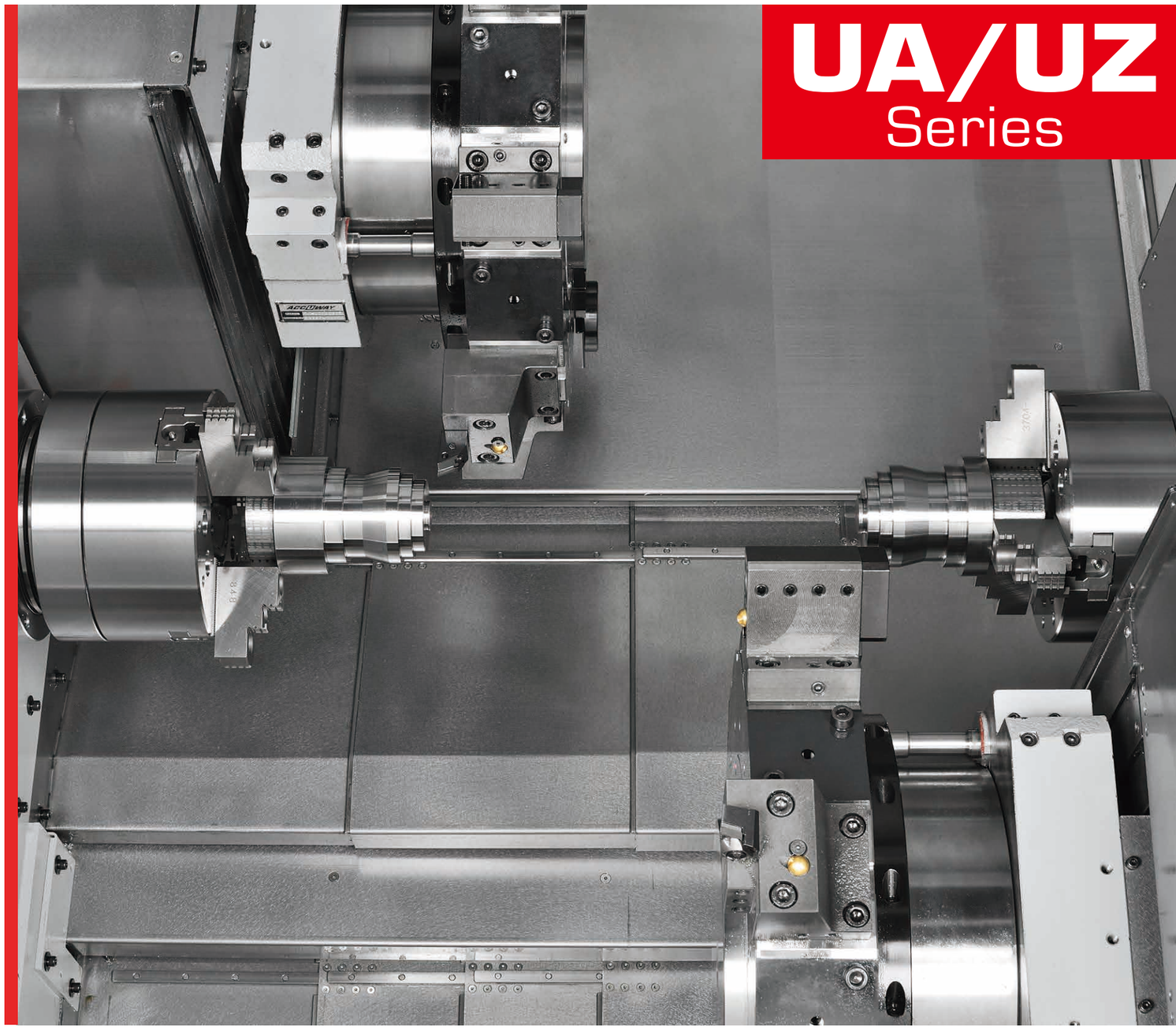
# Multi-axis Complex Turning-milling Center


**UA/UZ Series**


鉅基科技股份有限公司
ACCUWAY MACHINERY CO., LTD.
42942台灣台中市神岡區豐工中路31號
No.31,Fenggong Central Rd., Shengang Dist., Taichung City 42942, Taiwan
TEL:+886-4-2520-9588 FAX:+886-4-2520-9716 market@accuway.com.tw



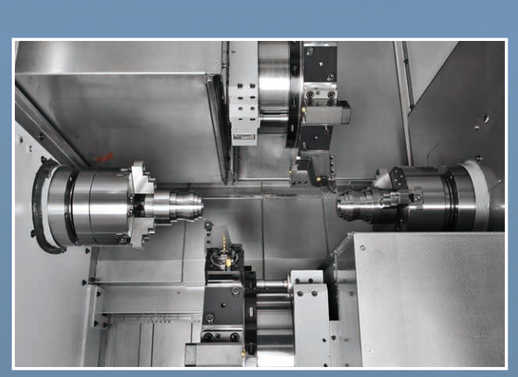
20230225


www.accuway.com.tw

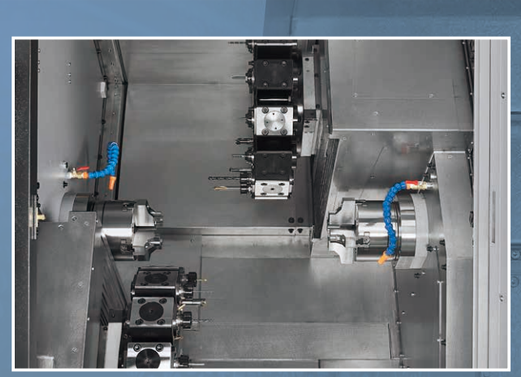
# UA/UZ Multi-axis Complex Turning-milling Centers

## Complex + Intelligent + Automation

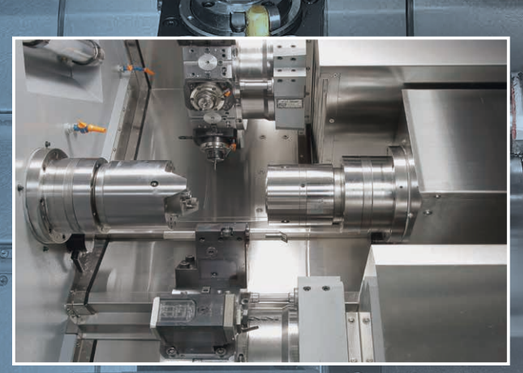
- Twin spindles, twin turrets, and multi-tools stations design.
- Upper and lower turrets perform multipath synchronous/ composite turning-milling process to shorten cycle time.
- High-speed tool spindle design for power turret meet any complex shape workpiece machining.



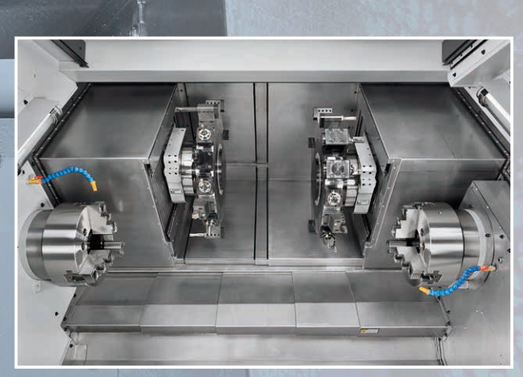
Opposite upper and lower turrets with a single Y-axis on the upper side



Opposite upper and lower turrets with twin Y-axis



Parallel upper and lower turrets with a single Y-axis on upper side



Opposite twin upper turrets

## UA-1500T2Y

## UA-1500T2Y2

## UZ-2000T2Y

## UA-2000T2M

# Enhancing Efficiency and Achieving Higher Accuracy

UA-200Y

SINGLE TURRET complex turning-milling Center

**Cycle Time**
1263sec./1pieces

OP 10 294 sec. | OP 11 358 sec. | OP 20 71 sec. | OP 21 540 sec.

UA-1500T2Y2

TWIN TURRET, TWIN SPINDLE complex turning-milling Center

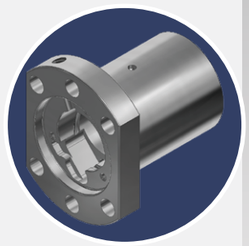
**Cycle Time**
652sec./1pieces

OP 10 294 sec. | OP 11 358 sec. | OP 20 71 sec. | OP 21 540 sec.

***SAVE 611 sec.***

***48%!***

Significantly improve productivity



Machining sample

Complete all machining procedures in a single machine.

**Advantages of UA/UZ series**
(compared to general machining procedures)

- Avoid clamping errors from manually changing jobs
- Save machine footprint
- Reduce equipment cost
- Reduce loading and unloading time
- Increase productivity
- Shorten delivery time

## Minimized Footprint

The processing capacity of each UA/UZ series is equivalent to the integration of two single-turret turning-milling machines, and the foor space is greatly reduced.

**SAVE 48%**

## Single/dual Y-axis control function

The Y-axis control function can meet machining requirements such as eccentric milling and drilling, so as to complete more complex processing tasks.

