



UG630 – Five Axis Vertical Machining Centers



Designed and built by Wele Mechatronic, this machining center is sold and serviced exclusively by JTEKT Machinery Americas Corp. and our exclusive representatives. All specifications are subject to change without prior notice. Verification of technical changes may be confirmed after receipt of order.

Machine Overview

Heidenhain TNC 640 CNC Control

15" Touch Screen Display

15,000 RPM Built-In Type Spindle

38HP CAT40 Big Plus Spindle

40m/min Rapid Traverse Rate X/Y/Z Axis

60 Pocket Automatic Tool Changer

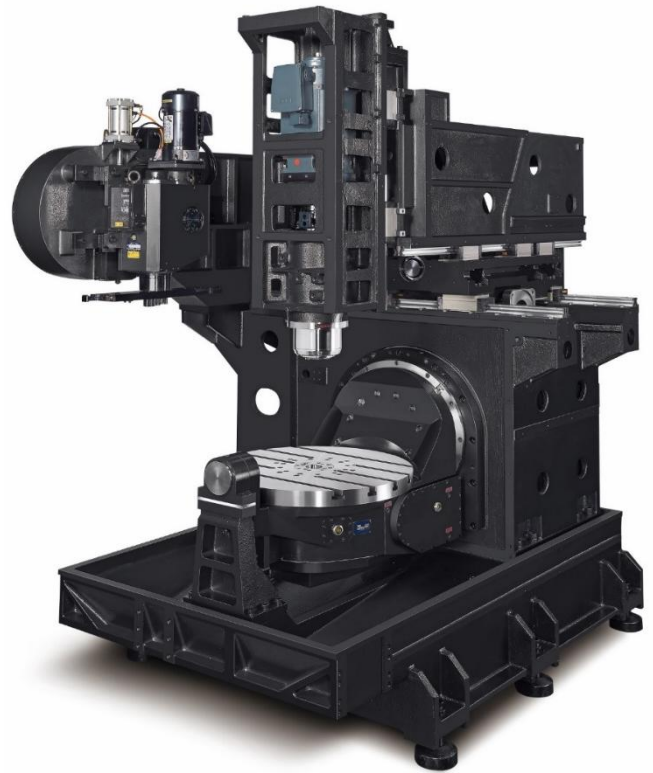
Blum Probe and Tool Setter Package

Coolant Through Spindle Prep – 1000PSI

Roller Cam Zero Backlash Design

X, Y, Z Scales and B, C Rotary Encoders

Precision Hand Scraped Machine Metal to Metal
Contact Points for Long Term Accuracy, Vibration
Dampening and Extended Machine Life



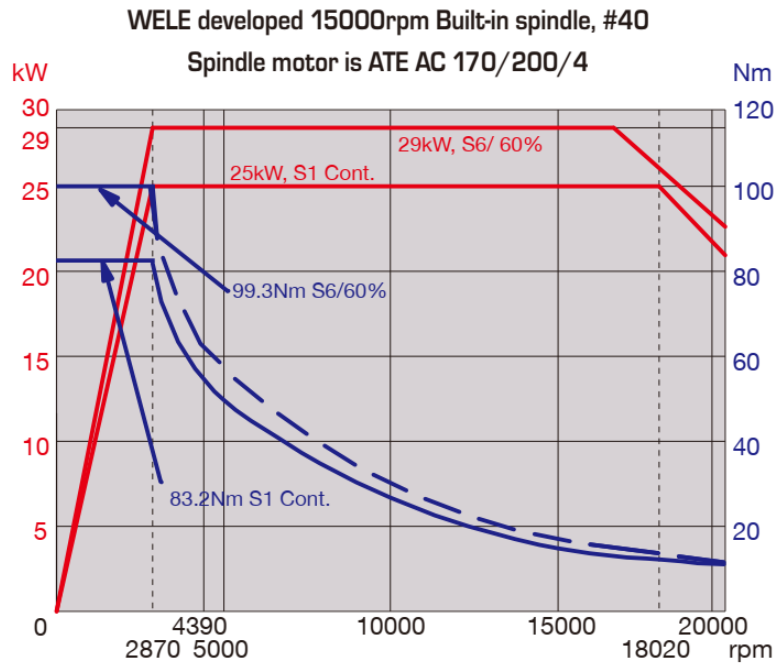
UG630 - Five Axis – High Speed Vertical Machining Centers



Machine Specifications

X Axis Travel	640 mm (25.1")
Y Axis Travel	520 mm (20.4")
Z Axis Travel	460 mm (18.1")
Distance from Spindle Nose to Table-Top	150 – 610 mm (5.9" – 24.0")
Table Height From Plant Floor	791 mm (31.1")
Table Load Capacity	660 lbs (B-Axis @ 0°) / 440 lbs (B-Axis @ 90°)
Spindle Taper	CAT40 (Big Plus)
Spindle Motor	38HP
Spindle Speed	15,000RPM
Spindle Type	Built in Motor
Rapid Feedrate (X & Y Axes)	40 m/min (1,574 ipm)
Rapid Feedrate (Z Axis)	40 m/min (1,574 ipm)
Chain Type ATC	60 Pockets
Maximum Tool Diameter with Tool in Adjacent Pocket	75 mm (2.9")
Maximum Tool Diameter with Adjacent Pocket Empty	127 mm (5.0")
Maximum Tool Length from Gage Line	300 mm (11.8")
Maximum Tool Weight	7 kg (15.4 lb)
Tool Taper	CAT40 Big Plus
Tool Selection	Random
Tool Access	Bi-Directional
Total Power Required	3 Phase $\pm 10\%$ 220 V (55 kVA)
Power Supply Frequency	50 / 60 Hz
Axis Guideways	Linear Roller Guideway





