OKUMA

OPEN POSSIBILITIES

Intelligent Multitasking Machines

MULTUS U series

MULTUS U3000 / MULTUS U4000
MULTUS U5000

Intelligent Multitasking Machines

MULTUS U series

MULTUS U3000 / MULTUS U4000 / MULTUS U5000

Intelligent Technology | Thermo-Friendly Concept | Collision Avoidance System | Machining Navi | 5-Axis Auto Tuning System | SERVONAVI

Highly accurate, rigid, hi-tech, and process-intensive
All that's required and packed in the ultimate multitasking machine

- Flexible machining from all directions
- Max milling or turning performance
- 2 saddles for minimum cycle times
- Process-intensive machining that goes beyond the framework of multitasking machines
- To support long and stable machining accuracies
- Maximizing machine tool performance
- Shorter lead-times with easy first part machining

MULTUS U3000
<DBC 1,000 mm 1SW>

MULTUS U4000
<DBC 1,500 mm 2SW>

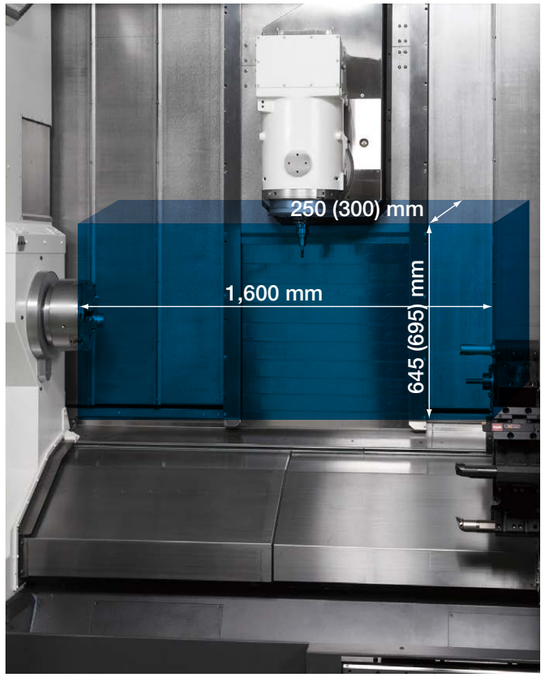
MULTUS U5000
<DBC 2,000 mm 2SC>

29 diverse variations in all

Spec extension		MULTUS U3000		MULTUS U4000		MULTUS U5000		
Distance between centers		1000	1500	1500	2000	1500	2000	3000
Upper turret	Chuck work	●	—	—	—	—	—	—
(1S)	Tailstock (C)	●	●	●	●	●	●	●
	Opposing spindles (W)	●	●	●	●	●	●	●
Upper/lower turret	Tailstock (C)	●	●	●	●	●	●	●
(2S)	Opposing spindles (W)	●	●	●	●	●	●	●

Door shape differs with 1S and 2S specifications.
Photos shown in this brochure include optional equipment.

Flexible machining from all directions

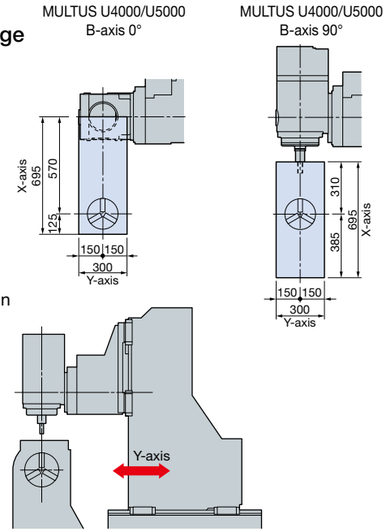


DBC 1500 illustration
( ) figures for the MULTUS U4000/U5000

Tough cutting in entire Y-axis range

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



Wide B-axis swing: 240°

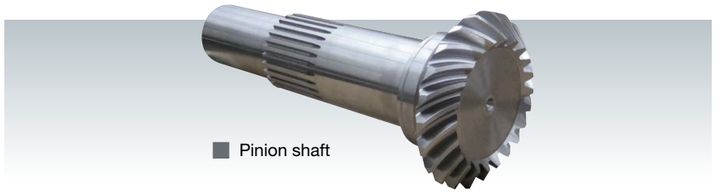
The wide 240-degree swing of the B axis spindle allows it to have equivalent machining areas for both the main and opposing spindle. With the NC-B axis, roller gears are used to achieve “0” backlash during B-axis drive, and highly accurate 5-axis machining.

Superb C-axis positioning accuracy: 0.0001°control

As an option*, a highly accurate C-axis 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.

* Standard in certain markets.

Wide variety of efficient machining applications



Spline machining

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

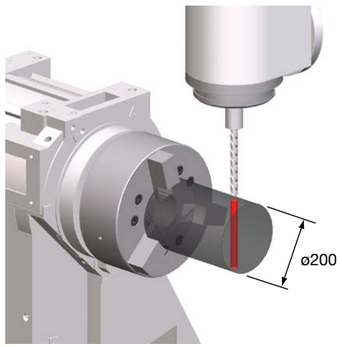
Cutting a spiral bevel gear

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

Machining examples

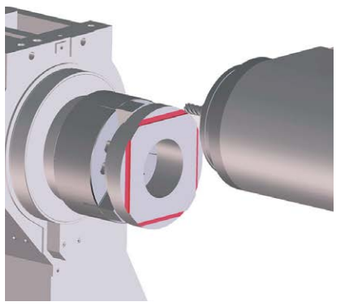
Thru-holes up to ø200 mm

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

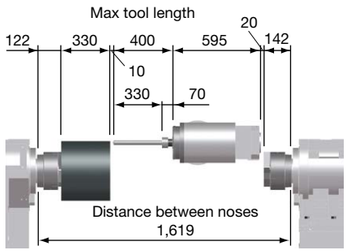
Cutting the outline of a □230 mm (9.06 × 9.06 in.) workpiece without C-axis rotation is also possible.
Square parts can be cut with machining-center-equivalent geometric accuracy. (MULTUS U4000/U5000)



When using a ø20 mm end mill

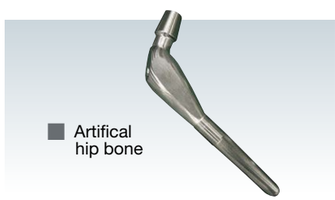
Deep drilling: 330 mm (13 in.)

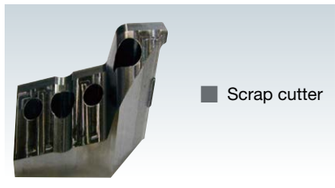
With the 1,000 mm machine (distance between centers), 330 mm long workpieces can be drilled (330 mm tool projection) to make deep holes.
(MULTUS U3000 with 1SW specifications, standard main and opposing spindles)



Unit : mm

Workpiece samples





Maximum milling or turning performance

Achieving highly efficient cutting of difficult-to-machine materials

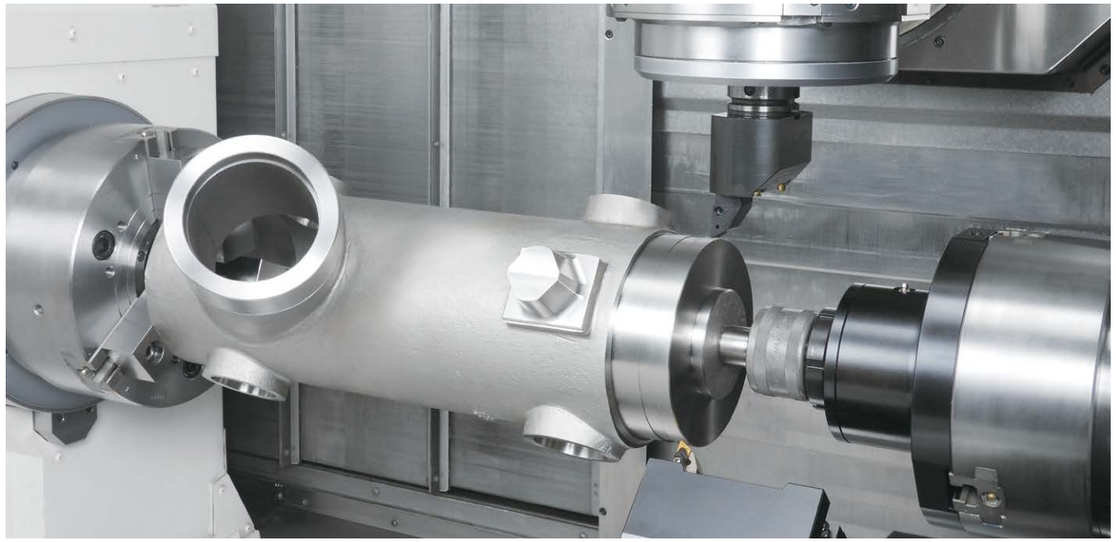


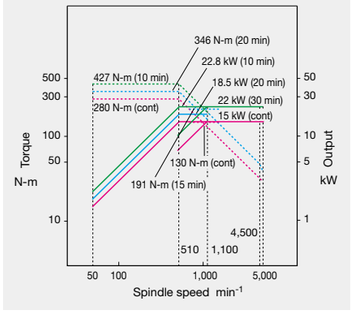
Photo shows a tailstock attachment mounted on the opposing spindle with tailstock control.

		MULTUS U3000	MULTUS U4000/MULTUS U5000
Turning		**Heavy-duty: 4.8 mm²**	**Heavy-duty: 5.0 mm²** (Big-Bore ø160)
● OD (S45C)	Cutting Speed	150 m/min	150 m/min
	Cutting depth	8 mm	8 mm
	Feed rate	0.6 mm/rev	0.625 mm/rev
● Insert drill (S45C)		ø63 Throwaway	ø63 Throwaway
	Cutting Speed	150 m/min	150 m/min
	Feed rate	0.23 mm/rev	0.23 mm/rev
Milling		**Chip volume: 604 cm³/min**	**Chip volume: 604 cm³/min**
● End milling (S45C)	Tooling	ø20-mm end mill 7-flute	ø20-mm end mill 7-flute
	Cutting Speed	192 m/min	192 m/min
	Cutting depth	6.5 × 20 mm	6.5 × 20 mm
	Feed rate	1.52 mm/rev	1.52 mm/rev
	Removal Rate	604 cm³/min	604 cm³/min
● Face milling (S45C)	Tooling	ø50 milling cutter 5-flute	ø50 milling cutter 5-flute
	Cutting Speed	300 m/min	300 m/min
	Cutting depth	6 × 35 mm	6 × 35 mm
	Feed rate	2,865 mm/min	2,865 mm/min
	Removal Rate	602 cm³/min	602 cm³/min
● Insert drill (S45C)		ø50 Throwaway	ø50 Throwaway
	Cutting Speed	150 m/min	150 m/min
	Feed rate	0.12 mm/rev	0.12 mm/rev
● TAP (S45C)		M30 P3.5	M30 P3.5

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.

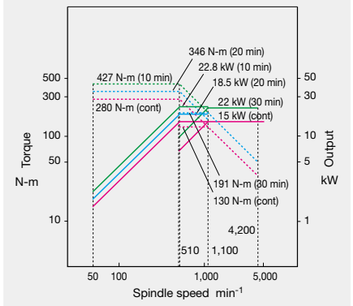
MULTUS U3000 ø120-mm Std spindle
ø120-mm Standard opposing spindle (1S)

- Spindle speed 5,000 min^{-1}
- Output 22/15 kW (30 min/cont)
- Torque 427/280 N-m (10 min/cont)



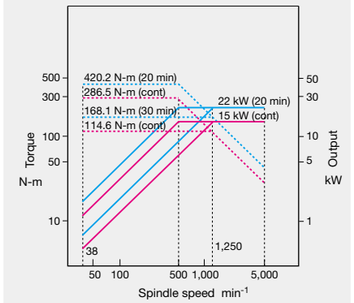
MULTUS U3000 ø140-mm Big-Bore spindle
ø120-mm Opposing big bore spindle (1S)

- Spindle speed 4,200 min^{-1}
- Output 22/15 kW (30 min/cont)
- Torque 427/280 N-m (10 min/cont)



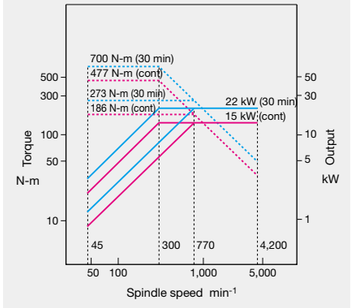
MULTUS U3000
ø100-mm Standard opposing spindle (2S)

- Spindle speed 5,000 min^{-1}
- Output 22/15 kW (20 min/cont)
- Torque 420.2/286.5 N-m (20 min/cont)



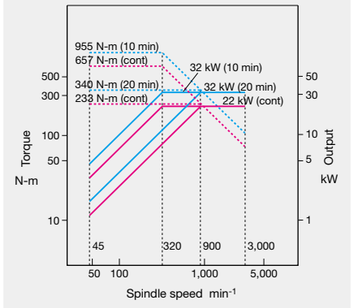
MULTUS U4000 ø140-mm Std spindle
ø140-mm Standard opposing spindle (1S)