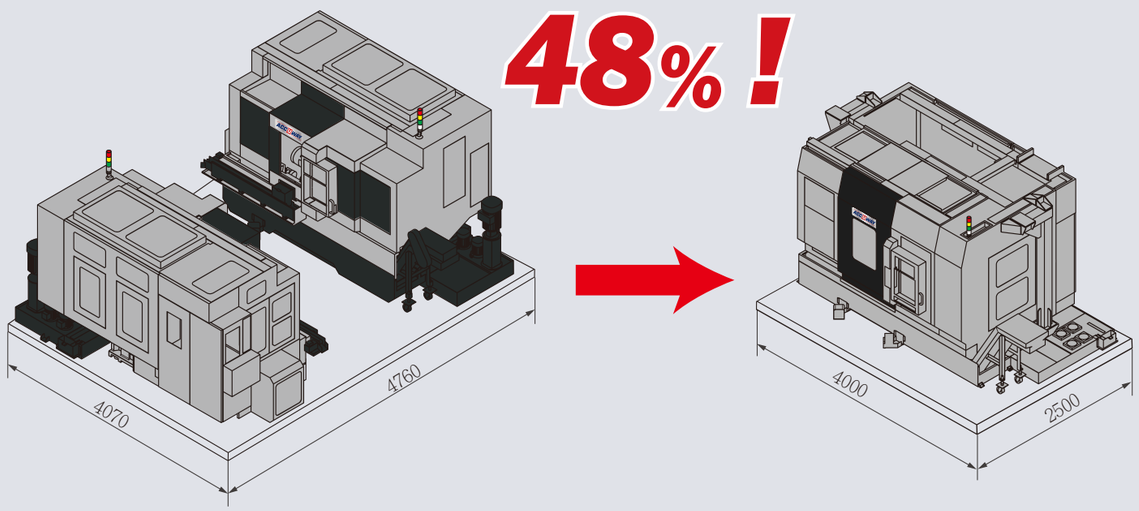
**±50mm**
Y-axis Travel

## Sufficient turret capacity

Each turret can store up to 16 power tools maximum.

**32station**
Turret 1
+
Turret 2

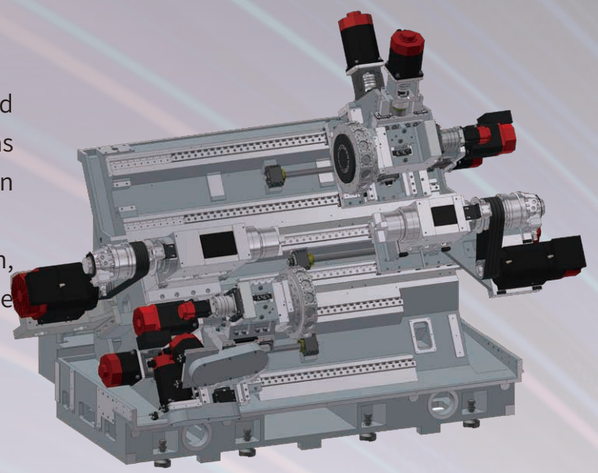

# Save floor space

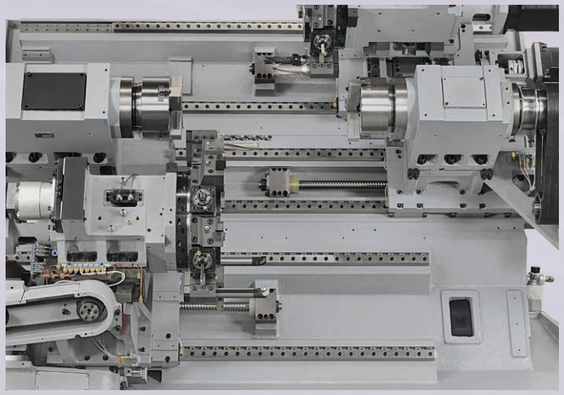


# Robust Structure Design

## High rigidity casting structure

The box-shaped one-piece bed has an optimized heavily and reinforced internal ribs design, which has strong stiffness to effectively absorb cutting vibration and maintain machining accuracy.
The casting material is made of Meehanite cast iron, which can preserve stable accuracy of the machine under long-term operation.



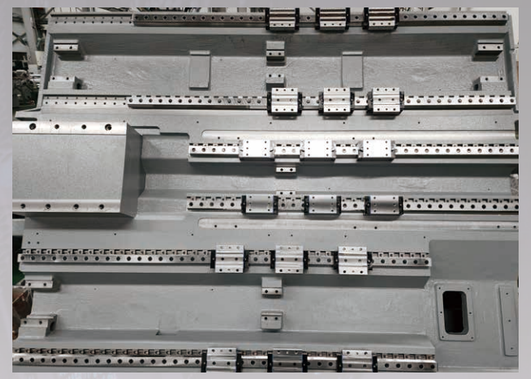


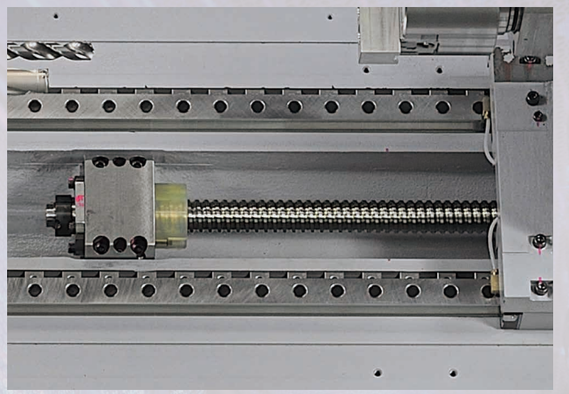
## Stable axis movement design

Having the large-span guideway design, whether during high-speed rapid feed movement or general machining movement , all axes can move simultaneously and smoothly without causing adverse resonance vibration.

## High-precision linear guide way design

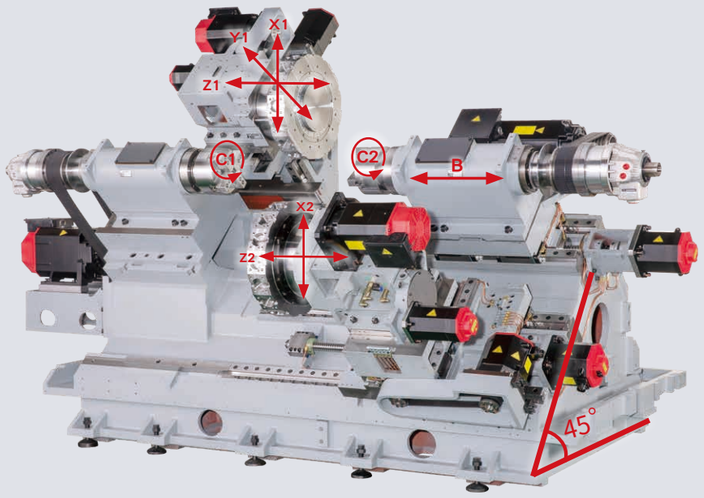
The linear guideway uses steel balls to support rolling motion contact between the block and the slide rail while reducing the coefficient of friction. Since the static friction force at startup is minimized, the equipment accuracy and mechanical performance can be greatly improved.



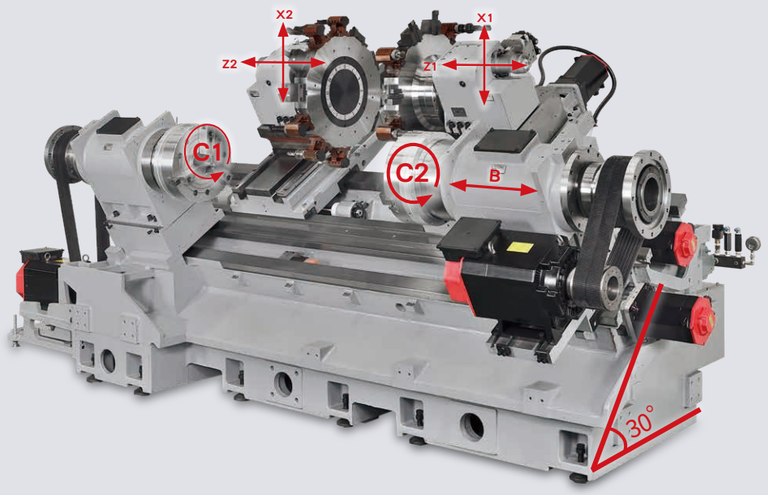


## Low backlash ballscrew drive mechanism

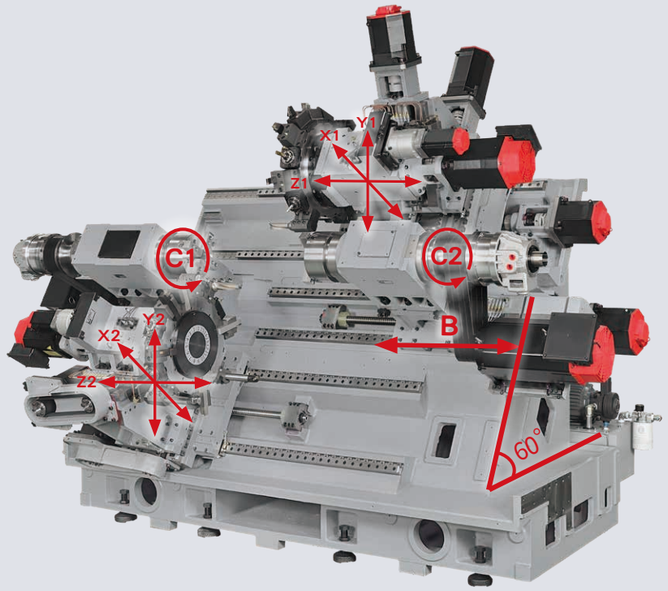
Pre-tensioned high-precision ballscrew and special heat suppression designs are used to effectively eliminate backlash and thermal elongation. The direct drive of the servo motor also reduces power losses and increases the positioning accuracy of the axial feed.




