

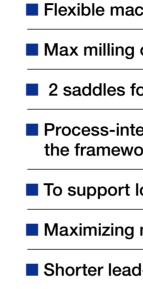
# **OPEN POSSIBILITIES**







multitasking machine





<DBC 1,000 mm 1SW>



<DBC 1,500 mm 2SW>

29 diverse variations in	all			220 2,000	/1111/2002			
Spec ext	ension	MULTU	S U3000	MULTU	S U4000	M	ULTUS U50	00
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)							

# 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

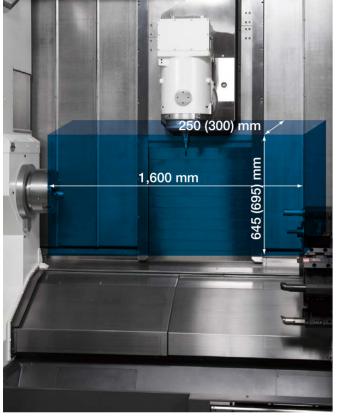
Maximizing machine tool performance

Shorter lead-times with easy first part machining

<DBC 2,000 mm 2SC>

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

# 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.

# 240

Tough cutting in entire Y-axis range

axis.

X-/Y-axis

working range

Traveling column

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

MULTUS U4000/U5000

B-axis 0°

MULTUS U4000/U5000

B-axis 90°

# Wide variety of efficient machining applications



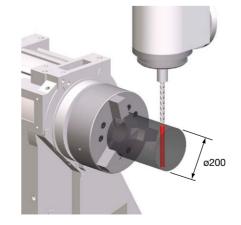
Spline machining -Done by mounting a hob cutter on a milling tool spindle and synchronizing it to C axis rotation (optional hobbing function).

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)



× 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)





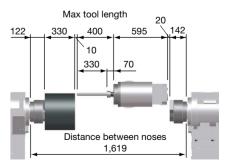
# Workpiece samples



## Maximum 230 mm contouring Cutting the outline of a 230 mm (9.06



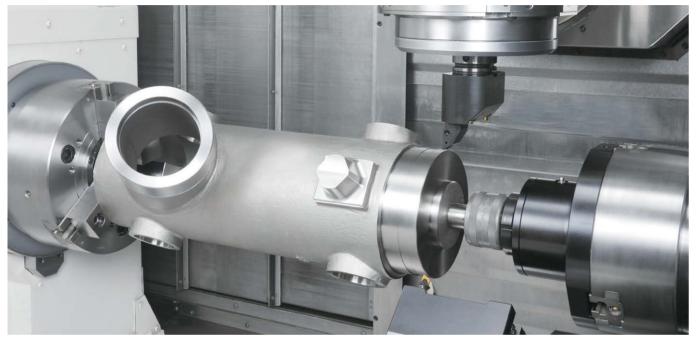
Deep drilling: 330 mm (13 in.) With the 1,000 mm machine (distance between centers), 330 mm long workpieces can be drilled (330 mm tool projection) to make deep holes. (MULTUS U3000 with 1SW specifications, standard main and opposing spindles)



Unit : mm

When using a ø20 mm end mill

# 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 mm <sup>2</sup>	Heavy-duty: 5.0 mm <sup>2</sup> (Big-Bore ø160)
• OD (S45C)	Cutting Speed Cutting depth Feed rate	150 m/min 8 mm 0.6 mm/rev	150 m/min 8 mm 0.625 mm/rev
<ul> <li>Insert drill (S45C)</li> </ul>	Cutting Speed Feed rate	ø63 Throwaway 150 m/min 0.23 mm/rev	ø63 Throwaway 150 m/min 0.23 mm/rev
Milling		Chip volume: 604 cm <sup>3</sup> /min	Chip volume: 604 cm <sup>3</sup> /min
End milling (S45C)	Tooling Cutting Speed Cutting depth Feed rate Removal Rate	ø20-mm end mill 7-flute 192 m/min 6.5 × 20 mm 1.52 mm/rev 604 cm <sup>3</sup> /min	ø20-mm end mill 7-flute 192 m/min 6.5 × 20 mm 1.52 mm/rev 604 cm <sup>3</sup> /min
<ul> <li>Face milling (S45C)</li> </ul>	Tooling Cutting Speed Cutting depth Feed rate Removal Rate	ø50 milling cutter 5-flute 300 m/min 6 × 35 mm 2,865 mm/min 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
Insert drill (S45C)	Cutting Speed Feed rate	ø50 Throwaway 150 m/min 0.12 mm/rev	ø50 Throwaway 150 m/min 0.12 mm/rev
<ul> <li>TAP (S45C)</li> </ul>		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<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 Torque