- Spindle speed 4,200 min^{-1}
- Output 22/15 kW (30 min/cont)
- Torque 700/477 N-m (30 min/cont)



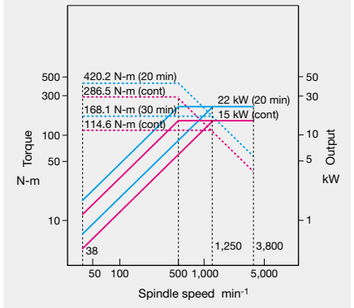
MULTUS U4000 ø160-mm Big-Bore spindle
ø160-mm Opposing big bore spindle (1S)
MULTUS U5000
ø160-mm Standard opposing spindle (1S)

- Spindle speed 3,000 min^{-1}
- Output 32/22 kW (20 min/cont)
- Torque 955/657 N-m (10 min/cont)



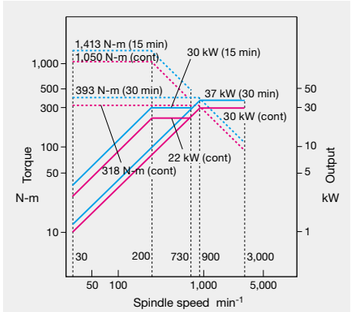
MULTUS U4000
ø120-mm Standard opposing spindle (2S)
MULTUS U5000
ø120-mm Standard opposing spindle (2S)

- Spindle speed 3,800 min^{-1}
- Output 22/15 kW (20 min/cont)
- Torque 420.2/286.5 N-m (20 min/cont)



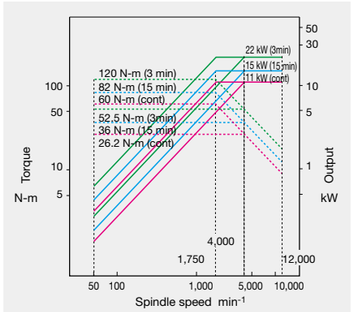
MULTUS U5000 ø160-mm Std spindle

- Spindle speed 3,000 min^{-1}
- Output 37/30 kW (30 min/cont)
- Torque 1,413/1,050 N-m (15 min/cont)



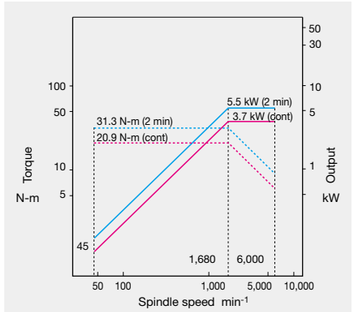
MULTUS U3000/U4000/U5000
Upper turret M-spindle

- Spindle speed 12,000 min^{-1}
- Output 22/15/11 kW (3 min/15 min/cont)
- Torque 120/82/60 N-m (3 min/15 min/cont)

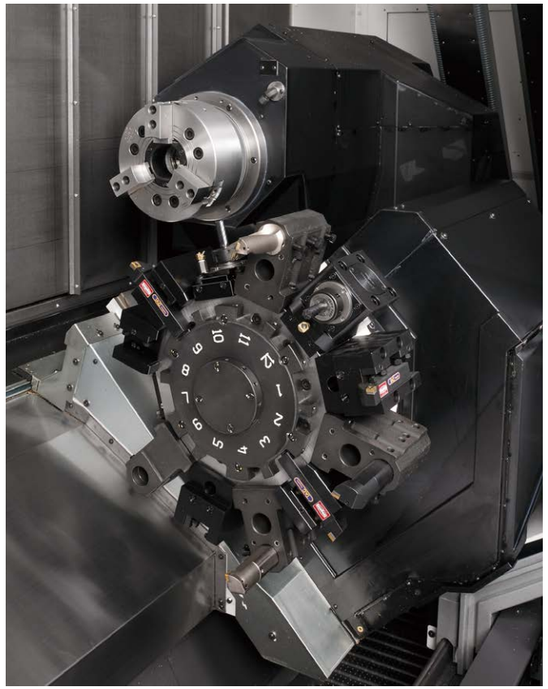


MULTUS U3000/U4000/U5000
Lower turret milling tool spindle

- Spindle speed 6,000 min^{-1}
- 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　Lower turret

Many different types of machining are possible with 12 tools

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

■ Multitasking specifications　Lower turret

A milling tool can be attached to the lower turret

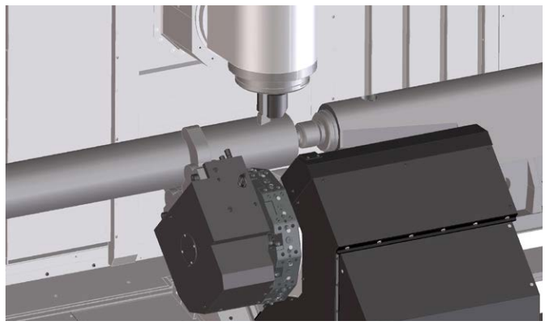
- Turret type: V12 multitasking turret
- Milling tool spindle speed: 6,000 min^{-1}
- Milling tool spindle motor: 5.5/3.7 (2 min/cont)

Note: With opposing spindle specifications only

Lower turret makes many types of machining possible

■ Mounted steadyrest

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.
(turning-dedicated turret)



■ Mounted workrest

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

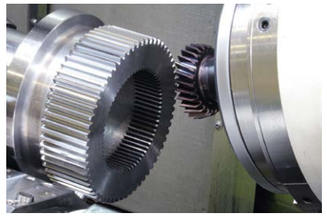
■ Tailstock attachment

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 itself uses a "dead quill" (with live, revolving center).

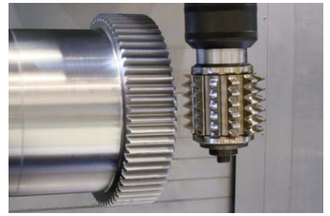
Achieves process-intensive machining beyond the framework of multitasking machines

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

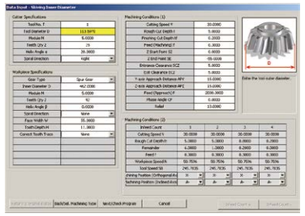
Gear cutting that previously required complex programming can now be done with ease. With easy programming, simply input the tool type, gear data, and cutting conditions to achieve highly accurate machining, reducing programming time to about one-tenth that of manual input. Process-intensive machining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



Skiving (OD/ID splines)



Hobbing



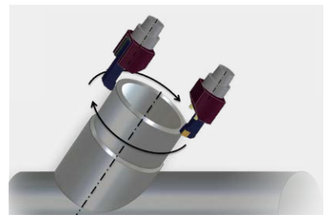
Input screen

3D measuring for multitasking machines
NC Gage (Optional)

Twenty types of geometrical accuracy, such as hole position and flatness, can be measured on the machine, greatly reducing lead time. A program to measure the positional relationship between geometric tolerance and workpiece shape is automatically produced by teaching. Data storage of the measurement results is possible.

Sloped axis turning
Turn-Cut

Turn-Cut is an original Okuma technology that enables turning on a milling spindle. The circular turning of the feed shaft 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

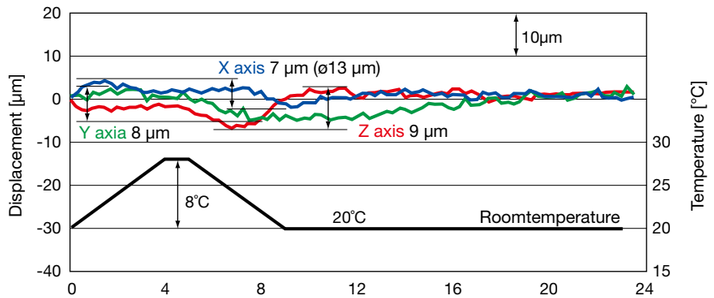
To support long and stable machining accuracies

Thermal deformation over time: less than 10 µm

Thermo-Friendly Concept

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^{-1} (2.5 min)
Milling tool spindle 6,000 min^{-1} (6 min)
10,000 min^{-1} (6 min)
Interval (0.5 min)
Cycle time: 15 min
W/Coolant

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.

Machine startup
Machining restart
Room temp change

High dimensional stability

TAS-C

(Thermo Active Stabilizer — Construction)
The machine is optimally controlled and machining accuracy is maintained when the ambient temperature changes.

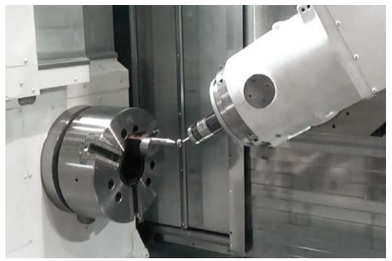
TAS-S

(Thermo Active Stabilizer — Spindle)
Even when the spindle speed changes frequently, the thermal deformation of the milling tool spindle is accurately controlled.

Gauging and compensatiom of geometric error

5-Axis Auto Tuning System (Optional)

On multitasking machines there is "geometric error," such as spindle runout, 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 multitasking machines for better operating accuracy through compensation control using the measurement results. This helps to achieve a higher level of 5-axis machining accuracy.*

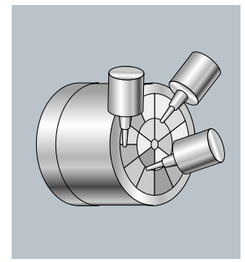


Manual adjustment without 5-AATS
Machining surface error
Max 25 µm

After using 5-AATS
Max 10 µm
(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: May not be available for certain specifications.



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.

Start of tuning

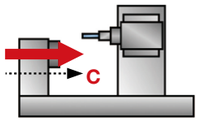
Set datum sphere on the table and move probe directly above it

Press START MEASURE key and cycle start button

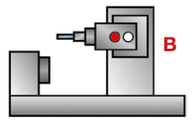
Auto measurement and then auto setting of compensation parameters

Tuning complete

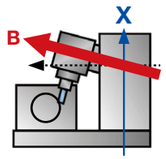
●Examples of geometric error



Perpendicularity of C and X axes



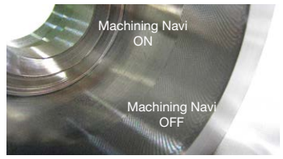
Perpendicularity of B and Z axes



B-axis misalignment in X-axis direction

Maximizing machine tool performance

Cutting condition search: Machining Navi (Optional)
With optimal cutting conditions: longer tool life, shorter cycle time



Machining Navi, with clear visuals of complex cutting conditions, is a breakthrough tool that enables the machine operator to navigate the machine and tool capabilities to their best performance levels.

For turning

Chatter-free applications for lathes

Machining Navi L-*g* (guidance)

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

Threading chatter can be easily controlled by anyone

Machining Navi T-*g* (threading)

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

For milling

Adjust cutting conditions while monitoring the data

Machining Navi M-*g* II +
(Optimum spindle speed/harmonic spindle speed control)

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.

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

Machining Navi M-*i*
(intelligently optimized spindle speed control)

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.

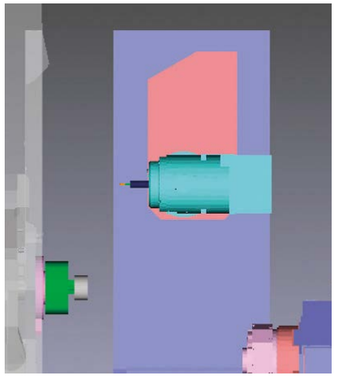
Setup/trial cut time: reduced by 40%
Preventing collisions: Collision Avoidance System

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 cycle 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, 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, origin settings; 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 preparation

Just after loading a tool in the machine, simply select it from among the registered tools.
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

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)

Easy zero offsets/ Machining start

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

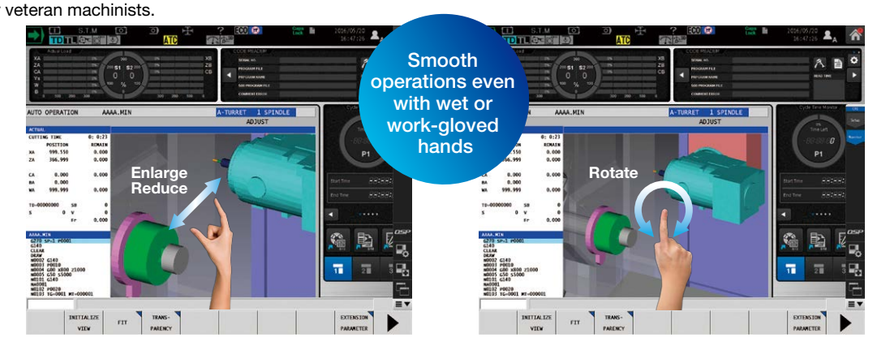
Service functions are concentrated in the maintenance area on the front side of the machine—a machine layout designed to make daily inspections easier.

With revamped operation and responsiveness— ease of use for machine shops first!

