

# ***MULTUS $\varnothing$ Series***

***MULTUS  $\varnothing$ 3000***

***MULTUS  $\varnothing$ 4000***

***MULTUS  $\varnothing$ 5000***

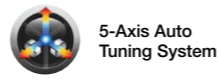
Intelligent Multitasking Machines



# MULTUS U Series

MULTUS U3000 / MULTUS U4000 / MULTUS U5000

Intelligent Multitasking Machines



Highly accurate, rigid, hi-tech, process-intensive, and eco-friendly

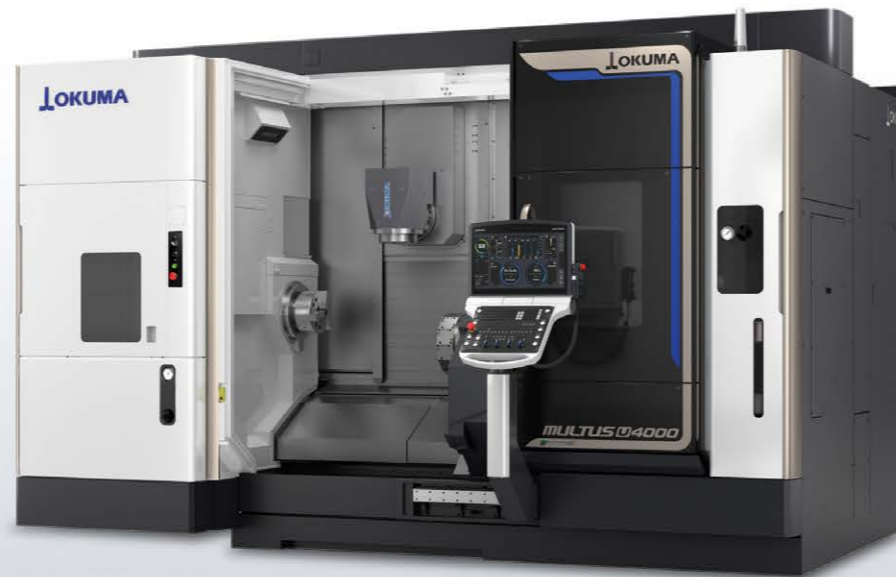
All that's required packed into the ultimate multitasking machine

- Flexible machining from all directions
- Max productivity for milling and turning
- 2 saddles (upper and lower turrets) for minimum cycle times
- Process-intensive machining that goes beyond the framework of multitasking machines
- Both highly accurate and eco-friendly
- Maximizing machine tool performance
- Shorter lead-times with easy first part machining



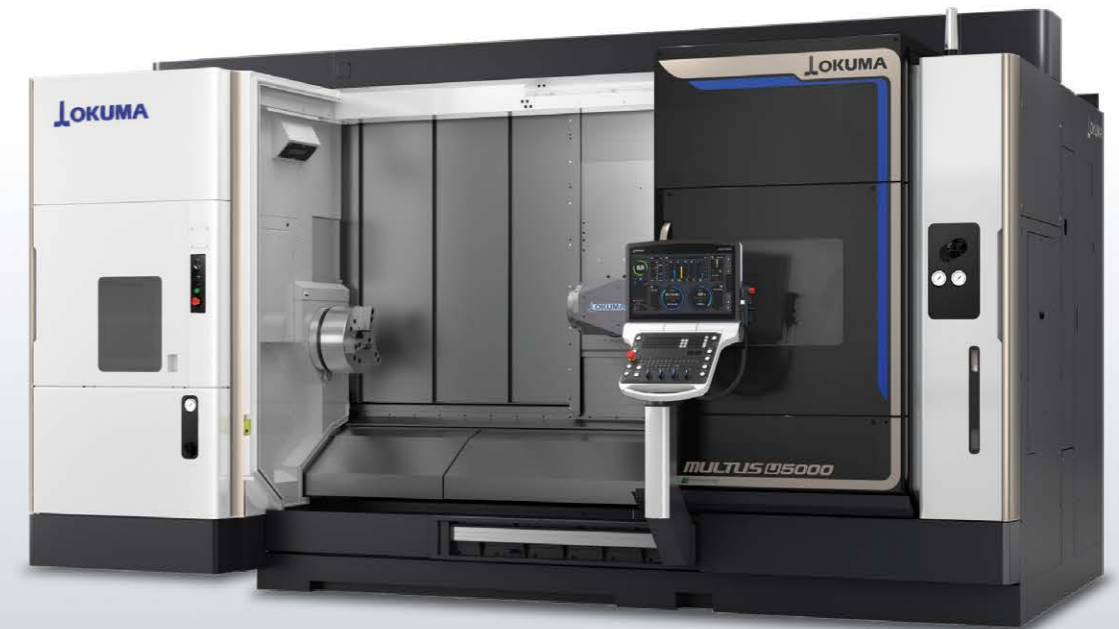
**MULTUS U3000**

<1SW DBC: 1000>



**MULTUS U4000**

<2SW DBC: 1500>



**MULTUS U5000**

<2SC DBC: 2000>

Photographs and images used in this brochure may include optional equipment.

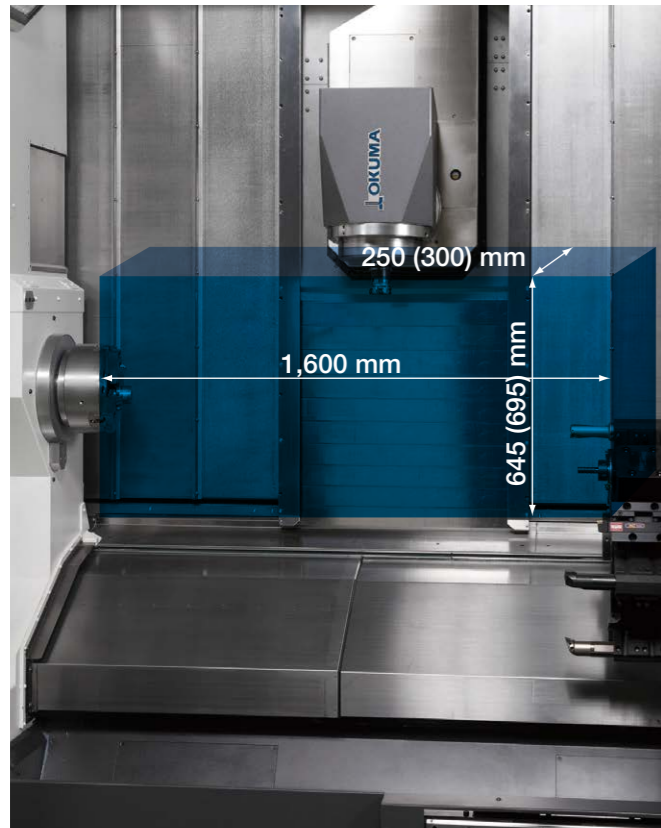
29 diverse variations in all

Spec extension		MULTUS U3000		MULTUS U4000		MULTUS U5000		
Distance between centers (DBC)		1000	1500	1500	2000	1500	2000	3000
Upper turret	Chuck work (1ST)	●	—	—	—	—	—	—
	Tailstock (1SC)	●	●	●	●	●	●	●
	Opposing spindles (1SW)	●	●	●	●	●	●	●
Upper and lower turrets	Tailstock (2SC)	●	●	●	●	●	●	●
	Opposing spindles (2SW)	●	●	●	●	●	●	●

Door shape differs between upper turret specifications and upper and lower turret specifications.

# Flexible machining from all directions

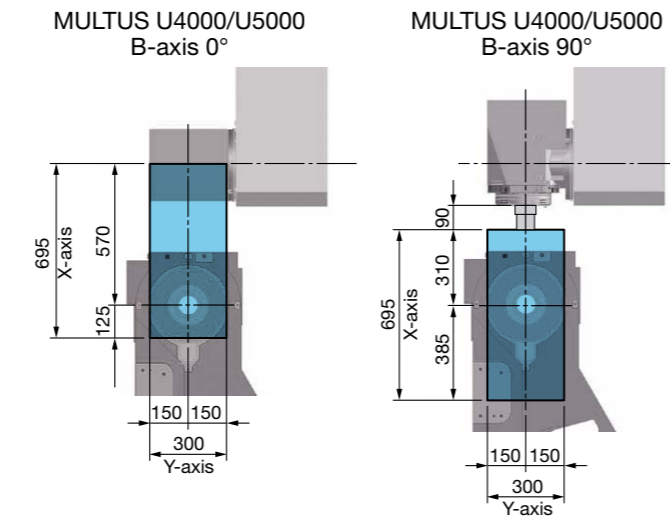
## Tough cutting in entire Y-axis range



DBC 1500 illustration  
( ) figures for the MULTUS U4000/U5000

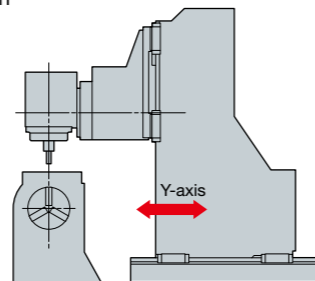
With the ideal, large work envelope for lots of milling of complex parts. The class best Y-axis travel is fully utilized with a highly rigid traveling column, for powerful cutting along the entire Y-axis.

### X-/Y-axis working range



Unit: mm

### Traveling column



## Wide B-axis swing: 240°

The wide 240-degree swing of the B-axis spindle allows it to have equivalent machining areas for both the main and opposing spindle. With the NC B-axis, roller gears are used to achieve "0" backlash during B-axis drive, and highly accurate 5-axis machining.

## Superb C-axis positioning accuracy: 0.0001° control

Highly accurate C-axis control function is used for both the main and opposing spindles. This will support end-users requiring very accurate machining of component shapes that are quite complex. Moreover, heavy-duty milling, with a solid retention mechanism, makes possible applications that require both high accuracy and high efficiency.



## High-efficiency production for a wide variety of machining applications with process-intensive machining



### Spline machining

Done by mounting a hob cutter on a milling tool spindle and synchronizing it to C-axis rotation (optional hobbing function).

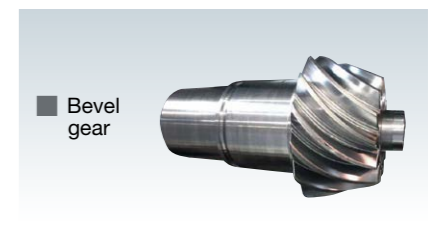
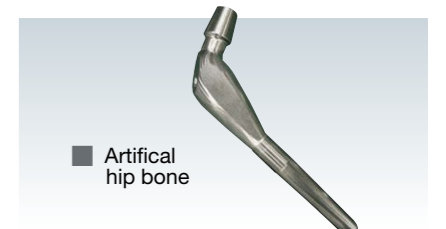


### Cutting a spiral bevel gear

C-/B-axis indexing with X-Y-Z axes generated to cut a spiral bevel gear.



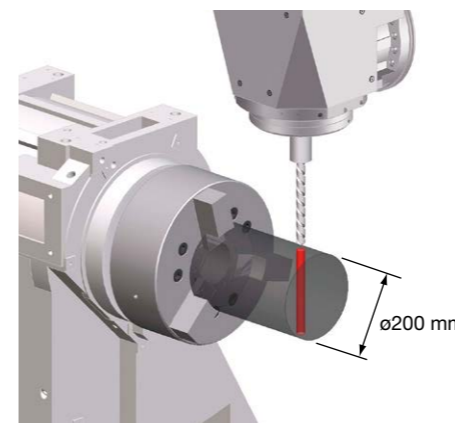
## Workpiece samples



## Machining examples

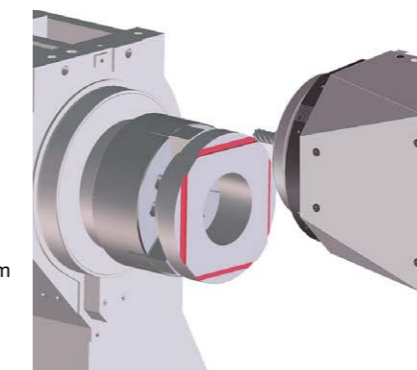
### Thru-holes up to ø200 mm

Long X-axis travel makes possible side-face thru-holes in ø200 mm workpieces—without C-axis rotation. (MULTUS U4000/U5000)



### Maximum □230 mm contouring

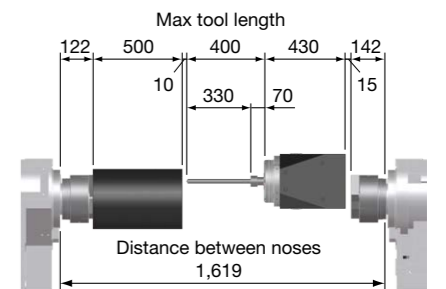
Cutting the outline of a □230 mm workpiece without C-axis rotation is also possible. Square parts can be cut with machining-center-equivalent geometric accuracy. (MULTUS U4000/U5000)



When using a ø20 mm end mill

### Deep drilling: 330 mm

With the DBC 1000 machine, 500 mm long workpieces can be drilled (330 mm tool projection) to make deep holes. (MULTUS U3000 with 1SW specifications, standard main and opposing spindles)



Unit: mm



# Outstanding productivity for turning and milling

## Achieving highly efficient cutting of difficult-to-machine materials

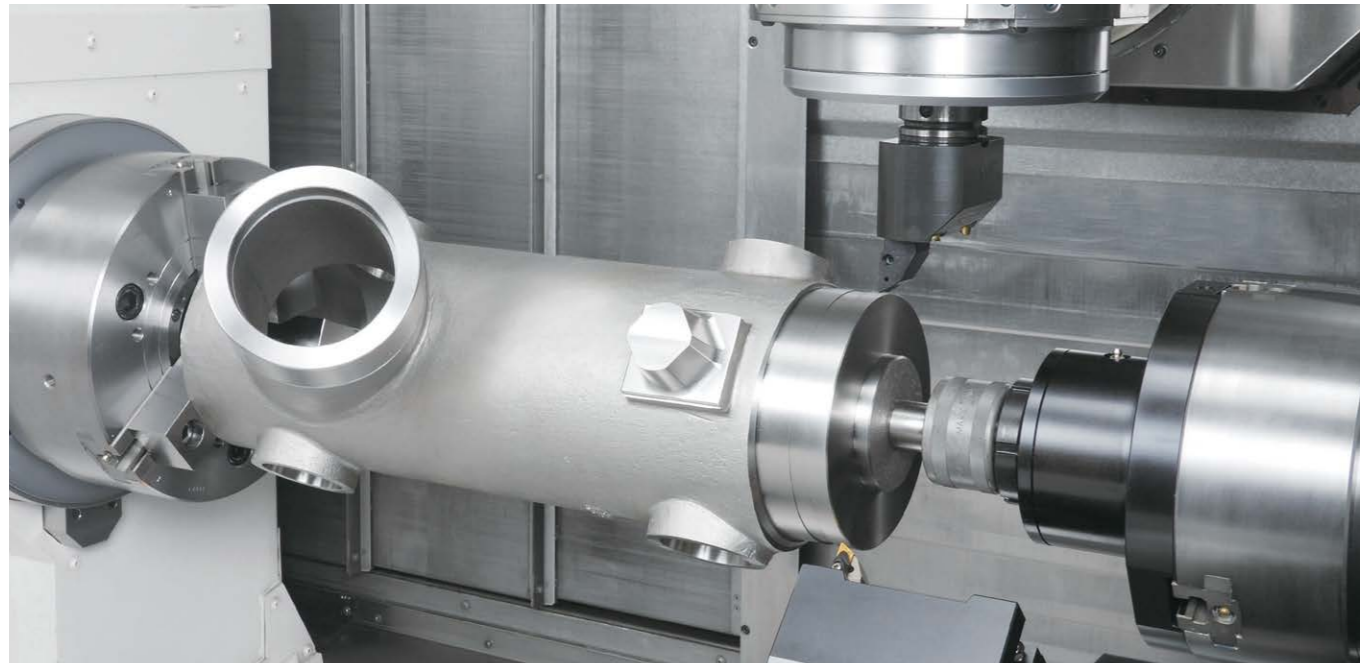
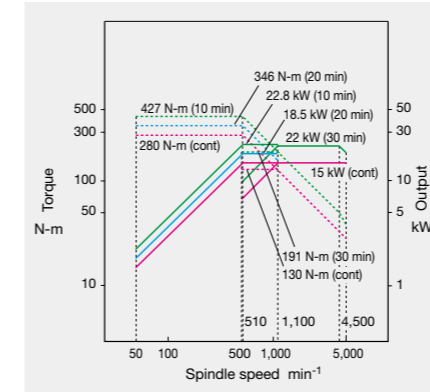


Photo shows a tailstock attachment mounted on the opposing spindle with tailstock control.

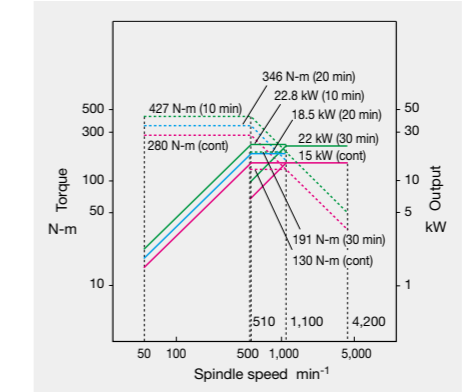
	MULTUS U3000	MULTUS U4000/MULTUS U5000
<b>Turning</b>	<b>Heavy-duty: 4.8 mm<sup>2</sup></b>	<b>Heavy-duty: 5.0 mm<sup>2</sup> (ø160 spindle)*</b>
● OD (S45C)	Cutting Speed 150 m/min Cutting depth 8 mm Feed rate 0.6 mm/rev	150 m/min 8 mm 0.625 mm/rev
● Drilling (S45C)	ø63 Throwaway drill Cutting Speed 150 m/min Feed rate 0.23 mm/rev	ø63 Throwaway drill 150 m/min 0.23 mm/rev
<b>Milling</b>	<b>Chip volume: 604 cm<sup>3</sup>/min</b>	<b>Chip volume: 604 cm<sup>3</sup>/min</b>
● End milling (S45C)	Tooling ø20 end mill 7-flute Cutting Speed 192 m/min Cutting depth 6.5 × 20 mm Feed rate 1.52 mm/rev Removal Rate 604 cm <sup>3</sup> /min	ø20 end mill 7-flute 192 m/min 6.5 × 20 mm 1.52 mm/rev 604 cm <sup>3</sup> /min
● Face milling (S45C)	Tooling ø50 milling cutter 5-flute Cutting Speed 300 m/min Cutting depth 6 × 35 mm Feed rate 2,865 mm/min Removal Rate 602 cm <sup>3</sup> /min	ø50 milling cutter 5-flute 300 m/min 6 × 35 mm 2,865 mm/min 602 cm <sup>3</sup> /min
● Drilling (S45C)	ø50 Throwaway drill Cutting Speed 150 m/min Feed rate 0.12 mm/rev	ø50 Throwaway drill 150 m/min 0.12 mm/rev
● Tapping (S45C)	TAP M30 P3.5	M30 P3.5

\* Optional on MULTUS U4000, standard on MULTUS U5000  
Note: The "actual data" referred to above for this brochure represent examples, and may not be obtained due to differences in specifications, environmental conditions during measurement, tooling, cutting, and other conditions.