427 N-m (10 min)

50 100

955 N-m (10 min)

657 N-m (cont)

340 N-m (20 min)

233 N-m (cont)

500

300 -

100

ğ

50 -

MULTUS U5000

Output

Torque

500

300

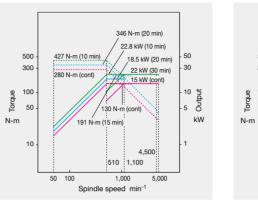
100

50· ğ

10

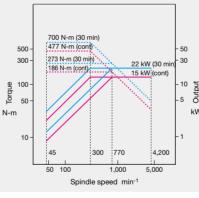
N-m

kW



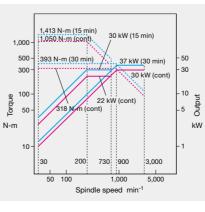
MULTUS U4000 ø140-mm Std spindle ø140-mm Standard opposing spindle (1S)

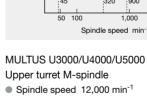
Spindle speed 4,200 min<sup>-1</sup> 22/15 kW (30 min/cont) Output Torque 700/477 N-m (30 min/cont)



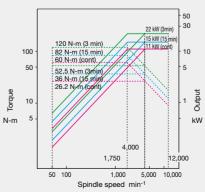
MULTUS U5000 ø160-mm Std spindle





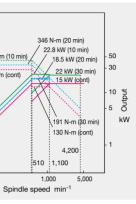


Output Torque

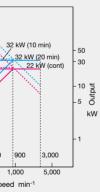


5

- 22/15 kW (30 min/cont)
- 427/280 N-m (10 min/cont)



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



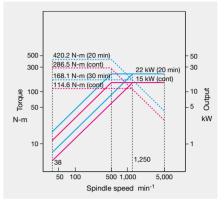
- 22/15/11 kW (3 min/15 min/cont) 120/82/60 N-m (3 min/15 min/cont)

# MULTUS U3000

ø100-mm Standard opposing spindle (2S) Spindle speed 5,000 min<sup>-1</sup>

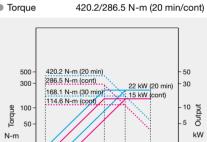
- Output
- 22/15 kW (20 min/cont) Torque

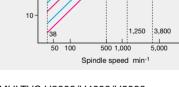
420.2/286.5 N-m (20 min/cont)



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

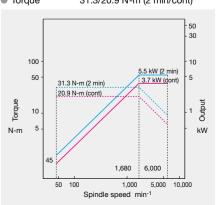
- ø120-mm Standard opposing spindle (2S)
- Spindle speed 3,800 min<sup>-1</sup>
  - 22/15 kW (20 min/cont)
- Output
- Torque





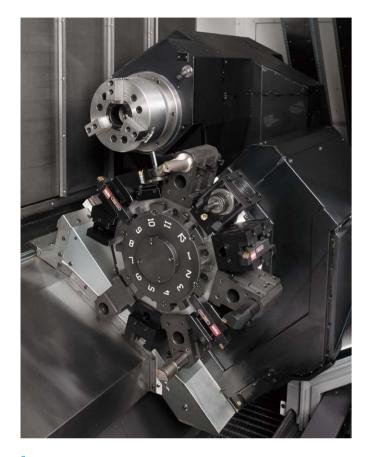
## MULTUS U3000/U4000/U5000 Lower turret milling tool spindle Spindle speed 6,000 min<sup>-1</sup>