Benefits to Built-In Spindle Design:

G.4 Spindle Balance Specification Achieved as WELE Standard vs G1 Industry Standard – Increased Tool Life and Superior Surface Finish

Reduction in External Connections, Cabling and Wiring

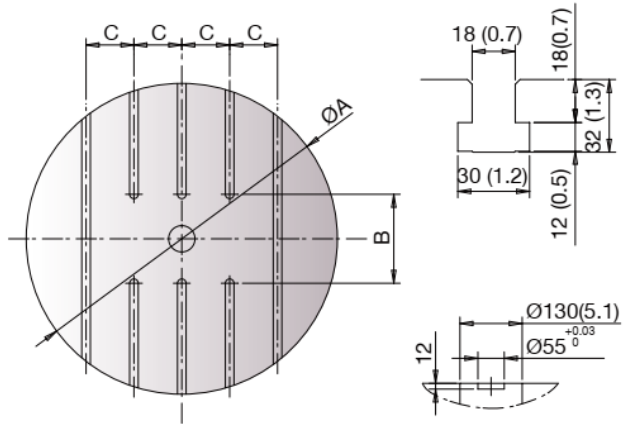
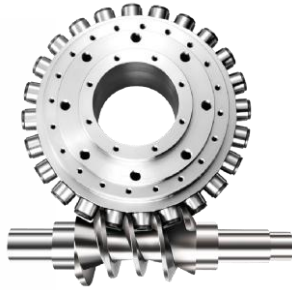
Increased Powerband to High Speed - Increased Torque at Low RPM Range

No Motor Coupling to Introduce Outside Vibration



Factory Balance Stand G.4 Specification

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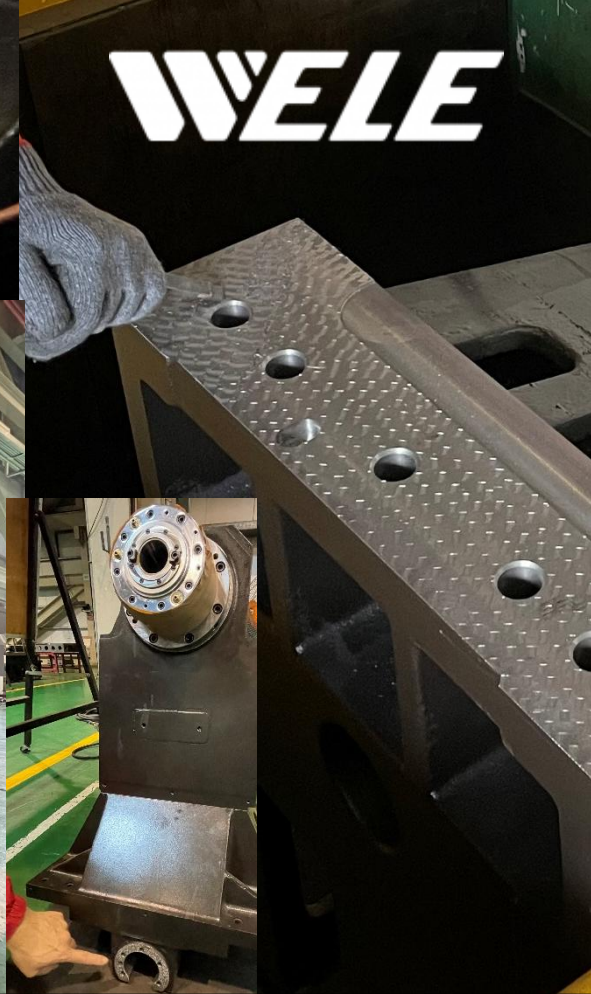
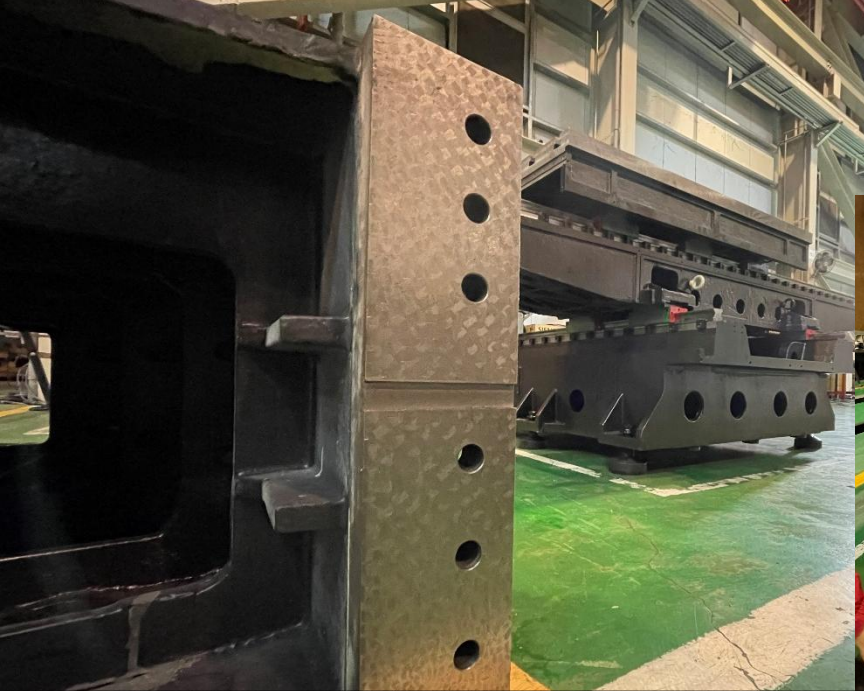
	A	B	C
UG630	650 (25.6)	186 (7.3)	100 (3.9)