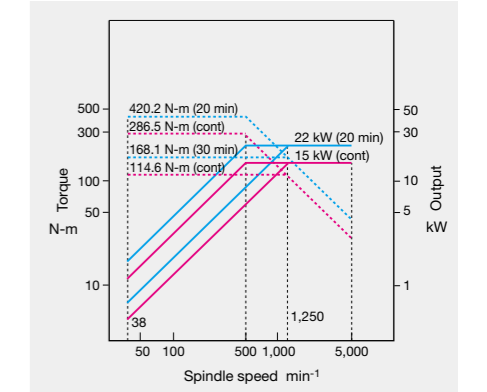
MULTUS U3000 ø120-mm Std spindle  
ø120-mm Standard opposing spindle (1S)  
● Spindle speed 5,000 min<sup>-1</sup>  
● Output 22/15 kW (30 min/cont)  
● Torque 427/280 N-m (10 min/cont)



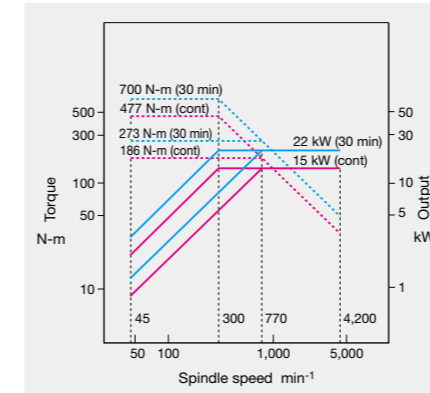
MULTUS U3000 ø140-mm Big-Bore spindle  
ø120-mm Opposing Big-Bore spindle (1S)  
● Spindle speed 4,200 min<sup>-1</sup>  
● Output 22/15 kW (30 min/cont)  
● Torque 427/280 N-m (10 min/cont)



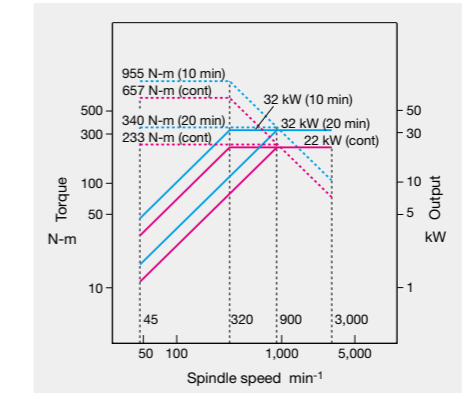
MULTUS U3000  
ø100-mm Standard opposing spindle (2S)  
● Spindle speed 5,000 min<sup>-1</sup>  
● Output 22/15 kW (20 min/cont)  
● Torque 420.2/286.5 N-m (20 min/cont)



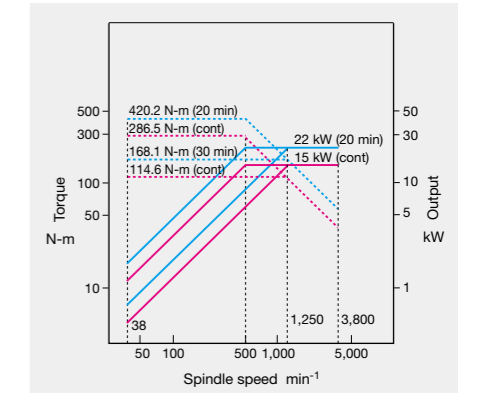
MULTUS U4000 ø140-mm Std spindle  
ø140-mm Standard opposing spindle (1S)  
● Spindle speed 4,200 min<sup>-1</sup>  
● Output 22/15 kW (30 min/cont)  
● Torque 700/477 N-m (30 min/cont)



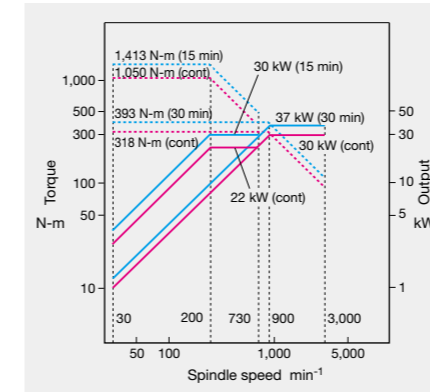
MULTUS U4000 ø160-mm Big-Bore spindle  
ø160-mm Opposing Big-Bore spindle (1S)  
MULTUS U5000  
ø160-mm Standard opposing spindle (1S)  
● Spindle speed 3,000 min<sup>-1</sup>  
● Output 32/22 kW (20 min/cont)  
● Torque 955/657 N-m (10 min/cont)



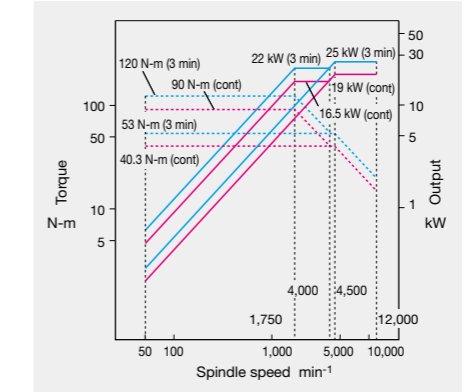
MULTUS U4000  
ø120-mm Standard opposing spindle (2S)  
MULTUS U5000  
ø120-mm Standard opposing spindle (2S)  
● Spindle speed 3,800 min<sup>-1</sup>  
● Output 22/15 kW (20 min/cont)  
● Torque 420.2/286.5 N-m (20 min/cont)



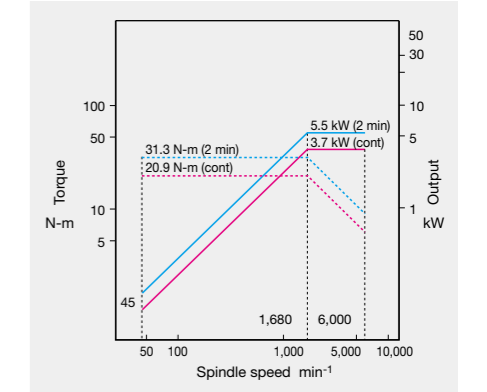
MULTUS U5000 ø160-mm Std spindle  
● Spindle speed 3,000 min<sup>-1</sup>  
● Output 37/30 kW (30 min/cont)  
● Torque 1,413/1,050 N-m (15 min/cont)



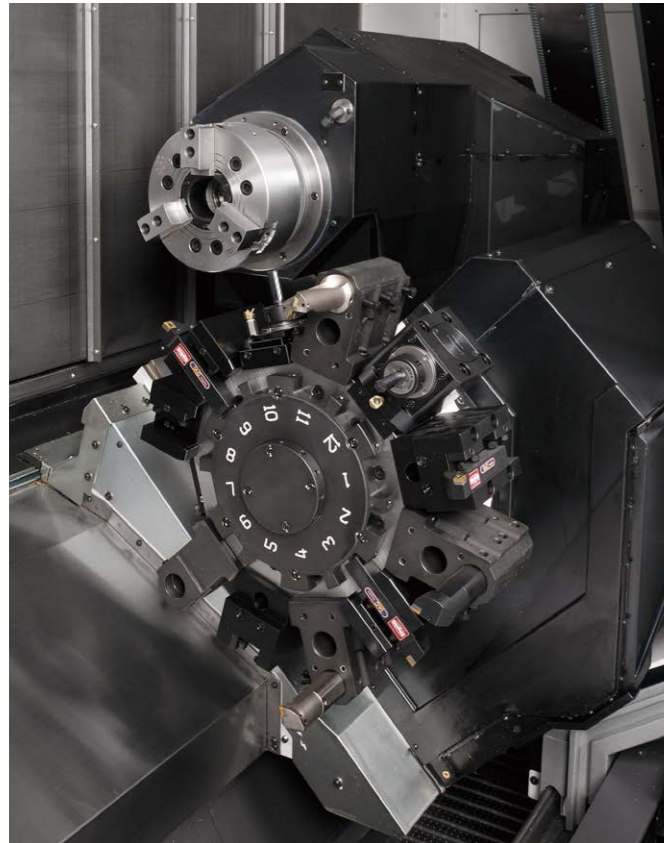
MULTUS U3000/U4000/U5000  
Upper turret M-spindle  
● Spindle speed 12,000 min<sup>-1</sup>  
● Output 25/19 kW (3 min/cont)  
● Torque 120/90 N-m (3 min/cont)



MULTUS U3000/U4000/U5000  
Lower turret M-spindle  
● Spindle speed 6,000 min<sup>-1</sup>  
● Output 5.5/3.7 kW (2 min/cont)  
● Torque 31.3/20.9 N-m (2 min/cont)



## 2 saddles for minimum cycle times



### Powerful cuts from a rigid lower turret

In variable-mix, variable-volume production, cycle times can be minimized, and high productivity can be achieved with a 2-saddle machine. The lower turret is very sturdy, and supports real milling and turning jobs. (The opposing spindle capacity and working range near the opposing spindle differ with 1SW and 2SW specifications.)

#### Turning specs

Many different types of machining are possible with 12 tools.

- Turret type: V12 turret
- OD tool size: □25 mm
- Boring bar size: ø40 mm

#### Multitasking specifications

(Selectable for opposing spindle specifications only)

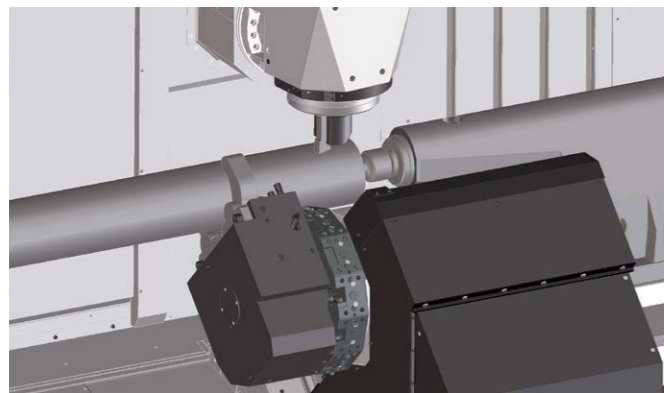
A milling tool can be attached to the lower turret.

- Turret type: V12 multitasking turret
- Milling tool spindle speed: 6,000 min<sup>-1</sup>
- Milling tool spindle motor: 5.5/3.7 kW (2 min/cont)

## Lower turret makes many types of machining possible

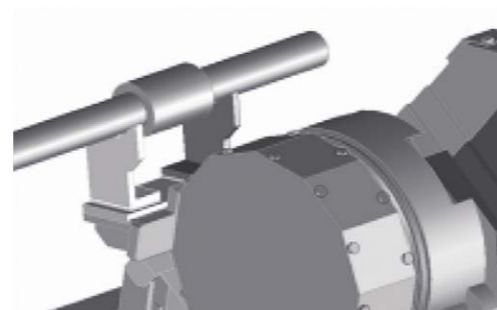
#### Steadyrest attachment (option)

A steadyrest can be attached to the lower turret to support the workpiece. Long or single-side clamped workpieces can then be cut with no chatter occurring. (Attached to lower turret turning specifications)



#### Mounted workrest (option)

A workrest can also be mounted to the lower turret, to help automate workpiece load/unload operations—and reduce operator burden.



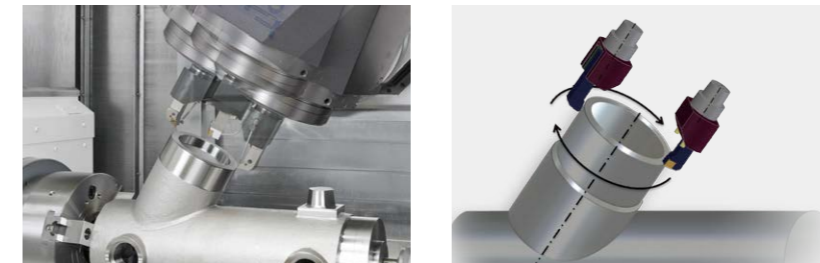
#### Tailstock attachment (option)

A tailstock attachment can be mounted on either side of the lower turret; facing the main spindle on the left or the opposing spindle on the right. The tailstock attachment uses a revolving center.

## Achieves process-intensive machining beyond the framework of multitasking machines

### Turn-Cut (option) Sloped axis turning

Turn-Cut is an original Okuma technology that enables turning with milling spindle. The circular turning of the feed axis and the spindle indexing angle are simultaneously controlled so that the tool edge is always facing the center of the milling spindle circular turning. Sloped axis turning can be done by sloping the B-axis. Moreover, machining of any diameter can be done with a single tool. Inside and outside diameter machining that is larger than the maximum tool diameter can be done. Note: Turn-Cut specifications require technical consultations.



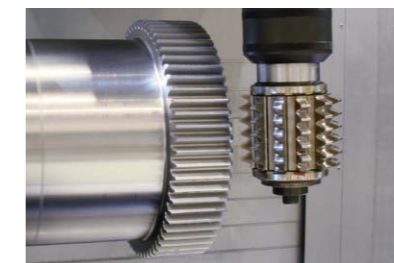
Turning can be done on a sloped axis

### Gear Machining Package (option) High accuracy gear cutting with a multitasking machine

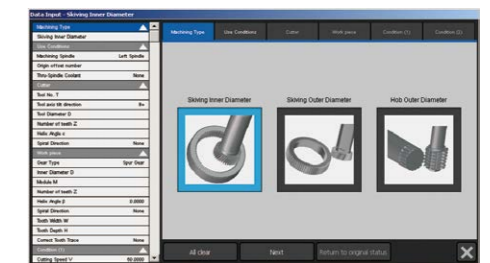
Gear cutting that previously required complex programming can now be done with ease. With easy programming, simply input the tool type, gear data, and cutting conditions to achieve highly accurate machining, reducing programming time to about one-tenth that of manual input. Process-intensive machining is achieved, including the gear cutting that used to be done on expensive special-purpose machines.



Skiving (OD/ID splines)



Hobbing



Input screen

### NC Gage (option) 3D measuring for multitasking machines

Dimensions and geometrical accuracy, such as hole position and flatness, can be measured on the machine. There is no need to transport and load/unload workpieces or to set up for each measurement point, significantly reducing the lead time.

More than 20 types of geometric tolerance and positional dimension measurement functions are provided, and measurement programs are automatically generated through intuitive teaching. Storage of measurement results data is possible.





# Highly accurate and eco-friendly



Okuma has worked to reduce energy consumption in order to achieve carbon neutrality at the three factories in Japan which are our main production bases.

We have realized high productivity through automation and process-intensive machining, in addition to high-accuracy machining, and we then introduced the use of green energy to transform the three domestic factories into carbon-neutral factories.

"Green-Smart Machines" is our definition of Okuma's intelligent machine tools, which autonomously achieve stable dimensional accuracy and reduced energy consumption, to support environmentally friendly production. Our policy is to deploy "Green-Smart Machines" fully, to help achieve a carbon-free society.

Starting with products manufactured at those carbon-neutral factories and supplying them all over the world, we will work together with our customers to help solve the social issues faced by the manufacturing industry.

## Green-Smart Machines are environmentally friendly

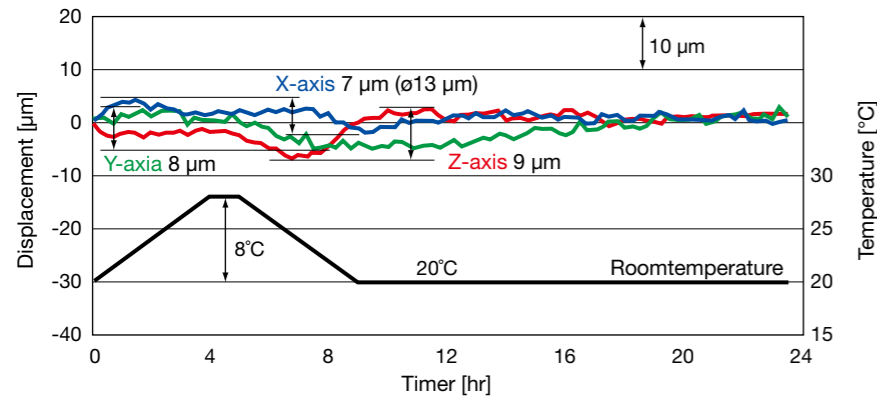
products that autonomously achieve stable dimensional accuracies and reduced energy consumption.

## Thermo-Friendly Concept

Thermal deformation over time: less than 10 μm

Okuma's "Thermo-friendly" concept enables remarkable machining accuracy through original structural design and thermal deformation control technology. Free from troublesome dimensional compensation and warm-up, it exhibits excellent dimensional stability even during consecutive operation over long periods and environmental temperature change in the plant.