45 ° slant bed design



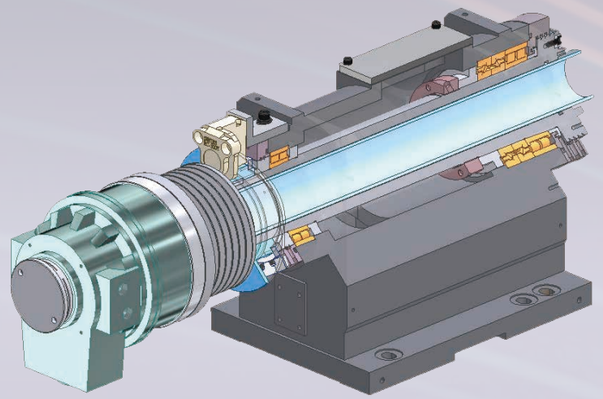

30 ° slant bed design



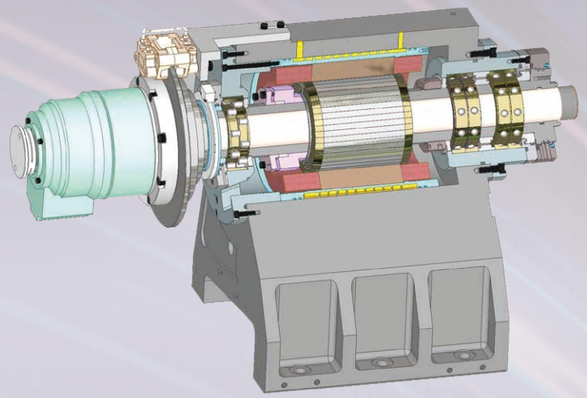

60 ° slant bed design

# Professional Indigenous Spindle Design

The precision belt-driven or built-in spindle is custom-designed according to machining requirements and has been assembled and rigorously tested in-house. The front and rear bearings of the spindle adopt large-diameter double-row roller bearings and a set of super precision self-alignment angular contact ball bearings, which provide unparalleled power, longterm durability, and superior processing capabilities. Each spindle is dynamically balanced to reduce vibration, thereby improving the machine's performance and overall machining quality.



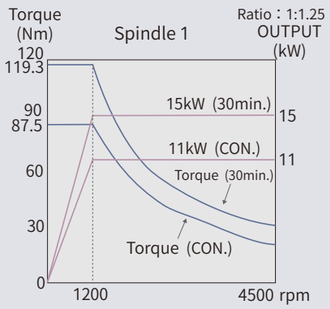
Belt-driven spindle

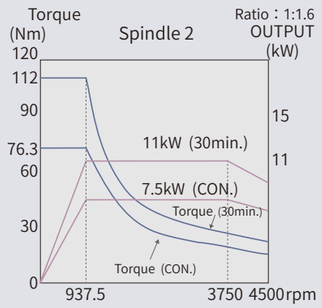


Built-in spindle

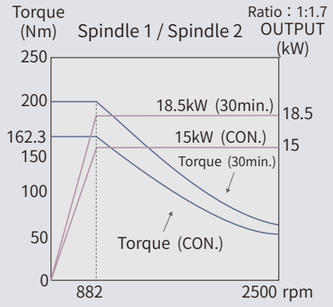
## Spindle Power Chart

### UA-1500T2Y、UA-1500T2Y2

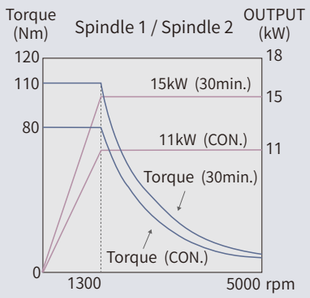


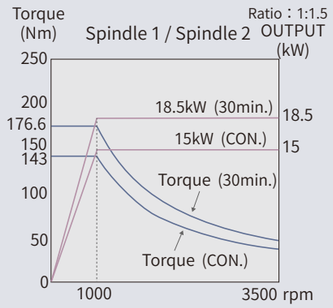

### UA-250、UA-2000T2MB




### UZ-2000T2Y、UZ-2000T2M、UZ-2000T2MW




### UA-2000T2M





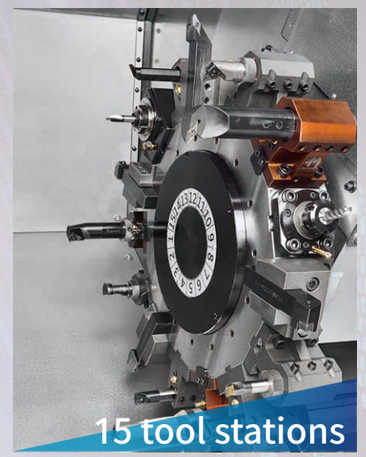

# High-Rigid Self-developed Power Turret

Independently develops and in-house manufactures BMT servo power turret, adopts high-precision 3-piece largediameter curved tooth clutch, and drives the cutter head to rotate with a servo motor, which has the characteristics of short tool change time and high positioning accuracy.

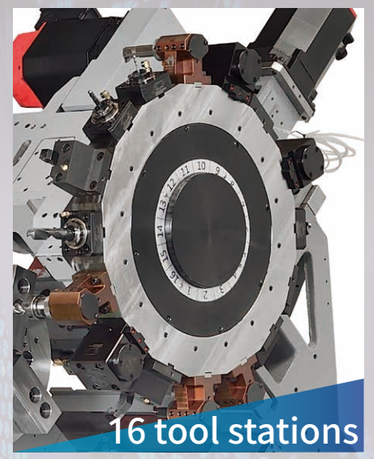
Up to **32** driven tool holders can be installed