Smart factories implement advanced digitization and networking (IoT) in manufacturing to achieve enhanced productivity and added value. The OSP has evolved tremendously as a CNC suited to advanced intelligent technology. Okuma's new control uses the latest CPUs for a tremendous boost in operability, rendering performance, and processing speed. The OSP suite also features a full range of useful apps that could only come from a machine-tool manufacturer, making smart manufacturing a reality.

Smooth, comfortable operation with the feeling of using a smart phone

Improved rendering performance and use of a multi-touch panel achieve intuitive graphical operation. Moving, enlarging, reducing, and rotating 3D models, as well as list views of tool data, programs, and other information can be accomplished through smooth, speedy operations with the same feel as using a smart phone. The screen display layout on the operation screen can also be changed to suit operator preferences and customized for the novice and/or veteran machinists.



* Screen example of 19-inch operation panel (optional)

"Just what we wanted."— Refreshed OSP suite apps

This became possible through the addition of Okuma's machining expertise based on requests we heard from real, machine-shop customers. The brainpower packed into the CNC, built by machine tool manufacturer, will "empower shop floor" management.

S11

Increased productivity through visualization of motor power reserve

Spindle Output Monitor

The specified spindle output (red line: short time rating, green line: continuous rating) and the spindle output in current cutting (blue circle) are simultaneously displayed on the screen, for real-time view of power reserve during cutting. This allows speeding up cutting by increasing the spindle speed or feed rate while monitoring the graph to ensure that the blue circle does not cross the lines.

S10

Easy programing without keying in code

Scheduled Program Editor

S15

Monitoring operating status even when away from the machine

E-mail Notification

Machine tool idling stop
ECO Idling Stop
Machine itself determines when to stop. Cooler is turned off while high accuracy is still maintained

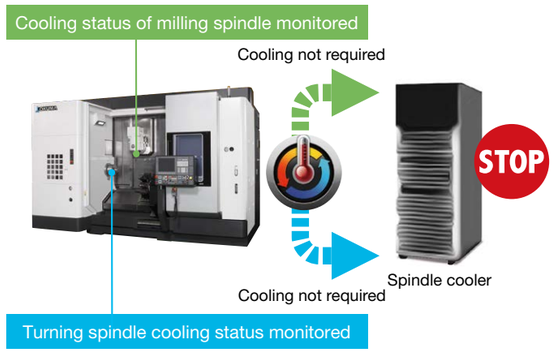
See energy-saving benefits right at the machine
ECO Power Monitor
Visual graphic of power consumption raises awareness of energy usage

Peripheral equipment runs only in the necessary amount and at the necessary time
ECO Operation (Optional)
Intermittent/linked operation of chip conveyor, or mist collector during machining

Accuracy ensured, cooler off

ECO Idling Stop

Intelligent energy-saving function with the Thermo-Friendly Concept. The machine itself determines whether or not cooling is needed and cooler idling is stopped with no loss to accuracy. (Standard application on machines with TAS-S/H1)

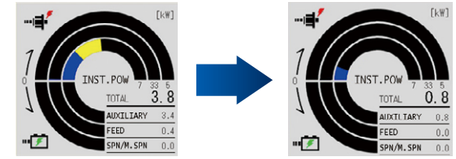


On-the-spot check of energy savings

ECO Power Monitor

Power is shown individually for spindle, feed axis, and peripheral equipment on OSP operation screen. The energy-saving effect from peripheral equipment stopped with ECO Idling Stop can be confirmed on the spot.

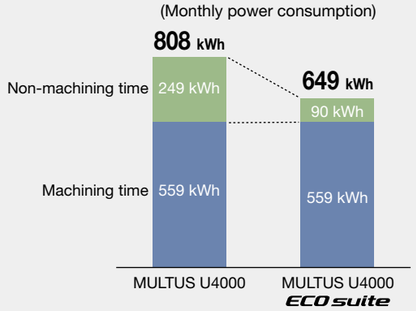
● Power Monitor confirmation example



The indicated values are one example.

Reduction in power consumption (example)

● Operating time 94 h, Non-operating time 66 h, Total 160 h (8 × 20 days)



Effects of ECO suite

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

(Non-cutting time)

159 kWh (64%) reduction!

*ECO Idling Stop

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

Machine Specifications

Item			MULTUS U3000							
			1SC		1SW		2SC		2SW	
			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 centers	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)
	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	Spindle speed	min^{-1}	50 to 5,000							
	Spindle speed ranges		2 auto ranges (2-speed motor coil switching)							
	Spindle nose shape		JIS A2-6							
	Taper bore	mm (in.)	ø80 (3.15)							
	Bearing dia	mm (in.)	ø120 (4.72)							
Opposing spindle*2	Spindle speed	min^{-1}	–		50 to 5,000		–		38 to 5,000	
	Spindle speed ranges		–		2 auto ranges (2-speed motor coil switching)		–		2 auto ranges (2-speed motor coil switching)	
	Spindle nose shape		–		JIS A2-6		–		JIS A2-6	
	Taper bore	mm (in.)	–		ø80 (3.15)		–		ø62 (2.44)	
	Bearing dia	mm (in.)	–		ø120 (4.72)		–		ø100 (3.94)	
Turret (tool spindle)	Type		H1				Upper: H1, Lower: V12			
	No. of tools		L / M: 1				Upper: L / M: 1, Lower: 12			
	Tool shank dimensions	mm (in.)	□25 (1 × 1)							
	ID tool shank diameter	mm (in.)	ø40 (1.57)							
	Milling tool spindle	min^{-1}	50 to 12,000							
	Milling tool spindle speed ranges		2 auto ranges (2-speed motor coil switching)							
Feedrates	Feedrates X, Z, Y axes	upper: m/min	X: 50, Z: 50, Y: 40							
		lower: m/min	–				X: 25, Z: 40			
	Feedrates W-axis	m/min	20 (tailstock)	12 (tailstock)	30		20 (tailstock)	12 (tailstock)	30	
	Feedrates C, B axis	min^{-1}	C: 200, B: 30							
	Cutting feedrate	mm/rev	0.001 to 1,000.000							
Tailstock	Tapered bore		MT. No.5 (revolving center)		–		MT. No.5 (revolving center)		–	
	Travel	mm (in.)	1,186 (46.69)	1,594 (62.76)	–		961 (37.83)	1,359.5 (53.52)	–	
ATC	Tool shank		HSK-A63							
	No. of tools	tools	40							
	Max tool dia	mm (in.)	ø90 (3.54) (w/o adjacent tools: ø130 (5.12))							
	Max tool length	mm (in.)	400 (15.75) (from gauge line)							
	Max tool weight	kg (lb)	10 (22)							
Motor	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)	22/15/11 (30/20/15) (3 min/15 min/cont)				22/15/11 (30/20/15) (3 min/15 min/cont)			
	X, Z, Y, B axis motor	kW (hp)	X: 5.2, Z: 4.6, Y: 3.5, B: 3.0 (X: 6.9, Z: 6.1, Y: 4.7, B: 4.0)				XA: 5.2, XB: 3.5, ZA:4.6, ZB: 3.5 (XA: 6.9, XB: 4.7, ZA:6.1, ZB: 4.7)(DBC 1,000) /4.6 (6.1) (DBC 1,500), Y: 3.5, B: 3.0 (Y: 4.7, B: 4.0)			
	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							
Machine size	Height	mm (in.)	2,955 (116.34)				3,030 (119.29)			
	Floor space W × D (tank included)	mm × mm (in.)	DBC 1,000: 4,925 × 2,995 (193.90 × 117.91) DBC 1,500: 5,425 × 2,995 (213.58 × 117.91)				DBC 1,000: 4,925 × 3,018 (193.90 × 118.82) DBC 1,500: 5,425 × 3,082 (213.58 × 121.34)			
	Weight	kg (lb)	DBC 1,000: 15,500 (34,100) DBC 1,500: 16,500 (36,300)				DBC 1,000: 16,500 (36,300) DBC 1,500: 17,500 (38,500)			
CNC			OSP-P300SA							

*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.

Machine Specifications

Item			MULTUS U4000							
			1SC		1SW		2SC		2SW	
			1500	2000	1500	2000	1500	2000	1500	2000
Capacity	Swing over saddle	mm (in.)	ø650 (25.59)				Upper: ø650 (25.59), Lower: ø320 (12.60)			
	Distance between centers	mm (in.)	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)
	Max machining dia	mm (in.)	ø650 (25.59)				Upper: ø650 (25.59)*1, Lower: ø320 (12.60)			
	Max machining length	mm (in.)	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)
Travels	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)
		lower: mm (in.)	–				1,461 (57.52)	1,961 (72.20)	1,524*2 (60.00)	2,045*3 (80.51)
	Y axis	mm (in.)	300 (11.81) (±150 (5.91))							
	W axis	mm (in.)	–		1,554 (61.18)	2,054 (80.87)	–		1,524*2 (60.00)	2,024*3 (79.69)
	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	Spindle speed	min^{-1}	45 to 4,200							
	Spindle speed ranges		2 auto ranges (2-speed motor coil switching)							
	Spindle nose shape		JIS A2-8							
	Taper bore	mm (in.)	ø91 (3.58)							
	Bearing dia	mm (in.)	ø140 (5.51)							
Opposing spindle*4	Spindle speed	min^{-1}	–		45 to 4,200		–		38 to 3,800	
	Spindle speed ranges		–		2 auto ranges (2-speed motor coil switching)		–		2 auto ranges (2-speed motor coil switching)	
	Spindle nose shape		–		JIS A2-8		–		JIS A2-8	
	Taper bore	mm (in.)	–		ø91 (3.58)		–		ø80 (3.15)	
	Bearing dia	mm (in.)	–		ø140 (5.51)		–		ø120 (4.72)	
Turret (tool spindle)	Type		H1				H1, Lower: V12		Upper: H1, Lower: V12	
	No. of tools		L / M: 1				Upper: L / M: 1, Lower: 12			
	Tool shank dimensions	mm (in.)	□25 (1 × 1)							
	ID tool shank diameter	mm (in.)	ø40 (1.57)							
	Milling tool spindle	min^{-1}	50 to 12,000							
	Milling tool spindle speed ranges		2 auto ranges (2-speed motor coil switching)							
Feedrates	Feedrates X, Z, Y axes	upper: m/min	X: 50, Z: 50, Y: 40	X: 50, Z: 40, Y: 40	X: 50, Z: 50, Y: 40	X: 50, Z: 40, Y: 40	X: 50, Z: 50, Y: 40	X: 50, Z: 40, Y: 40	X: 50, Z: 50, Y: 40	X: 50, Z: 40, Y: 40
		lower: m/min	–				X: 25, Z: 40	X: 25, Z: 30	X: 25, Z: 40	X: 25, Z: 30
	Feedrates W-axis	m/min	12 (tailstock)		30	20	12 (tailstock)		30	20
	Feedrates C, B axis	min^{-1}	C: 200, B: 30							
	Cutting feedrate	mm/rev	0.001 to 1,000.000							
Tailstock	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)	–	
ATC	Tool shank		HSK-A63							
	No. of tools	tools	40							
	Max tool dia	mm (in.)	ø90 (3.54) (w/o adjacent tools: ø130 (5.12))							
	Max tool length	mm (in.)	400 (15.75) (from gauge line)							
	Max tool weight	kg (lb)	10 (22)							
Motor	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)	22/15/11 (30/20/15) (3 min/15 min/cont)				22/15/11 (30/20/15) (3 min/15 min/cont)			
	X, Z, Y, B axis motor	kW (hp)	X: 5.2, Z: 4.6 (X: 6.9, Z: 6.1) (DBC 1,500)/ 5.2 (6.9) (DBC 2,000), Y: 3.5 (4.7), B: 3.0 (4.0)				XA: 5.2, XB: 3.5, ZA:4.6 (XA: 6.9, XB: 4.7, ZA:6.1) (DBC 1,500), 5.2 (6.9) (DBC 2,000), ZB: 4.6, Y: 3.5, B: 3.0 (ZB: 6.1, Y: 4.7, B: 4.0)			
	W-axis motor	kW (hp)	2.8 (3.7) (tailstock)	4.6 (6.1)			2.8 (3.7) (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							
Machine size	Height	mm (in.)	2,955 (116.34)				3,030 (119.29)			
	Floor space W × D (tank included)	mm × mm (in.)	DBC 1,500: 5,425 × 2,995 (213.58 × 117.91) DBC 2,000: 6,175 × 2,995 (243.11 × 117.91)				DBC 1,500: 5,425 × 3,082 (213.58 × 385.25) DBC 2,000: 6,175 × 3,082 (243.11 × 121.34)			
	Weight	kg (lb)	DBC 1,500: 17,000 (37,400) DBC 2,000: 19,000 (41,800)				DBC 1,500: 18,000 (39,600) DBC 2,000: 20,000 (44,000)			
CNC			OSP-P300SA							

*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.