Clamping area	mm/in.	650 / 25.5
Swiveling range of the B-axis	degree	-50 / +110
Rotating range of the C-axis	degree	360
Swiveling speed of the B-axis	rpm	25
Rotating speed of the C-axis	rpm	25
Max. torque of the B-axis	Nm/ft-lb	5,760/4,250
Max. torque of the C-axis	Nm/ft-lb	960/708
Brake torque of the B-axis	Nm/ft-lb	4,490/3,310
Brake torque of the C-axis	Nm/ft-lb	2,570/1,895



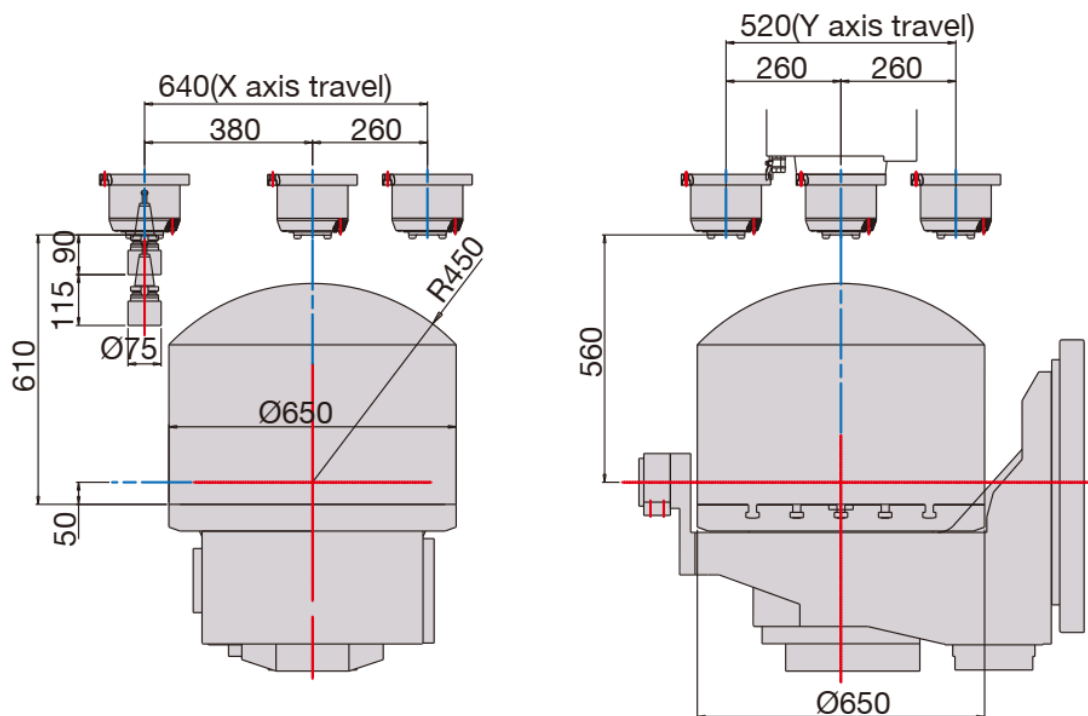


WELE

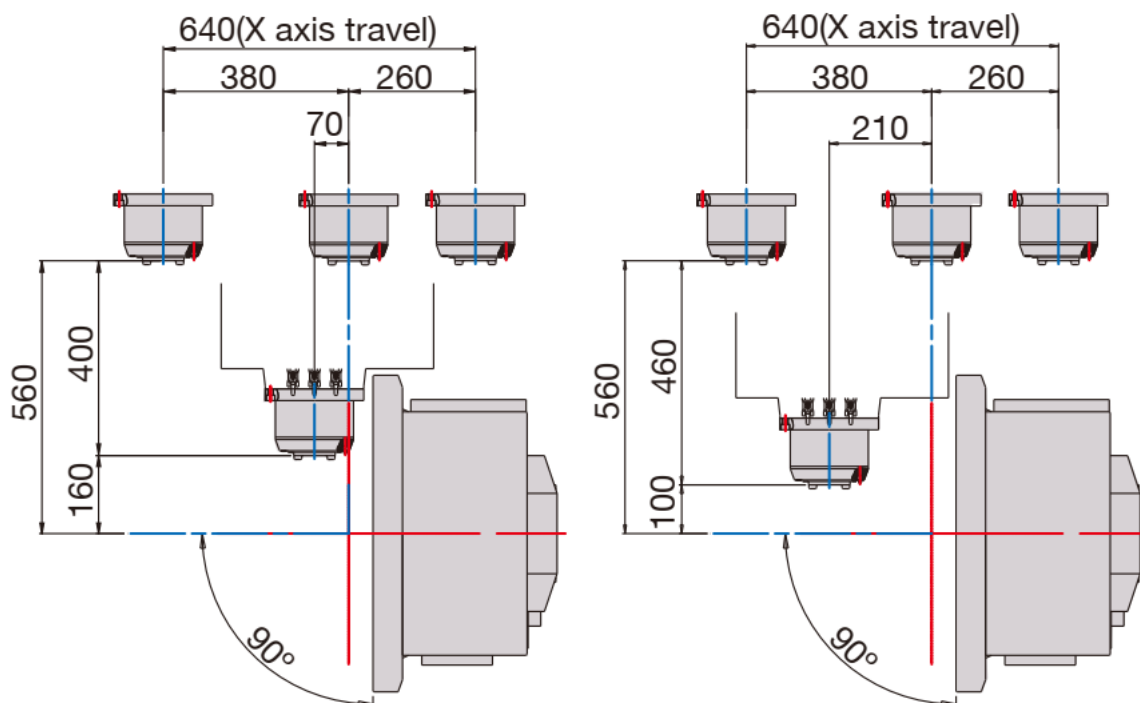


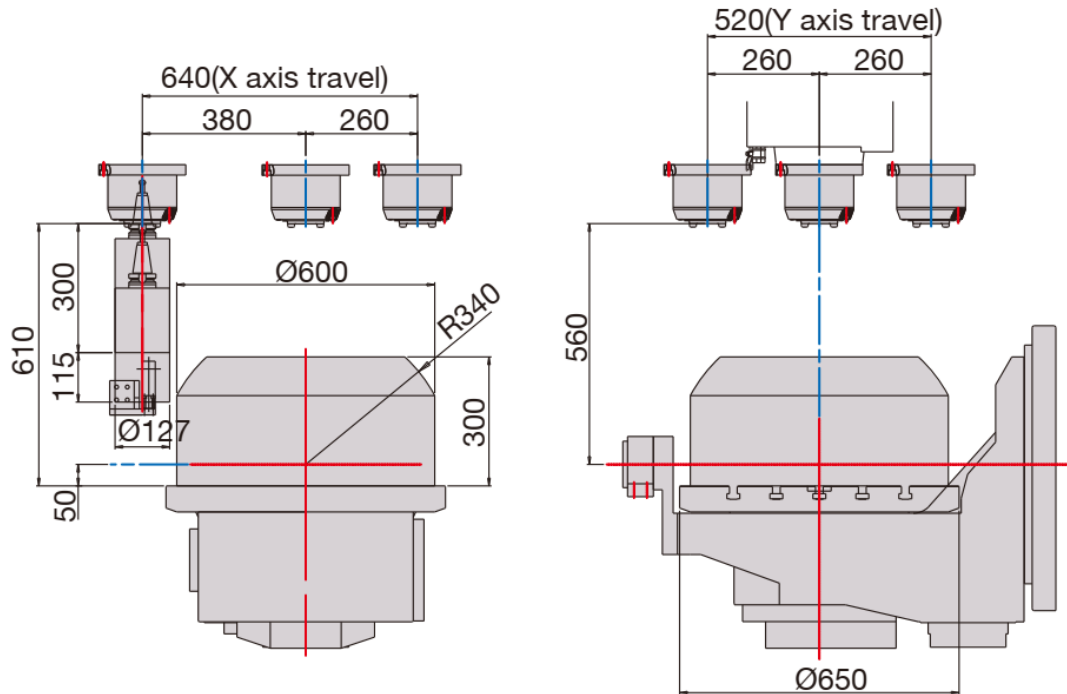
WELE Precision Hand Scraping – All Metal Contact Surfaces