Turret 1
16 tool stations
+
Turret 2
16 tool stations

12 tool stations

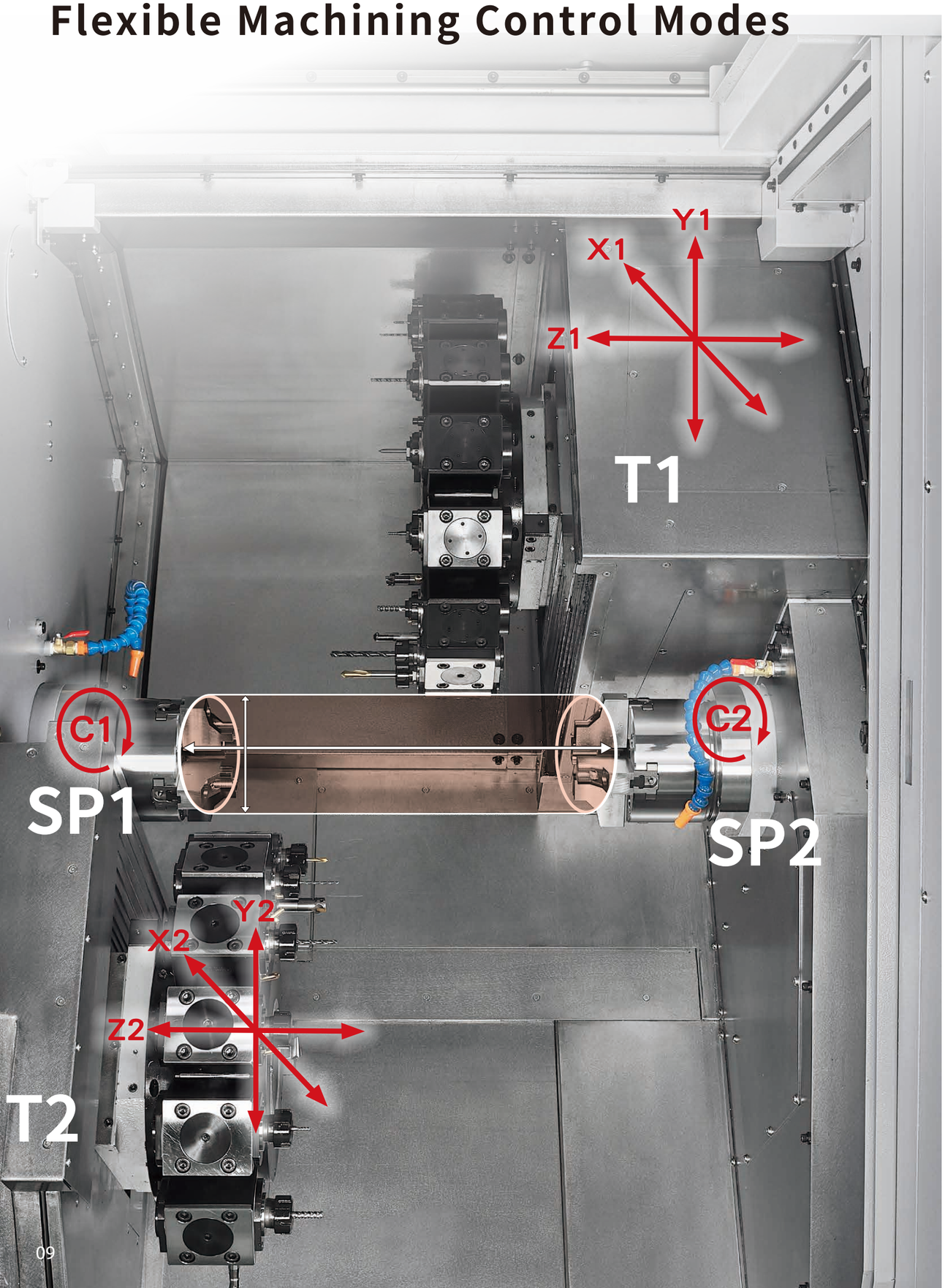


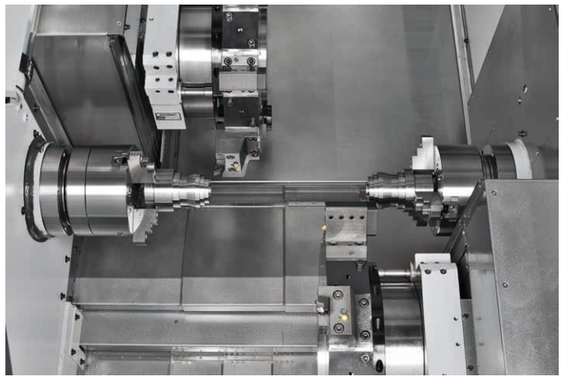
15 tool stations



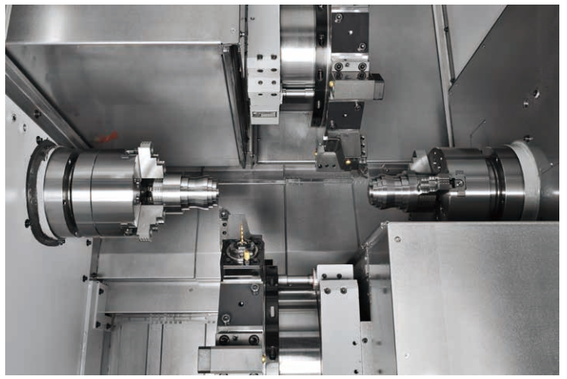
16 tool stations

# Flexible Machining Control Modes

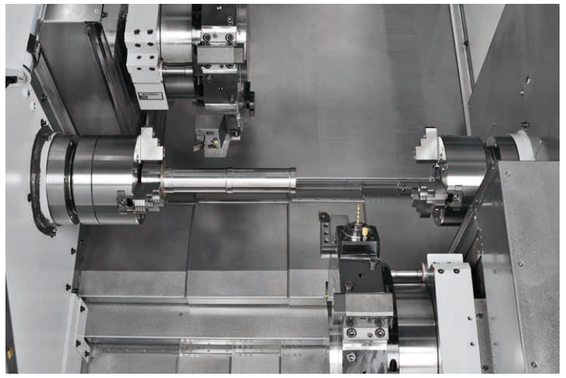


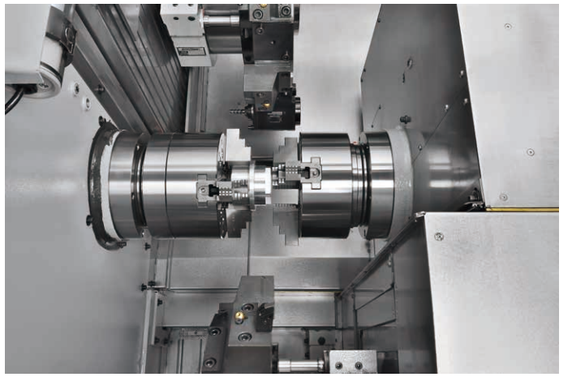
Independent machining control in each path



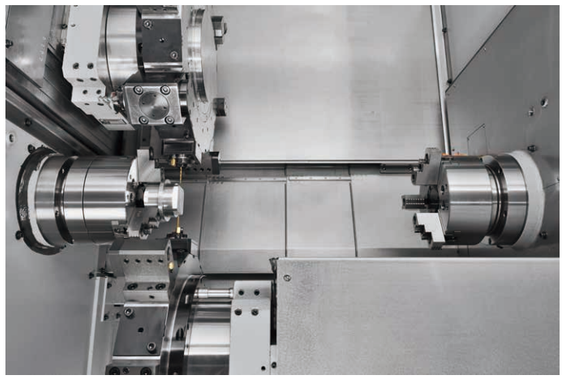
Twin path composite machining control



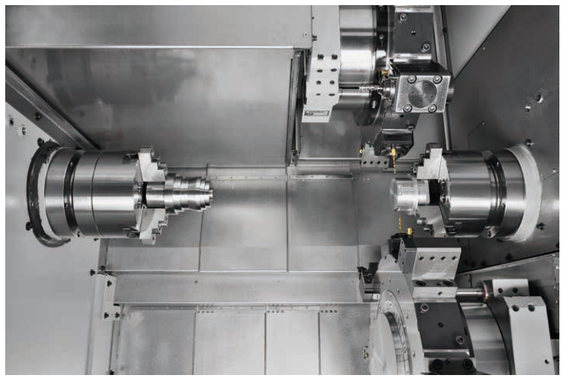
Twin path composite balance cutting control



Synchronous parts interchange control



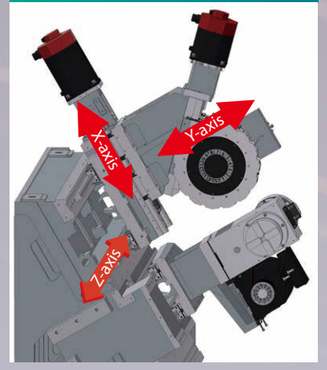
Twin path composite balance cutting control on SP1



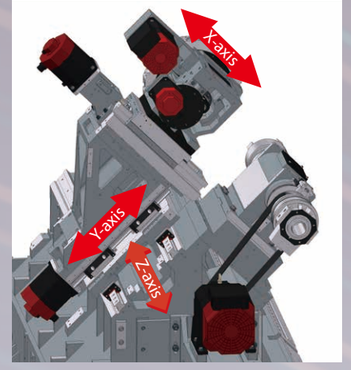
Twin path composite balance cutting control on SP2

# Y-axis Machining Capability

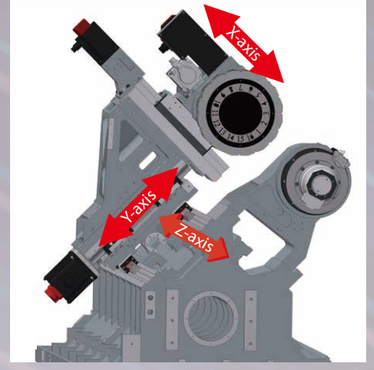
**UA-1500T2Y2**




**UA-1500T2Y**




**UZ-2000T2Y**

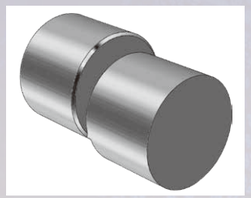



## Keyway milling

Applying Y-axis machining can accurately control the width of the keyway even when the tool is worn out. In addition, because the turning and milling of the keyway are completed in the same cycle during shaft machining, the excellent geometric tolerance of the keyway symmetry can be precisely maintained.

## Asymmetric/eccentric hole machining

The simple C-axis can only process symmetric holes when drilling and tapping in both radial and axial directions, while the Y-axis turning center can perform asymmetric hole machining by creating an offset in the Y-axis direction.

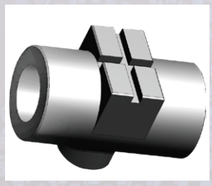


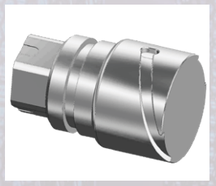
## Cam profile face milling

Applying the Y-axis function can perform 3D simultaneous machining of end face cams or cylindrical cam contours.

## Radial face, profile, and pocket machining

Various drilling, milling, thread milling, etc. can be performed on the radial cylindrical surface of the workpiece.





## Thread milling

The Y-axis turning-milling center is equipped with a controller function to perform milling internal and external threads on end faces and radial surfaces.

## 3D contour engraving and milling

Applying simultaneous compound servo motion control of X/Y/Z linear axes plus C-axis indexing synchronous movement, it can perform engraving and milling of 3D geometric contours.



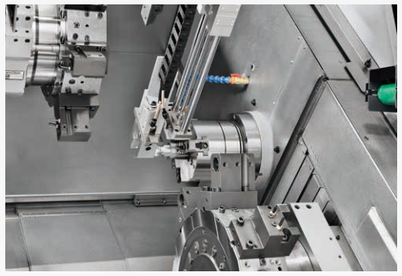
# Optional Accessories

## Gantry external loading/ unloading system

Integrating the external gantry-type loader system and the work stocker for storing various shapes of raw materials and finished products, perform continuous loading and unloading operations, greatly reducing manpower dependence and increasing production efficiency and output value.

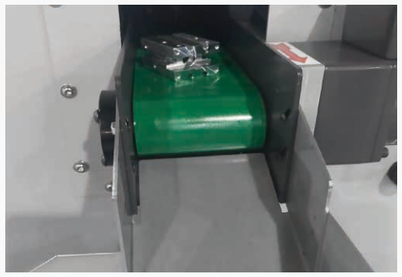
## Built-in unloading system

The built-in unloader system picks up the workpiece after completing each work cycle and sends it directly to the workpiece conveyor and collected it to the outside stoker without opening the door. If cooperates with the bar feeder, it can achieve unmanned automatic production.



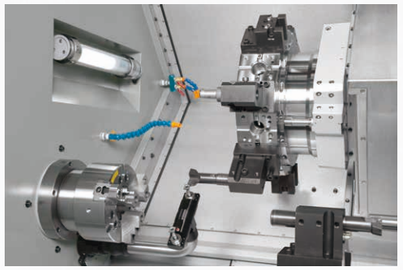
## Conveyor for finished parts

The finished product conveyor is placed inside the machine, which is both convenient and safe and can send the workpiece to the collection box outside the machine to reduce labor cost.



## Tool setter

Use a manual or automatic tool setter arm to detect tool wear and feedback compensation amount to the controller to maintain the critical dimensions of the workpiece within the tolerance range, reduce defective products, maintain stable machining quality, increase efficiency, and improve yield rate.