Machine Specifications

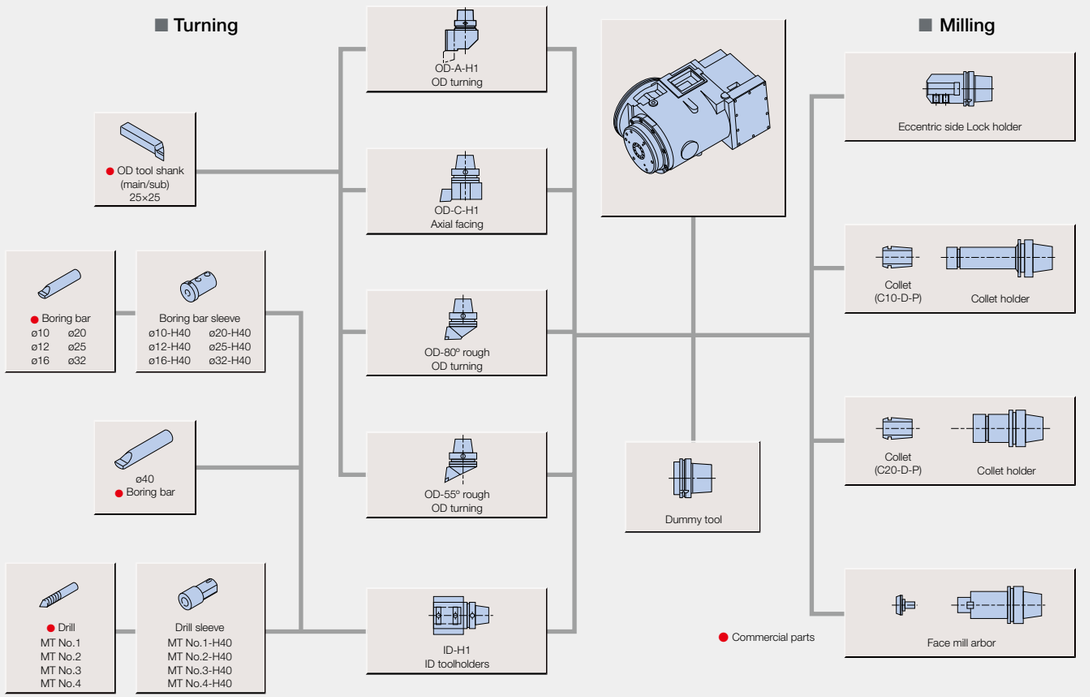
Item			MULTUS U5000							
			1SC		1SW		2SC		2SW	
			1500	2000	1500	2000	1500	2000	1500	2000
Capacity	Swing over saddle	mm (in.)	ø650 (25.59)				Upper: ø650 (25.59), Lower: ø320 (12.60)			
	Distance between centers	mm (in.)	1,500 (59.06)	2,000 (78.74)	1,500 (59.06)	2,000 (78.74)	1,500 (59.06)	2,000 (78.74)	1,500 (59.06)	2,000 (78.74)
	Max machining dia	mm (in.)	ø650 (25.59)				Upper: ø650 (25.59)*1, Lower: ø320 (12.60)			
	Max machining length	mm (in.)	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)
Travels	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)
		lower: mm (in.)	–				1,461 (57.52)	1,961 (72.20)	1,524 (60.00)	2,024 (79.69)
	Y axis	mm (in.)	300 (11.81) (±150 (5.91))							
	W axis	mm (in.)	–		1,554 (61.18)	2,054 (80.87)	–		1,500 (59.06)	2,000 (78.74)
	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	Spindle speed	min^{-1}	30 to 3,000							
	Spindle speed ranges		2 auto ranges (2-speed motor coil switching)							
	Spindle nose shape		JIS A2-11							
	Taper bore	mm (in.)	ø112 (4.41)							
	Bearing dia	mm (in.)	ø160 (6.30)							
Opposing spindle*2	Spindle speed	min^{-1}	–		30 to 3,000		–		38 to 3,800	
	Spindle speed ranges		–		2 auto ranges (2-speed motor coil switching)		–		2 auto ranges (2-speed motor coil switching)	
	Spindle nose shape		–		JIS A2-11		–		JIS A2-8	
	Taper bore	mm (in.)	–		ø112 (4.41)		–		ø80 (3.15)	
	Bearing dia	mm (in.)	–		ø160 (6.30)		–		ø120 (4.72)	
Turret (tool spindle)	Type		H1				H1, Lower: V12			
	No. of tools		L / M: 1				Upper: L / M: 1, Lower: 12			
	Tool shank dimensions	mm (in.)	□25 (1 × 1)							
	ID tool shank diameter	mm (in.)	ø40 (1.57)							
	Milling tool spindle	min^{-1}	50 to 12,000							
	Milling tool spindle speed ranges		2 auto ranges (2-speed motor coil switching)							
Feedrates	Feedrates X, Z, Y axes	upper: m/min	X: 50, Z: 50, Y: 40	X: 50, Z: 40, Y: 40	X: 50, Z: 50, Y: 40	X: 50, Z: 40, Y: 40	X: 50, Z: 50, Y: 40	X: 50, Z: 40, Y: 40	X: 50, Z: 50, Y: 40	X: 50, Z: 40, Y: 40
		lower: m/min	–				X: 25, Z: 40	X: 25, Z: 30	X: 25, Z: 40	X: 25, Z: 30
	Feedrates W-axis	m/min	8 (tailstock)		30	20	8 (tailstock)		30	20
	Feedrates C, B axis	min^{-1}	C: 200, B: 30							
	Cutting feedrate	mm/rev	0.001 to 1,000.000							
Tailstock	Tapered bore		MT. No.5 (Built-in)		–		MT. No.5 (Built-in)		–	
	Travel	mm (in.)	1,554 (61.18)	2,054 (80.87)	–		1,359.5 (53.52)	1,961 (77.20)	–	
ATC	Tool shank		HSK-A63							
	No. of tools	tools	40							
	Max tool dia	mm (in.)	ø90 (3.54) (w/o adjacent tools: ø130 (5.12))							
	Max tool length	mm (in.)	400 (15.75) (from gauge line)							
	Max tool weight	kg (lb)	10 (22)							
Motor	Main spindle motor	kW (hp)	37/30 (49/40) (30 min/cont)							
	Opposing spindle motor	kW (hp)	–		32/22 (42/30) (20 min/cont)		–		22/15/11 (30/20/17) (20 min/cont)	
	Milling tool spindle motor	kW (hp)	22/15/11 (30/20/15) (3 min/15 min/cont)				22/15/11 (30/20/15) (3 min/15 min/cont)			
	X, Z, Y, B axis motor	kW (hp)	X: 5.2, Z: 4.6 (X: 6.9, Z: 6.1) (DBC 1,500)/ 5.2 (6.9) (DBC 2,000), Y: 3.5 (4.7), B: 3.0 (4.0)				XA: 5.2, XB: 3.5, ZA:4.6 (XA: 6.9, XB: 4.7, ZA:6.1) (DBC 1,500), 5.2 (6.9) (DBC 2,000), ZB: 4.6, Y: 3.5, B: 3.0 (ZB: 6.1, Y: 4.7, B: 4.0)			
	W-axis motor	kW (hp)	2.8 (3.7) (tailstock)		4.6 (6.1)		2.8 (3.7) (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							
Machine size	Height	mm (in.)	2,955 (116.34)				3,030 (119.29)			
	Floor space W × D (tank included)	mm × mm (in.)	DBC 1,500: 5,530 × 2,995 (217.72 × 117.91) DBC 2,000: 6,280 × 2,995 (247.24 × 117.91)				DBC 1,500: 5,530 × 3,082 (217.72 × 385.25) DBC 2,000: 6,280 × 3,082 (247.24 × 121.34)			
	Weight	kg (lb)	DBC 1,500: 17,300 (38,060) DBC 2,000: 19,300 (42,460)				DBC 1,500: 18,300 (40,260) DBC 2,000: 20,300 (44,660)			
CNC			OSP-P300SA							

*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.

Optional Specifications

Big-Bore spindle	MULTUS U3000	4,200 min^{-1} A2-8 ø140 22/15 kW (30 min/cont)
	MULTUS U4000	3,000 min^{-1} A2-11 ø160 32/22 kW (20 min/cont)
Opposing spindle	MULTUS U3000	1S Big-Bore 4,200 min^{-1} A2-8 ø140 22/15 kW (30 min/cont)
	MULTUS U4000	1S Big-Bore 3,000 min^{-1} A2-11 ø160 32/22 kW (20 min/cont)
B-axis indexing		NC-B axis
Lower turret		V12 multitasking 6,000 min^{-1} PREX 5.5/3.7 kW (2 min/cont)
High pressure coolant		Upper turret, upper + lower turret
Tailstock		1S: NC tailstock, 2S: hydraulic quill (self-propelled)
Tailstock sleeve system		Built-in type MT No. 4
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		7MPa
Turret 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 auto open/close confirm		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, tailstock thrust high/low switch
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 blower (blast) options		Shower coolant (main/opposing: A, B), thru-spindle coolant blower (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 work gauging		Renishaw
Touch setter		M (manual), A (auto)
Workrest		
Work stopper in spindle		
Chuck internal sizing stopper		Main, opposing
Additional coolant pump		0.8 kW
Coolant tank		Thickener back, line filter, reverse cleaning 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, spindle temperature)
Bar feeder		
Work 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)
Workpiece unloader		
Loader		OGL10-P, OGL30-P, OGL50-P
CNC		High class (B axis contouring)

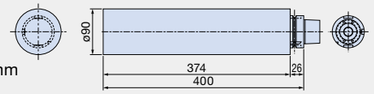
Upper Turret Tooling System (HSK-A63)



Commercial milling tools with shank and grip that are compliant with DIN 69893-1, HSK-A63 can be used.
For turning tools, please contact Okuma when using tools other than Okuma standard tools, since some dimensions are specially designed to improve fitting accuracy.
Outside toolholders A and C are for large diameter tools, and require empty adjacent tool pots when stored in the tool magazine.

MaxTool Dimensions

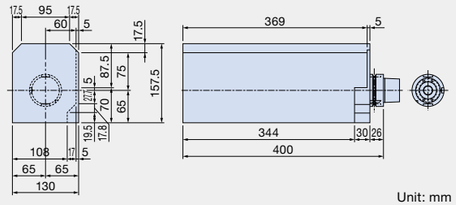
Standard tool



ø90 × 400 mm
10 kg

Unit: mm

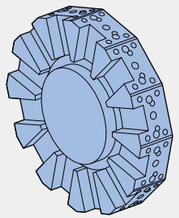
Super big dia tool



Unit: mm

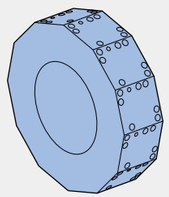
Lower turret for each specification

2SC specs, lower turret L



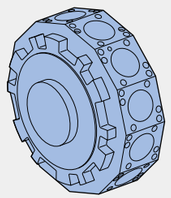
Lower V12 turret (L direct mounting)
(400 across flats)

2SW specs, lower turret L



Lower V12 turret (L radial)
(340 across flats)

2SW specs, lower turret M

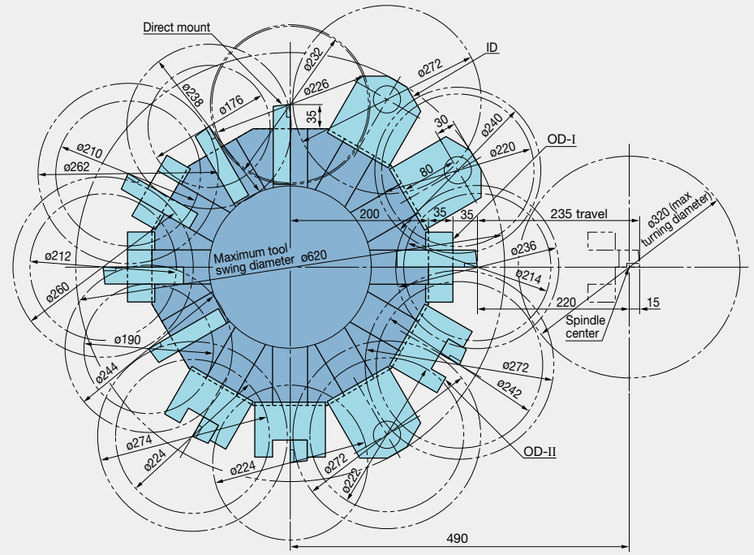


Lower V12 turret (M radial)
(340 across flats)

*Lower turret multitasking is only with opposing spindle specifications

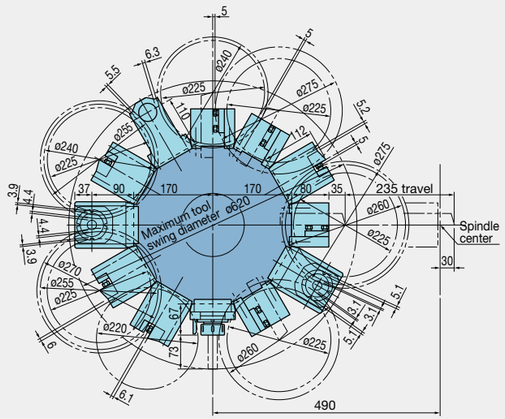
Tool interference drawing

2SC Lower turret (OD)