# 2 saddles for minimum cycle times

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



# 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<sup>-1</sup>

 Milling tool spindle motor: 5.5/3.7 (2 min/cont) Note: With opposing spindle specifications only

# 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

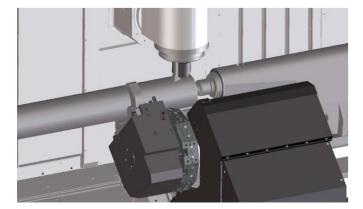
# 3D measuring for multitasking machines NC Gage (Optional)

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.

# 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.

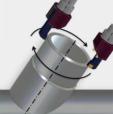
## Tailstock attachment

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).

# 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



ther Specifications			Plaiteing Conditions (1)				
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Ted Danetw D	113.59%		Foreh Cut Expent		5.0000		-
Hodule H	£.0000		Finaling Cut Depth If		6.2000	1 //08	12.00
Teeth Qty 2	25		Precide/hongif		6.3000	110	180.0
Hall: Angle a	20.9000		2 Stat forc S2	2 Stat Fore S2 0.0000			
Sonal Deechon	Kight.	-	Z End Point 3E		-05-0009	111 -	and a
		Britrance Cease ance SC	2	5.0000	1	•	
shpiece Specifications			Elif Charance ECZ	000	5.8000		
Gear Type	Spux Gear	-	* avic Approach Detance		15-0000	Kates Tra	Vali estre diacente
Preer Daneter D	462.0000		2-site Approach Detence	APE .	25.0000	1110000	
Plodule M	5.0000		Fand (Represel)(#	2010-3000			
Seeth (py 2	12		Phase Ande CP	6.8000		1	
Holic Angle P	0.0000		Total		13.0000		
Sonid Developm	Nine	•					
Face Width W	\$5.3000		Mathering Conditions (2)				
TolthDepthH	11.9900		InterdCount	and an	1	3	
Corvect Tooth Trace	Nine		Cutting Speed 1	30.0039	30.0000	30.0000	20.0030
			Receip Cat Depth In	5.000	5.0000	8,9900	\$,2900
			Fenander	6.3000	1.0000	8.2900	6.3800
			Feed?	8.3000	0.3000	8.3800	0.3000
			Workpince Speed N	50.75N	50.75%	50.75%	50.75M
			loo/speed 58	246.7635	245,7635	26.755	245.78,5
			dwing histon (Orthogonal Au	X	2 .	× •	3
			Saturag Pesten (Indeed Arm		A .	* *	* *

Input screen





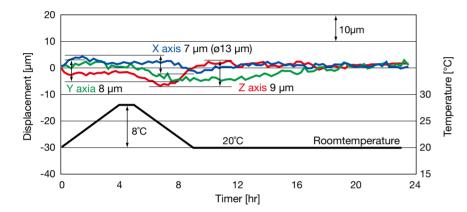
# To support long and stable machining accuracies



# 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 $10 \ \mu m$ Thermal deformation over time



# 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.

[Operating conditions]

Cycle time: 15 min

Milling tool spindle 6,000 min<sup>-1</sup> (6 min)

Machine startup

Machining restart

Room temp change

High dimensional stability

Main spindle

Interval

W/Coolant

3,800 min<sup>-1</sup> (2.5 min)

10,000 min<sup>-1</sup> (6 min)

(0.5 min)



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 um

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 guickly 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.







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

Press START MEASURE key and cycle start button

# Examples of geometric error

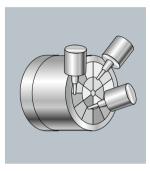


Perpendicularity of C and X axes

Perpendicularity of B and Z axes

After using 5-AATS

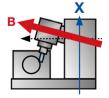






Auto measurement and then auto setting of compensation parameters

Tuning complete



B-axis misalignment in X-axis direction

# Maximizing machine tool performance

# Shorter lead-times with easy first part machining



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.



# Adjust cutting conditions while monitoring the data Machining Navi M-gII+

(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)

For milling

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.