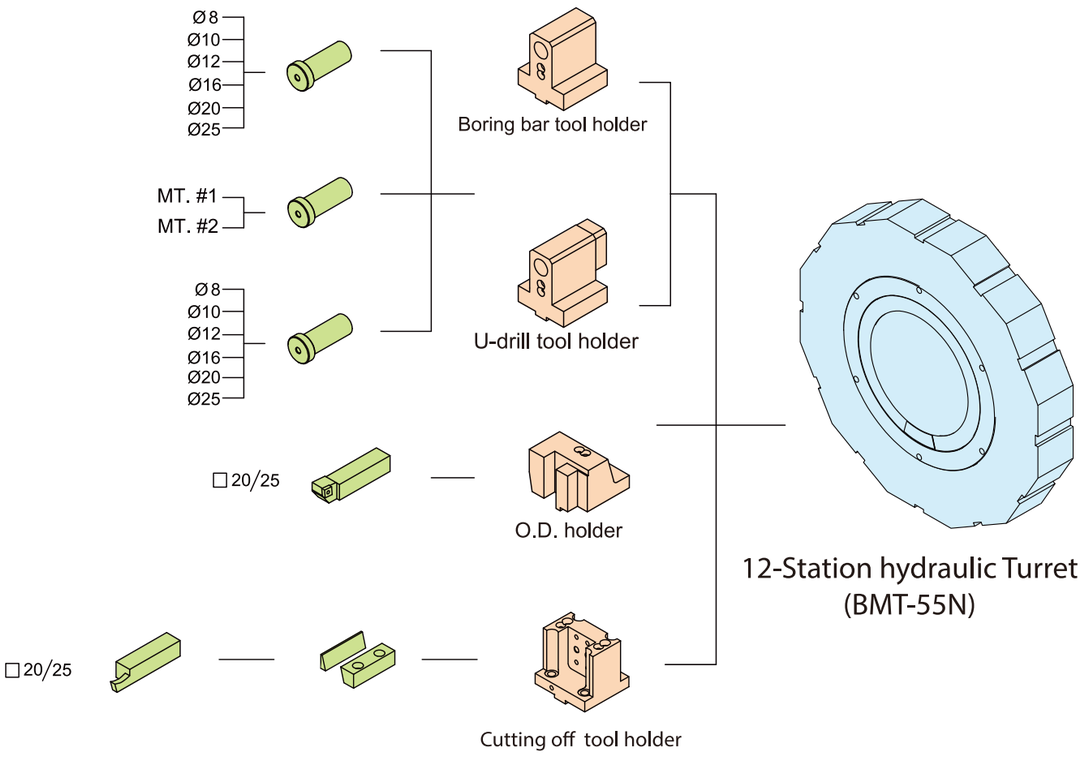


## Bar feeder

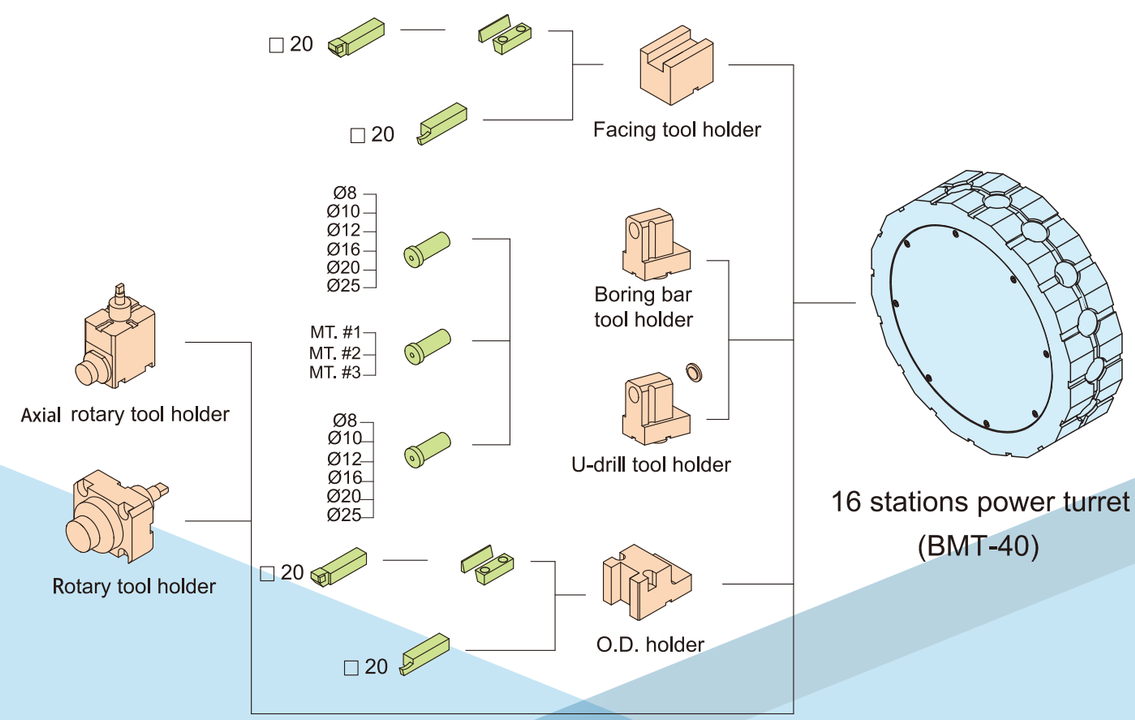
Through the programming of machining cycle, long raw material bars are automatically fed into the spindle, which can realize the continuous operation mode without the operator's intervention for a long period, increase the production capacity and reduce the labor cost.