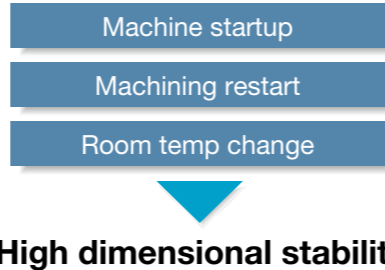
### Less than 10 μm Thermal deformation over time



[Operating conditions]

Main spindle	3,800 min <sup>-1</sup>	2.5 min
Milling tool spindle	6,000 min <sup>-1</sup>	6 min
	10,000 min <sup>-1</sup>	6 min
Interval		0.5 min
Cycle time	Total	15 min
Coolant: Used		

Note: The data mentioned in this brochure are "actual data" and do not represent guaranteed accuracies.



## Eliminate waste with the Thermo-Friendly Concept

In addition to maintaining high dimensional accuracy when room temperature changes, Okuma's Thermo-Friendly Concept provides high dimensional accuracy during machine startup and machining restart.

To stabilize thermal deformation, warming-up time is shortened and the burden of dimensional correction during machining restart is reduced.

## TAS-C

(Thermo Active Stabilizer—Construction)

The machine is optimally controlled and machining accuracy is maintained when the ambient temperature changes.

## TAS-S

(Thermo Active Stabilizer—Spindle)

Even when the spindle speed changes frequently, the thermal deformation of the milling tool spindle is accurately controlled.

# ECO suite plus

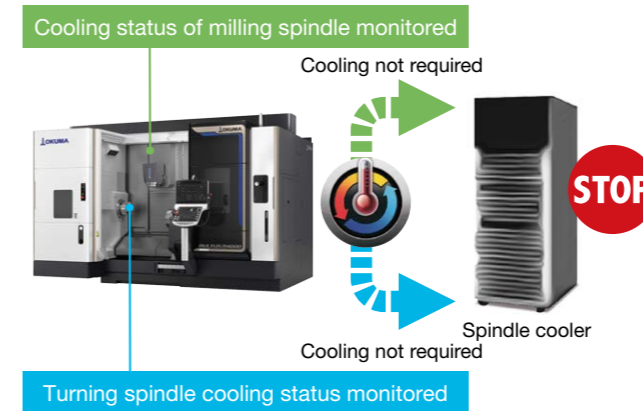
A system for an energy-saving society

## ECO Idling Stop

Accuracy ensured, cooler off

All auxiliary equipment when not needed (most of factory power consumption), can be turned off. The cooling system necessary for maintaining accuracy uses Thermo-Friendly Concept technology, and the machine itself decides when to cool and stop idling while maintaining high accuracy.

With ECO suite plus, the machine automatically detects the operating status, eliminating the need to push buttons while reducing carbon dioxide emission as much as possible without operator awareness.



## ECO Operation

Peripheral equipment runs only when needed

By using only the required peripherals (chip conveyor, mist collector), energy-saving operations that also maintain high productivity are possible. ECO suite plus enables more detailed tuning of "operation patterns" to thoroughly reduce carbon dioxide emission.

ECO PARAMETER	ECO IDLE STOP (1/4)	ECO OPERATION
ECO IDLE STOP ELAPSED TIME	000:00:00	REMAINING TIME UNTIL ECO IDLE STOP READY: 12:46
Chip conveyor interval control	PARAMETER: OFF	UNIT: [min]
Chip conveyor interval:active time	100	[min]
Chip conveyor interval:suspended time	200	[min]

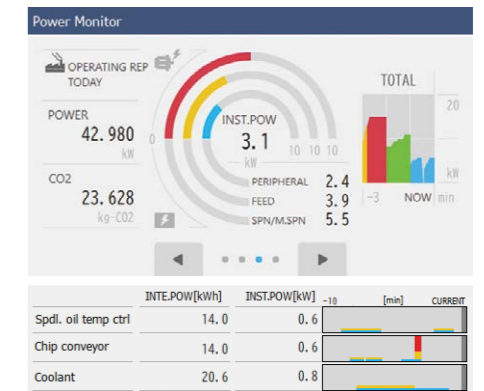
## ECO Power Monitor

Confirming energy savings and analyzing reductions

Power is shown individually for spindle, feed axes, and auxiliaries on the OSP operation screen. In addition to regenerative power, the energy-saving benefits from auxiliary equipment stopped with ECO Idling Stop can be confirmed on the spot.

[On-the-spot checks of operating status, power consumption, and carbon dioxide emissions]

Three phases of visualization (view, record, and analyze) and energy-saving functions, which make it possible to analyze even the operating status of each device, support the decarbonization cycle.



[Analysis of carbon dioxide emissions and improvement of multitasking machine movement]

With ECO suite plus, detailed data analysis of carbon dioxide emissions for each device is possible on a PC.

[Example of auxiliary power display using One-Touch Spreadsheet (option)]



\* The spreadsheet file for data analysis needs to be prepared by the customer.

## Effects of ECO suite plus

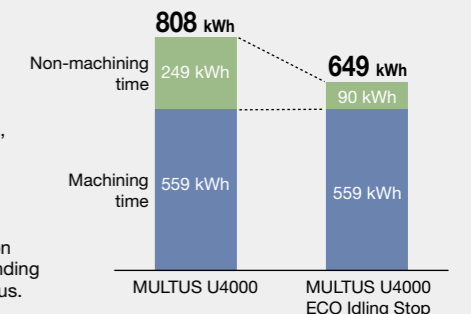
Energy consumption during non-machining time greatly reduced with "ECO Idling Stop," which shuts down each piece of peripheral equipment not in use.

## Reduction in power consumption (example)

<Monthly power consumption>  
 ● Operating time 94 h, Non-operating time 66 h,  
 Total 160 h (8 × 20 days)

<Non-cutting time>  
**159 kWh (64%) reduction**

Note: Calculated from actual power consumption data. Power consumption will differ depending on machine specifications and usage status.



# Maximizing machine tool performance



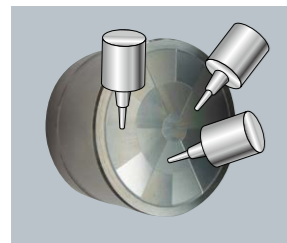
## 5-Axis Auto Tuning System (option) Gauging and compensation of geometric error

On 5-axis machines there is "geometric error," such as spindle misalignment, that have huge effects on machining accuracy. The 5-Axis Auto Tuning System measures geometric error with a touch probe and datum sphere, and tunes 5-axis machines for better operating accuracy through compensation control using the measurement results. This helps to achieve a higher level of 5-axis machining accuracy.

Note: May not be applicable depending on the specifications of the fixtures, such as chucks (jaws) and steady rests. It can also be applied to the opposing spindle side.



### Comparison of accuracy using multi-sided machined samples



Manual adjustment without 5-AATS  
Machining surface error  
**Max 25  $\mu\text{m}$**

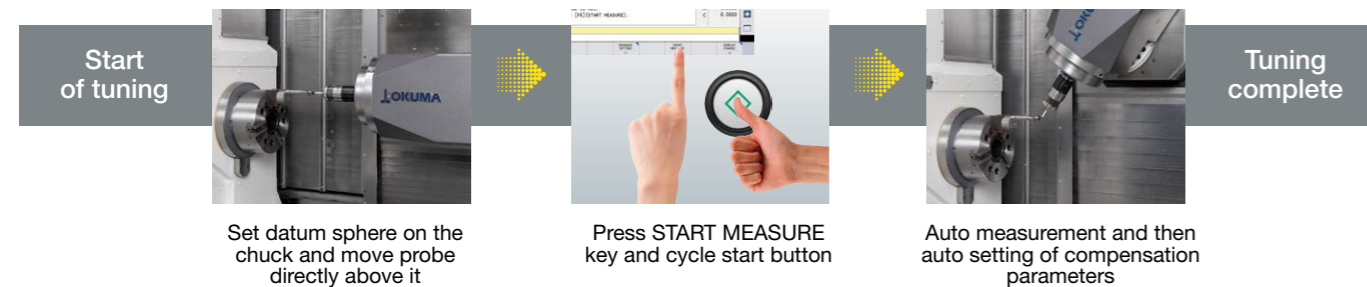
After using 5-AATS  
**Max 10  $\mu\text{m}$**   
(Actual data with MULTUS U4000)

In multi-sided machining with tools inclined at different angles for each surface, accuracy is improved after use of the 5-Axis Auto Tuning System.

Note: The data mentioned in this brochure are "actual data" and do not represent guaranteed accuracies.

### Anyone can automatically check for geometric error quickly and easily

Manual measurement and adjustment of geometric error is bothersome and time-consuming. The 5-Axis Auto Tuning System conducts automatic tuning to correct geometric error in a short time.

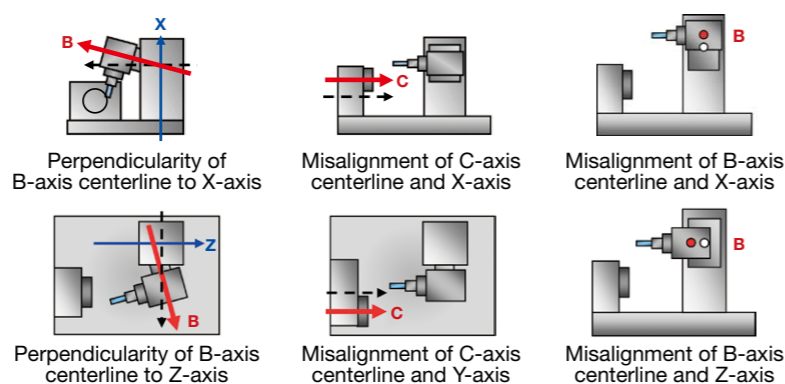


### Examples of geometric error

In 5-axis machining, slight errors resulting from setup and machine structure affect the machining accuracy. One of the main reasons for this is the geometric errors related to the operation and position of each axis.

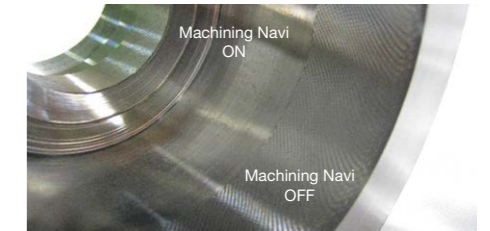
Geometric errors vary slightly due to the change in conditions and ambient temperature (thermal deformation) as well as the floor surface when installed in a plant.

It is necessary to correct geometric errors, as needed and in a short amount of time, in the environment where the machine is used.



## Machining Navi Cutting Conditions Search Function (option) With optimal cutting conditions: longer tool life, shorter cycle time

Machining Navi instantly searches for the optimum cutting conditions and "visualizes" the machining status to help maximize machine and tooling capabilities, and provide improvements in productivity.



### For turning

#### Machining Navi L-g II (guidance)

Chatter-free applications for lathes

Chatter in during turning can be suppressed by changing spindle speeds to the ideal amplitude and wave cycle.

#### Machining Navi T-g (threading)

Threading chatter can be easily controlled by anyone

In the threading cycle, chatter during threading is controlled through appropriate change of the spindle speed in each pass.

### For milling

#### Machining Navi M-g II +

(Optimum spindle speed/harmonic spindle speed control)

Adjust cutting conditions while monitoring the data

From chatter noise picked up by the microphone, Machining Navi will display the best options for chatter-free spindle speed. The operator can select a recommended speed and immediately confirm the result.

#### Machining Navi M-i

(Intelligently optimized spindle speed control)

Simple, auto-mode—leave it to the machine  
Finding optimum cutting conditions quickly

Chatter vibration is measured by built-in sensors, and spindle speed is automatically changed to the optimum speed. In addition, advanced graphics of the optimal cutting conditions represent effective alternatives to suppress various chatter characteristics throughout the low to high speed zones.

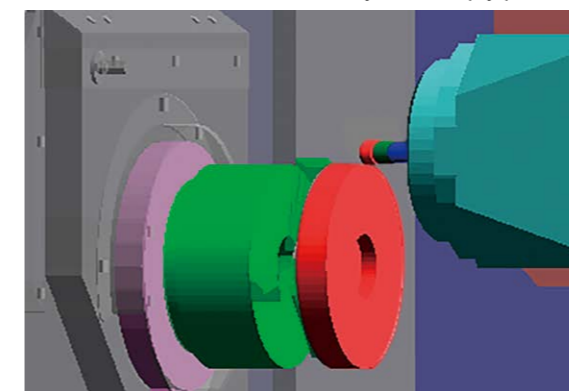


## Collision Avoidance System Setup, trial cut times reduced by 40%—preventing collisions

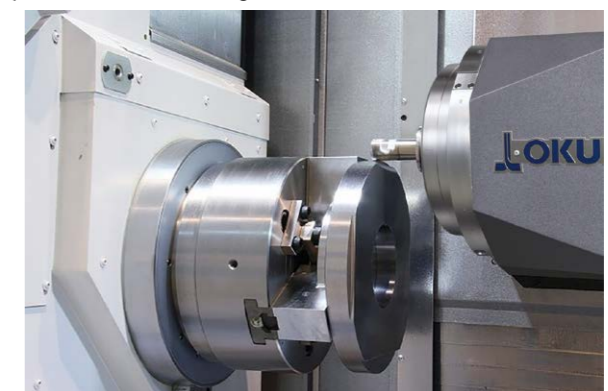
NC controller (OSP) with 3D model data of machine components—workpiece, tool, chuck, fixture, headstock, turret, tailstock—performs real time simulation just ahead of actual machine movements. It checks for interference or collisions, and stops the machine movement immediately before collision. Machinists (novice or pro) will benefit from reduced setup and trial machining times, and the confidence to focus on making parts. Troublesome settings eliminated. With easy tool preps, you can use the preset tool data just as it is.

### Eliminate collision-related machine down time

When a multitasking machine breaks down by collisions, both L and M machining stop; causing large productivity losses. The Collision Avoidance System simply prevents this problem from occurring.



Virtual machine (advance simulation)



Actual machine



# Shorter lead-times with easy first part machining

## With keyboard operations reduced by: 1/2

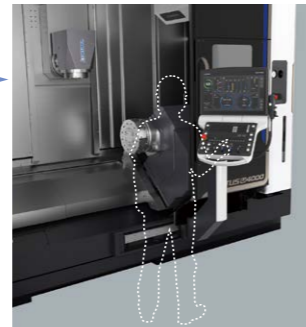
For multitasking machines that handle high-mix low volume production, the Okuma Control considerably reduces the cost and time required to perform first-part trial cuts. Tool preparations, forming soft-jaws, zero offsets, all of the related machining preps required for the job can be done much easier simply because the CNC was produced by a machine tool manufacturer who has the experience and know-how to reduce keyboard input operations by half compared with the previous control.

### Easy tool preparations



Just after loading a tool in the machine, simply select it from among the registered tools. Auto tool changer (ATC) manual operation does not require inputting the tool number. Just select the tool from the list and press the function key. (Touch Setter is optional.)

### Define machining requirements



### Forming soft jaws



### Easy zero offsets and machining starts



A simple function key operation is all it takes to shift a zero offset to either the left or right end of a workpiece. The required zero offset will be calculated automatically based on jaw and workpiece lengths. (When the tool offset is set with reference to the turret tool mounting surface)

## Work load reduced by operator-friendly designing

### Eliminates troublesome tool checks

Tools can be easily and quickly loaded from the machine front; freeing the operator for other production tasks.



### Reduced setup times

With considerably improved access to the spindle, and easier workpiece loading/unloading.



### Maintenance

Service functions are concentrated in the maintenance area on the front side of the machine—a machine layout designed to make daily inspections easier.



