Backlash Compensation for each Rapid Traverse and Cutting Feed	
Buffer Register	
Circular Interpolation	
Circular Interpolation by R Programming	R, I, J, K 12 Digit
Clock Function	
Common Offset Memory Between Each Path	Only for Multi Path
Connectable Servo Amplifier	FANUC Servo Amplifier Series SVM, for (30i / 31i / 32i), bi Series SVM
Connectable Servo Motor	FANUC AC Servo Motor ais Series, ai Series, bis Series
Connectable Spindle Motor	FANUC AC Spindle Motor ai Series
Control Axes	5 Axes
Control Axis Detach	
Control In / Out	
Coordinate System Rotation	
Coordinate System Setting	G92
Cs Contouring Control	Maximum 4 Axes / 6 Axes
Current Position Display	
Custom Macro B	
Cutting Feedrate Clamp	
Cutting Mode	G64
Cutting Point Interpolation for Cylindrical Interpolation	
Cylindrical Interpolation	
Data Protection Key	4 Types
Data Server Buffer Mode (*1)	Fast Data Server is Required

Toyoda Standard Machine Functions (Continued):

Standard Functions	Description
Decimal Point Programming / Pocket Calculator Type Decimal Point Programming	
Diameter / Radius Programming	
Display of Hardware and Software Configuration	
DNC Operation with Memory Card (*2)	CF Card and PCMCIA Card Attachment is Required
Dry Run	
Dwell (Second Designation)	Dwell in Seconds and Dwell in Revolution. (In Case of Dwell in Revolution for M Series, Threading, Synchronous Cutting Option is Required.)
Embedded Ethernet	
Emergency Stop	
Erase CRT Screen Display (*1)	Manual or Automatic
Exact Stop	G09
Exact Stop Mode	G61
Extended Part Program Editing	
External Data Input	Including External Tool Offset and External Message
External Deceleration	
External Key Input	
External Workpiece Number Search	9999
Feed Per Minute	
Feedrate Override	0 - 200%
Follow-up	
Function of Deceleration Stop in Case of Power Failure	
Handle Interruption	
Helical Interpolation	Circular Interpolation Plus Maximum 2 Axes Linear Interpolation
Help Function	
High Speed M / S / T / B Interface	

Toyoda Standard Machine Functions (Continued):

Standard Functions	Description
High-Speed Processing (AI Contour Control II Included)	Look Ahead Block Number is Maximum 600
HRV2 Control	
Inch / Metric Conversion	
Increment System	IS-A, IS-B
Incremental Feed	×1, ×10, ×100, ×1000, ×10000
Input Power Supply	24V DC ±10%
Input Unit (10x Multiply)	
Interlock	All / Each Axis, Each Direction, Block Start, Cutting Block Start
Interpolation Type Pitch Error Compensation	Stored Pitch Error Compensation is Required
Involutes Interpolation	
Jog Override	0 - 200%
Label Skip	
Linear Acc / Dec after Cutting Feed Interpolation	
Linear Interpolation	
Machine Lock	All / Each Axis
Machining Time Stamp	
Macro Executor	3 MB
Maintenance Information Screen	
Malfunction Prevent Functions	
Manual Absolute On and Off	
Manual Continuous Feed (JOG)	
Manual Feed for 5 Axis Machining	
Manual Guide i	Basic, Milling Cycle, Animation, Set Up Guidance
Manual Handle Feed 1-unit	1 Unit / All Path
Manual Reference Position Return	

Toyoda Standard Machine Functions (Continued):