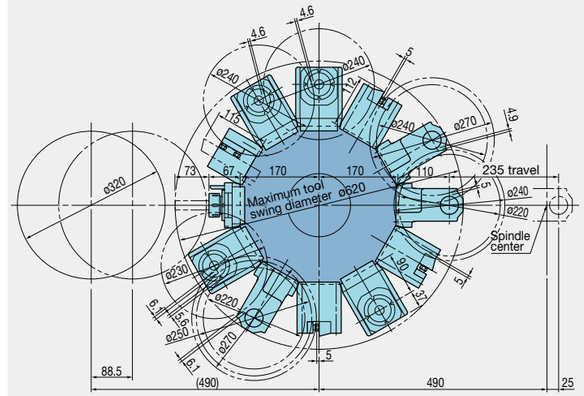
Unit: mm

2SW Lower turret (OD)



Unit: mm

2SW Lower turret (ID)



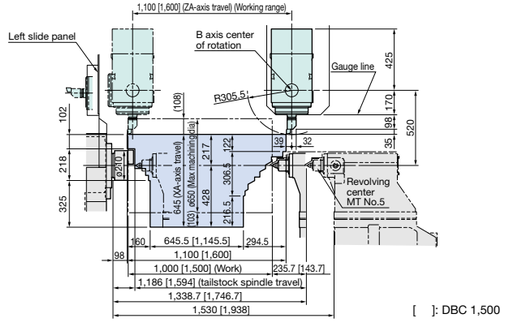
Unit: mm

■ Working Range

MULTUS U3000 1SC (DBC: 1,000, 1,500)

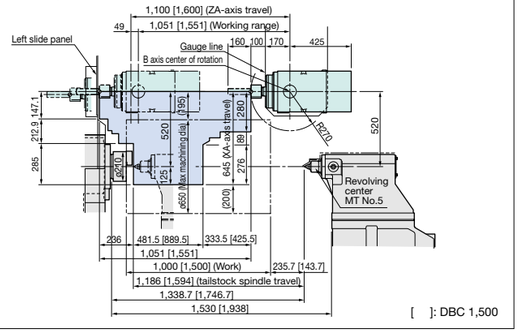
Unit: mm

OD-A, Main spindle



[ ]: DBC 1,500

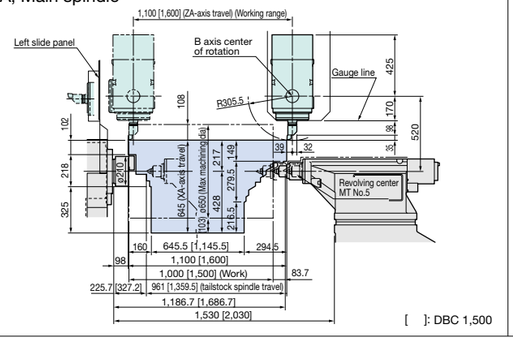
ID, Main spindle



[ ]: DBC 1,500

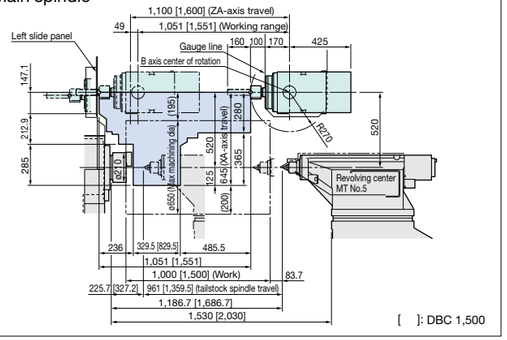
MULTUS U3000 2SC (DBC: 1,000, 1,500)

OD-A, Main spindle



[ ]: DBC 1,500

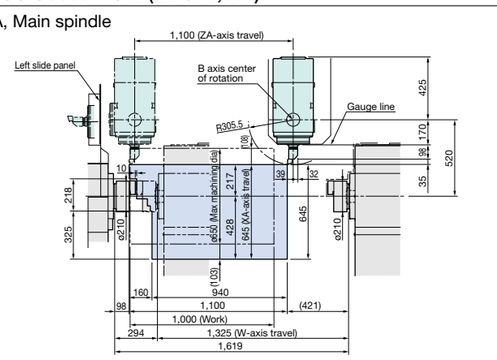
ID, Main spindle



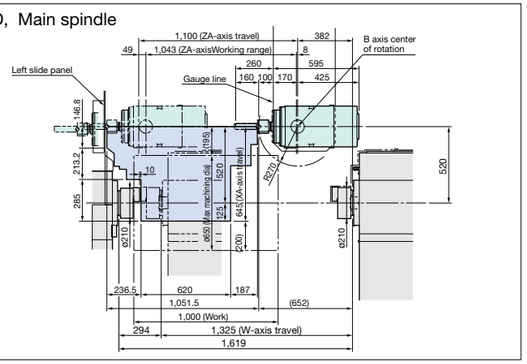
[ ]: DBC 1,500

MULTUS U3000 1SW (DBC: 1,000)

OD-A, Main spindle

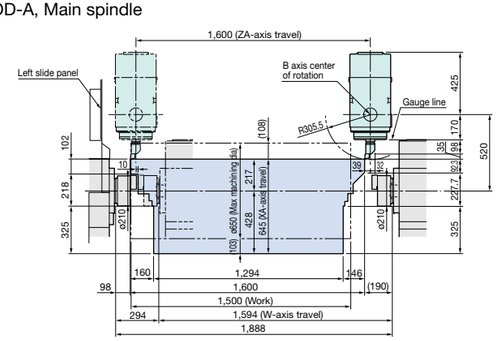


ID, Main spindle

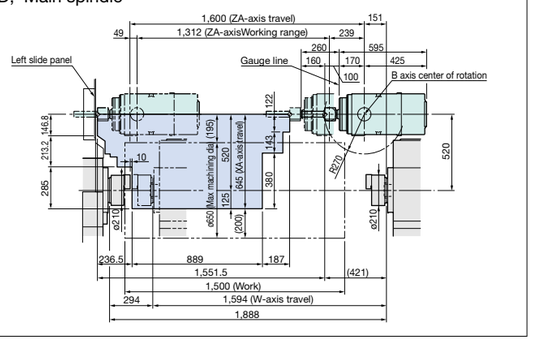


MULTUS U3000 1SW (DBC: 1,500)

OD-A, Main spindle



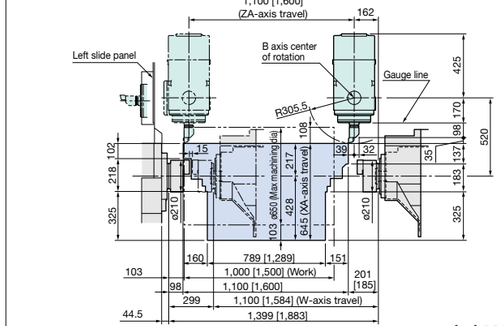
ID, Main spindle



MULTUS U3000 2SW (DBC: 1,000, 1,500)

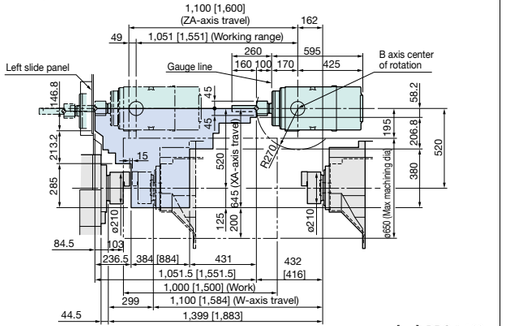
Unit: mm

OD-A, Main spindle



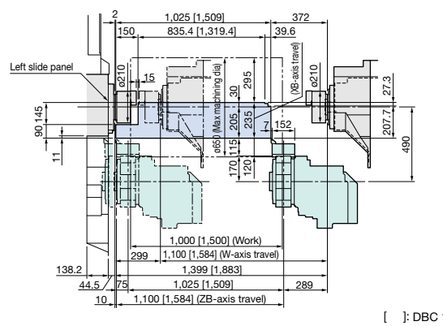
[ ]: DBC 1,500

ID, Main spindle



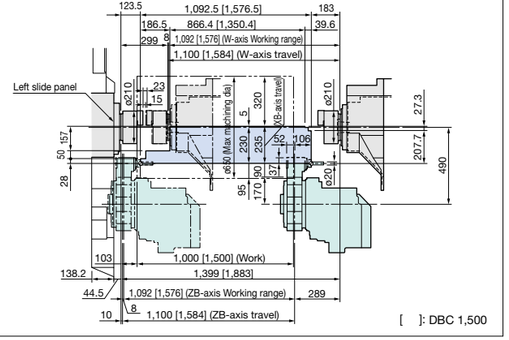
[ ]: DBC 1,500

Lower Turret, OD-I



[ ]: DBC 1,500

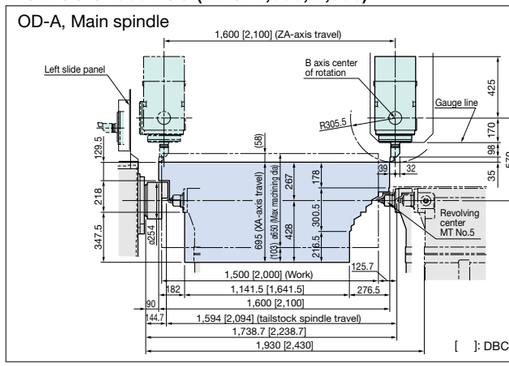
Lower Turret, Axial mill/drill, Opposing spindle



[ ]: DBC 1,500

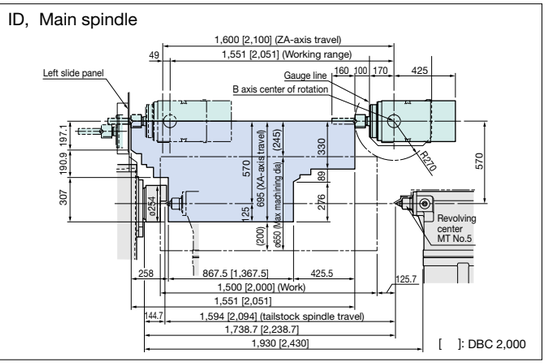
MULTUS U4000 1SC (DBC: 1,500, 2,000)

OD-A, Main spindle



[ ]: DBC 2,000

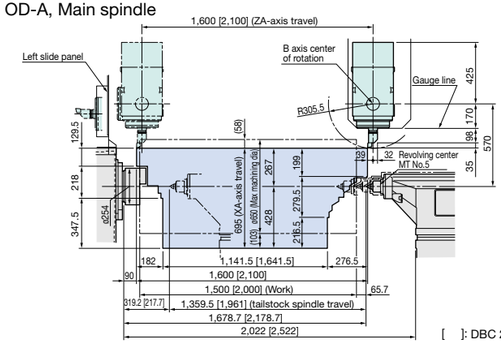
ID, Main spindle



[ ]: DBC 2,000

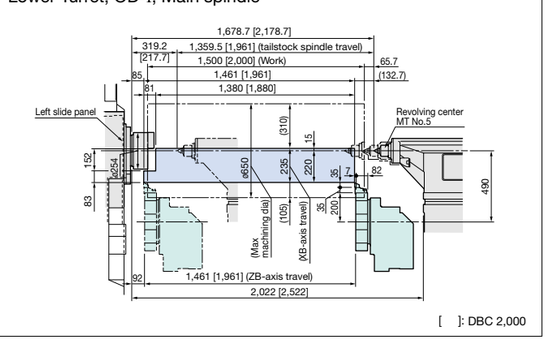
MULTUS U4000 2SC (DBC: 1,500, 2,000)

OD-A, Main spindle



[ ]: DBC 2,000

Lower Turret, OD-I, Main spindle



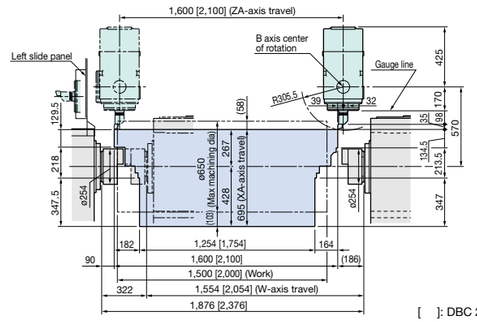
[ ]: DBC 2,000

Working Range

MULTUS U4000 1SW (DBC: 1,500, 2,000)

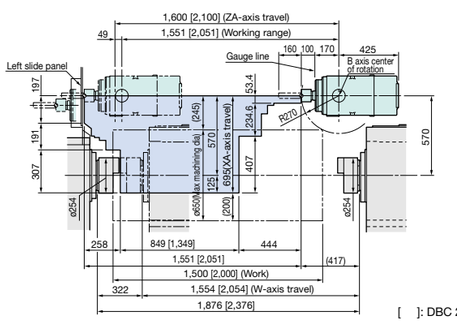
Unit: mm

OD-A, Main spindle



[ ]: DBC 2,000

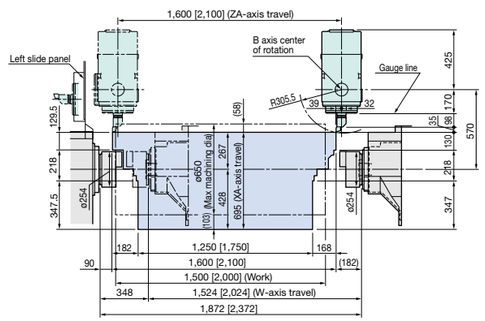
ID, Main spindle



[ ]: DBC 2,000

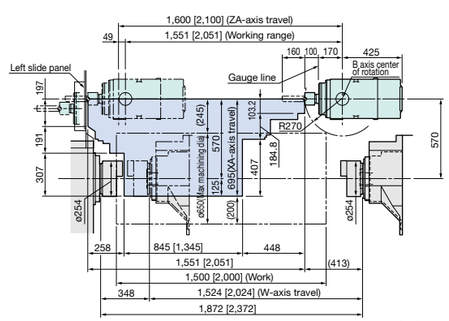
MULTUS U4000 2SW (DBC: 1,500, 2,000)