## Machine Specifications

Item		MULTUS U3000																	
		1ST		1SC		1SW		2SC		2SW									
		1000	1000	1500	1000	1500	1000	1500	1000	1500									
Capacity	Swing over saddle	mm (in) ø650 (25.59)						Upper: ø650 (25.59), Lower: ø320 (12.60)											
	Distance between nose and center (between noses)	mm (in) -		1,338.7 (52.70)		1,746.7 (68.77)		1,619 (63.74)		1,888 (74.33)		1,186.7 (46.72)		1,686.7 (66.41)		1,399 (55.08)		1,883 (74.13)	
	Max machining dia	mm (in) ø650 (25.59)						Upper: ø650 (25.59)*1, Lower: ø320 (12.60)											
	Max machining length	mm (in) -		1,000 (39.37)		1,500 (59.06)		1,000 (39.37)		1,500 (59.06)		1,000 (39.37)		1,500 (59.06)		1,000 (39.37)		1,500 (59.06)	
Travels	X-axis	mm (in) 645 (25.39)						Upper: 645 (25.39), Lower: 235 (9.25)											
	Z-axis	upper: mm (in) 1,100 (43.31)		1,600 (62.99)		1,100 (43.31)		1,600 (62.99)		1,100 (43.31)		1,600 (62.99)		1,100 (43.31)		1,600 (62.99)			
		lower: mm (in) -		-		-		961 (37.83)		1,461 (57.52)		1,100 (43.31)		1,584 (62.36)					
	Y-axis	mm (in) 250 (9.84) (±125 (4.92))																	
	W-axis	mm (in) -		1,325 (52.17)		1,594 (62.76)		-		1,100 (43.31)		1,584 (62.36)							
	B-axis / indexing angle	degree -30 to +210 (min controlled angle 0.001)																	
C-axis / indexing angle	degree 360 (min controlled angle 0.0001)																		
Spindle	Speed	min <sup>-1</sup> 50 to 5,000																	
	Speed ranges	2 auto ranges (2-speed motor coil switching)																	
	Nose shape	JIS A2-6																	
	Taper bore / Bearing dia	mm (in) ø80/ø120 (3.15/4.72)																	
Opposing spindle *2	Speed	mm (in) -		50 to 5,000		-		38 to 5,000											
	Speed ranges	-		2 auto ranges (2-speed motor coil switching)		-		2 auto ranges (2-speed motor coil switching)											
	Nose shape	-		JIS A2-6		-		JIS A2-6											
	Taper bore / Bearing dia	-		ø80/ø120 (3.15/4.72)		-		ø62/ø100 (2.44/3.94)											
Turret (milling tool spindle)	Type	H1						Upper: H1, Lower: V12											
	No. of tools	L / M: 1						Upper: L / M: 1, Lower: 12											
	Tool shank dimensions / ID tool shank diameter	mm (in) □25 / ø40 (1 × 1 / 1-1/2)																	
	Milling tool spindle	min <sup>-1</sup> Upper: 50 to 12,000																	
Feed rates	Milling tool spindle speed ranges	Upper: 2 auto ranges (2-speed motor coil switching)																	
	X-, Z-, Y-axis	upper: m/min		-		X: 50, Z: 50, Y: 40		-		X: 25, Z: 40									
		lower: m/min		-		-		-		-									
	W-axis	m/min -		20 (tailstock) 12 (tailstock)		30		20 (tailstock) 12 (tailstock)		30									
Tailstock	C-, B-axis	min <sup>-1</sup> C: 200, B: 30																	
	Tapered bore	mm (in) -		MT No. 5 (revolving center)		-		MT No. 5 (revolving center)		-									
Auto tool changer (ATC)	Travel	mm (in) -		1,186 (46.69)		1,594 (62.76)		-		961 (37.83) 1,359.5 (53.52)		-							
	Tool shank	HSK-A63																	
	No. of tools	tools 40																	
	Max tool dia	mm (in) ø90 (3.54) (w/o adjacent tools: ø130 (5.12))																	
Motor	Max tool length	mm (in) 400 (15.75) (from gauge line)																	
	Max tool mass	kg (lb) 10 (22)																	
	Main spindle motor	kW (hp) 22/15 (30/20) (30 min/cont)																	
	Opposing spindle motor	kW (hp) -		22/15 (30/20) (30 min/cont)		-		22/15 (30/20) (20 min/cont)											
	Milling tool spindle motor	kW (hp) 25/19 (33/25) (3 min/cont)																	
	X-, Z-, Y-, B-axis motors	kW (hp) X: 5.2, Z: 4.6, Y: 3.5, B: 3.0						XA: 5.2, ZA: 4.6, Y: 3.5, B: 3.0 (XA: 6.9, ZA: 6.1, Y: 4.7, B: 4.0)											
Machine size		(X: 6.9, Z: 6.1, Y: 4.7, B: 4.0)						XB: 3.5, ZB: 3.5 (XB: 4.7, ZB: 4.7) (DBC 1000)/4.6 (6.1) (DBC 1500)											
	W-axis motor	kW (hp) -		2.8 (3.7) (tailstock)		3.5 (4.7)		4.6 (6.1)		2.8 (3.7) (tailstock)		3.5 (4.7)		4.6 (6.1)					
	Coolant motor (50Hz/60Hz)	kW (hp) 0.25/0.25 (0.33/0.33) × 1, 0.55/0.75 (0.73/1.0) × 3																	
	Height	mm (in) 2,955 (116.34)						3,030 (119.29)											
CNC	Floor space	mm × mm (in) DBC 1000: 4,925 × 2,995 (193.90 × 117.91)						DBC 1000: 4,925 × 3,276 (193.90 × 128.98)											
	W × D (tank included)	mm (in) DBC 1500: 5,425 × 2,995 (213.58 × 117.91)						DBC 1500: 5,425 × 3,276 (213.58 × 128.98)											
	Mass	kg (lb) DBC 1000: 15,500 (34,100)/DBC 1500: 16,500 (36,300)		DBC 1000: 16,500 (36,300)/DBC 1500: 17,500 (38,500)		OSP-P500S													

\*1. ø320 (swing over lower turret) during shaft work and when machining with opposing spindles.  
\*2. The opposing spindle capacity and working range near the opposing spindle differ with 1SW and 2SW specifications.

## Standard Specifications/Accessories

		MULTUS U3000				
		1ST	1SC	1SW	2SC	2SW
Spindle	JIS A2-6 5,000 min <sup>-1</sup> 22/15 kW (30 min/cont)			○		
Opposing spindle	JIS A2-6 5,000 min <sup>-1</sup> 22/15 kW (30 min/cont)			○		
Turret	JIS A2-6 5,000 min <sup>-1</sup> 22/15 kW (20 min/cont)					○
	Upper turret H1 ATC L/M HSK-A63 12,000 min <sup>-1</sup> 25/19 kW (3 min/cont) Through coolant, B-axis indexing 0.001°			○		
Lower turret	V12 direct mounting				○	
	V12 radial					○
ATC	40-tool ATC chain magazine			○		
Tailstock	NC tailstock inching specifications, including tailstock thrust high/low switch		○			
	Self-traveling hydraulic quill				○	
High-accuracy C-axis control				○		
Spindle temperature regulator (both turning spindle and milling tool spindle)				○		
Thermo Active Stabilizer—Spindle [milling tool] (TAS-S)				○		
Thermo Active Stabilizer—Construction (TAS-C)				○		
Collision Avoidance System				○		
Chuck auto open/close confirmation				○		
CNC	OSP-P500S			○		
	21.5-inch LCD operation panel			○		
	Portable pulse handle			○		
Accessories	Full enclosure shielding, work lamp (L/R LED), door interlock, lubrication monitor A-1, hydraulic unit, coolant supply system, foundation block and jack bolts, hand tools					



**Machine Specifications**

Item		MULTUS U4000								MULTUS U5000													
		1SC		1SW		2SC		2SW		1SC		1SW		2SC		2SW							
		1500	2000	1500	2000	1500	2000	1500	2000	1500	2000	3000	1500	2000	3000	1500	2000	3000					
Capacity	Swing over saddle	mm (in) ø650 (25.59)								Upper: ø650 (25.59), Lower: ø320 (12.60)													
	Distance between nose and center (between noses)	1,738.7 (68.45)	2,238.7 (88.14)	1,876 (73.86)	2,376 (93.54)	1,678.7 (66.09)	2,178.7 (85.78)	1,872 (73.70)	2,372 (93.39)	1,724.6 (67.90)	2,224.6 (87.58)	3,391.6 (133.53)	1,858 (73.15)	2,358 (92.83)	3,508 (138.11)	1,671.6 (65.81)	2,171.6 (85.50)	3,246.6 (127.82)	1,865 (73.43)	2,365 (93.11)	3,440 (135.43)		
	Max machining dia	mm (in) ø650 (25.59)								Upper: ø650 (25.59) <sup>*1</sup> , Lower: ø320 (12.60)													
Travels	Max machining length	1,500 (59.06)	2,000 (78.74)	1,500 (59.06)	2,000 (78.74)	1,500 (59.06)	2,000 (78.74)	1,500 (59.06)	2,000 (78.74)	1,500 (59.06)	2,000 (78.74)	3,000 (118.11)	1,500 (59.06)	2,000 (78.74)	3,000 (118.11)	1,500 (59.06)	2,000 (78.74)	3,000 (118.11)	1,500 (59.06)	2,000 (78.74)	3,000 (118.11)		
	X-axis	mm (in) 695 (27.36)								Upper: 695 (27.36), Lower: 235 (9.25)													
	Z-axis	upper: mm (in) 1,600 (62.99)		2,100 (82.68)		1,600 (62.99)		2,100 (82.68)		1,600 (62.99)		2,100 (82.68)		1,600 (62.99)		2,100 (82.68)		1,600 (62.99)		2,100 (82.68)		1,600 (62.99)	
		lower: mm (in) -		-		1,461 (57.52)		1,961 (77.20)		1,524 (60.00) <sup>*2</sup>		2,024 (79.69) <sup>*3</sup>		-		1,461 (57.52)		1,961 (77.20)		3,036 (119.53)		1,524 (60.00)	
	Y-axis	mm (in) 300 (11.81) (±150 (5.91))								300 (11.81) (±150 (5.91))													
	W-axis	mm (in) -		1,554 (61.18)		2,054 (80.87)		-		1,524 (60.00) <sup>*2</sup>		2,024 (79.69) <sup>*3</sup>		-		1,554 (61.18)		2,054 (80.87)		3,050 (120.08)		-	
	B-axis / indexing angle	degree -30 to +210 (min controlled angle 0.001)								-30 to +210 (min controlled angle 0.001)													
C-axis / indexing angle	degree 360 (min controlled angle 0.0001)								360 (min controlled angle 0.0001)														
Spindle	Speed	min <sup>-1</sup> 45 to 4,200								30 to 3,000													
	Speed ranges	2 auto ranges (2-speed motor coil switching)								2 auto ranges (2-speed motor coil switching)													
	Nose shape	JIS A2-8								JIS A2-11													
Opposing spindle *4	Taper bore / Bearing dia	mm (in) ø91/ø140 (3.58/5.51)								ø112/ø160 (4.41/6.30)													
	Speed	min <sup>-1</sup> -								30 to 3,000													
	Speed ranges	2 auto ranges (2-speed motor coil switching)								2 auto ranges (2-speed motor coil switching)													
Turret (milling tool spindle)	Nose shape	-								JIS A2-8													
	Taper bore / Bearing dia	mm (in) -								ø80/ø120 (3.15/4.72)													
	Type	H1								Upper: H1, Lower: V12													
	No. of tools	L / M: 1								Upper: L / M: 1, Lower: 12													
Feed rates	Tool shank dimensions / ID tool shank diameter	mm (in) □25 / ø40 (1 × 1 / 1-1/2)								□25 / ø40 (1 × 1 / 1-1/2)													
	Milling tool spindle	min <sup>-1</sup> Upper: 50 to 12,000								Upper: 50 to 12,000													
	Milling tool spindle speed ranges	Upper: 2 auto ranges (2-speed motor coil switching)								Upper: 2 auto ranges (2-speed motor coil switching)													
Tailstock	X-, Z-, Y-axis	upper: m/min X: 5.0, Z: 5.0, Y: 4.0		X: 5.0, Z: 4.0, Y: 4.0		X: 5.0, Z: 5.0, Y: 4.0		X: 5.0, Z: 4.0, Y: 4.0		X: 5.0, Z: 5.0, Y: 4.0		X: 5.0, Z: 4.0, Y: 4.0		X: 5.0, Z: 5.0, Y: 4.0		X: 5.0, Z: 4.0, Y: 4.0		X: 5.0, Z: 5.0, Y: 4.0		X: 5.0, Z: 4.0, Y: 4.0			
		lower: m/min -		-		X: 25, Z: 4.0		X: 25, Z: 3.0		X: 25, Z: 4.0		X: 25, Z: 3.0		-		X: 25, Z: 4.0		X: 25, Z: 3.0		X: 25, Z: 4.0		X: 25, Z: 3.0	
	W-axis	m/min 12 (tailstock)		30		20		12 (tailstock)		30		20		8 (tailstock)		30		20		8 (tailstock)		30	
C-, B-axis	min <sup>-1</sup> C: 200, B: 30								C: 200, B: 30														
Auto tool changer (ATC)	Tapered bore	MT No. 5 (revolving center)				-				MT No. 5 (revolving center)				-									
	Travel	mm (in) 1,594 (62.76)		2,094 (82.44)		-		1,359.5 (53.52)		1,961 (77.20)		-		1,554 (61.18)		2,054 (80.87)		3,170 (124.80)		-		1,359.5 (53.52)	
	Tool shank	HSK-A63								HSK-A63													
Motor	No. of tools	40								40													
	Max tool dia	mm (in) ø90 (3.54) (w/o adjacent tools: ø130 (5.12))								ø90 (3.54) (w/o adjacent tools: ø130 (5.12))													
	Max tool length	mm (in) 400 (15.75) (from gauge line)								400 (15.75) (from gauge line)													
	Max tool mass	kg (lb) 10 (22)								10 (22)													
Machine size	Main spindle motor	kW (hp) 22/15 (30/20) (30 min/cont)								37/30 (49/40) (30 min/cont)													
	Opposing spindle motor	kW (hp) -		22/15 (30/20) (30 min/cont)		-		22/15 (30/20) (20 min/cont)		-		32/22 (43/30) (20 min/cont)		-		22/15 (30/20) (20 min/cont)							
	Milling tool spindle motor	kW (hp) 25/19 (33/25) (3 min/cont)								25/19 (33/25) (3 min/cont)													
	X-, Z-, Y-, B-axis motors	kW (hp) X: 5.2, Z: 4.6 (X: 6.9, Z: 6.1) (DBC 1500)/5.2 (6.9) (DBC 2000), Y: 3.5, B: 3.0 (Y: 4.7, B: 4.0)				XA: 5.2, ZA: 4.6 (XA: 6.9, ZA: 6.1) (DBC 1500)/5.2 (6.9) (DBC 2000), XB: 3.5, ZB: 4.6 (Y: 3.5, B: 3.0) (Y: 4.7, B: 4.0)				X: 5.2, Z: 4.6 (X: 6.9, Z: 6.1) (DBC 1500)/5.2 (6.9) (DBC 2000)/6.4 (8.5) (DBC 3000), Y: 3.5, B: 3.0 (Y: 4.7, B: 4.0)				XA: 5.2, ZA: 4.6 (XA: 6.9, ZA: 6.1) (DBC 1500)/5.2 (6.9) (DBC 2000)/6.4 (8.5) (DBC 3000), XB: 3.5, ZB: 4.6 (XB: 4.7, ZB: 6.1) (DBC 1500/2000)/5.2 (6.9) (DBC 3000), Y: 3.5, B: 3.0 (Y: 4.7, B: 4.0)									
	W-axis motor	kW (hp) 2.8 (3.7) (tailstock)		4.6 (6.1) (tailstock)		2.8 (3.7) (tailstock)		4.6 (6.1)		2.8 (3.7) (tailstock)		4.2 (5.6) (tailstock)		4.6 (6.1)		5.2 (6.9)		2.8 (3.7) (tailstock)		4.2 (5.6) (tailstock)		4.6 (6.1)	
Coolant motor (50Hz/60Hz)	kW (hp) 0.25/0.25 (0.33/0.33) × 1, 0.55/0.75 (0.73/1.0) × 3								0.25/0.25 (0.33/0.33) × 1, 0.55/0.75 (0.73/1.0) × 3														
CNC	Height	mm (in) 2,955 (116.34)				3,030 (119.29)				2,955 (116.34)				3,090 (121.65)									
	Floor space	mm × mm (in) DBC 1500: 5,425 × 2,995 (213.58 × 117.91)				DBC 1500: 5,425 × 3,276 (213.58 × 128.98)				DBC 1500: 5,530 × 2,995 (217.72 × 117.91)/DBC 2000: 6,280 × 2,995 (247.24 × 117.91)				DBC 1500: 5,530 × 3,276 (217.72 × 128.98)/DBC 2000: 6,280 × 3,276 (247.24 × 128.98)									
	W × D (tank included)	DBC 2000: 6,175 × 2,995 (243.11 × 117.91)				DBC 2000: 6,175 × 3,276 (243.11 × 128.98)				DBC 3000: 8,420 × 3,228 (331.50 × 127.09)				DBC 3000: 8,420 × 3,228 (331.50 × 127.09)									
Mass	kg (lb) DBC 1500: 17,000 (37,400)/DBC 2000: 19,000 (41,800)				DBC 1500: 18,000 (39,600)/DBC 2000: 20,000 (44,000)				DBC 1500: 17,300 (38,060)/DBC 2000: 19,300 (42,460)/DBC 3000: 22,300 (49,060)				DBC 1500: 18,300 (40,260)/DBC 2000: 20,300 (44,660)/DBC 3000: 23,300 (51,260)										
		OSP-P500S								OSP-P500S													

\*1. ø320 (swing over lower turret) during shaft work and when machining with opposing spindles.  
 \*2. In the main Big-Bore spindle, it will be 1,500.  
 \*3. In the main Big-Bore spindle, it will be 2,000.  
 \*4. The opposing spindle capacity and working range near the opposing spindle differ with 1SW and 2SW specifications.