# Tooling System

## UA-250

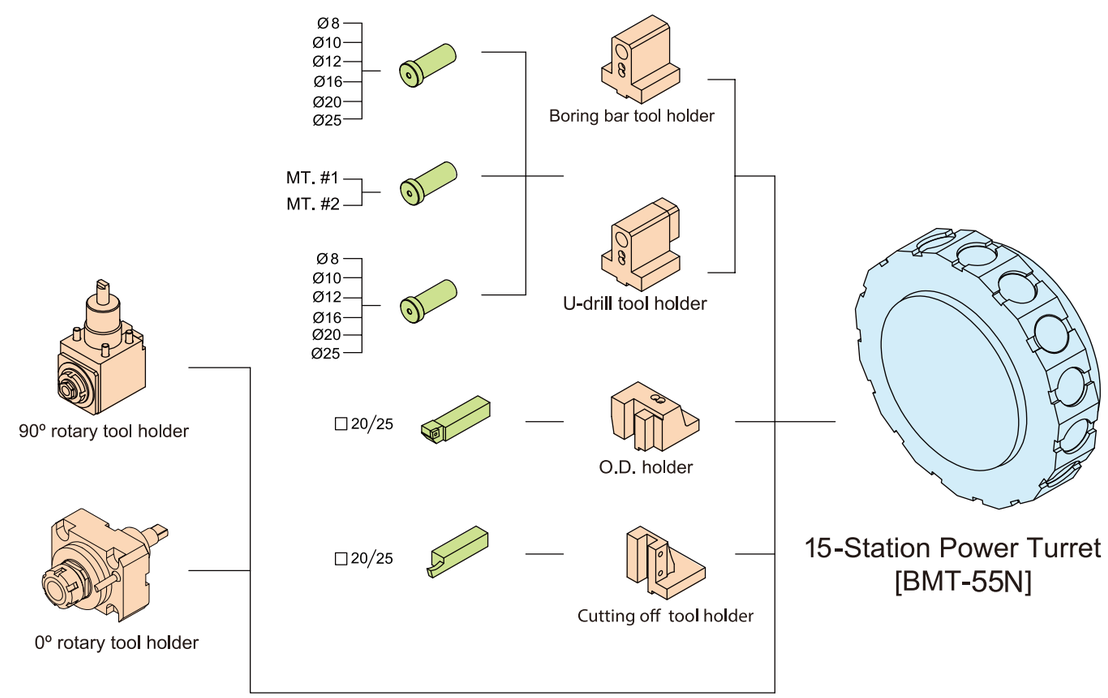



## UZ-2000T2M/T2MW/T2Y

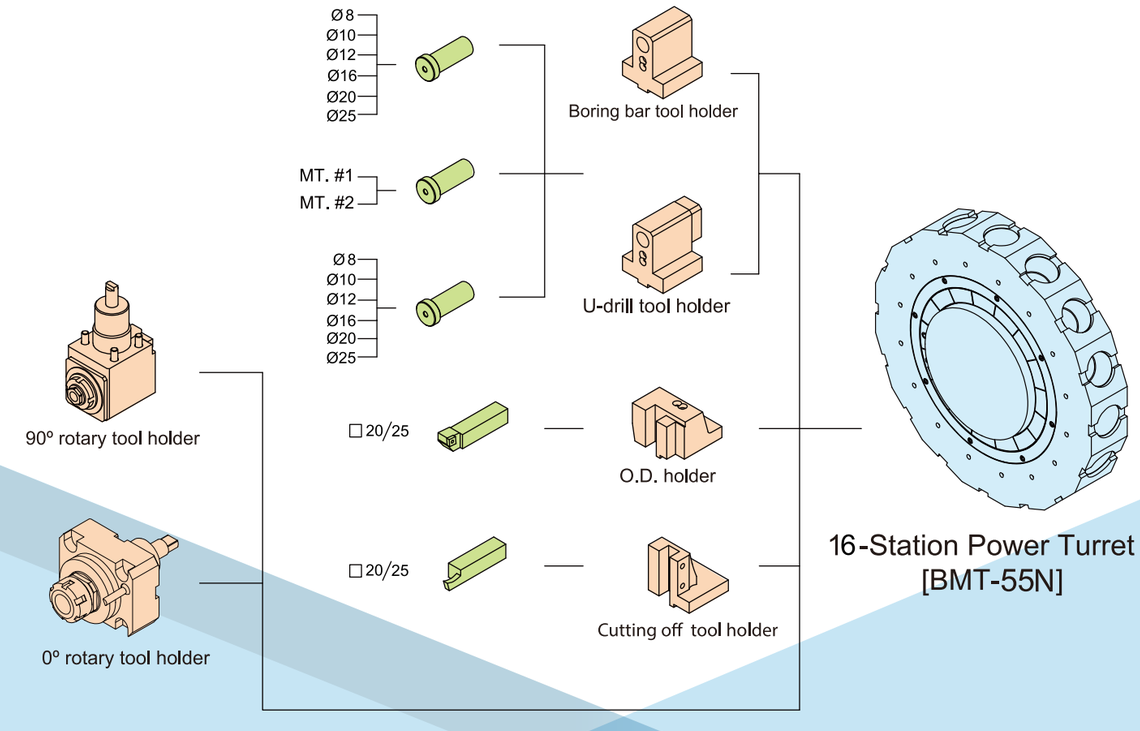





## UA-1500T2Y2

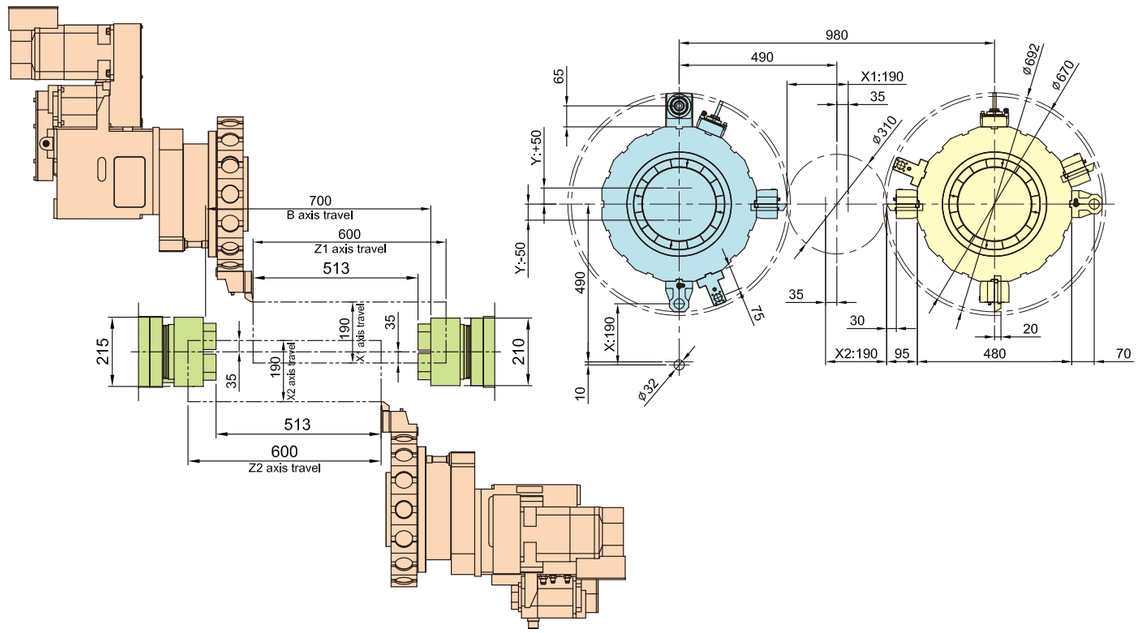



## UA-1500T2Y、UA-2000T2M、UA-2000T2MB

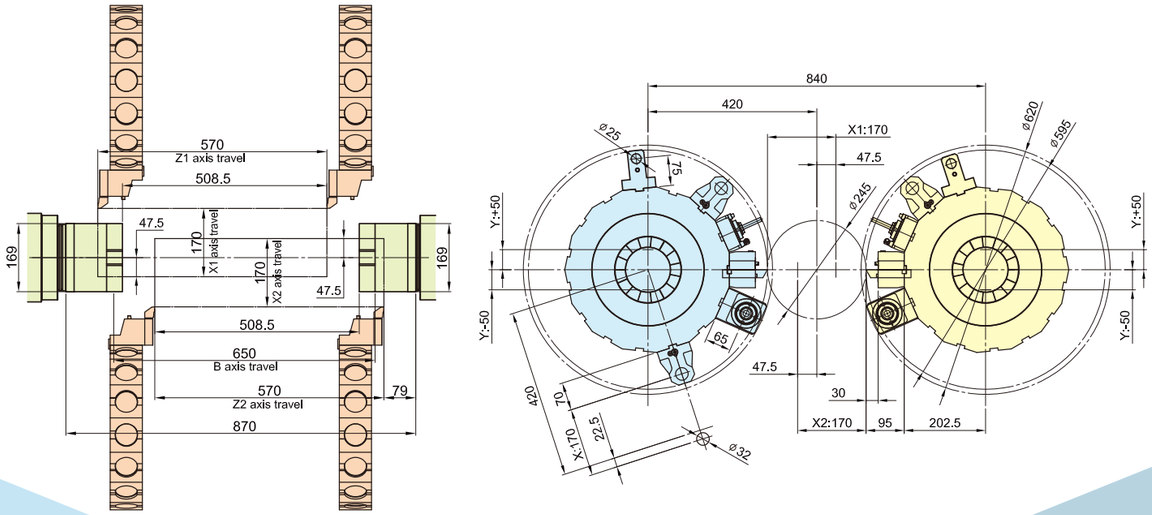


# Tool Interference Diagrams

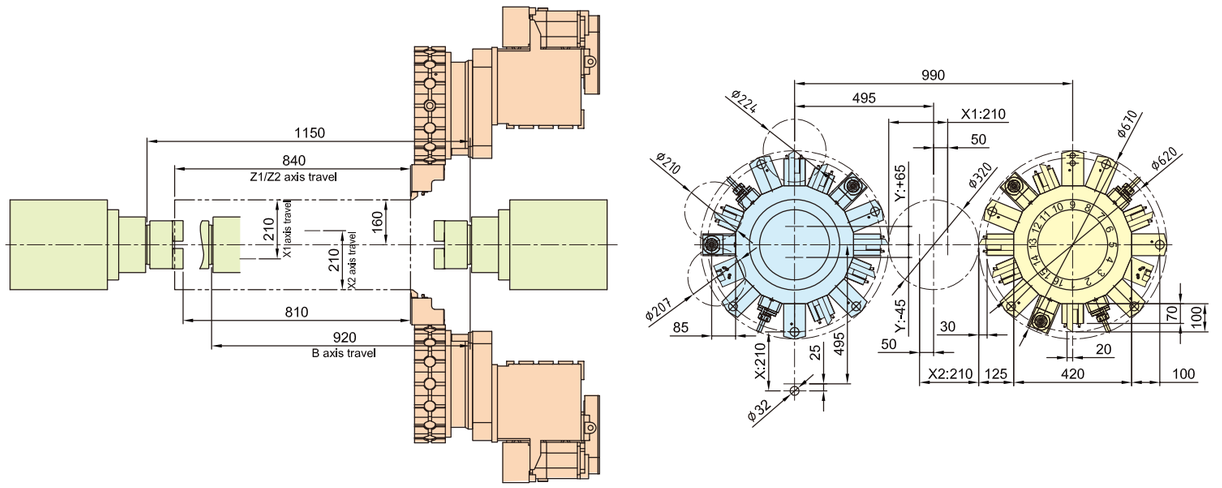
## UA-1500T2Y



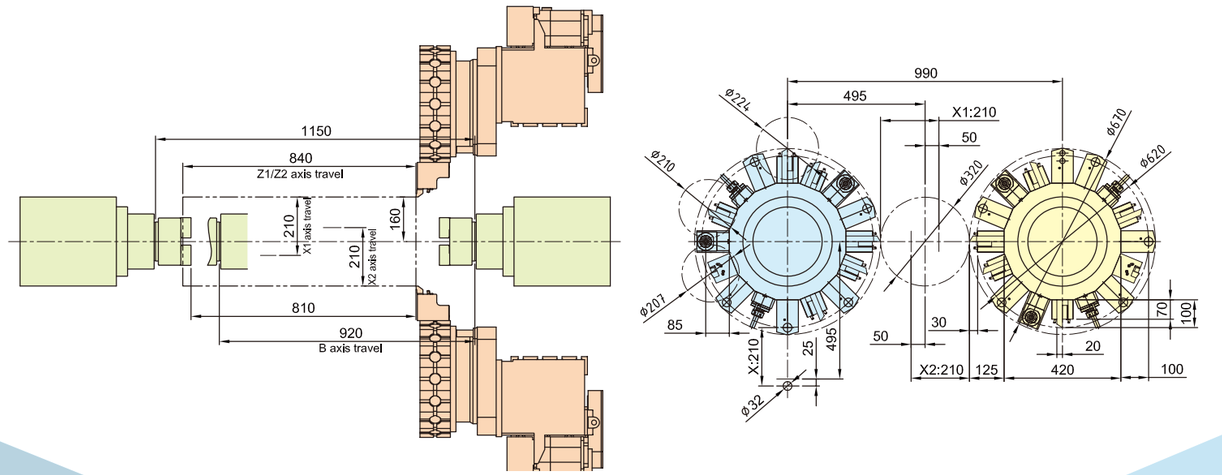

## UA-1500T2Y2




## UZ-2000T2Y

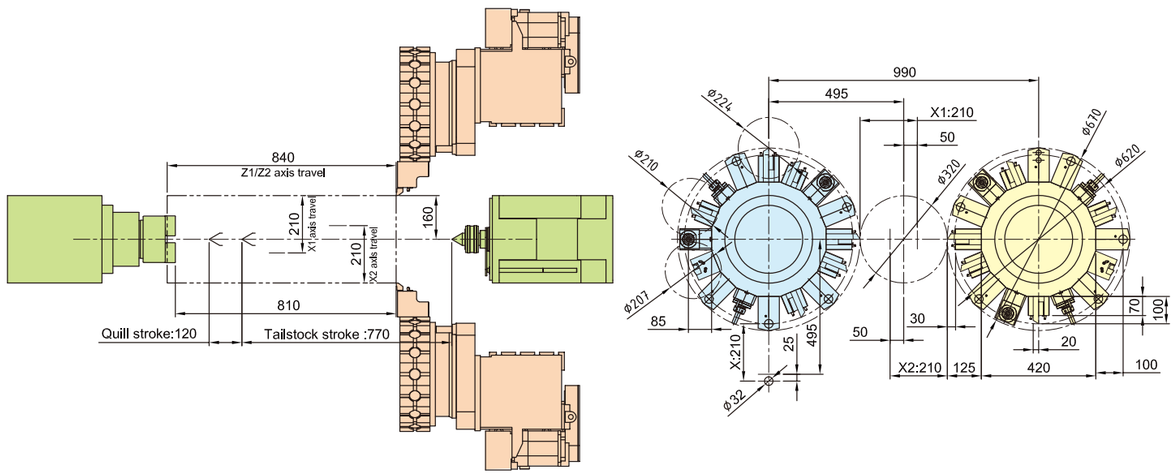



## UZ-2000T2M

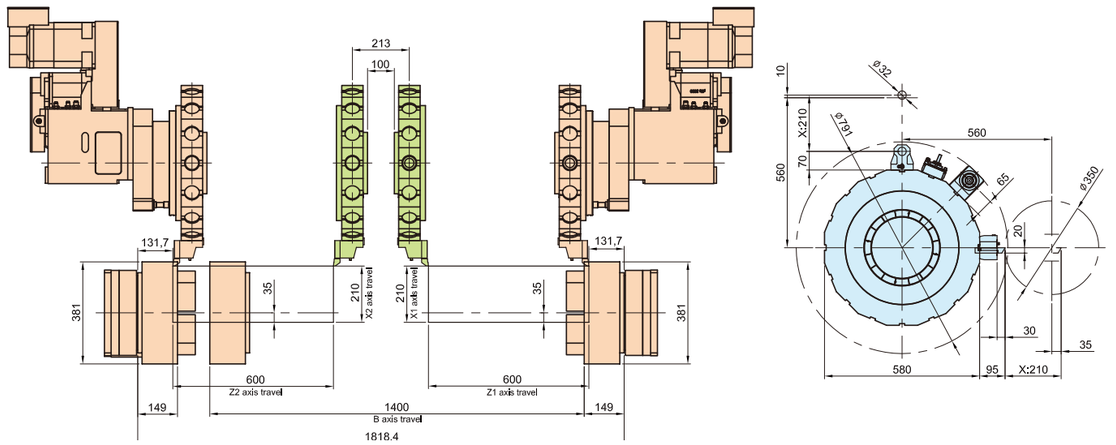


# Tool Interference Diagrams

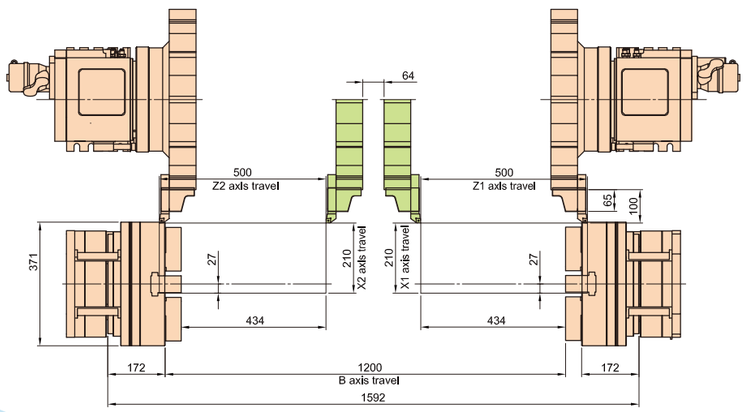
## UZ-2000T2MW

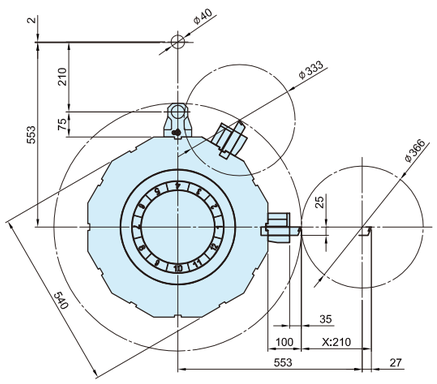



## UA-2000T2MB

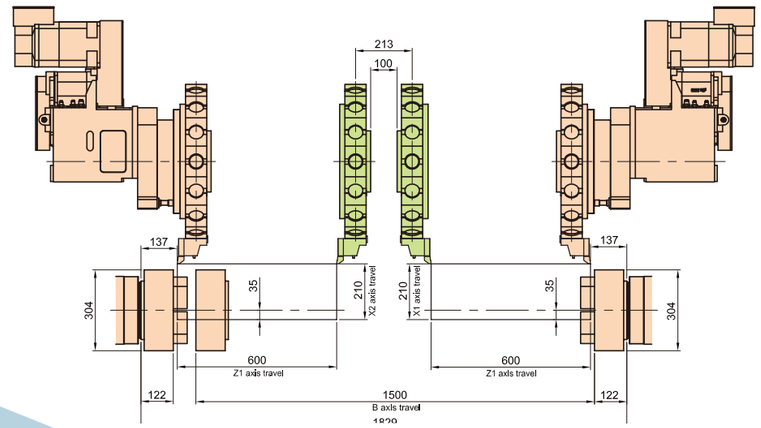


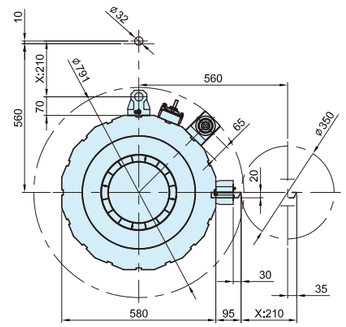

## UA-250




## UA-2000T2M

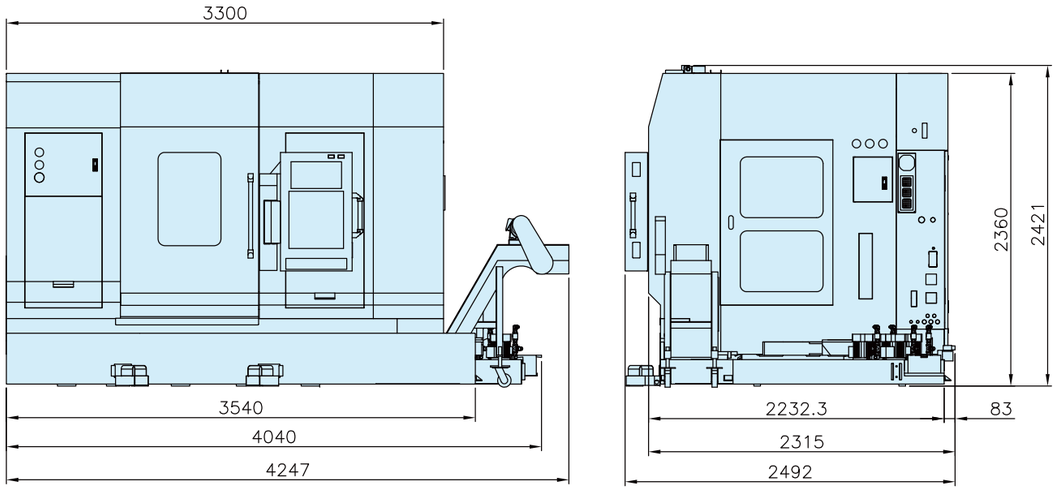


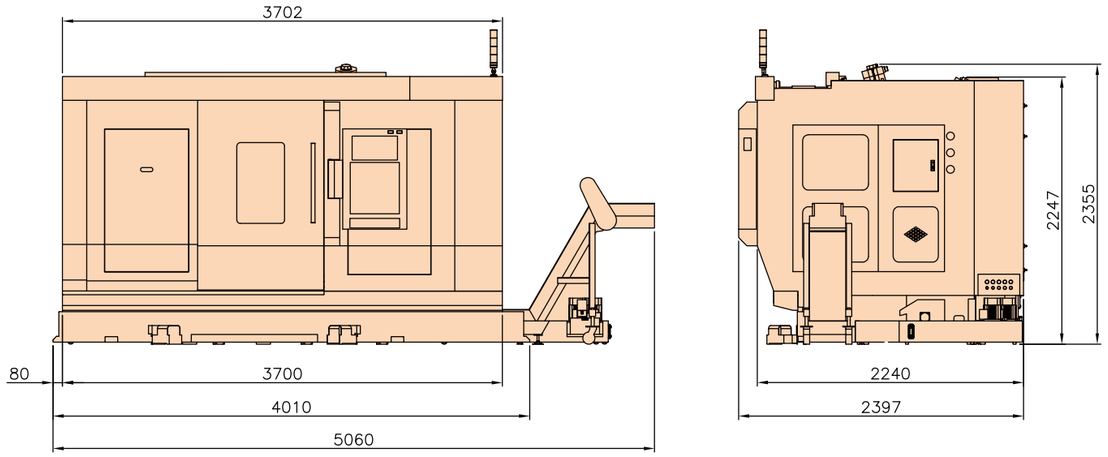
# Machine Dimensions

Unit: mm

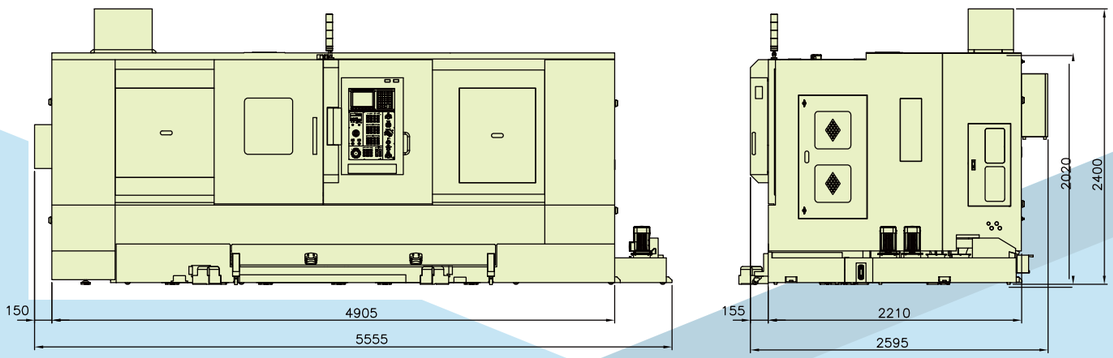
## UA-1500T2Y



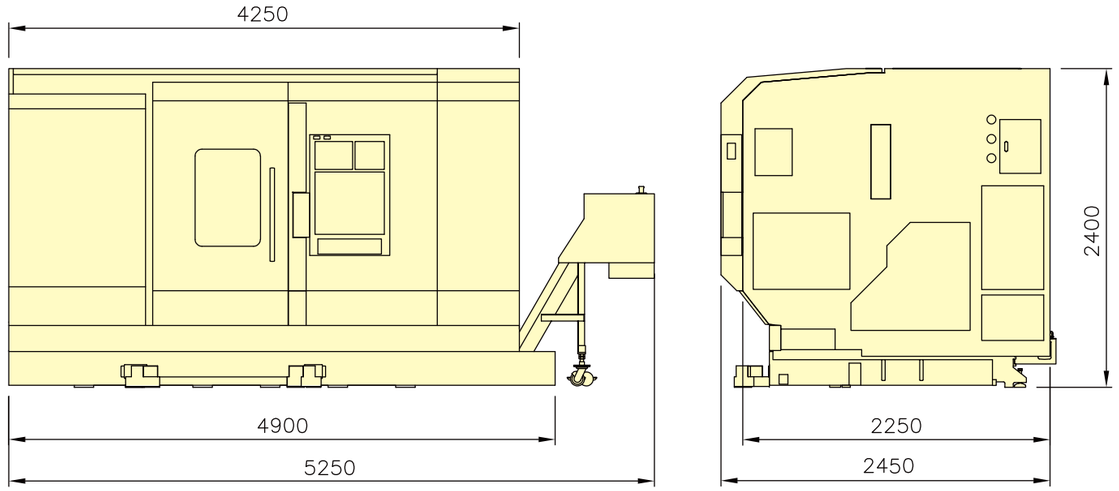

## UA-1500T2Y2



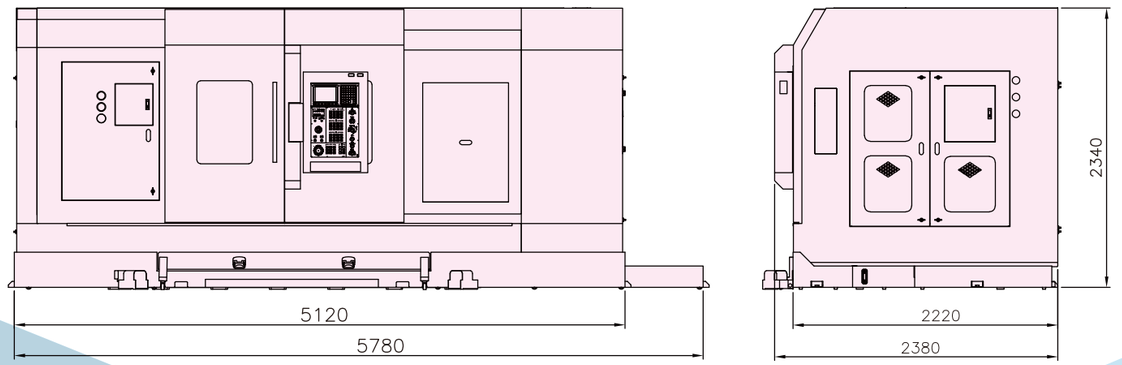

## UA-250




## UZ-2000T2M、T2MW、T2Y




## UA-2000T2M、UA-2000T2MB



# Specifications

| Item / Model | | UA-1500T2Y | UA-1500T2Y2 | UA-2000T2M | UA-2000T2MB |
|---|---|---|---|---|---|
| Controller | | FANUC 0i-T | | | |
| CAPACITY | | | | | |
| Swing Over Bed | mm | 660 | 460 | 660 | |
| Swing Over Saddle | mm | 620 | 400 | 620 | |
| Max. Turning Diameter | mm | 300 | 200 | 340 | |
| Max. Turning Length | mm | 480 | 500 | 510 | 440 |
| Bed Slant Angle | degree | 45 | 60 | 45 | |
| Guideway Type | | Linear + Box | | | |
| SPINDLE 1 | | | | | |
| Spindle Nose Taper | ASA | A2-6 | | A2-8 | A2-11 |
| Spindle Drive Type | | Belt | | | |
| Chuck Diameter | inch | 6 (8) | | 8(12) | 15 |
| Spindle Speed | rpm | 4500 | | 3500(2500) | 2500 |
| Bar Capacity | mm | 52 | | 75 | 105 |
| SPINDLE 2 | | | | | |
| Spindle Nose Taper | ASA | A2-6 | | A2-8 | A2-11 |