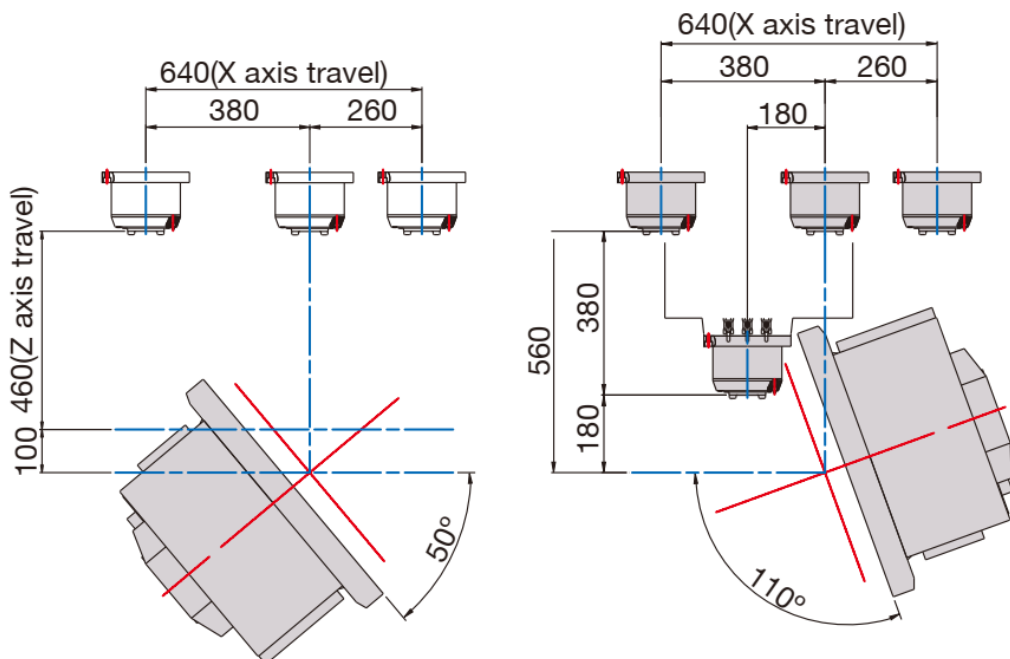
The working envelope area is following the below any condition,
1. When the tool's length(90mm) and diameter (75mm).