**Standard Specifications/Accessories**

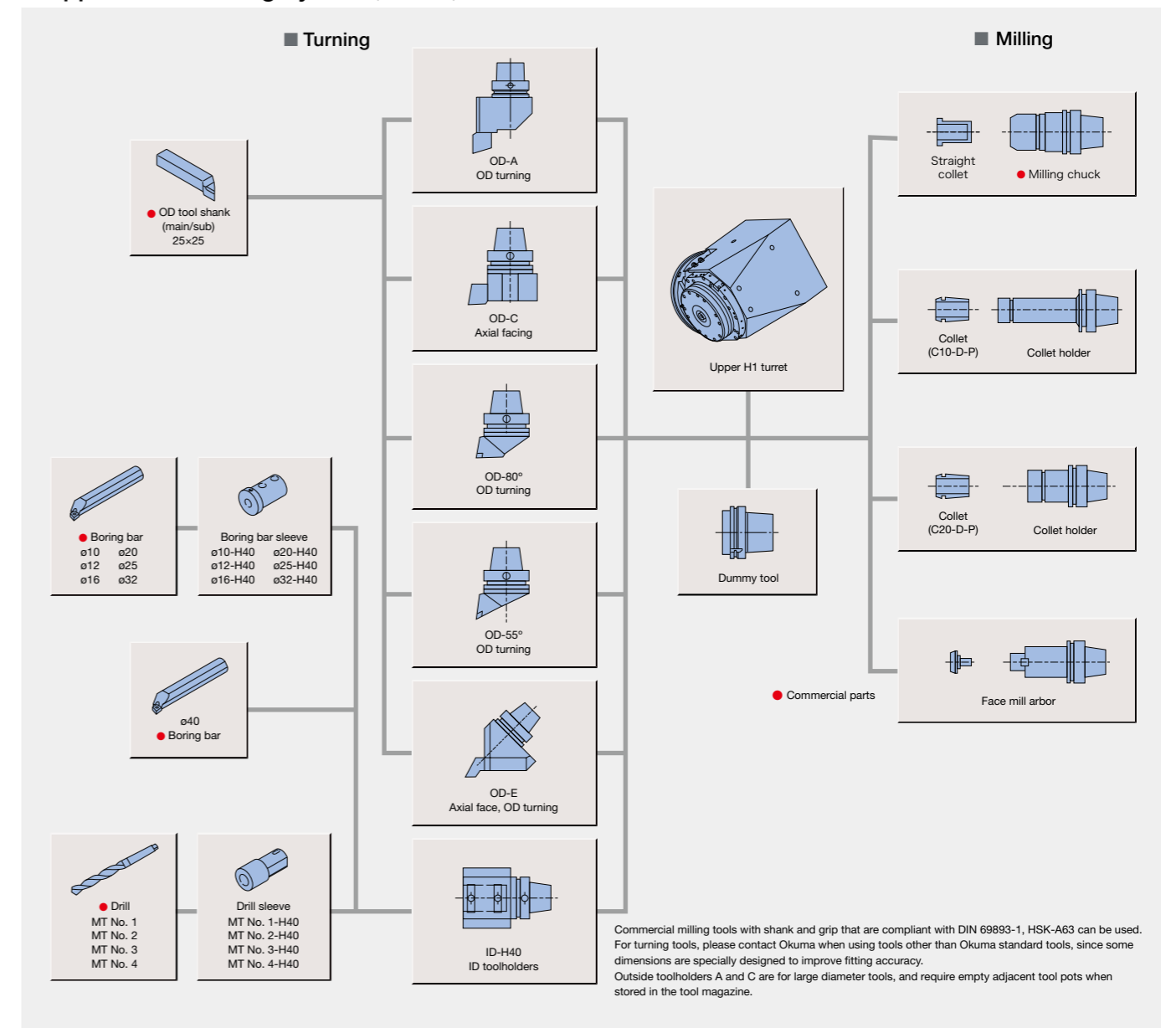
		MULTUS U4000				MULTUS U5000			
		1SC	1SW	2SC	2SW	1SC	1SW	2SC	2SW
Spindle	JIS A2-8 4,200 min <sup>-1</sup> 22/15 kW (30 min/cont)		○						
	JIS A2-11 3,000 min <sup>-1</sup> 37/30 kW (30 min/cont)							○	
Opposing spindle	JIS A2-8 4,200 min <sup>-1</sup> 22/15 kW (30 min/cont)	-	○						
	JIS A2-8 3,800 min <sup>-1</sup> 22/15 kW (20 min/cont)				○				○
Turret	Upper turret H1 ATC L/M HSK-A63 12,000 min <sup>-1</sup> 25/19 kW (3 min/cont) Through coolant, B-axis indexing 0.001°								○
	Lower turret V12 direct mounting V12 radial		-	○				○	-
ATC	40-tool ATC chain magazine								○
Tailstock	NC tailstock inching specifications, including tailstock thrust high/low switch	○				○			
	Self-traveling hydraulic quill			○				○	
High-accuracy C-axis control									○
Spindle temperature regulator (both turning spindle and milling tool spindle)									○
Thermo Active Stabilizer—Spindle [milling tool] (TAS-S)									○
Thermo Active Stabilizer—Construction (TAS-C)									○
Collision Avoidance System									○
Chuck auto open/close confirmation									○
CNC	OSP-P500S								○
	21.5-inch LCD operation panel								○
	Portable pulse handle								○
Accessories	Full enclosure shielding, work lamp (L/R LED), door interlock, lubrication monitor A-1, hydraulic unit, coolant supply system, foundation block and jack bolts, hand tools								

## Optional Specifications

Big-Bore spindle	MULTUS U3000	4,200 min <sup>-1</sup> A2-8	ø140	22/15 kW (30 min/cont)
	MULTUS U4000	3,000 min <sup>-1</sup> A2-11	ø160	32/22 kW (20 min/cont)
Opposing spindle	MULTUS U3000	1S Big-Bore 4,200 min <sup>-1</sup> A2-8	ø140	22/15 kW (30 min/cont)
	MULTUS U4000	1S Big-Bore 3,000 min <sup>-1</sup> A2-11	ø160	32/22 kW (20 min/cont)
B-axis indexing	NC B-axis			
Lower turret	V12 multitasking 6,000 min <sup>-1</sup> 5.5/3.7 kW (2 min/cont) - opposing spindle specifications only			
High pressure coolant	Upper turret, upper + lower turret			
Tailstock	Hydraulic quill (self-propelled) (Standard with 2SC)			
Tailstock sleeve system	Built-in type MT No. 4 - MULTUS U3000/U4000 only			
Tool shank profile	CAPTO C6			
ATC tool magazine capacity	80 tools, 120 tools, 180 tools (matrix)			
Chip conveyor	Drum filter type, hinge type, scraper type			
Conveyor-related options	Chip conveyor torque limiter (alarm C at detection), intermittent feed chip conveyor, machine linked chip conveyor			
Chip buckets	L type, H type			
Coolant sludge prevention	Oil skimmer mounted			
High pressure coolant unit	7 MPa			
Turret coolant high/low pressure switch	L/M thru high/low pressure switch, M peripheral low pressure; L/M thru high/low pressure switch; M peripheral high/low pressure switch			
Lower turret coolant high/low pressure switch				
Lubrication monitor	B-2 (w/ warning lamp)			
Cover-related options	Upper door auto open/close, front door auto open/close, auto open/close on both upper + front door			
Front cover auto open/close safety devices	Safety tape switch			
Dual palm start buttons (door close interlock)				
Front cover open/close inching				
Chuck-related options	Chuck auto open/close confirm, chuck high/low pressure switch (re-gripping) (main, opposing), chucking miss detection (main, opposing)			
Tailstock-related options	Tailstock quill auto advance/retract confirmation (hydraulic quill-type tailstock specifications), tailstock thrust high/low switch (standard for 1SC), door open/close tailstock quill advance speed switch (hydraulic quill-type tailstock specifications), high-thrust specifications (Big-Bore spindle specifications need to be selected) - MULTUS U3000/U4000 only			
Opposing spindle tailstock control				
Air blower (blast) options	Chuck air blower, tailstock air blower, spindle ID air blower (main, opposing) Turret air blower (L/M thru-spindle during rotation only, L/M thru-spindle during rotation/M periphery, M periphery only) Lower turret air blower (internal piping, common coolant nozzle)			
Coolant-related options	Shower coolant (main/opposing: A, B), thru-spindle coolant (main/opposing: A, B), ceiling shower coolant (A, B)			
Dust-proofing	Spindle air purge (main, opposing), guideway double wiper (X + Y + Z, X + Y + Z + Xb + Zb) Ball screw double wiper (X + Y + Z, X + Y + Z + Xb + Zb)			
5-Axis Auto Tuning System	Standard kit, High spec kit			
NC Gage	Standard kit, High spec kit			
In-process workpiece gauging	Renishaw			
Touch Setter	M (manual), A (auto)			
Workrest				
Workpiece stopper in spindle	Main (cannot be used in combination with tailstock specifications)			
Chuck internal sizing stopper	Main, opposing			
Additional coolant pump	0.8 kW			
Coolant tank	Thickener bags, line filter, backwashing filter			
Coolant sensor	Level detection, flow sensor, Level + flow sensor			
Coolant gun mounted				
Steadyrest	1S: Self-propelled (no relieving), 2S: lower turret, lower cross-slide			
Mist collector				
High accuracy options	AbsoScale (Xa-axis, Xb-axis, Ya-axis, Za-axis), temperature regulator (coolant, hydraulic oil)			
Bar feeder				
Workpiece sizing stopper	Upper turret, lower turret			
Parts catcher-related options	Main spindle side eject, opposing spindle side eject, Workpiece ejector (spring type, air type) Workpiece eject conveyor (finished parts right eject)			
Workpiece unloader				
Gantry loader	OGL10-P, OGL30-P, OGL50-P			

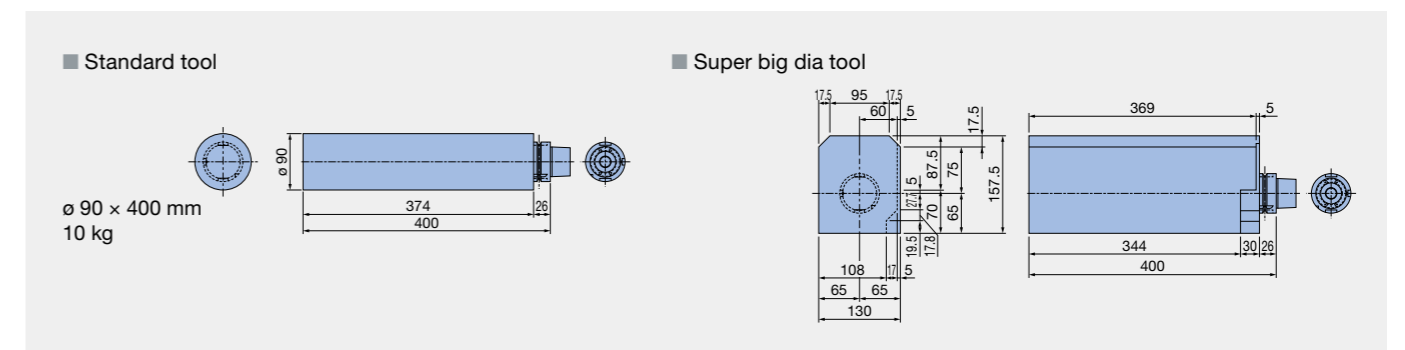
## Upper Turret Tooling System (HSK-A63)

Unit: mm



## Max Tool Dimensions

Unit: mm



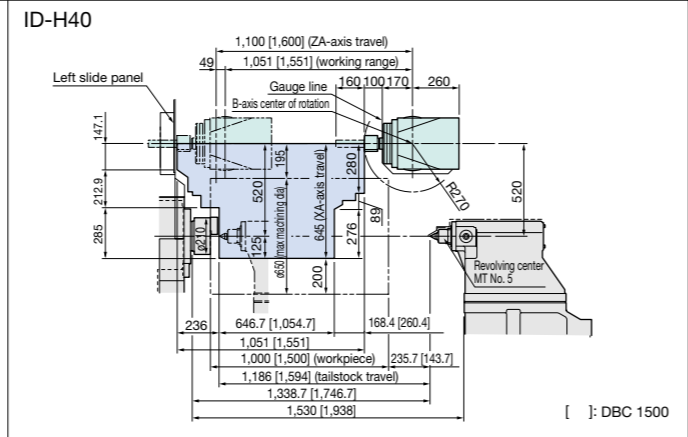
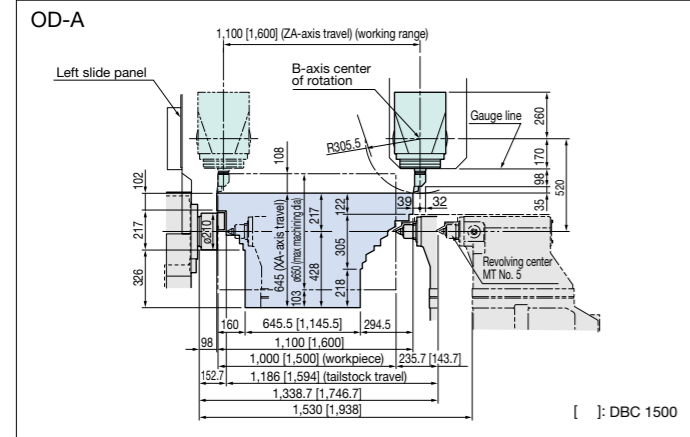




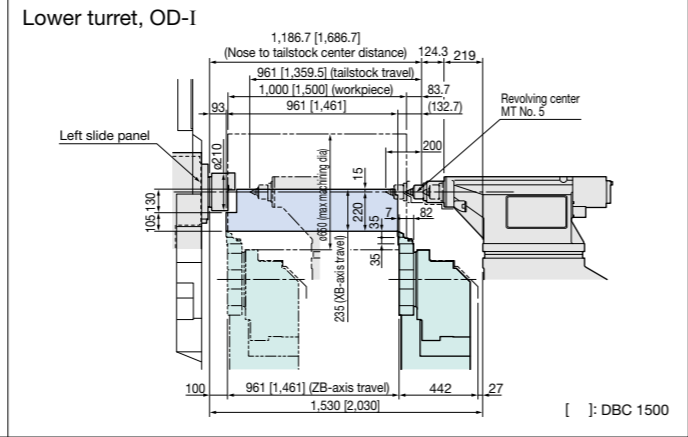
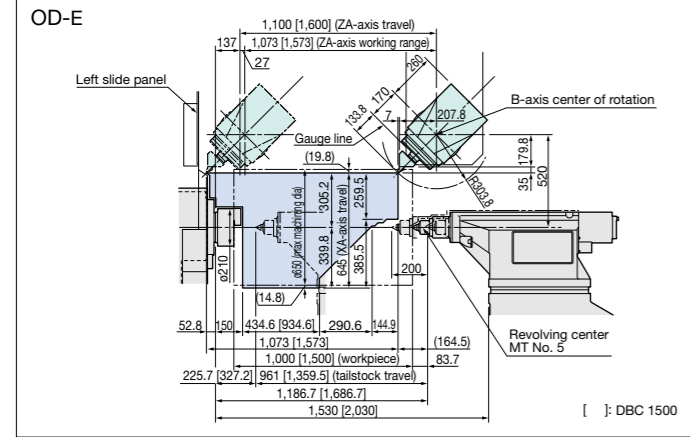
**Working Range**

**MULTUS U3000 1SC (DBC: 1000/1500)**

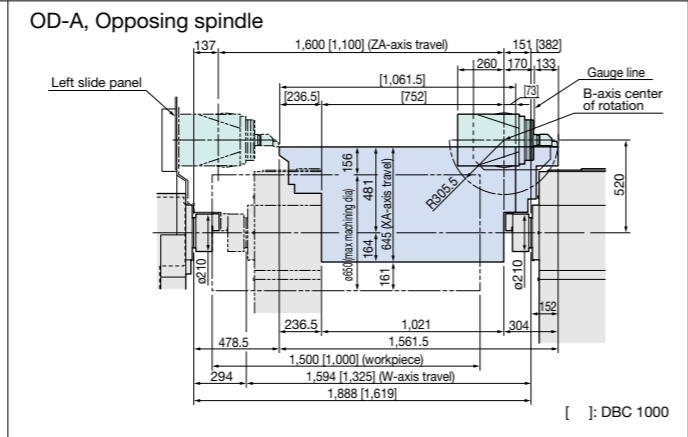
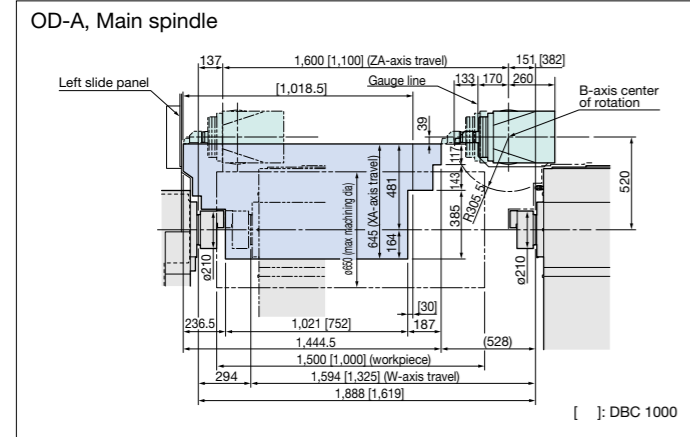
Unit: mm



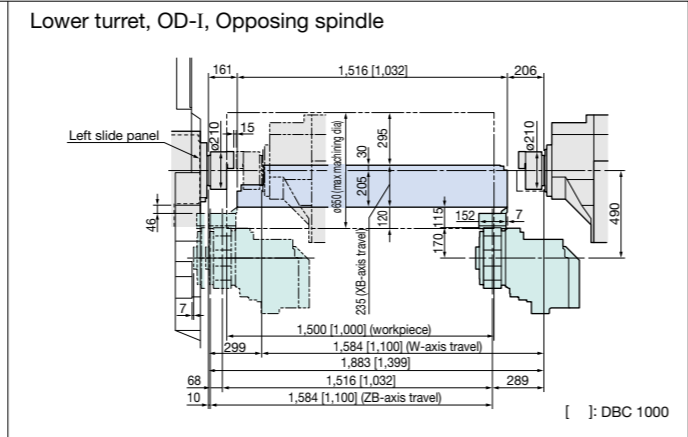
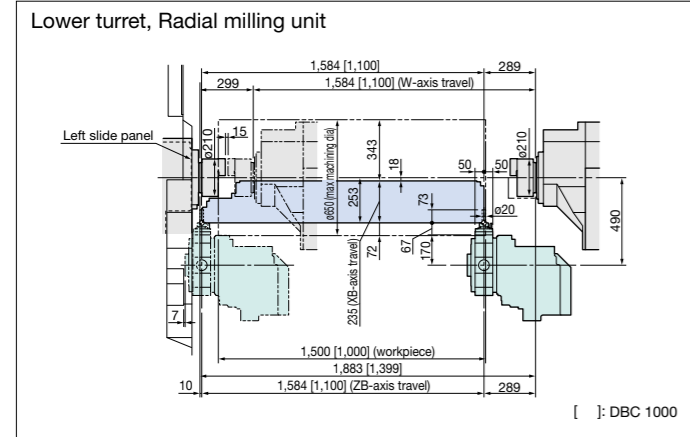
**MULTUS U3000 2SC (DBC: 1000/1500)**