Standard Functions	Description
Max. Programmable Dimension	±9 Digits (R, I, J and K is ±12 Digits)
MDI Operation	
Memory Card Input / Output	
Memory Card Program Edit and Operation	Maximum 63 Programs
Mirror Image	Each Axis
Multi Language Display	English, Japanese, German, French, Korean, Spanish, Italian, Chinese, Chinese (simplified), Portuguese, Dutch, Danish, Swedish, Hungarian, Czech, Polish
Multi Spindle Control	
Multiple Command of Auxiliary Function	3
Nano Interpolation	
Nano Smoothing	AI Contour Control I or II is Required
Number of Registerable Programs	63
Operating Monitor Screen	Load Meter, etc
Operation History Display	
Optional Block Skip	1
Optional Path Name Display	Only for More than 2 Path Control
Over Travel	
Override Cancel	
Parameter Set Supporting Screen	
Parameter Setting and Display	
Parity Check	Horizontal and Vertical Parity
Part Program Editing	
Part Program Storage Size (Specify Total of Part Program Storage Size of Each Path.) (*3)	512K byte (STD) 2M byte (Optional)
Periodic Maintenance Screen	
Plane Selection	G17, G18, G19

Toyoda Standard Machine Functions (Continued):

Standard Functions	Description
Polar Coordinate Command	
Polar Coordinate Interpolation	
Position Switch	
Positioning	G00 (Linear Interpolation Type Positioning, is possible)
Program Code	EIA/ISO
Program Comment Display	Program Name 31 Characters
Program File Name	32 Characters
Program Number Search	
Program Protect	
Program Restart	
Programmable Data Input	G10
Programmable Mirror Image	
Programmable Parameter Input	
Rapid Traverse Bell-Shaped	
Rapid Traverse Override	F0, 25, 50, 100% or 0100% (1% Step)
Rapid Traverse Rate (Increment System B)	Maximum 999.999 m / min (1µm)
Reader / Puncher Interface	Reader / Puncher (Ch.1) Interface
Reference Position Return	G28
Reference Position Return Check	G27
Reference Position Return Speed Set	
Reference Position Setting without DOG	
Reference Position Shift	
Rigid Tapping by Manual Handle	
Rotary Axis Designation	
Rotary Axis Rollover	
Run Hour and Parts Count Display	

Toyoda Standard Machine Functions (Continued):

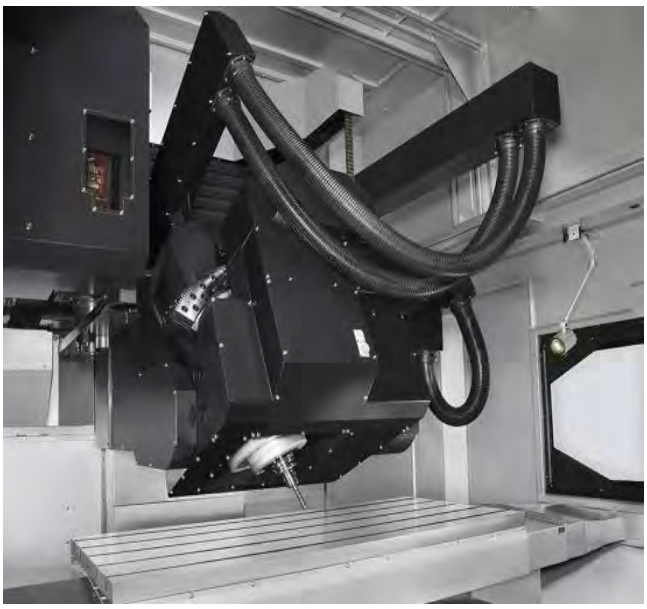
Standard Functions	Description
Scaling	
Screen Hard Copy (*2)	
Self Diagnosis Function	
Sequence Number	N8 Digit
Sequence Number Search	
Servo Information Screen	
Servo Off / Mechanical Handle	
Servo Setting Screen	
Servo Waveform Display	
Simultaneously Controlled Axes Expansion	Maximum 5 Axes
Single Block	
Single Direction Positioning	G60
Skip	G31
Small Hole Peck Drilling Cycle	
Smooth Backlash Compensation	
Spindle Orientation	1 Spindle
Spindle Output Switching Function	1 Spindle
Spindle Serial Output	S5 Digit, Serial Output (Max 6 Spindles)
Spindle Speed Function	S5 Digit, Binary Output
Status Display	
Stored Limit Check Before Move	
Stored Pitch Error Compensation	
Stored Stroke Check 1	
Stored Stroke Check 2, 3	
Straightness Compensation	Stored Pitch Error Compensation is Required