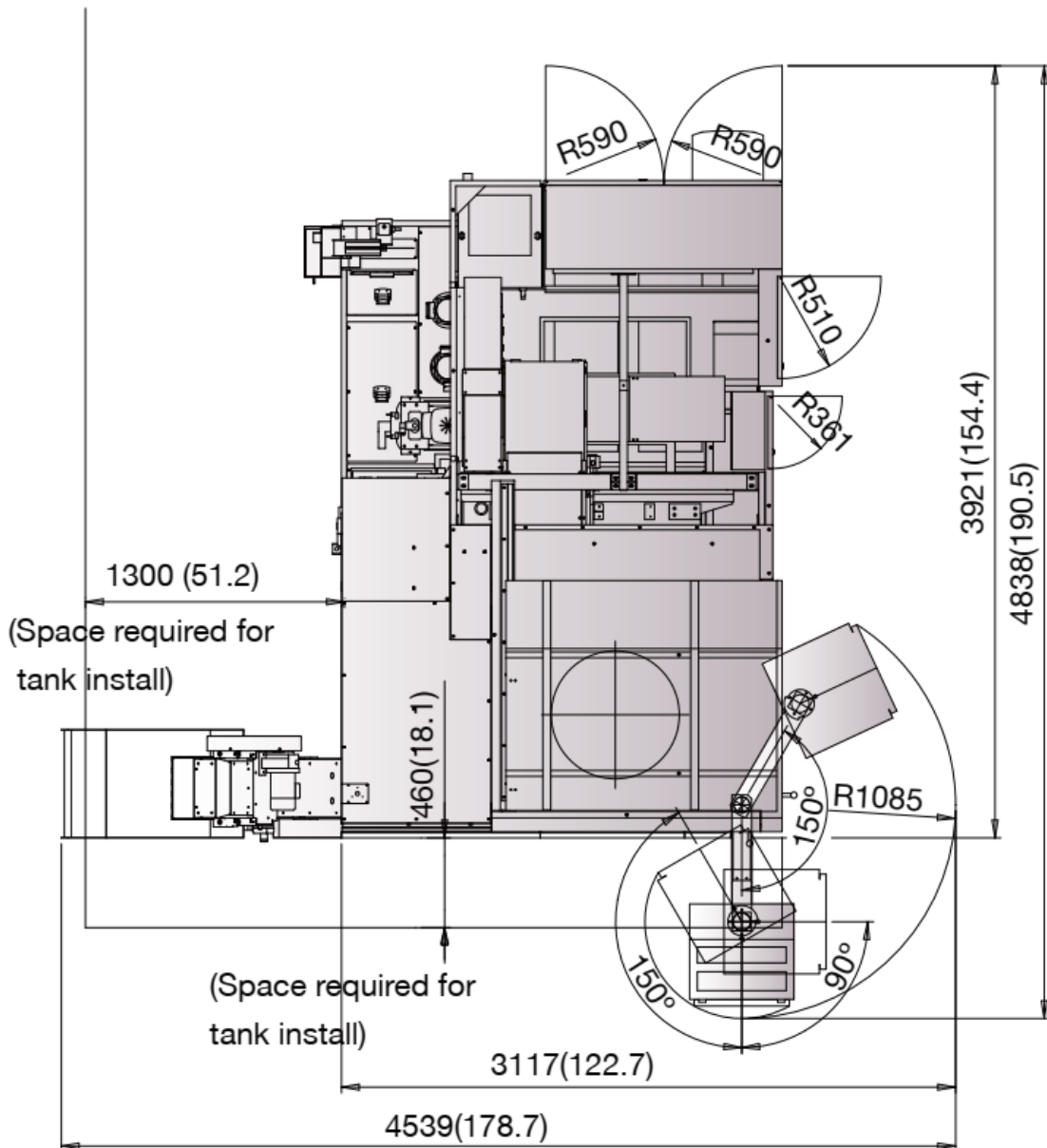


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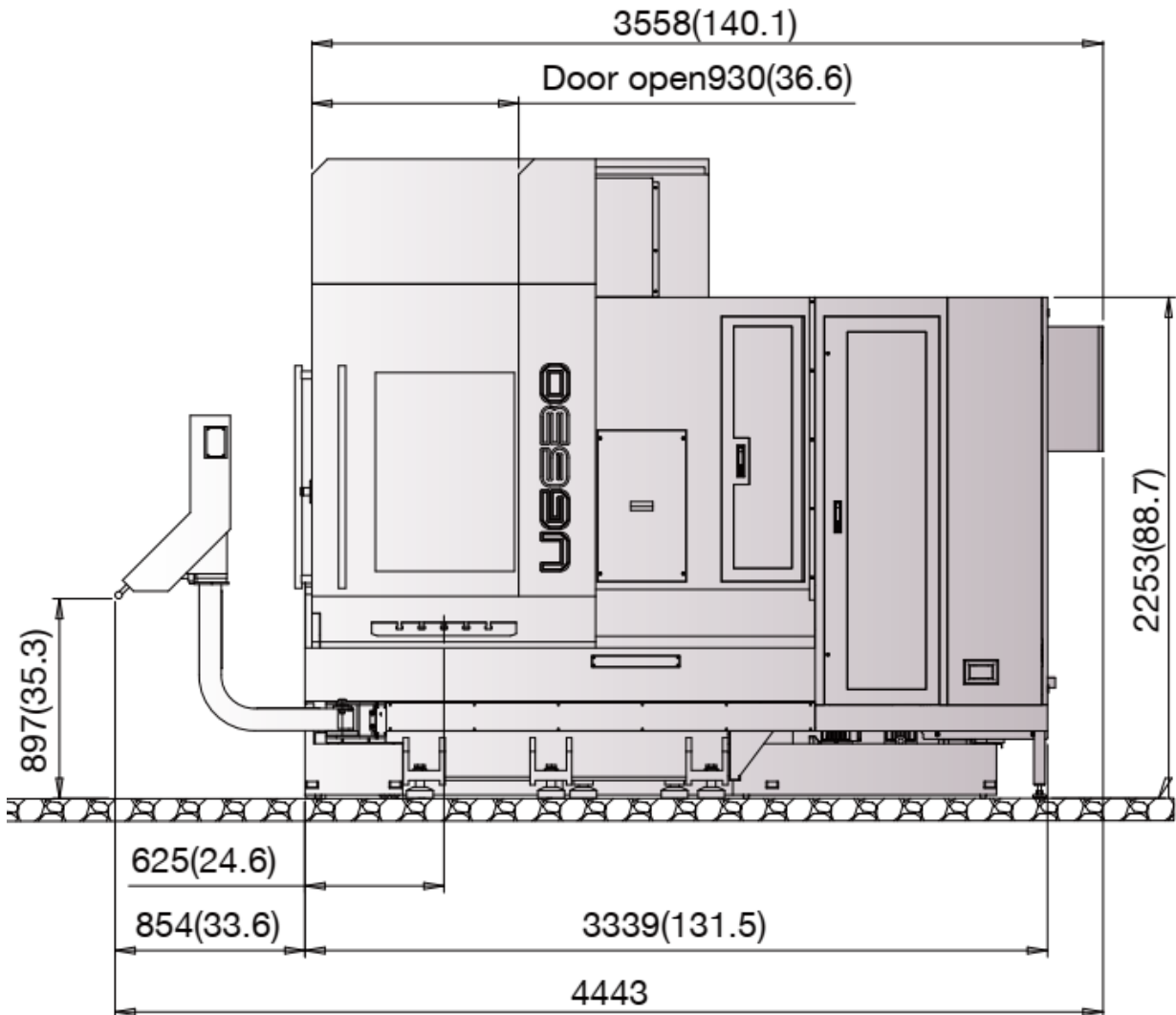
1. When the tool's length(300mm) and diameter (127mm).
2. The ATLM equipment is installed.