**MULTUS U3000 1SW (DBC: 1000/1500)**

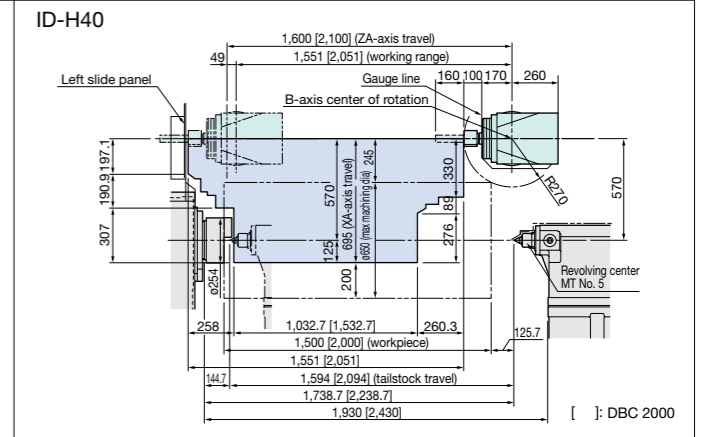
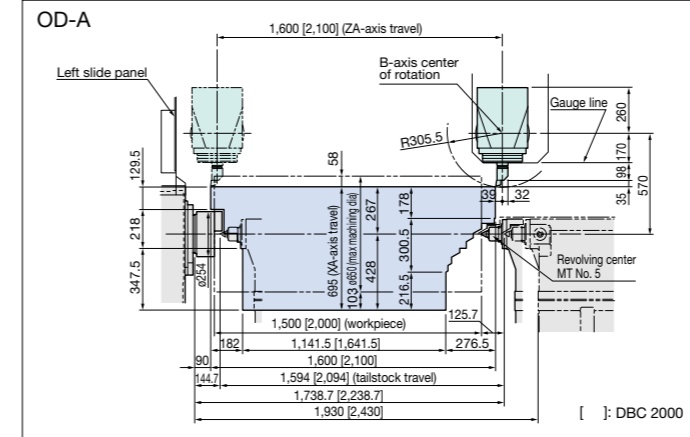


**MULTUS U3000 2SW (DBC: 1000/1500)**

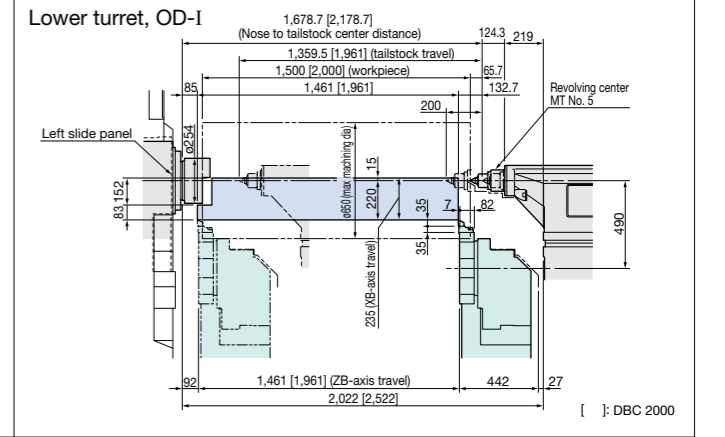
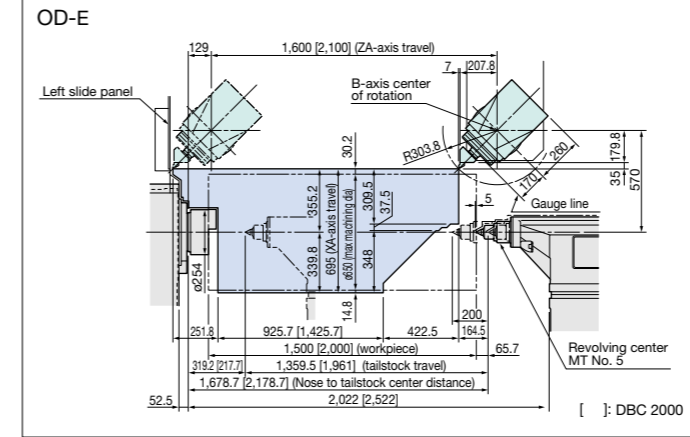


**MULTUS U4000 1SC (DBC: 1500/2000)**

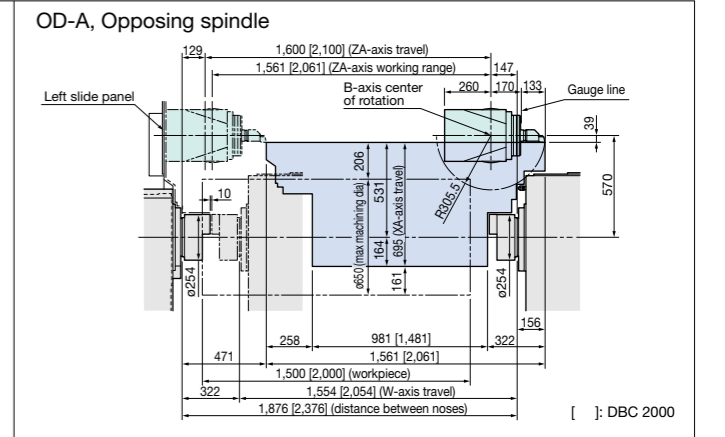
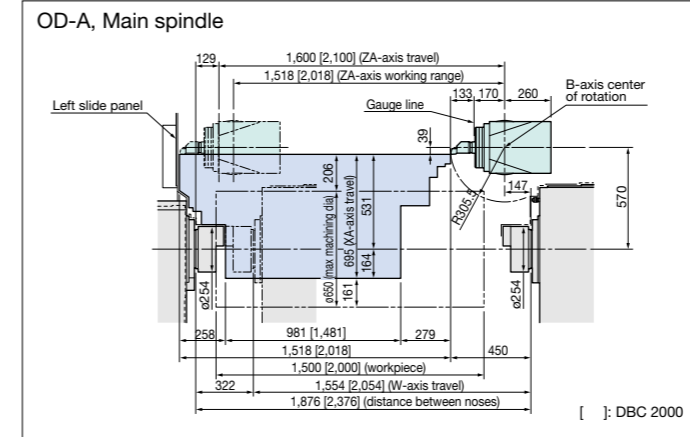
Unit: mm



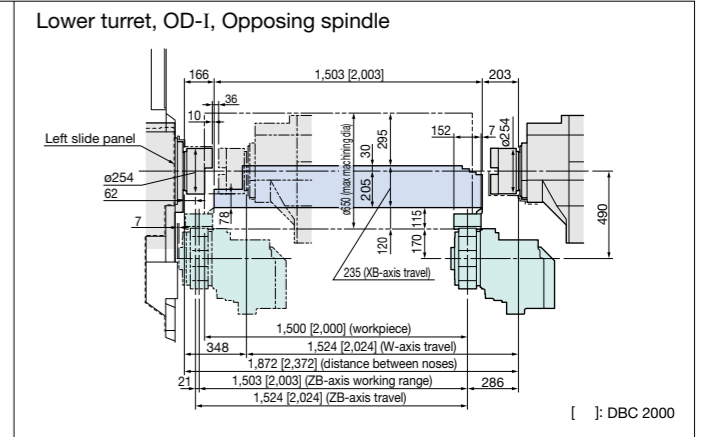
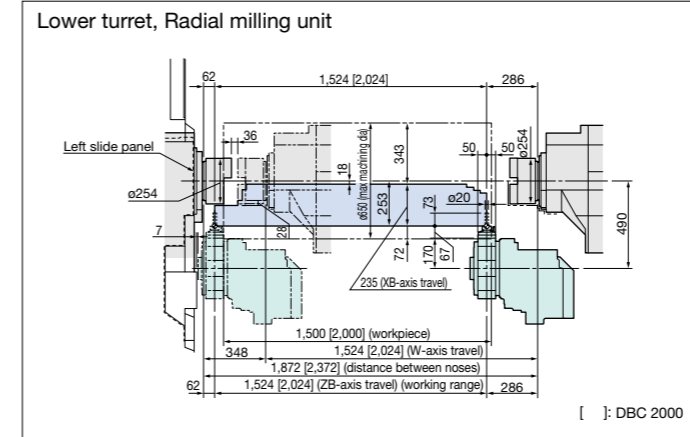
**MULTUS U4000 2SC (DBC: 1500/2000)**



**MULTUS U4000 1SW (DBC: 1500/2000)**



**MULTUS U4000 2SW (DBC: 1500/2000)**

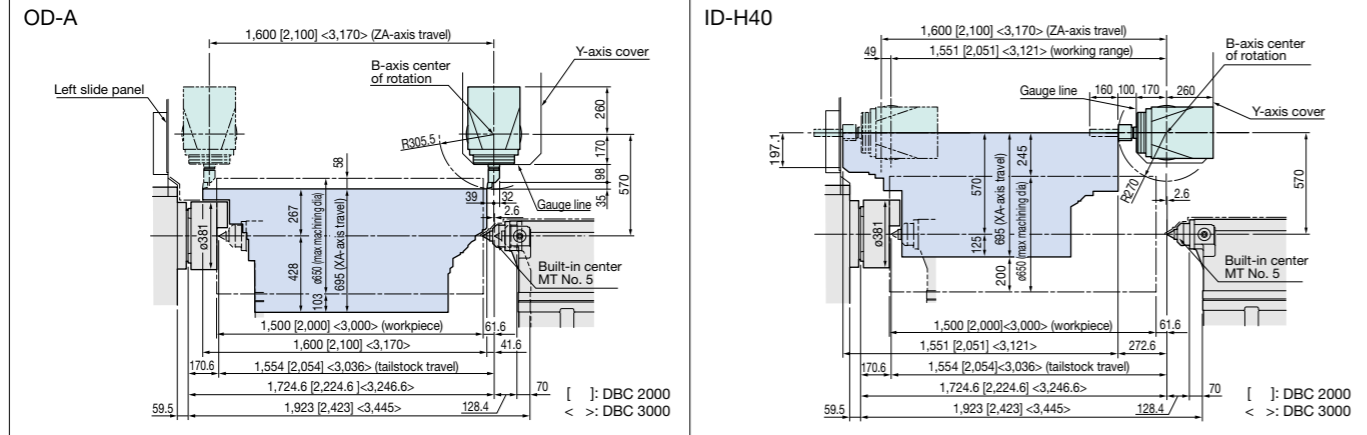




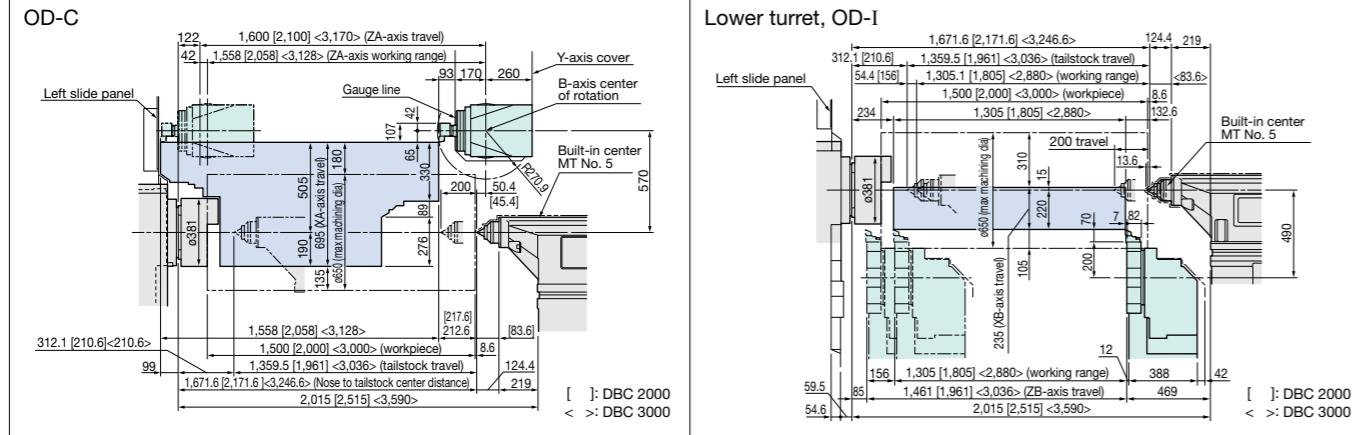
**Working Range**

**MULTUS U5000 1SC (DBC: 1500/2000/3000)**

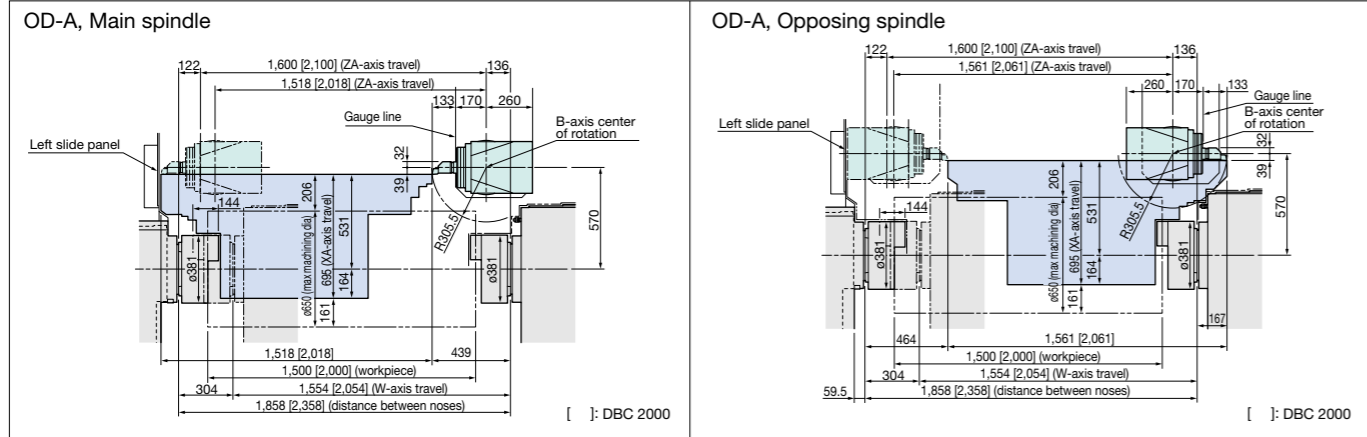
Unit: mm



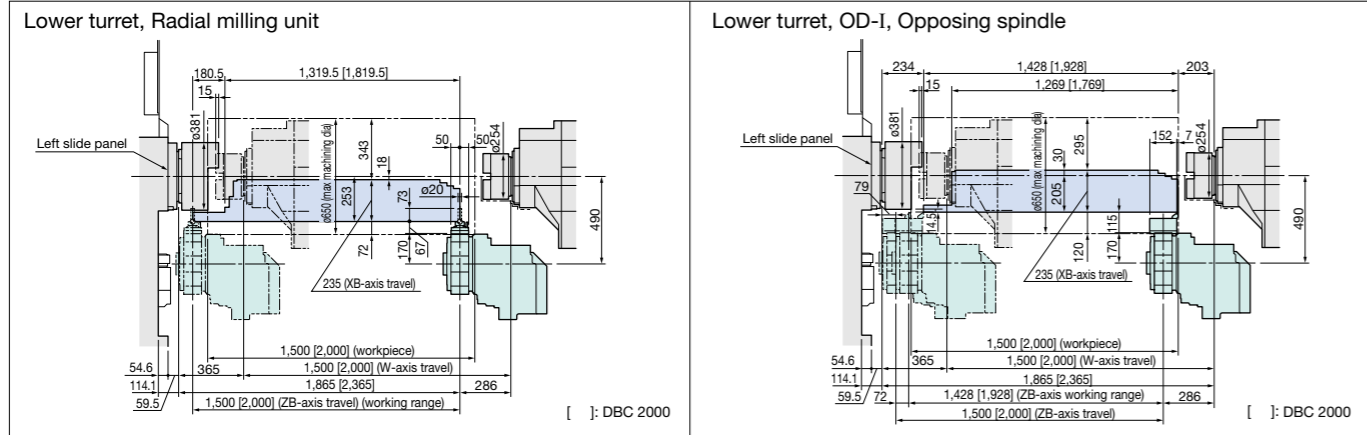
**MULTUS U5000 2SC (DBC: 1500/2000/3000)**