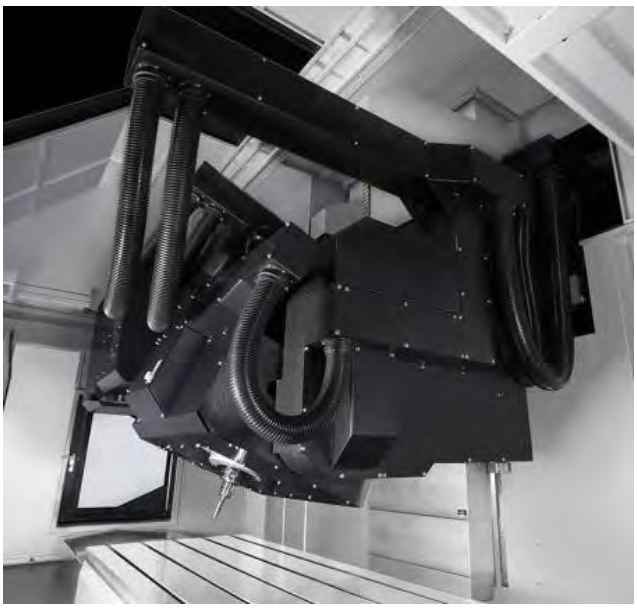
Toyoda Standard Machine Functions (Continued):

Standard Functions	Description
Stroke Limit External Setting	
Sub Program Call	10 Folds Nested
Synchronous / Composite Control	
Tandem Control	
Tangential Speed Constant Control	
Tapping Mode	G63
Thread Cutting, Synchronous Cutting	Spindle Serial Output is Required
Three Dimensional Coordinate System Conversion	
Three Dimensional Tool Compensation	
Tilted Working Plane Command	
Tool Center Point Control for 5 Axis	
Tool Function	T8 Digit
Tool Length / Work Zero Point Measurement	
Tool Length Measurement	
Tool Length Offset	
Tool Offset Memory C	Distinction Between Geometry and Wear or Between Cutter and Tool Length Compensation
Tool Offset Pairs (Note) Specify Total of Tool Offset Pairs of Each Path. Maximum Digit of Tool Offset is 9	32
Tool Radius	
Torque Limit Skip	
Vibration	IEC68-2-6 Conforming
Waiting Function	Only for More than 2 Path Control
Workpiece Coordinate System	G54 - G59
Wrong Operation Prevention	

Included with this Model:

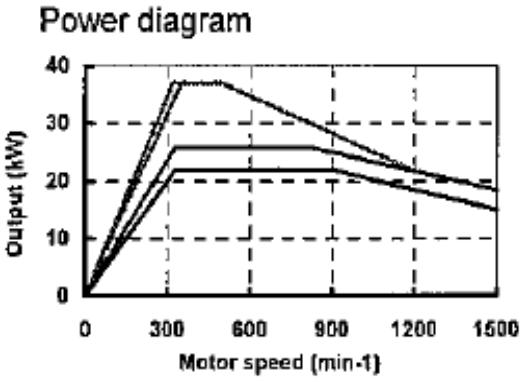
1. Coolant System including tank & pumps, Bed Flushing Coolant
2. Nitrogen Charged Z Axis Counter Balance System
3. Built in / integral motor Spindle 8,000 RPM,35hp, BCV50, 811 Ft. Lbs. Torque
4. Hinged Belt Type Chip Conveyor 1200mm Drop Height
5. Centralized Guide Ways Lubrication System
6. Plumbing for Coolant Through Spindle up to 70 bar (1000 PSI)
7. Coolant Pistol, Air Pistol
8. Three (3) Screw Type Chip Augers along Three (3) Paths of the Y Axis
9. Hand Tool Box
10. Three (3) Axes Ballscrew Pretension (2 on Y axis)
11. Fagor Linear Scales for X, Y, Z Axes
12. Manual Pulse Generator (Hand Wheel)
13. Operation and Maintenance Manual, Fanuc Manuals
14. Programmable Air Blast
15. Roof Enclosed Guarding
16. Spindle Oil Cooler
17. 30 (Std.) or 40 Pocket (Optional) ATC
18. Three (3) Tier Status / Alarm Lamp
19. Work Light
20. **Rack Gear Driven A & B Axes for Optimum Cutting Rigidity, 7" Pivot Point**