OD-A, Main spindle



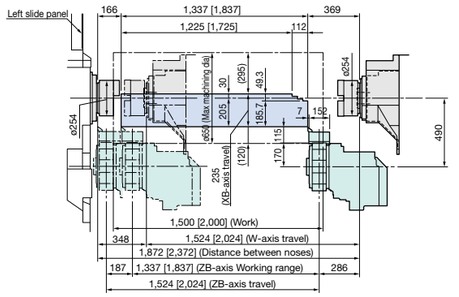
[ ]: DBC 2,000

ID, Main spindle



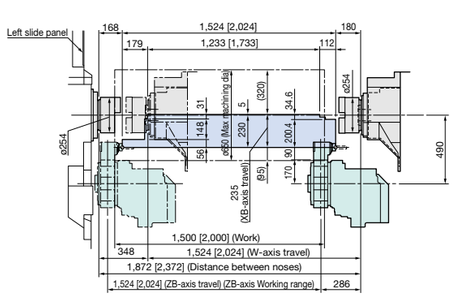
[ ]: DBC 2,000

Lower Turret, OD-I



[ ]: DBC 2,000

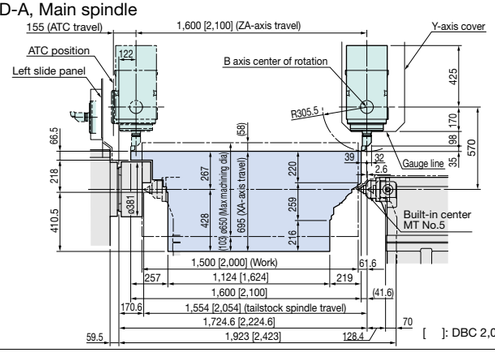
Lower Turret, Axial mill/drill, Opposing spindle



[ ]: DBC 2,000

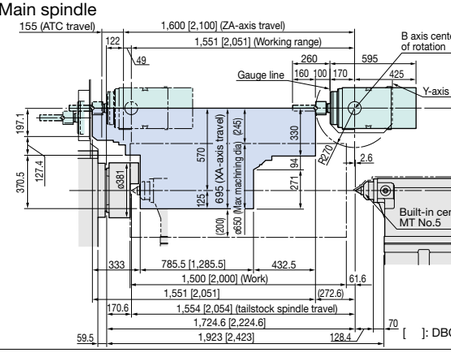
MULTUS U5000 1SC (DBC: 1,500, 2,000)

OD-A, Main spindle



[ ]: DBC 2,000

ID, Main spindle

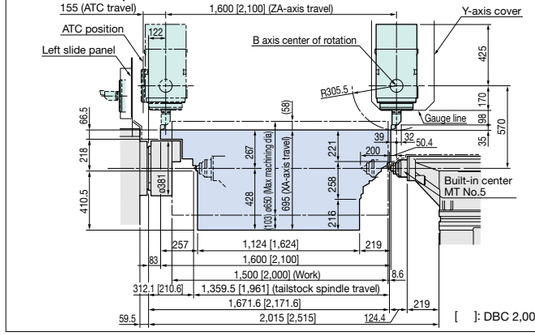


[ ]: DBC 2,000

MULTUS U5000 2SC (DBC: 1,500, 2,000)

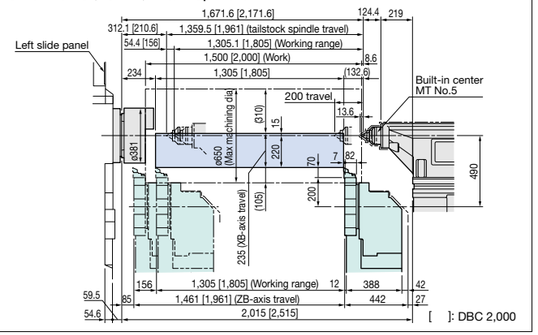
Unit: mm

OD-A, Main spindle



[ ]: DBC 2,000

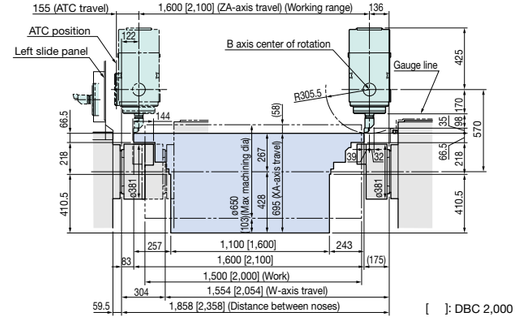
Lower Turret, OD-I, Main spindle



[ ]: DBC 2,000

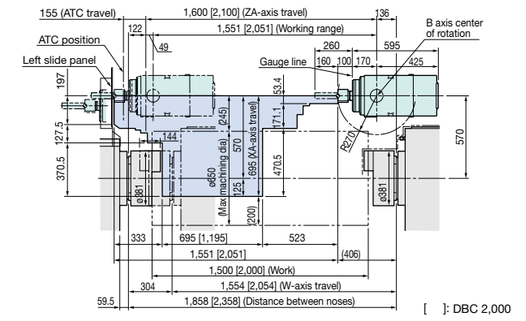
MULTUS U5000 1SW (DBC: 1,500, 2,000)

OD-A, Main spindle



[ ]: DBC 2,000

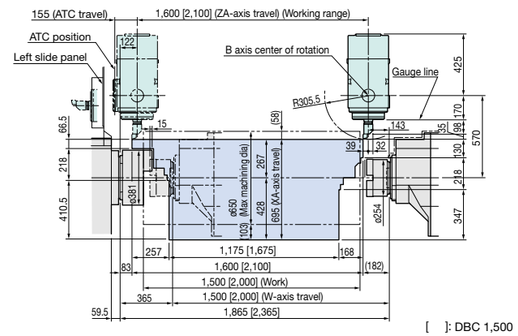
ID, Main spindle



[ ]: DBC 2,000

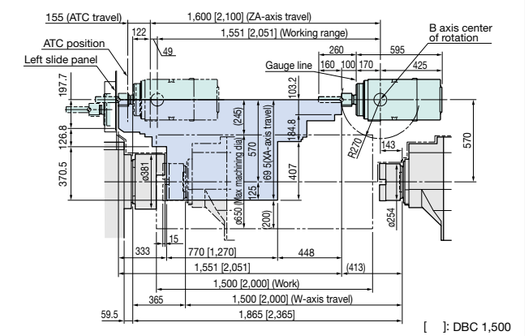
MULTUS U5000 2SW (DBC: 1,000, 1,500)

OD-A, Main spindle



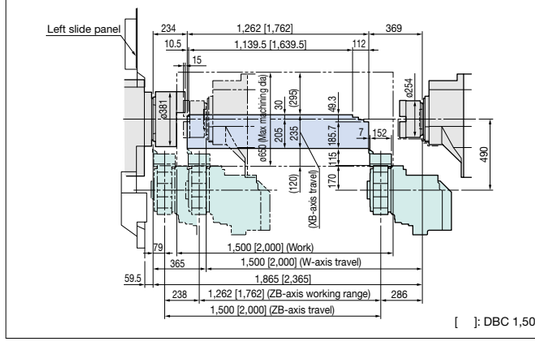
[ ]: DBC 1,500

ID, Main spindle



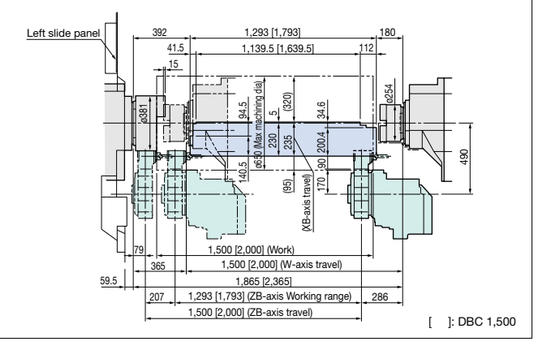
[ ]: DBC 1,500

Lower Turret, OD-I, Main spindle



[ ]: DBC 1,500

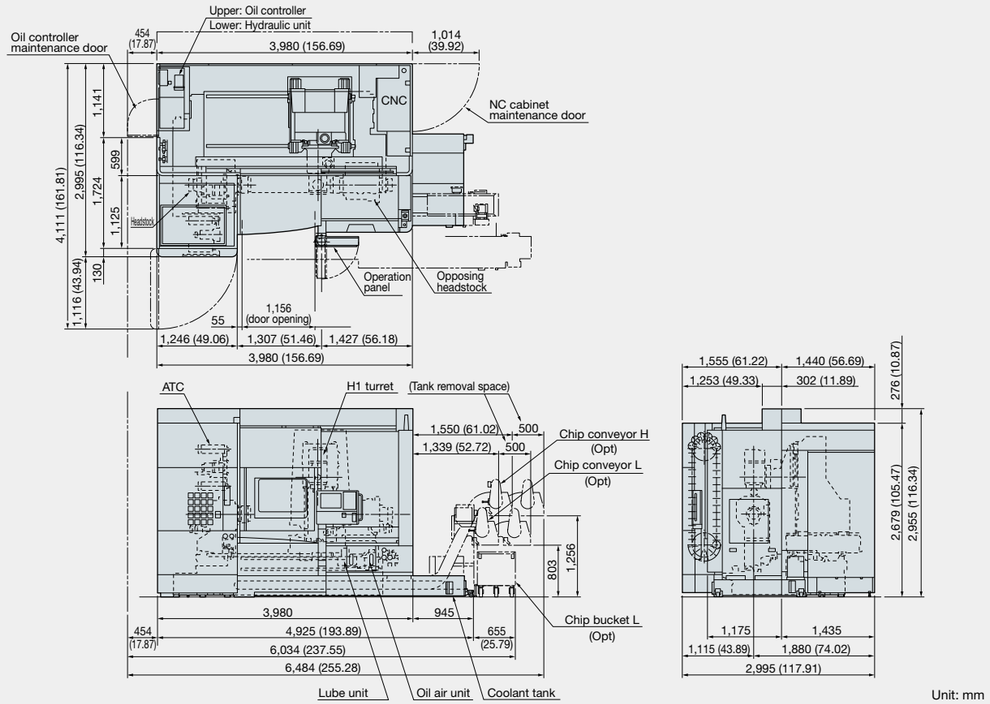
Lower Turret, Axial mill/drill, Opposing spindle



[ ]: DBC 1,500

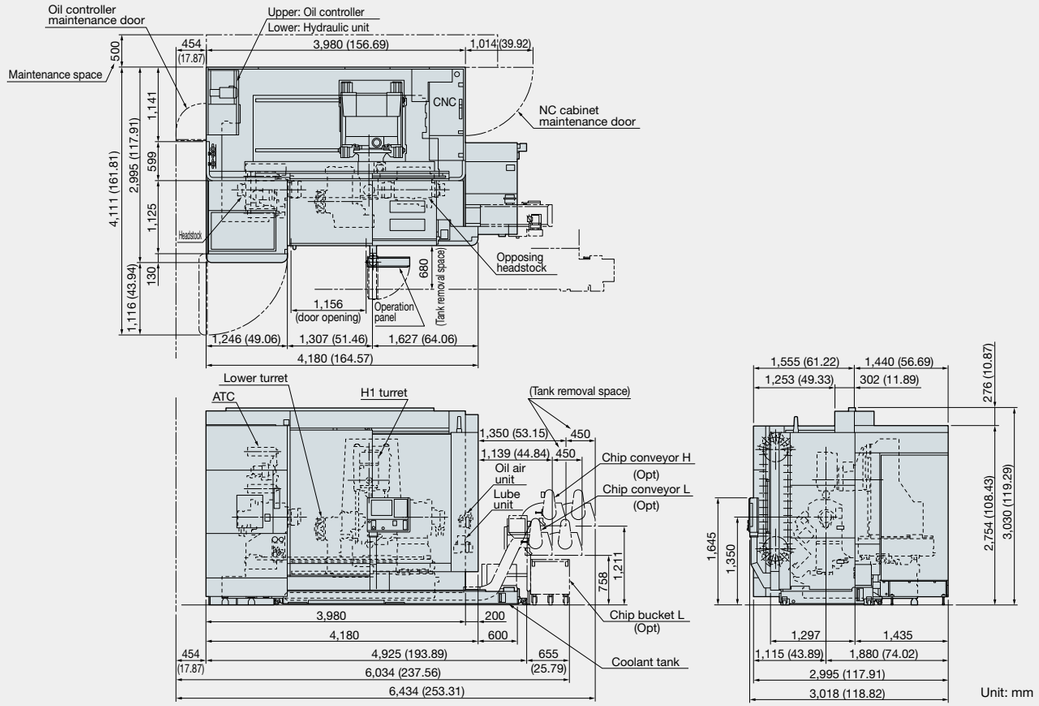
Dimensional and Installation Drawings

MULTUS U3000 (DBC: 1,000 1SW)