**MULTUS U5000 1SW (DBC: 1500/2000)**

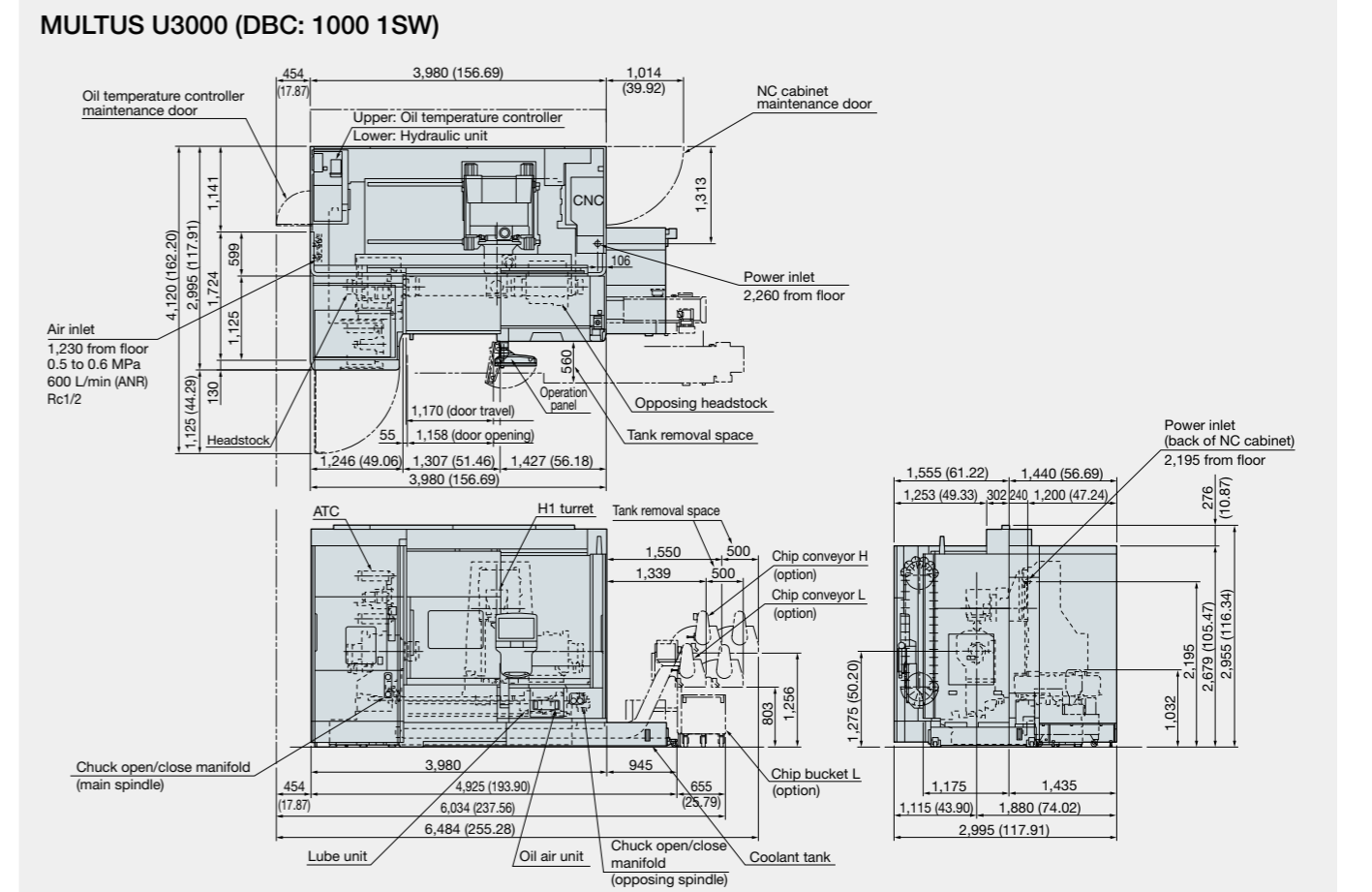


**MULTUS U5000 2SW (DBC: 1500/2000)**

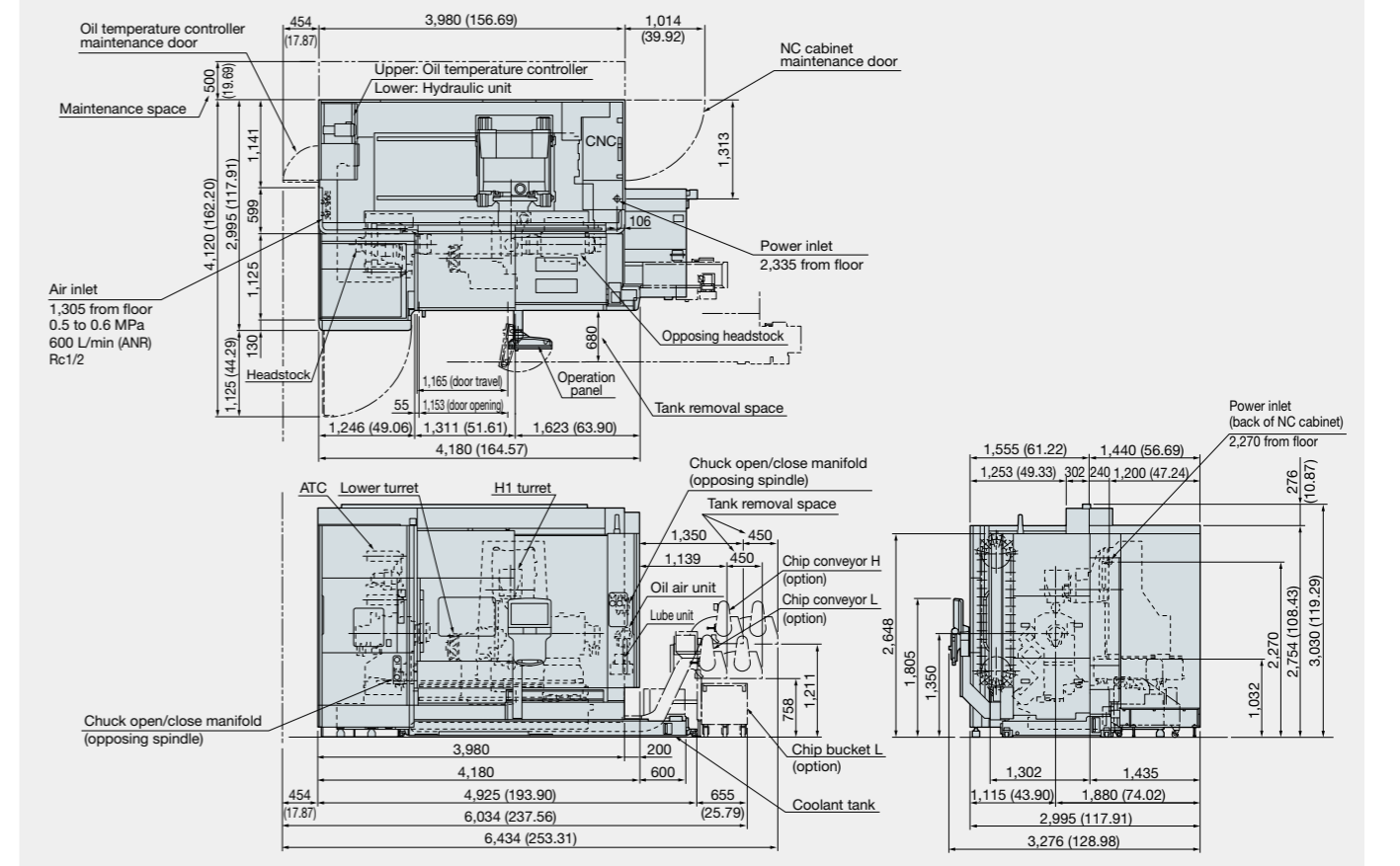


**Dimensional and Installation Drawings**

Unit: mm (in)



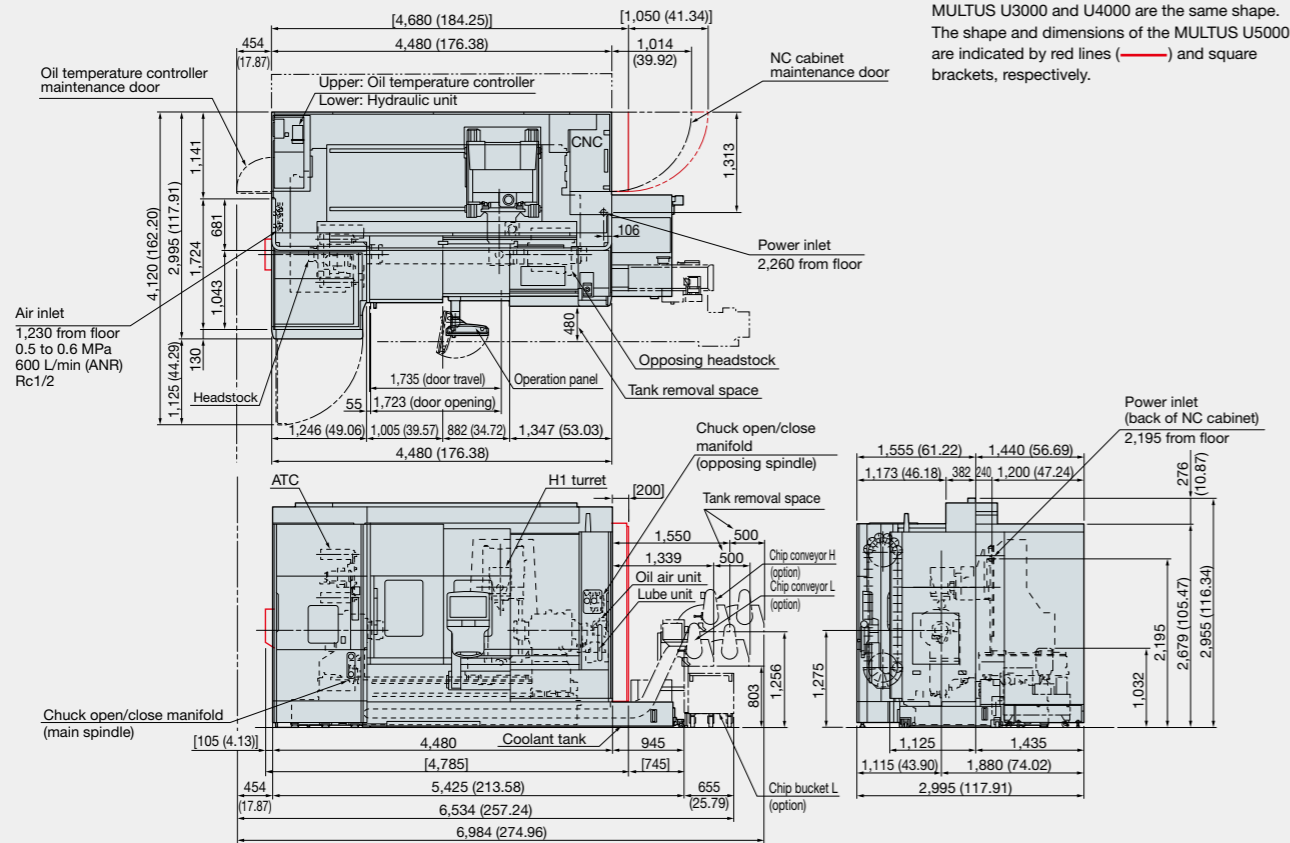
**MULTUS U3000 (DBC: 1000 2SW)**



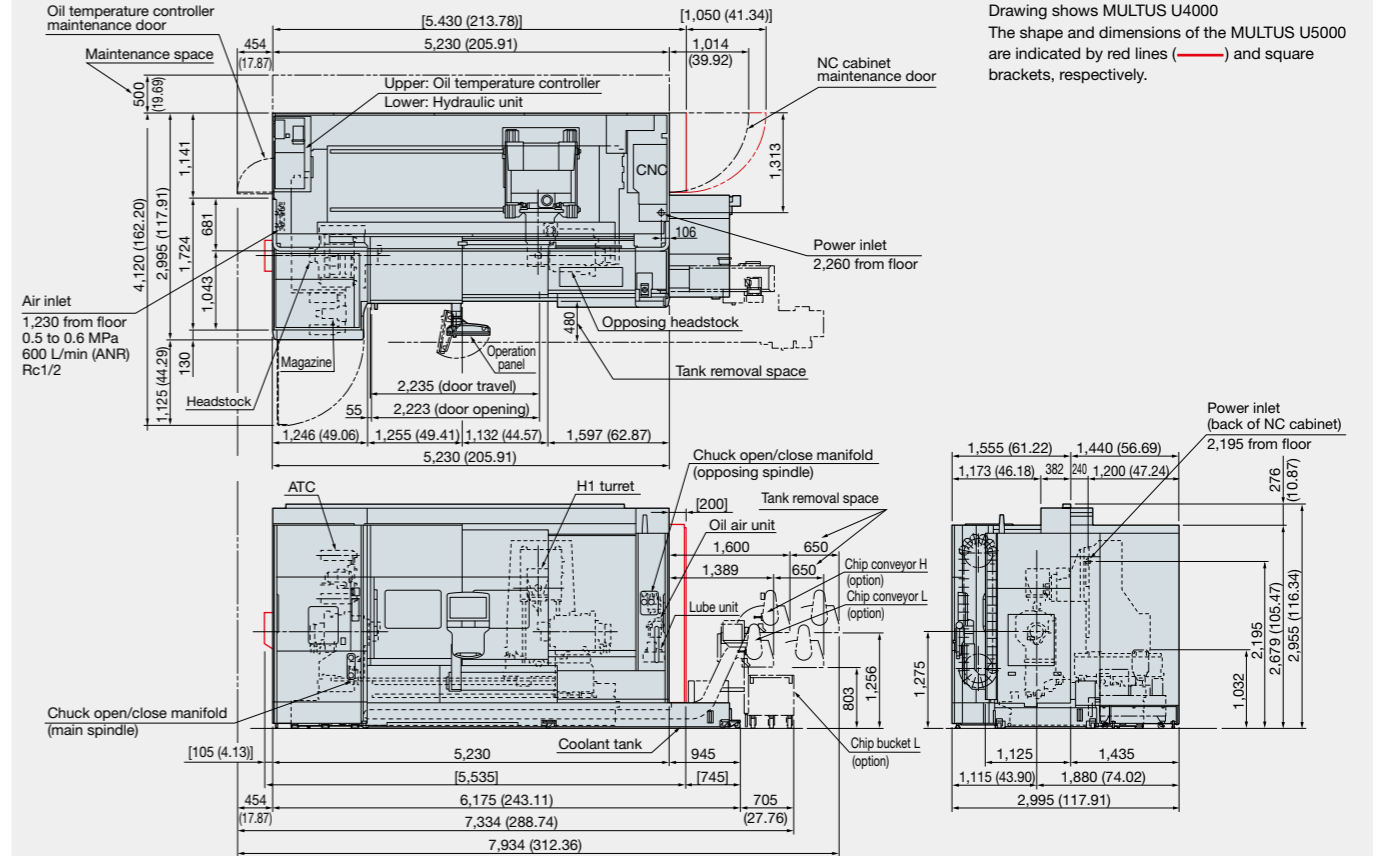
## Dimensional and Installation Drawings

Unit: mm (in)

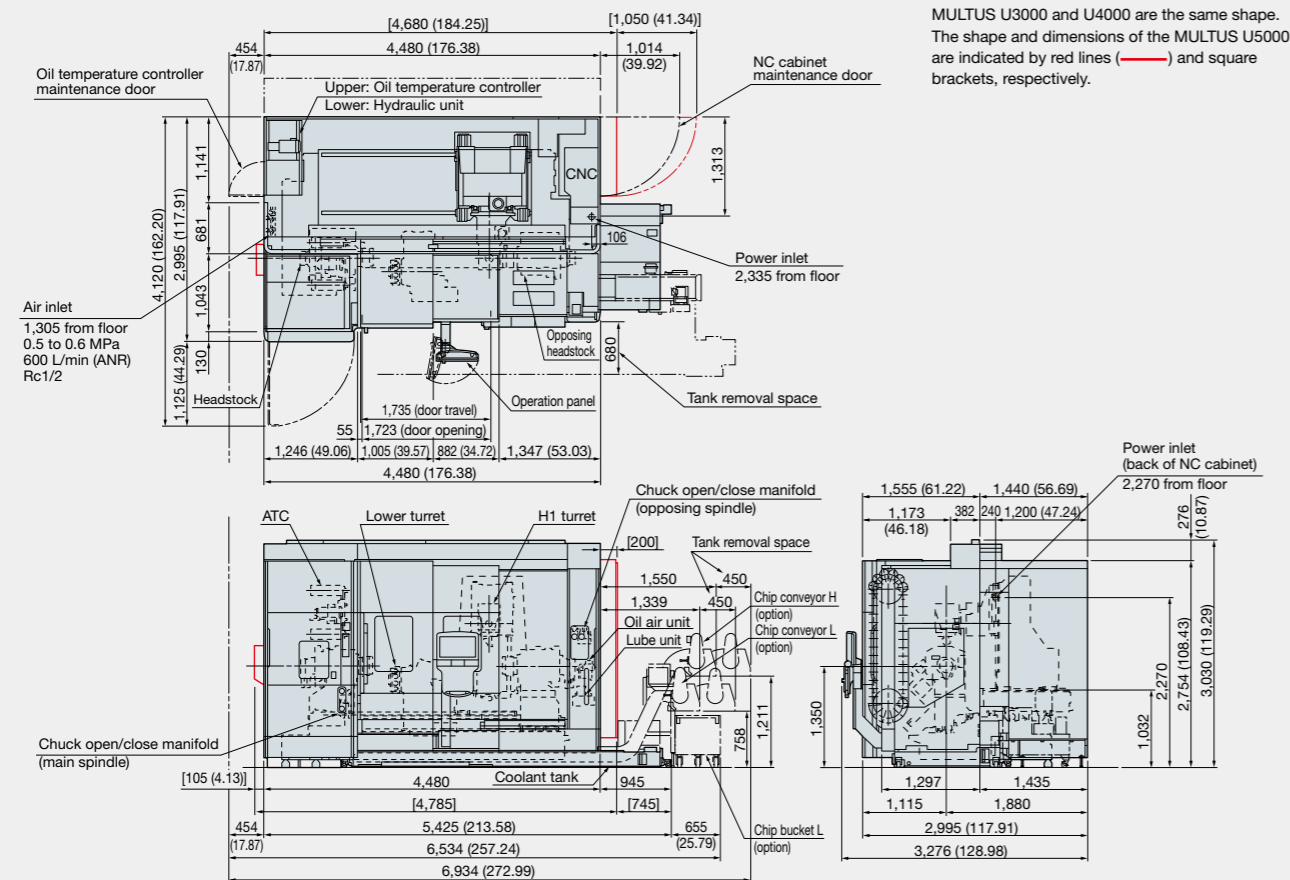
### MULTUS U3000/MULTUS U4000/MULTUS U5000 (DBC: 1500 1SW)