| Spindle Drive Type | | Belt | | | |
| Chuck Diameter | inch | 6 (8) | | 12 | 15 |
| Spindle Speed | rpm | 4500 | | 3500(2500) | 2500 |
| Bar Capacity | mm | 52 | | 75 | 105 |
| MOTOR | | | | | |
| Spindle 1 Motor Power (Cont./30min) | kW | 11/15 | | 15/18.5 | |
| Spindle 2 Motor Power (Cont./30min) | kW | 7.5/11 | | 11/15 | 15/18.5 |
| Rotary Tool Driver Power | kW | 3.7/5.5 | | | |
| TURRET | | | | | |
| Tooling system | | BMT-55N | | | |
| Number Of Tools | station | 16+16 | 15+15 | 16+16 | |
| Square Tool Shank Size | mm | 20(25) | | | |
| Round Tool Shank Size | mm | 25(32) | | 32(40) | |
| Max. Rotary Tool Speed | rpm | 6000 | | | |
| TRAVELS | | | | | |
| X1/X2 axis Travel | mm | 190 | 170 | 210 | |
| Z1/Z2 axis Travel | mm | 600 | 570 | 600 | |
| Y1/Y2 axis Travel | mm | ±50/- | ±50 | - | |
| B-axis Travel | mm | 700 | 650 | 1500 | 1400 |
| FEED RATES | | | | | |
| X1/X2 axis Rapid Traverse Rate | m/min | 20 | | | |
| Z1/Z2 axis Rapid Traverse Rate | m/min | 36 | | 30 | |
| Y1/Y2 axis Rapid Traverse Rate | m/min | 10 | | - | |
| B-axis Rapid Traverse Rate | m/min | 40 | | 30 | |
| TAILSTOCK | | | | | |
| Tailstock Body Travel | mm | - | | | |
| Quill Travel | mm | - | | | |
| Quill Diameter | mm | - | | | |
| Quill Taper | MT# | - | | | |
| DIMENSIONS | | | | | |
| Machine dimension (L x W x H) | m | 4.0 x 2.5 x 2.4 | 4.0 x 2.4 x 2.4 | 6.0 x 2.4 x 2.4 | |
| Machine Weight | kg | 10000 | 10500 | 11500 | 13000 |



| Item / Model | | UA-250 | UZ-2000T2MW | UZ-2000T2M | UZ-2000T2Y |
|---|---|---|---|---|---|
| Controller | | FANUC 0i-T | | | |
| CAPACITY | | | | | |
| Swing Over Bed | mm | 700 | 660 | | |
| Swing Over Saddle | mm | 600 | 620 | | |
| Max. Turning Diameter | mm | 360 | 320 | | |
| Max. Turning Length | mm | 290 | 790 | | |
| Bed Slant Angle | degree | 30 | 45 | | |
| Guideway Type | | Box | Linear + Box | | |
| SPINDLE 1 | | | | | |
| Spindle Nose Taper | ASA | A2-11 | A2-5(A2-8 / A2-11) | | |