Machine Layout



Machine Layout

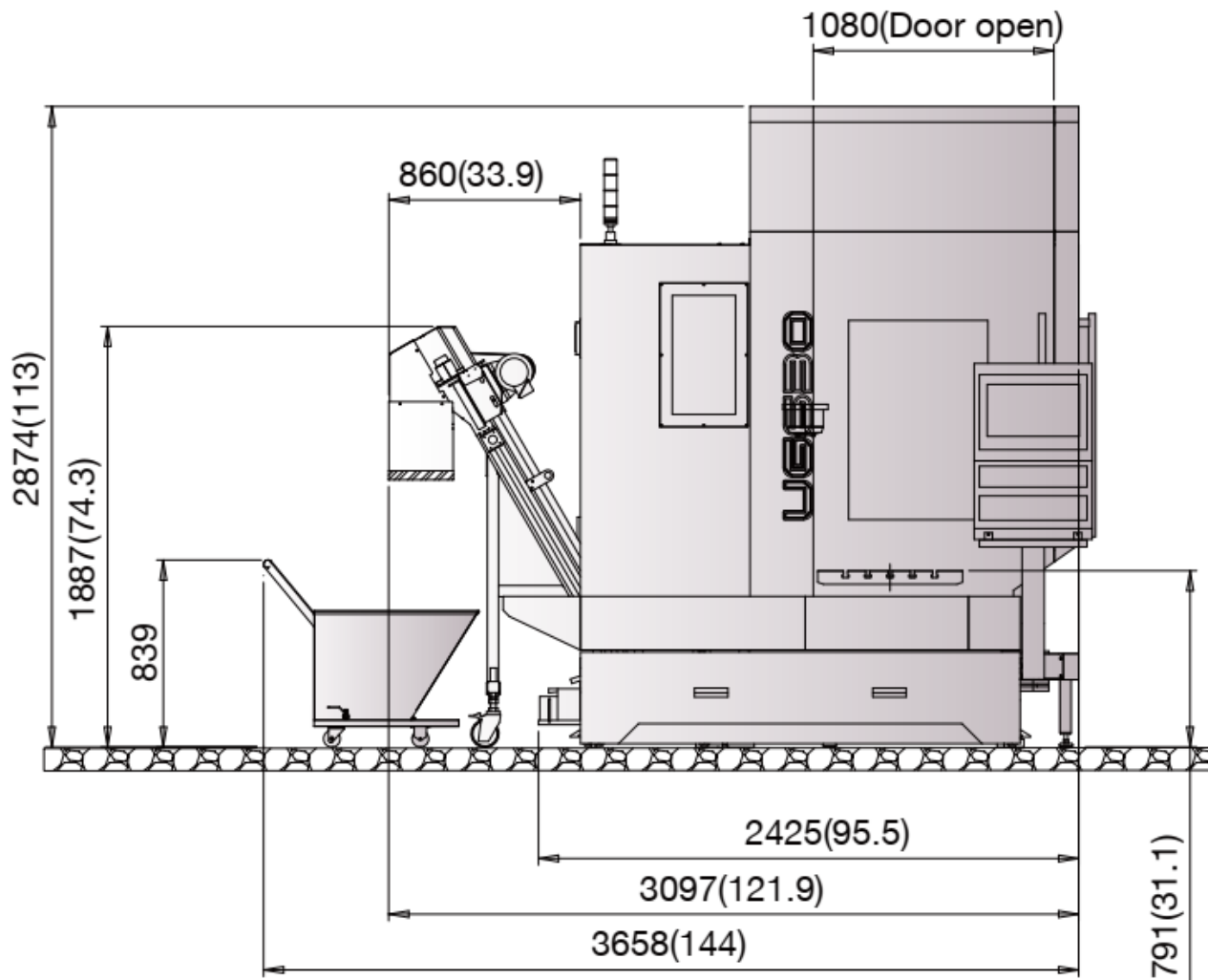


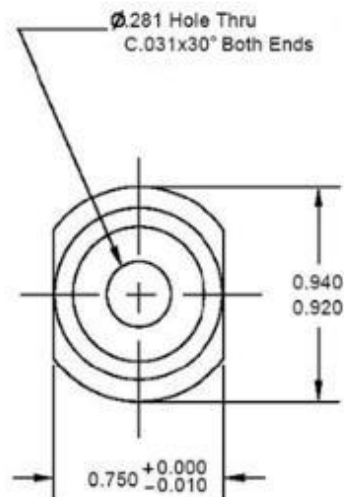
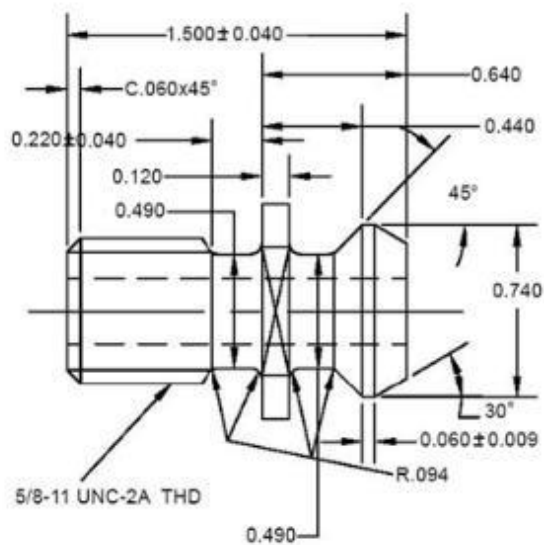
Shipping Dimensions - Reference