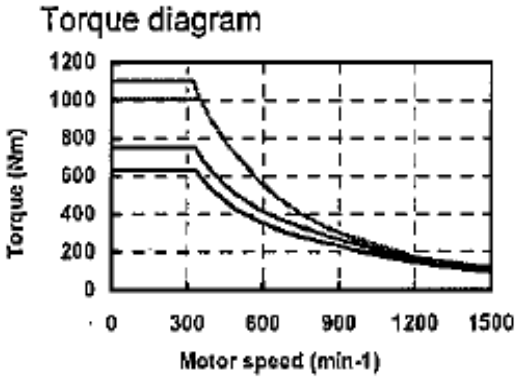




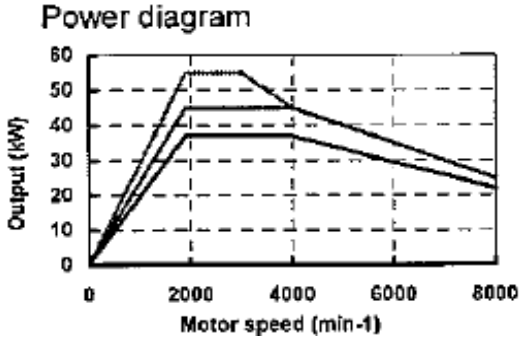
Spindle Power& Torque

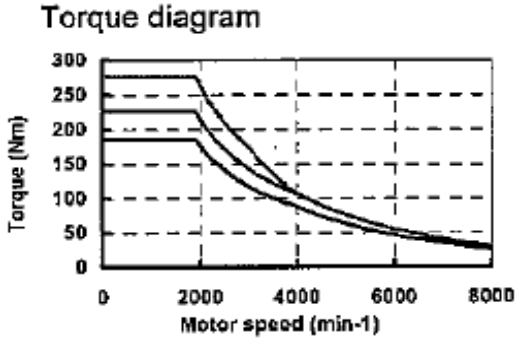
LOW winding

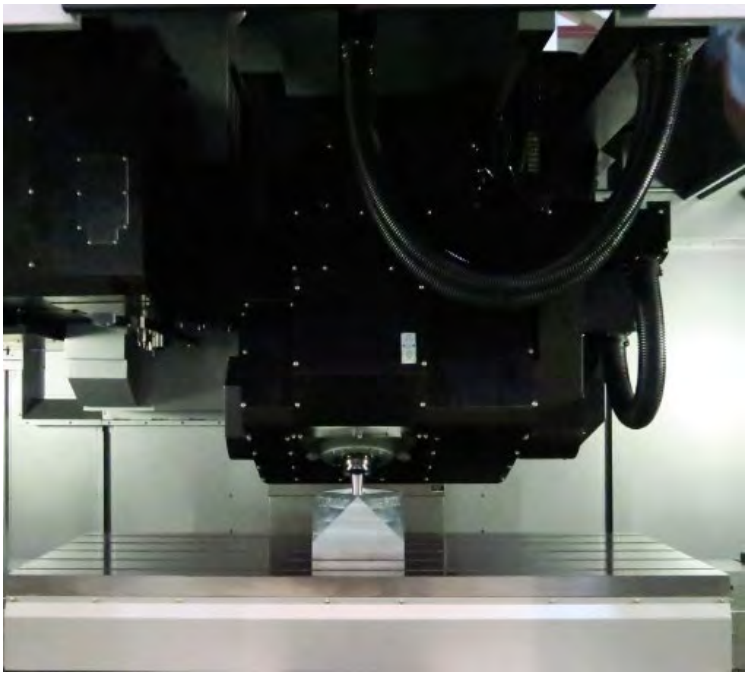