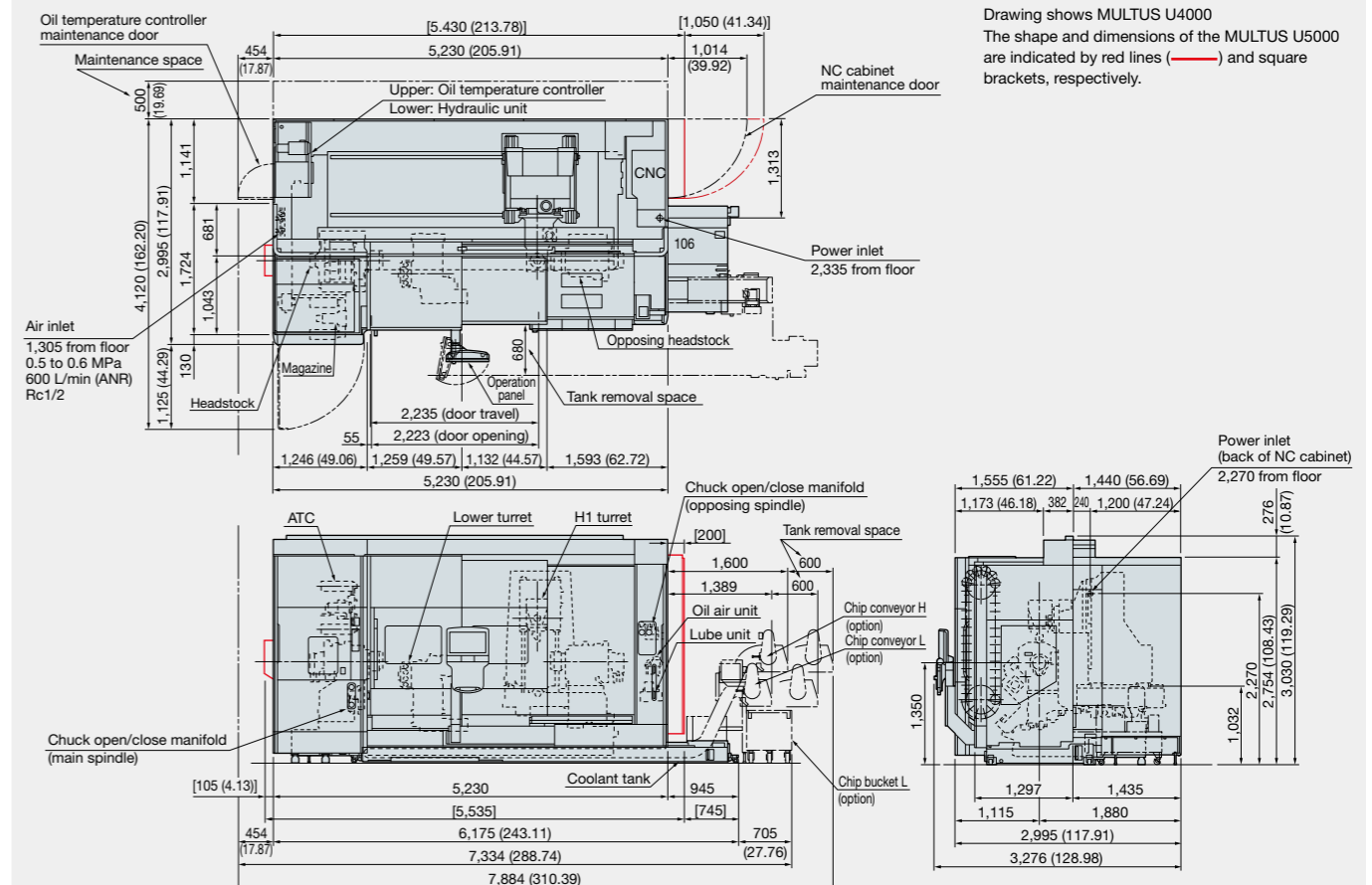
### MULTUS U4000/MULTUS U5000 (DBC: 2000 1SW)



### MULTUS U3000/MULTUS U4000/MULTUS U5000 (DBC: 1500 2SW)



### MULTUS U4000/MULTUS U5000 (DBC: 2000 2SW)

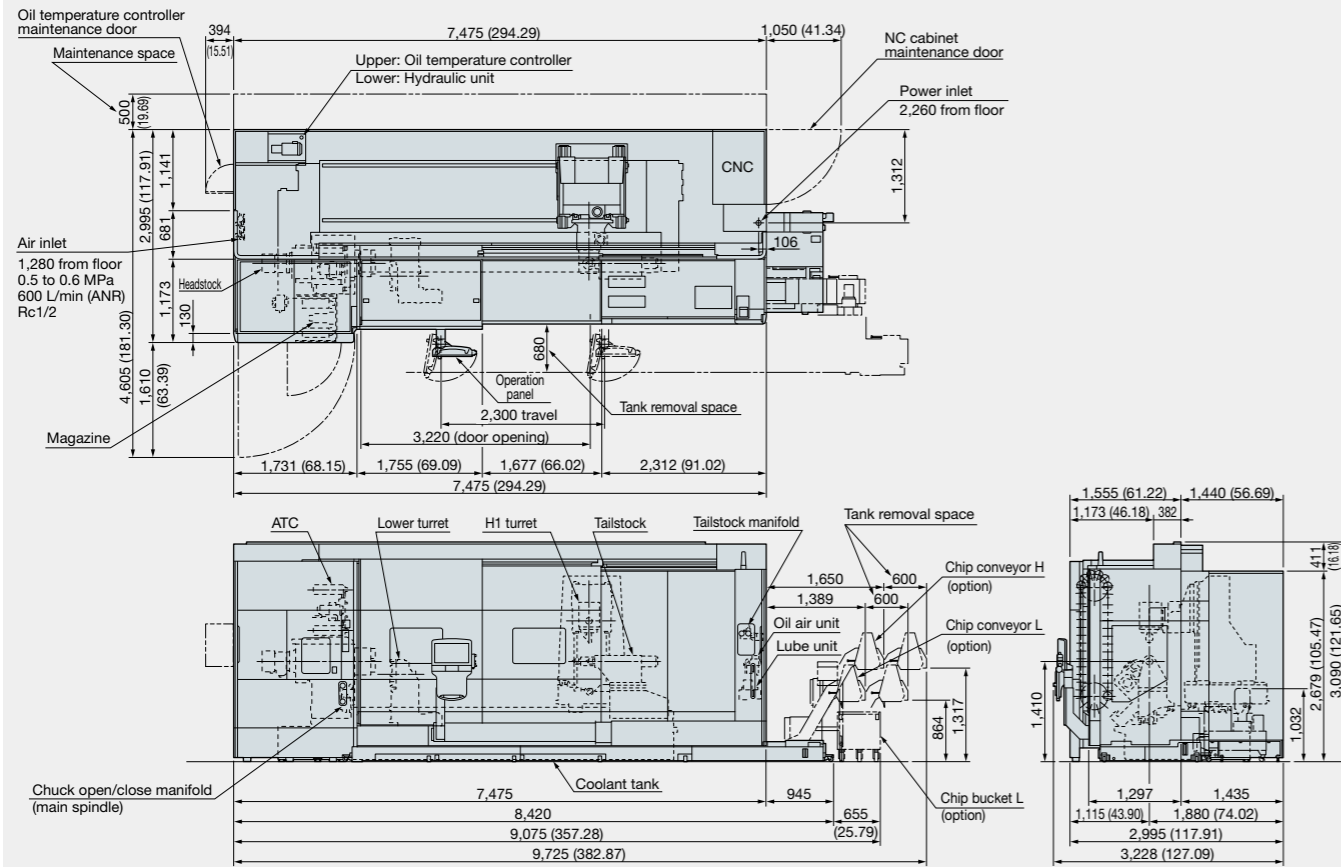




■ Dimensional and Installation Drawings

Unit: mm (in)

MULTUS U5000 (DBC: 3000, 2SC)



A next-generation CNC that makes manufacturing DX (digital transformation) a reality  
**OSP-P500**

Improved productivity and stable production

As Your Single Source for M-E-I-K (Mechanics - Electronics - IT - Knowledge) maring technology, Okuma offers this CNC to build an advanced “digital twin” that faithfully reproduces machine control and machining operations and create new value. In addition, Okuma offers productivity improvement and stable production with ease of use that allows customers to use their machining know-how, an energy-saving solutions that achieve both high accuracy/productivity and eco-friendly products, with robust security protection against increasing threats of cyber attacks.

Faithful reproduction of machines and processing — Digital support for shop floor work  
**Digital Twin (option)**

“Okuma’s **two** digital twins” made possible by an office PC and a next-generation CNC reduce machine downtime and improve machine utilization

Simulation using the latest machine information can be achieved with an office PC and OSP-P500 installed on the physical machine. This enables preparation for machining in advance in the office environment (front loading). Physical machine preparation time can be reduced by using digital twin preparation results to prepare for machining the next parts while machining continues. When a problem occurs on the shop floor, it can be solved quickly on site without going back to the office.



21.5-inch operation panel

1 Digital Twin On PC<sup>\*1</sup>

Simulate shop machines in the office

Front loading is performed with the actual status matched with the data on the office PC to further improve productivity. Highly accurate pre-verification minimizes trial and error in first part machining, and reduces machine downtime to the minimum.

\*1. The PC software is to be used with one package for one machine.

2 Digital Twin On Machine

Simulating the CNC of a real machine

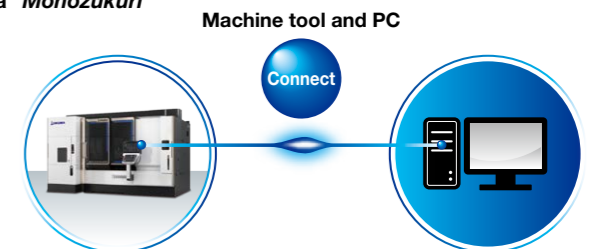
Super-fast and super-accurate machining simulations are performed with the CNC of a real machine on-site to minimize machining preparation work. Actual machining can be started immediately, greatly improving the operating rate of the machine.



**Connect Plan** Get Connected, Get Started, and Get Innovative with Okuma “*Monozukuri*”

Connect, Visualize, Improve

Okuma’s Connect Plan is a system that provides analytics for improved utilization by connecting machine tools and visual control of factory operation results and machining records. Simply connect the OSP and a PC and install Connect Plan on the PC to see the machine operation status from the shop floor, from an office, from anywhere. The Connect Plan is an ideal solution for customers trying to raise their machine utilization.



# A next-generation CNC that makes manufacturing DX (digital transformation) a reality

## OSP-P500

### Standard Specifications OSP-P500S

Item	Kit spec	NML	AOT-M	DT	DT AOT-M		
		E	D	E	D	E	D
Basic Specs	Control	Turning: X, Z simultaneous 2-axis, Multitasking: X, Y, Z, B, C simultaneous 5-axis, Spindle control max 4 axes (2 spindles, 2 milling tool spindles)					
	Position feedback	OSP full range absolute position feedback (zero point return not required)					
	Min / Max command	±99999.999 mm, ±99999.999° 8-digit decimal, command unit: 0.001 mm, 0.01 mm, 1 mm, 0.001°, 0.01°, 1°					
	Feed	Override: 0 to 200%					
	Spindle control	Direct spindle speed commands override 50~200%, Milling tool override 30~200%, Constant cutting speed, Optimum turning speed designate					
	Tool commands	2-digit tool no. + 4-digit tool no. (max tool registration: 1,000 sets)					
	Tool compensation	Tool offset, nose R comp: 20 sets per tool, multi-coordinate tool compensation					
	Display	21.5-inch color display operational panel, multi touch panel operations					
	Security	Operator authentication, lock screen, OSP-VPSII-STD					
Programming	Program capacity	Program storage: 4 GB, operation buffer: 2 MB					
	Programming	Program management, edit, scheduled programs, G-/M-code macros, fixed cycles, special fixed cycles, M-spindle synchronized tapping, fixed drilling cycles, user task, auto programming (LAP4), programming help, block skip					
Operations	OSP suite	Various "suite apps" support the series of machining operations, and "suite operation" enables one-touch access to those apps					
	Easy Operation	"Single-mode operation" for a series of operations from a single screen. Easy-to-use operation panel supports complete machine control.					
	Collision Avoidance System	Prevents interference during manual, automatic operation Easy modeling of shape data (there are limits in interference prevention unit, unit movement)					
	Machine operations	MDI, manual (rapid traverse, pulse handle), load meter, operations help, alarm help, sequence return, manual interrupt & auto return, Easy parameter setting					
	MacMan plus	Machining management: machining results, machine utilization, fault data compile & report, visualization of power consumption, External output					
Communications / Networking		USB ports, Ethernet, DNC-T1, Smart I/F					
High speed/accuracy	Thermo-Friendly Concept	TAS-C (Thermo Active Stabilizer—Construction): corrects machine construction thermal deformation error during shop temperature change. TAS-S (Thermo Active Stabilizer—Spindle): corrects milling tool spindle thermal deformation error during spindle rotation.					
	High speed/accuracy	Hi-G control, Machining time shortening function					
Energy-saving	ECO suite plus	ECO Idling Stop, ECO Operation, ECO Power Monitor (on machine watt meter is optional)					
	Power Regeneration System	Regenerative power is used when the spindle and feed axes decelerate to reduce energy waste.					

### Novice-friendly smart operation

## Innovative operability

### It's possible to speed up preparation for machining, even without knowledge of NC programs

While preparation for machining is conventionally conducted by writing G/M code programs for machining settings and processes based on the drawing, this product enables the machining processes to be determined automatically, simply by following the guidance and entering drawing information.

#### In the case of preparation for tapping (part of the process)

Enter data following the guidance diagram

Machining shape entered is displayed

The screen keyboard can be used for input Minimal hand movements

### Optional Specifications OSP-P500S

Item	Kit spec	NML		AOT-M		DT		DT AOT-M	
		E	D	E	D	E	D	E	D
<b>Digital Twin</b>									
Virtual Machining						●	●	●	●
Quick Modeling						●	●	●	●
OPC UA for Machine Tools						●	●	●	●
OSP API KIT						●	●	●	●
<b>Interactive Programming</b>									
Advanced One-Touch IGF-L Multitasking (w/Real 3D)				●	●			●	●
Smart OSP Operation				●	●	●	●	●	●
<b>Programming</b>									
Operation buffer (10 MB)		●	●	●	●	●	●	●	●
Circular threading				●	●	●	●	●	●
Program notes				●	●	●	●	●	●
User task I/O variables, 24 each 1,000 common variables									
Work coordinate system select	10 sets	●	●	●	●	●	●	●	●
	100 sets								
Thread matching									
Pause for threading during non-fixed cycle		●	●	●	●	●	●	●	●
Variable Spindle Speed Threading (VSST)									
Inverse time feed									
Mid-block sequence return				●	●	●	●	●	●
Coordinate convert		●	●	●	●	●	●	●	●
Profile generate		●	●	●	●	●	●	●	●
Fiat turning									
Coordinate calculation (with NCYL commands)		●	●	●	●	●	●	●	●
Coordinate shifting, rotation, copying		●	●	●	●	●	●	●	●
Enlarge/reduce				●	●	●	●	●	●
Helical cutting									
Slope machining (Type I, Type II)									
B-axis slope machining		●	●	●	●	●	●	●	●
Profile helical cutting									
Harmonic Spindle Speed Control		●	●	●	●	●	●	●	●
Tool life management (include prior notice)				●	●	●	●	●	●
Turn-Cut									
Hobbing									
Multi-flute cutter function									
Block skip; 9 sets									
Home position									
Dynamic tilt turning									
<b>Monitoring</b>									
Real 3-D simulation				●	●	●	●	●	●
Cycle time over check		●	●	●	●	●	●	●	●
Load monitor (spindle, feed axis)									
No-load detection, part number expansion, Workpiece ejection detection				●	●	●	●	●	●
AI machine diagnostics (M-spindle, feed axes) <sup>1</sup>									
Machine Status Logger									
Cutting Status Monitor									
Operation end buzzer									
Workpiece counters	Count only								
	Cycle stop								
	Start disabled								
Hour meters	Power ON								
	Spindle rotation								
	NC operating								
NC operation monitor (counter, totaling)		●	●	●	●	●	●	●	●
Status indicator (3-color C type) [A type, B type]		●	●	●	●	●	●	●	●
<b>External Input/Output and Communication Functions</b>									
RS-232C connector									
Ethernet/IP									
Networking	DNC-DT, DNC-T3								
	DNC-C/Ethernet								

Item	Kit spec	NML		AOT-M		DT		DT AOT-M	
		E	D	E	D	E	D	E	D
<b>Measuring</b>									
In-process workpiece gauging	Tool compensation								
	Z-axis automatic zero offset								
	C-axis automatic zero offset								
	Y-axis zero offset and tool offset								
	Y-axis slope gauging								
	3-point gauging								
Gauge data output	File output								
Post-process workpiece gauging	Quantitative compensation (five level, seven level)								
	BCD								
	RS-232C (w/dedicated channel)								
<b>Energy saving ECO suite plus</b>									
Spindle power peak cutting									
ECO Power Monitor	On-machine wattmeter								
<b>Automation / Unattended Operation</b>									
Auto power shutoff	M02, alarm	●	●	●	●	●	●	●	●
Warm-up function (by calendar timer)									
Tool retract cycle									
External program	Pushbutton, rotary switch								
	Digital switch, BCD								
Connection with automated devices	Robot, loader I/F								
	Bar feeder I/F								
	FMS link I/F								
<b>High-Speed /High-Accuracy</b>									
B-axis NC									
Simultaneous 5-axis kit (NC B-axis)	Hyper-Surface II (5 axes)								
	Tool center point control II								
	Tool tilt command								
	DNC-DT								
	Inverse time feed								
	Herical cutting								
	Slope machining, B-axis slope machining								
Cycle time reduction <sup>2</sup>	Operation time reduction	●	●	●	●	●	●	●	●
	Chuck and tailstock movement during spindle rotation								
0.1 μm control <sup>2</sup>									
Pitch error compensation									
AbsoScale detection <sup>2</sup>									
Hi-Cut Pro		●	●	●	●	●	●	●	●
Dynamic displacement compensation		●	●	●	●	●	●	●	●
Hyper-Surface II	3 linear axes								
	3 linear axes + 2 rotary axes								
5-Axis Auto Tuning System kit	Standard, high spec								
NC Gage kit	Standard, high spec								
<b>Other</b>									
One-Touch Spreadsheet									
Gear machining package									
Machining Navi [M-gII+, M-]									
Machining Navi [L-gII, T-g threading]									
Spindle dead-slow cutting									
Synchronized C-axis control									
Y-axis center height offset									
Feed axis retract									
Short circuit breaker									
External M signals [2 sets, 4 sets, 8 sets, 16 sets]									
OSP-VPSII-EX (Virus Protection System)									

Note: NML: Normal kit, AOT-M: Advanced One-Touch IGF-L kit, DT: Digital Twin kit, DT AOT-M: Digital Twin Advanced One-Touch IGF-L kit, E: Economy, D: Deluxe  
VE and VD kits are also equipped with the Digital Twin on PC function, allowing running from a PC.  
<sup>1</sup>. Engineering discussions required. With AbsoScale detection specs, ball screw wear detection is possible.  
<sup>2</sup>. Engineering discussions required.  
Specifications, etc. are subject to change without notice.

When using Okuma products, always read the safety precautions mentioned in the instruction manual and attached to the product.

● The specifications, illustrations, and descriptions in this brochure vary in different markets and are subject to change without notice.  
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This product is subject to the Japanese government Foreign Exchange and Foreign Trade Control Act with regard to security controlled items; whereby Okuma Corporation should be notified prior to its shipment to another country.