| Spindle Drive Type | | Belt | Bulit-in / Belt | | |
| Chuck Diameter | inch | 15 | 6 (10 / 15) | | |
| Spindle Speed | rpm | 2500 | 5000 / 3500 / 2500 | | |
| Bar Capacity | mm | 105 | 52 (78 / 105) | | |
| SPINDLE 2 | | | | | |
| Spindle Nose Taper | ASA | A2-11 | - | A2-5(A2-6) | |
| Spindle Drive Type | | Belt | - | Bulit-in | |
| Chuck Diameter | inch | 15 | - | 6 (8) | |
| Spindle Speed | rpm | 2500 | - | 5000 (4500) | |
| Bar Capacity | mm | 105 | - | 52 (65) | |
| MOTOR | | | | | |
| Spindle 1 Motor Power (Cont./30min) | kW | 15/18.5 | 11/15 (15/18.5) | | |
| Spindle 2 Motor Power (Cont./30min) | kW | 15/18.5 | 11/15 | | |
| Rotary Tool Driver Power | kW | - | 3.7/5.5 | | |
| TURRET | | | | | |
| Tooling system | | BMT-55N | BMT-40 | | |
| Number Of Tools | station | 12+12 | 16+16 | | |
| Square Tool Shank Size | mm | 25 | 20 | | |
| Round Tool Shank Size | mm | 40 | 32 | | |
| Max. Rotary Tool Speed | rpm | - | 6000 | | |
| TRAVELS | | | | | |
| X1/X2 axis Travel | mm | 210 | 210 | | |
| Z1/Z2 axis Travel | mm | 500 | 840 | | |
| Y1/Y2 axis Travel | mm | - | - | - | -45/+65 |
| B-axis Travel | mm | 1200 | - | 920 | |
| FEED RATES | | | | | |
| X1/X2 axis Rapid Traverse Rate | m/min | 20 | | 30 | |
| Z1/Z2 axis Rapid Traverse Rate | m/min | 24 | 36 | 40 | 30 |
| Y1/Y2 axis Rapid Traverse Rate | m/min | - | - | - | 30 |
| B-axis Rapid Traverse Rate | m/min | 24 | - | 40 | |
| TAILSTOCK | | | | | |
| Tailstock Body Travel | mm | - | 770 | - | |
| Quill Travel | mm | - | 120 | - | |
| Quill Diameter | mm | - | 85 | - | |
| Quill Taper | MT# | - | 5 | - | |
| DIMENSIONS | | | | | |
| Machine dimension (L x W x H) | m | 5.6 x 2.6 x 2.4 | 5.1 x 2.4 x 2.4 | 4.7 x 2.4 x 2.3 | |
| Machine Weight | kg | 11000 | 10500 | | 11000 |

■The manufacturer reserves the right to modify the design, specifications, mechanisms, etc. to improve the performance of the machine without prior notice. All the specifications shown above are just for reference.