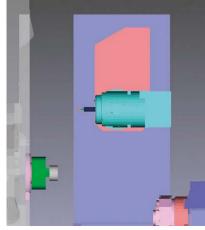
# Setup/trial cut time: reduced by 40% Preventing collisions: Collision Avoidance System

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)

11

# 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.)

# 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)

# 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.



# OSP suite osp-p300sA



# 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)

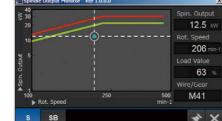
# "Just what we wanted."— Refreshed OSP suite apps

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.



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.

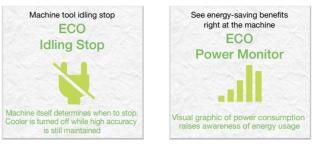




Easy programing without keying in code Scheduled Program Editor

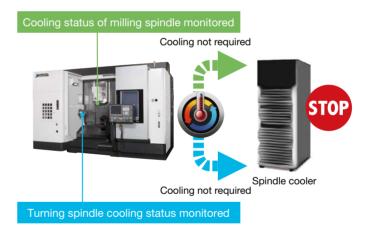


Monitoring operating status even when away from the machine **E-mail Notification** 



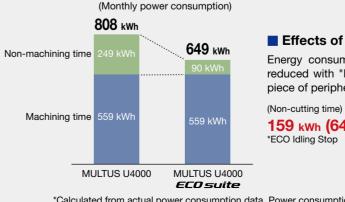
Accuracy ensured, cooler off ECO Idling Stop

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)



# Reduction in power consumption (example)

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





# 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

# 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.

159 kWh (64%) reduction!