Crate #1: 4330mm x 2320mm x 2550mm @ 7,790KGS

Crate #2: 4670mm x 1150mm x 2260mm @ 1,150KGS

Machine Layout



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Main computer : MC7522	<ul style="list-style-type: none"> ● Processor: Intel Core i7-3 1.7 GHz, dual-core ● 4 GB RAM memory
Controller unit : CC6106 or CC6108	<ul style="list-style-type: none"> ● 6 or 8 position and speed encoder inputs 1 VPP or EnDat
Display : BF750	<ul style="list-style-type: none"> ● 15.1" TFT
SSDR 21GB	Solid state disk
Keyboard TE730	
Input resolution display step	<ul style="list-style-type: none"> ● Linear axes 0.1μm ● Rotary axes 0.0001°
Interpolation	<ul style="list-style-type: none"> ● Straight lines in 5 axes ● Circle in 3 axes ● Helical
Cycle time	<ul style="list-style-type: none"> ● Block processing 0.5ms ● Position controller 0.2ms ● Speed controller 0.2ms ● Current controller 0.1ms
Error compensation	<ul style="list-style-type: none"> ● Linear and nonlinear axis error ● Backlash ● Reversal spikes with circular movements
	<ul style="list-style-type: none"> ● Static friction ● Sliding friction
Integrated PLC	<ul style="list-style-type: none"> ● PLC memory >1GB ● Program format: statement list ● PLC cycle time 9 to 30 ms (can be set) ● PLC inputs 24 Vdc ● PLC outputs 24 Vdc ● Analog inputs ±10 V ● Analog outputs ±10 V ● Inputs for thermistors
Commissioning aids for PLC	<ul style="list-style-type: none"> ● Integrated oscilloscope ● Trace function ● Table function ● Log book
Data interfaces	<ul style="list-style-type: none"> ● Ethernet(1000BaseT) ● USB 2port
Program entry	<ul style="list-style-type: none"> ● HEIDENHAIN conversational language ● ISO
	<ul style="list-style-type: none"> ● Drilling, tapping with a floating tap holder, rigid tapping Peck drilling, reaming, boring, counterboring, centering
Fixed cycles	<ul style="list-style-type: none"> ● Milling internal and external threads ● Roughing and finishing rectangular and circular pockets ● Cycles for face milling plane and oblique surfaces ● Cycles for milling linear and circular slots ● Hole patterns on circle and line ● Contour pockets - also contour parallel ● Contour train
FK free contour programming	<ul style="list-style-type: none"> ● FK free contour programming in HEIDENHAIN conversational format with graphic support for workpiece drawings not dimensioned for NC
Background programming	
Axes: 6 control loop	<ul style="list-style-type: none"> ● Rotary axis ● Synchronized axes ● Plc axes
Spindle	<ul style="list-style-type: none"> ● Position controlled spindle ● Spindle orientation ● Gear stages
3-D machining	<ul style="list-style-type: none"> ● Motion control with smoothed jerk
Rotary table machining	<ul style="list-style-type: none"> ● Programming of cylindrical contours as if in two axes ● Feed rate in distance per minute

Q parameters programming with variables	<ul style="list-style-type: none"> • Mathematical functions =, +, -, *, /, sin α, cos α, angle α from sin α and cos α, • Logical comparisons (=, \neq, <, >) • Parentheses • tan α, arc sin, arc cos, arc tan, an, en, ln, log, absolute value of a number, constant π, negation, truncation before or after decimal point • Functions for calculating a circle
Programming aids	<ul style="list-style-type: none"> • Pocket calculator • Context-sensitive help function for error messages • Graphic support for the programming of cycles • Comment blocks in the NC program
Tool compensation	<ul style="list-style-type: none"> • Tool radius in the working plane and tool length • Radius compensated contour look ahead for up to 99 blocks (M120) • Three-dimensional tool radius compensation for editing tool data without a recalculate an existing program
Program jumps	<ul style="list-style-type: none"> • Subroutines • Program-section repeat • Calling any program as a subprogram
Coordinate transformation	<ul style="list-style-type: none"> • Datum shift, rotation, mirroring • Scaling factor (axis specific) • Tilting the working plane
Test graphics	<ul style="list-style-type: none"> • Graphical simulation before a program run, even while another program is running • Plan view, view in three planes, 3-D view • Magnification of details
Programming graphics	<ul style="list-style-type: none"> • In the Programming and Editing mode, the contour of the NC blocks is drawn on screen while they are being entered (2-D pencil-trace graphics), even while another program is running
Machining time	<ul style="list-style-type: none"> • Calculation of machining time in the Test Run operating mode • Display of the current machining time in the Program Run operating modes • Mid-program startup in any block in the program, returning the tool to the calculated nominal position to continue machining
Returning to the contour	<ul style="list-style-type: none"> • Program interruption, contour departure and return
Electronic Handwheels	<ul style="list-style-type: none"> • One HR 510 portable handwheel • Superimpose handwheel positioning during program run
Advanced function set 1 (standard for 5 axis machine)	<ul style="list-style-type: none"> • Cylinder surface interpolation for rotary table • Feed rate in mm/min for rotary table • Tilting the working plane
Advanced function set 2 (standard for 5 axis machine)	<ul style="list-style-type: none"> • Circular interpolation in 3 axes with tilted working plane • 3-D tool compensation through surface-normal vectors • TCPM = Tool Center Point Management • Tool perpendicular to contour • Tool radius compensation vertical to the tool direction • Straight-line interpolation in 5 axes (permit required for export) • Manual traverse in the active tool-axis system
Servo system	<ul style="list-style-type: none"> • X axis: QSY 155F EcoDyn (6.0 kW) • Y axis: QSY 155C EcoDyn (5.7 kW), • Z axis: QSY 190C EcoDyn (8.9 kW), brake • A axis: QSY 190C EcoDyn (5.1 kW), brake • C axis: QSY 155C EcoDyn (5.1 kW) • Spindle motor: ATE /15,000