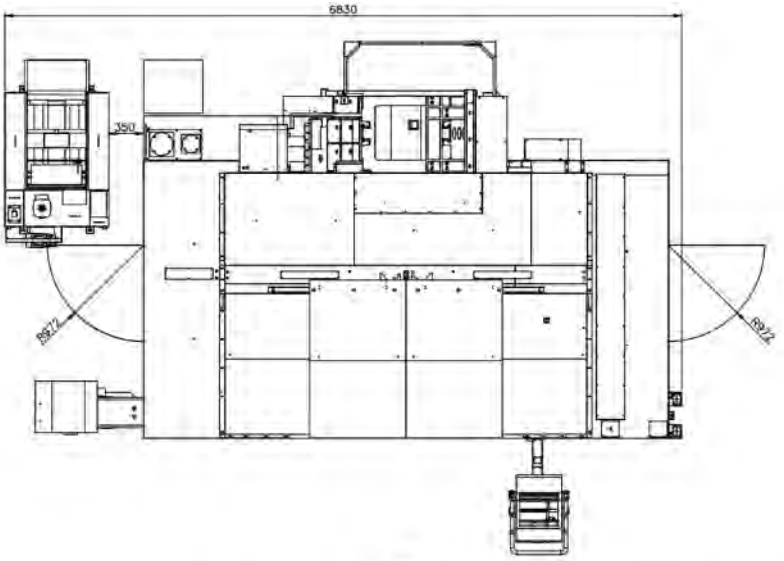


HIGH winding

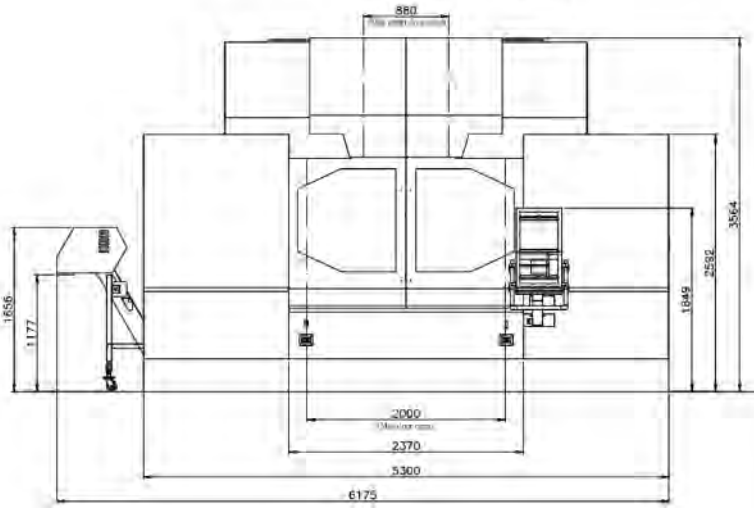


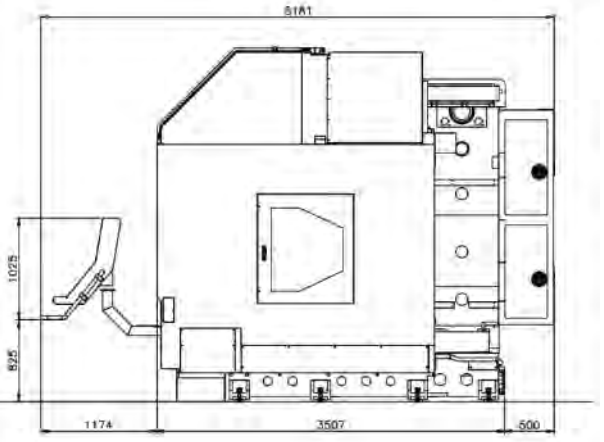






UA2090Ti layout drawing
CAT #50/30T
Chip conveyor





Layout Optional 40 Tool Magazine