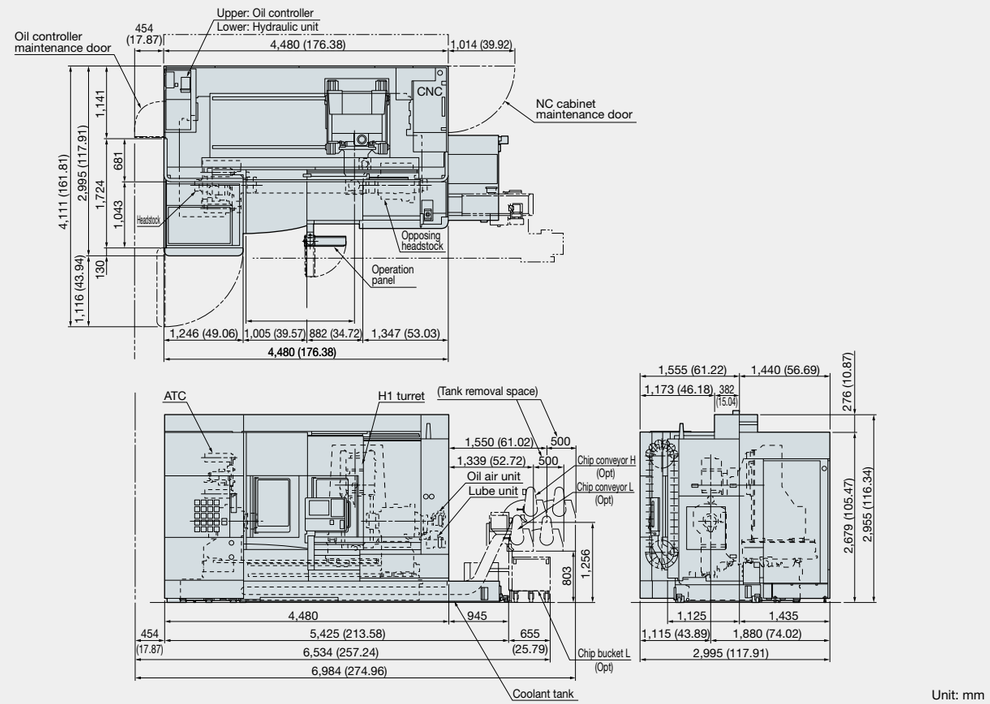
Unit: mm

MULTUS U3000 (DBC: 1,000, 2SW)



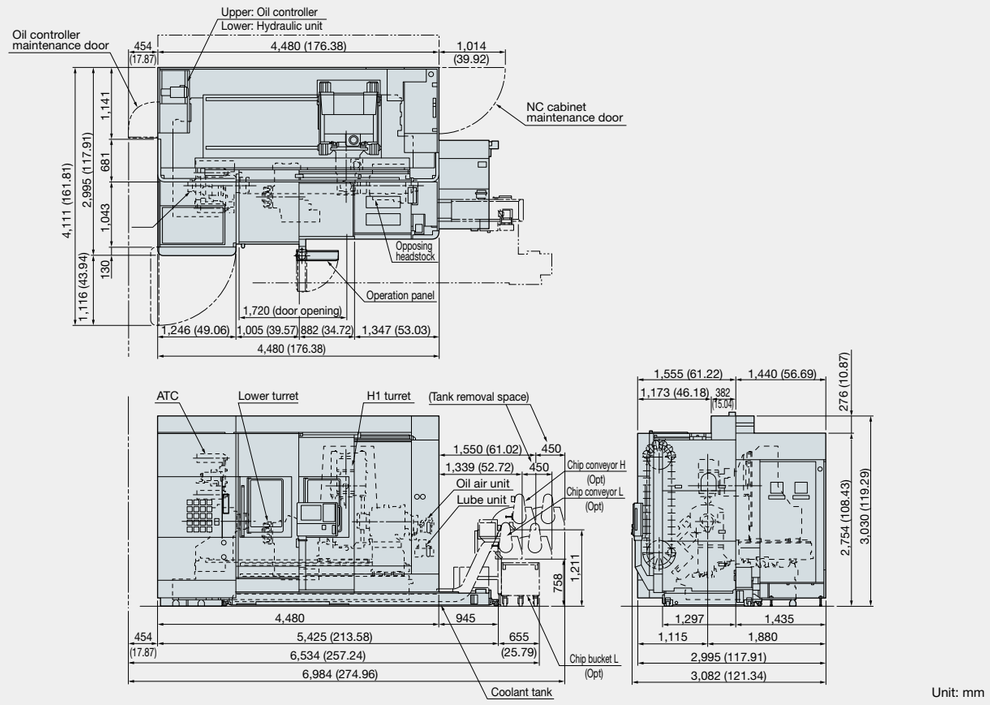
Unit: mm

MULTUS U3000/MULTUS U4000 (DBC: 1,500, 1SW)



Unit: mm

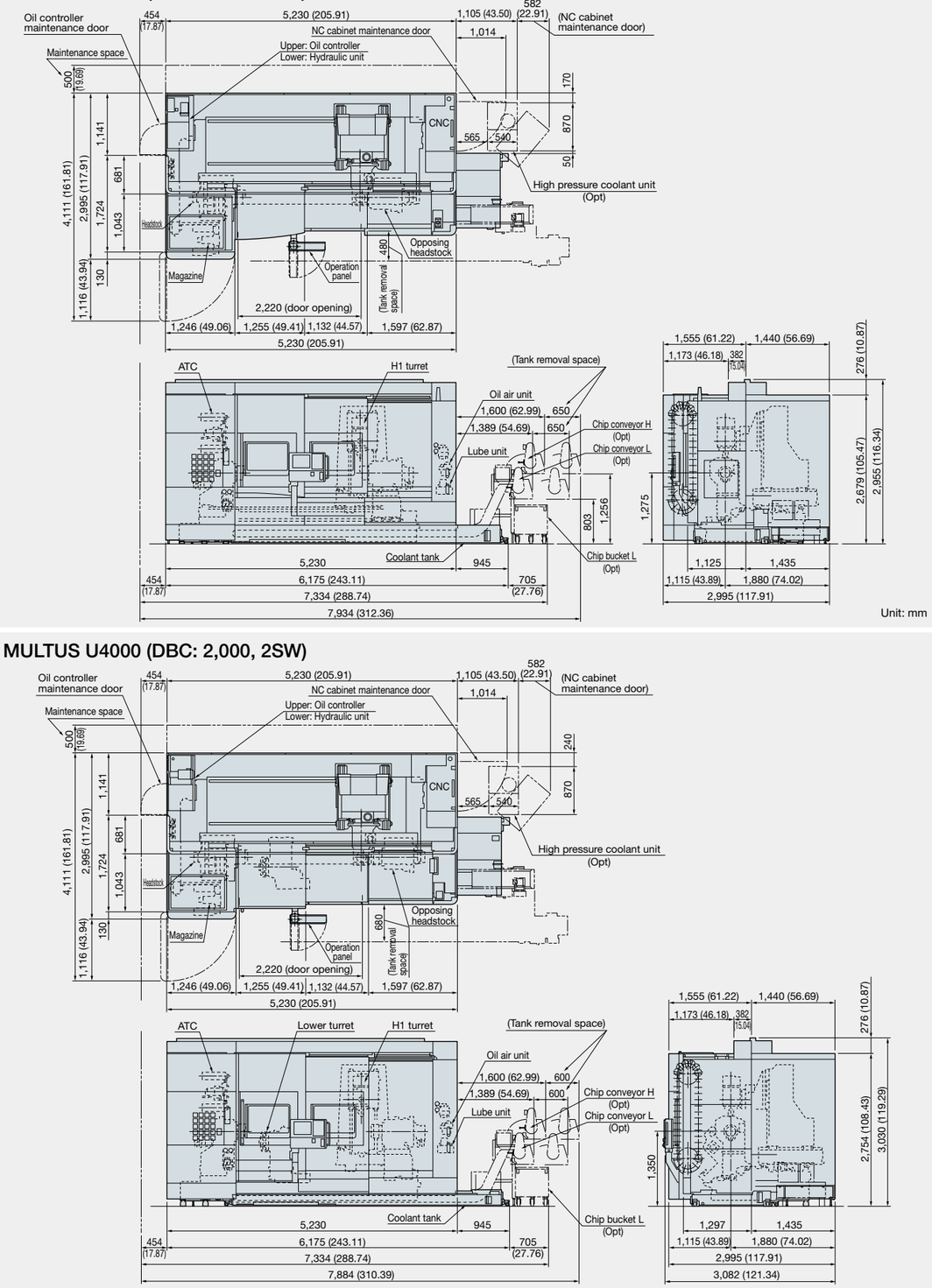
MULTUS U3000/MULTUS U4000 (DBC: 1,500, 2SW)



Unit: mm

Dimensional and Installation Drawings

MULTUS U4000 (DBC: 2,000, 1SW)

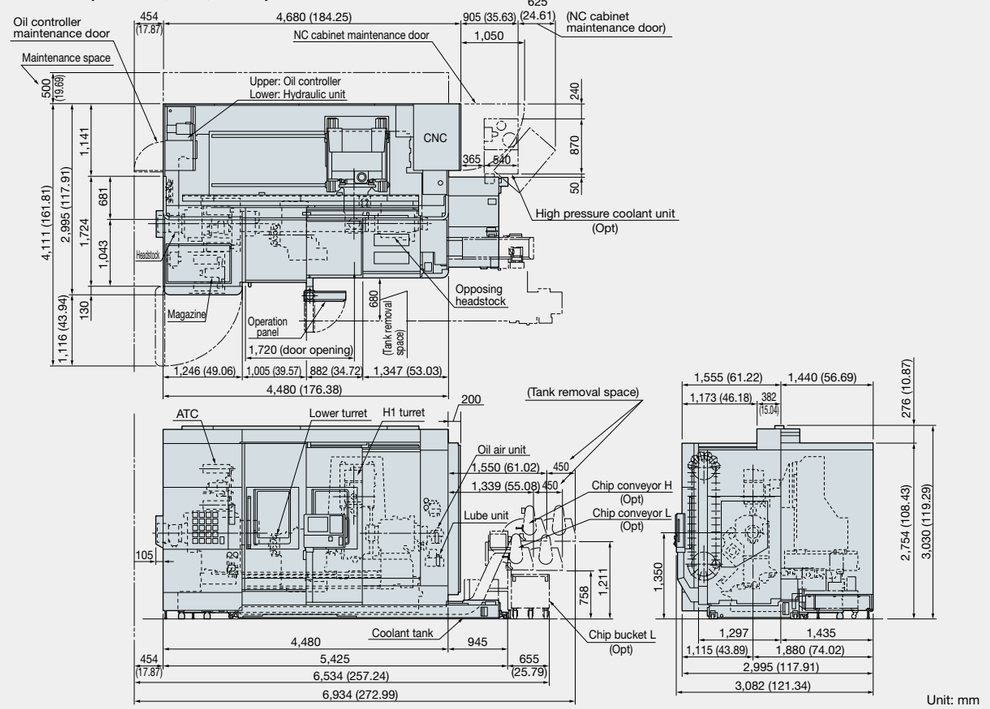


Unit: mm

MULTUS U4000 (DBC: 2,000, 2SW)

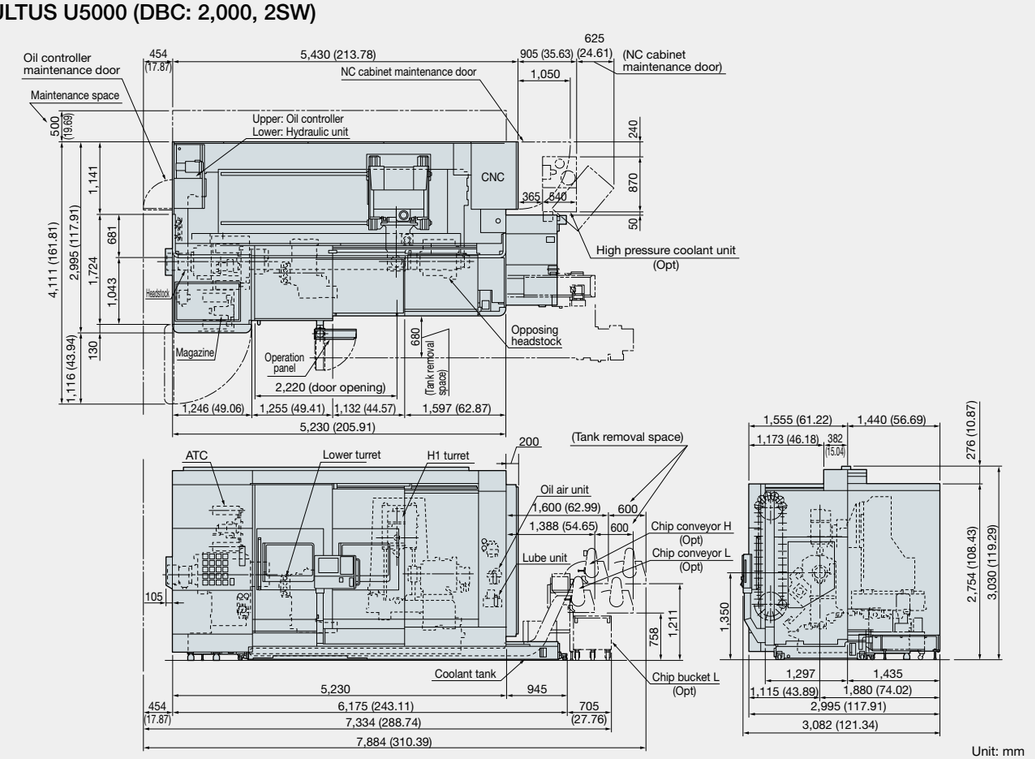
Unit: mm

MULTUS U5000 (DBC: 1,500, 2SW)



Unit: mm

MULTUS U5000 (DBC: 2,000, 2SW)



Unit: mm

Standard Specifications

Control

5-axis machining	Multitasking X-Y-Z-B-C simultaneous:5 axes
Spindle axis	Max 4 axes (= 2 axes + 2 rotary tool axes)
Position feedback	OSP full range absolute position detection
No. of control systems	Max 4 systems (= 2 spindles + 2 turrets)
2-spindle independent control	Each spindle executes an independent part program
Y axis control	X-Y-Z simultaneous 3 axes, orthogonal Y axis
Override structure	Spindle override 50 to 200%
	Milling tool override 30% to 200% (max 300% possible)
	Feed override 0 to 200%
Programmable units	0.0001 mm, 0.001 mm, 0.01 mm, 1 mm, 0.0001°, 0.001°, 0.01°, 1°
Min input	0.0001 mm, 0.0001°
Max input	Decimal 9 digits, ±99999.9999 mm (3937.00787 in.)

Display/Operating functions

Suite operation	Shop floor suitable; pointing device not required
Suite apps	Instruction manual viewer
	Maintenance application
Operation panel	15-inch liquid crystal display
	Multi touch panel operations
Program editing	Simultaneous edit 2 files in 1 screen
	Selected part program edit
	A/B turret simultaneous editing (2 turret specs)
	Selected range copy, paste, delete
	Adds files
	Moves edit pointer (designates top, end and number of lines)
	Arranges sequence numbers
	Program editing exceeds editing backup capacity
File name index display	2 file name indexes displayed in 1 screen
	Sorting (by file names, date and size)
Programming operations	Copies, renames, deletes, protects and verifies programs
	Memory initializing, formatting
	Memory available display (pie gragh)
	Multi-level directory
Scheduled programs	Run several programs in a sequence
Sequence number search	Machine from the specified sequence no.
Manual interrupt, auto return	After manual operations, auto mode restarted from interrupted position
Sequence return	Return to specified sequence, auto restart from returned point
PLC monitor	Supports maintenance work after machine shutdown Ladder display, data trace, etc
Parameter I/O	Parameter file input/output, verify

Easy Operation

Single-mode operation	Series of tasks completed on a single screen
Tool information management	Integrated management of collective tool data for each tool no.
	Setup data shared between machining operation, Advanced One-Touch IGF (optional), and Collision Avoidance System
	Multiple tool management for each turret station
	Display/change of tool comp data for tools commanded in machining program
Setup data save	Setup data saved together with machining program
Soft jaw machining	Automatic machining of soft jaws with set shape, tools, and conditions
Easy zero setting	Auto calculation of zero point offset from jaw and workpiece length
SERVONAVI	Inertia auto setting
Tool position compensation	Dimensional errors corrected with cutting conditions
Tool command (TD command)	Tool orientation, tool comp command based on tool information
Machine operation panel	Clear, straightforward machine operation

Programming

Basic interpolation	Linear/circular interpolation
Tool compensation	No. of registered tools: Max. 1,000 sets Tool offset, tool edge R, amount of wear: 20 sets per tool
Nose-radius comp (2B)	Auto correct of tool nose error (No. of comp sets same as tool comp)
Tool wear compensation	Blade tip position compensation due to tool wear amount (No. of comp sets same as tool comp)
Automatic programming (LAP4)	Automatically carries out from roughing to finishing Generates cutting paths according to material shape
Taper fixed cycles	Taper machining with 4 patterns: ID, OD/longitudinal, axial face
mm/min programming	Use feedrate in mm/rev and mm/min together
Chamfering, corner R	Chamfering, corner R instructions on drawing commanded in program
Arbitrary angle chamfering	Easy any-angle chamfering (C, R)
Taper angle designate	With command for angle from starting point
Threading	Designated lead thread crest, variable lead thread Chamfering while thread cutting, thread cutting cycle
Threading slide hold	Temporary stop during threading, excluding G34/G35
User Task 1	GOTO statement, IF statement, arithmetic operation
	Local variables, system variables
	Common variable (Standard 200 sets)
User Task 2	Sub-programs, functional operation, logical operation
Zero shift	Zero offset calculation, and shift according to G code

Milling programming (milling applications only)

Hole drilling fixed cycle	Drilling, boring and tapping
	Fine boring, back boring
	Deep bore drill cycle gradually decreasing movement
Synchronized tapping	High speed, high accuracy tapping with synchronized control of rotation angle and feed shaft position
	Synchronized tapping torque monitor
	Synchronized deep bore tapping
C axis synchronized control	Cutting with C axis on both main and opposing spindles

Programming capacities

Program storage capacity	2 GB
Operation backup capacity	2 MB

Machining management

Machining records	Totals and displays machining status per selected main program
Operating records	Machine operating times (power ON, cutting, etc)
	Input of reasons for non-operation
Operating history	Time charts of machine operating status
Trouble information	Auto totaling of data required for troubleshooting (alarm history, etc)
Records, trouble information output	Machining, operating, operating history, trouble info

Monitoring

Collision Avoidance System	Prevents interference during manual operation
	Prevents interference during auto operation
	Easy modeling of shape data
	New path assurance: Prevents interference due to sagging paths
Load meter display	Feed and spindle axis loads (With peak value hold function)
Chuck barrier	Set up tool off-limit area depending on chuckshape
Tailstock spindle barrier	Set up tool off-limit area depending on tailstock shape
User regular maintenance	Management of maintenance period with respect to any item

External input/output and networking

Ethernet interface	Ethernet (1000 Mbps)
USB interface	USB 2.0 interface 2 ch
DNC-T1	Ethernet part program transfers

High-speed/high-accuracy functions

Hi-G control	Positioning acceleration/deceleration conforming to motor's speed/torque characteristics
Rapid traverse droop	Droop control at feedrate command
Lost motion compensation	Dead zone, elastic deformation compensation during travel direction reversal
Pitch error compensation	Compensates for ball screw pitch error
TAS-S/H1 (spindle)	Thermal deformation from heat generated during milling tool spindle rotation is compensated
TAS-C (construction)	Corrects thermal deformation error generated during shop temperature changes affecting machine construction

Pocket manual functions (online help)

Programming help	Explains part program G, M codes, cycle commands, etc
Operation help	Screen menu functions explained Menu selected operation procedures explained
Alarm help	Alarm causes and remedies explained

Energy saving ECO suite

ECO Idling Stop	Accuracy remains stable with cooler idling stop
ECO Power Monitor	Visualization of power usage

Other functions

Tool compensation function for multi control system	Management of compensation for base, vertical and L-tool index position (when using a turret with B axis control or tool index)

* Ethernet is a registered trademark of Xerox Corp., USA.

Ergonomically-based, operator-friendly operation panel (Optional)

Large 19-inch monitor

Large, easy-to-use 19-inch monitor available. “Single-screen operation,” which lets you see and do all you want on a single operation screen, has even greater visibility with larger monitor.

Adjustable-tilt keyboard

The keyboard angle can be adjusted for ease of use, and reduced work-related stress on the operator.

• Four tilt angle positions from 0° to 45°

OSP suite is even more convenient with large screen

Greater amounts of information on screen makes OSP suite even easier to use.

Ergonomic control panel (Optional*)

·19” display ·Adjustable-tilt keyboard

*Standard in certain markets.

Optional Specifications

Optional		Kit spec *1	NML E	NML D	3D E	3D D	AOT-M E	AOT-M D
Interactive Programming								
Advanced One-Touch IGF-L Multitasking (w/Real 3D)							●	●
Programming								
Circular threading				●		●		●
Program notes				●		●		●
User task 2 I/O variables, 8 each								
Work coordinate system select	10 sets		●	●	●	●	●	●
	50 sets							
	100 sets							
1,000 common variables (200 is standard)								
Thread matching								
Threading slide hold (G34, G35)								
Variable spindle speed threading (VSST)								
Inverse time feed								
Spindle synchronized tapping								
Coordinate convert			●	●	●	●	●	●
Profile generate			●	●	●	●	●	●
Flat turning								
Coordinate calculation (with NCYL commands)			●	●	●	●	●	●
Coordinate shifting, rotation, copying			●	●	●	●	●	●
Helical cutting								
Slope machining								
Profile helical cutting								
Hobbing								
Multi-flute cutter function								
3-dimensional coordinate conversion								
Monitoring								
Real 3-D simulation*					●	●	●	●
Cycle time over check			●	●	●	●	●	●
Load monitor (spindle, feed axis)					●	●	●	●
Load monitor no-load detection (load monitor ordered)								
Machine StatusLogger								
Tool life management				●		●		●
Tool life prior notice								
Operation end buzzer								
Work counters	Count only							
	Cycle stop							
	Start disabled							
Hour meters	Power ON							
	Spindle rotation							
	NC operating							
NC operation monitor (counter, totaling)			●	●	●	●	●	●
NC work counter (Stops at full count with alarm)								
Status indicator (3-color C type) [A type, B type]			●	●	●	●	●	●
Measuring								
In-process work gauging			Included in machine specs					
Z-axis automatic zero offset by touch sensor								
C-axis automatic zero offset by touch sensor								
Y-axis gauging								
Gauge data output	File output							
Post-process work gauging interface	Quantitative compensation (five level, seven level)							
	BCD							
	RS-232-C (w/dedicated channel)							
Touch setter [M, A]			Included in machine specs					

Optional		Kit spec	NML E	NML D	3D E	3D D	AOT-M E	AOT-M D
Energy saving ECO suite								
ECO operation	Chip conveyor intermittent/linked operation							
	Mist collector intermittent/linked operation							
	Spindle power peak cutting							
External Input/Output and Communication Functions								
RS-232-C connector								
DNC links	DNC-T3							
	DNC-C / Ethernet *2							
	DNC-DT							
	FL-Net *2							
USB	2 additional ports possible							
Automation / Untended Operation								
Auto power shutoff M02, alarm								
Warmup function (by calendar timer)								
Tool retract cycle								
External program selections	A (pushbutton), 8 types							
	B (rotary switch), 8 stages							
	C1 (digital switch), 2-digit BCD							
	C2 (external input), 4-digit BCD							
Okuma loader (OGL) interfaces			Included in Loader specs					
Third party robot and loader interface *2	TYPE B (machine)							
	TYPE C (robot and loader)							
	TYPE D							
	TYPE E							
Bar feeders	Bar feeder		Included in machine specs					
	Interface only							
Cycle time reduction*2	Operation time reduction		●	●	●	●	●	●
High-Speed /High-Accuracy Functions								
NC-B axis								
Simultaneous 5-axis kit	Super-NURBS							
	Tool center point control II							
	Inverse time feed							
	DNC-DT							
	Tool posture command							
	3-dimensional coordinate conversion							
	Herical cutting							
	Slope machining							
Hi-Cut Pro			●	●	●	●	●	●
Super-NURBS	Linear axes							
	Linear and rotational axes							
Other Functions								
One-Touch Spreadsheet								
Gear machining package								
Machining Navi [M-gII+, M-i]								
Machining Navi [L-g, T-g threading]								
Harmonic spindle speed control (HSSC)			●	●	●	●	●	●
Spindle dead-slow cutting								
Tool center point control II								
Tool tilt command								
Synchronized C-axis control								
Y-axis alignment compensation								
Short circuit breaker								
External M signals [2 sets, 4 sets, 8 sets, ( )]								
Edit interlock								
OSP-VPS (Virus Protection System)								
19-in. display ergonomic control panel								

*1. NML: Normal, 3D: Real 3D simulation, E: Economy, D: Deluxe, AOT-M: Advanced One-Touch IGF-L Multitasking

*2. Engineering discussions required.

MULTUS U series

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.

Pub.No. MULTUS U series-E-(2b)-500 (Jun 2018)

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