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

# Machine Specifications

						MULTU	S U3000						
Item			15	SC	15	SW	25	SC	25	SW			
			1000	1500	1000	1500	1000	1500	1000	1500			
apacity	Swing over saddle	mm (in.)		ø650	(25.59)		Upper:	ø650 (25.59),	Lower: ø32	0 (12.60)			
	Distance between cente		1,000	1,500	1,000	1,500	1,000	1,500	1,000	1,50			
			(39.37)	(59.06)	(39.37)	(59.06)	(39.37)	(59.06)	(39.37)	(59.0			
	Max machining dia	mm (in.)	(00101)		(25.59)	(00100)		2650 (25.59)*1		· ·			
	Max machining length	mm (in.)	1,000	1,500	1,000	1,500	1.000	1,500	1,000	1,50			
	Max machining length			,			,			· ·			
		<i>(</i> , )	(39.37)	(59.06)	(39.37)	(59.06)	(39.37)	(59.06)	(39.37)	(59.0			
avels	X axis	mm (in.)			25.39)			r: 645 (25.39)		· · · · ·			
	Z axis	upper: mm (in.)	1,100	1,600	1,100	1,600	1,100	1,600	1,100	1,60			
			(43.31)	(62.99)	(43.31)	(62.99)	(43.31)	(62.99)	(43.31)	(62.9			
		lower: mm (in.)					961	1,461	, , , ,				
					-		(37.83)	(57.52)	(43.31)	(62.3			
	Y axis	mm (in.)				250 (9.84) (	±125 (4.92))						
	W axis	mm (in.)			1,325	1,594			1,100	1,58			
			-	-	(52.17)	(62.76)		-	(43.31)	(62.3			
	B-axis / indexing angle	degree				+210 (min co	ntrolled and	0.001)	(10.01)	(02.0			
	v v	×				(min control		,					
	C-axis / indexing angle	degree			300			,001)					
oindle	Spindle speed	min <sup>-1</sup>					5,000						
	Spindle speed ranges				2 auto rai	nges (2-spee		switching)					
	Spindle nose shape						A2-6						
	Taper bore	mm (in.)				ø80	(3.15)						
	Bearing dia	mm (in.)				ø120	(4.72)						
pposing	Spindle speed	min <sup>-1</sup>	-	_	50 to	5,000		-	38 to	5,000			
spindle*2	Spindle speed ranges				-	ranges				ranges			
	aprilia aprova rangoo		-	-		d motor		_		ed motor			
						itching)				/itching)			
	Spindle nose shape					A2-6		_		A2-6			
		(* )											
	Taper bore	mm (in.)	-	-		(3.15)		-		(2.44)			
	Bearing dia	mm (in.)	-	-		(4.72)		-	1	(3.94)			
urret	Туре			ŀ	-11				Lower: V12				
ool spindle)	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	0 (1.57)						
	Milling tool spindle	min <sup>-1</sup>			50 to 12,000								
	Milling tool spindle spee				2 auto rai	nges (2-spee	,	switching)					
eedrates	Feedrates	upper: m/min			2 4410 14	iges (2 spee		Switching)					
eeurales	X, Z, Y axes					X: 50, Z:	50, Y: 40						
	, <u>,</u> , , , , , , , , , , , , , , , , ,	louver m/min						V. 05	7.40				
		lower: m/min	00	10	-				, Z: 40				
	Feedrates W-axis	lower: m/min m/min	20	12	-	80	20	12		30			
	Feedrates W-axis	m/min	20 (tailstock)	12 (tailstock)	-	-	(tailstock)			30			
	Feedrates W-axis Feedrates C, B axis		-		-	C: 200	(tailstock) ), B: 30	12		30			
	Feedrates W-axis	m/min	-		-	C: 200	(tailstock) ), B: 30 1,000.000	12 (tailstock)		30			
ailstock	Feedrates W-axis Feedrates C, B axis	m/min min <sup>-1</sup>	-	(tailstock)		C: 200 0.001 to	(tailstock) ), B: 30 1,000.000	12	3				
ailstock	Feedrates W-axis Feedrates C, B axis Cutting feedrate	m/min min <sup>-1</sup>	(tailstock)	(tailstock) No.5		C: 200	(tailstock) 0, B: 30 1,000.000 MT.	12 (tailstock)	3	30			
ailstock	Feedrates W-axis Feedrates C, B axis Cutting feedrate	m/min min <sup>-1</sup> mm/rev	(tailstock) MT.	(tailstock) No.5		C: 200 0.001 to	(tailstock) 0, B: 30 1,000.000 MT.	12 (tailstock) No.5	3				
ailstock	Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore	m/min min <sup>-1</sup>	(tailstock) MT. (revolving 1,186	(tailstock) No.5 g center) 1,594		C: 200 0.001 to	(tailstock) 0, B: 30 1,000.000 MT. (revolvin 961	12 (tailstock) No.5 Ig center) 1,359.5	3				
	Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel	m/min min <sup>-1</sup> mm/rev	(tailstock) MT. (revolving	(tailstock) No.5 g center)		C: 200 0.001 to	(tailstock) b, B: 30 1,000.000 MT. (revolvin 961 (37.83)	12 (tailstock) No.5 ig center)	3				
	Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank	m/min min <sup>-1</sup> mm/rev mm (in.)	(tailstock) MT. (revolving 1,186	(tailstock) No.5 g center) 1,594		C: 200 0.001 to - - HSK	(tailstock) ), B: 30 1,000.000 MT. (revolvin 961 (37.83) (-A63	12 (tailstock) No.5 Ig center) 1,359.5	3				
	Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools	m/min min <sup>-1</sup> mm/rev mm (in.) tools	(tailstock) MT. (revolving 1,186	(tailstock) No.5 g center) 1,594		C: 200 0.001 to - - HSK	(tailstock) ), B: 30 1,000.000 MT. (revolvin 961 (37.83) -A63 10	12 (tailstock) No.5 ng center) 1,359.5 (53.52)	3				
	Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia	m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.)	(tailstock) MT. (revolving 1,186	(tailstock) No.5 g center) 1,594	ø90 (3.5	C: 200 0.001 to - - HSK 4) (w/o adjac	(tailstock) p, B: 30 1,000.000 MT. (revolvin 961 (37.83) -A63 0 ent tools: ø1	12 (tailstock) No.5 ig center) 1,359.5 (53.52) 30 (5.12))	3				
	Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia Max tool length	m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) mm (in.)	(tailstock) MT. (revolving 1,186	(tailstock) No.5 g center) 1,594	ø90 (3.5	C: 200 0.001 to - - - 4) (w/o adjac 00 (15.75) (fr	(tailstock) b, B: 30 1,000.000 MT. (revolvin 961 (37.83) A63 10 ent tools: ø1 om gauge lir	12 (tailstock) No.5 ig center) 1,359.5 (53.52) 30 (5.12))	3				
TC	Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia Max tool length Max tool weight	m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) mm (in.) kg (lb)	(tailstock) MT. (revolving 1,186	(tailstock) No.5 g center) 1,594	<u>σ90 (3.5</u> 4	C: 200 0.001 to - - 4) (w/o adjac 00 (15.75) (fr 10	(tailstock) b, B: 30 1,000.000 MT. (revolvin 961 (37.83) -A63 -60 ent tools: ø1 om gauge lir (22)	12 (tailstock) Ig center) 1,359.5 (53.52) 30 (5.12)) re)	3				
тс	Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia Max tool length	m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) mm (in.)	(tailstock) MT. (revolving 1,186	(tailstock) No.5 g center) 1,594	<u>σ90 (3.5</u> 4	C: 200 0.001 to - - - 4) (w/o adjac 00 (15.75) (fr	(tailstock) b, B: 30 1,000.000 MT. (revolvin 961 (37.83) -A63 -60 ent tools: ø1 om gauge lir (22)	12 (tailstock) Ig center) 1,359.5 (53.52) 30 (5.12)) re)		-			
тс	Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia Max tool length Max tool weight	m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) mm (in.) kg (lb) kW (hp)	(tailstock) MT. (revolving 1,186	(tailstock) No.5 g center) 1,594	ø90 (3.5 4	C: 200 0.001 to - - 4) (w/o adjac 00 (15.75) (fr 10	(tailstock) b, B: 30 1,000.000 MT. (revolvin 961 (37.83) -A63 -60 ent tools: ø1 om gauge lir (22)	12 (tailstock) Ig center) 1,359.5 (53.52) 30 (5.12)) re)					
тс	Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia Max tool length Max tool weight Main spindle motor	m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) mm (in.) kg (lb) kW (hp)	(tailstock) MT. (revolving 1,186	(tailstock) No.5 g center) 1,594	@90 (3.5 4 22/15	C: 200 0.001 to - - 4) (w/o adjac 00 (15.75) (fr 10 22/15 (30/20)	(tailstock) b, B: 30 1,000.000 MT. (revolvin 961 (37.83) -A63 -60 ent tools: ø1 om gauge lir (22)	12 (tailstock) Ig center) 1,359.5 (53.52) 30 (5.12)) re)	22/15	-			
ТС	Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool shank Max tool length Max tool length Main spindle motor Opposing spindle motor	m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) mm (in.) kg (lb) kW (hp) kW (hp)	(tailstock) MT. (revolving 1,186	(tailstock) No.5 g center) 1,594 (62.76)	090 (3.5 4 22/15 (30 mi	C: 200 0.001 to - - 4) (w/o adjac 00 (15.75) (fr 10 22/15 (30/20) (30/20)	(tailstock) b, B: 30 1,000.000 MT. (revolvin 961 (37.83) -A63 -60 ent tools: ø1 om gauge lir (22)	12 (tailstock) No.5 (g center) 1,359.5 (53.52) 30 (5.12)) ne) tt)	22/15 (20 mi	- (30/20)			
тс	Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia Max tool length Max tool weight Main spindle motor	m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) mm (in.) kg (lb) kW (hp) kW (hp)	(tailstock) MT. (revolving 1,186	(tailstock) No.5 g center) 1,594 (62.76)	090 (3.5 4 22/15 (30 mi (30/20/15)	C: 200 0.001 to - - 4) (w/o adjac 00 (15.75) (fr 10 22/15 (30/20) (30/20)	(tailstock) b, B: 30 1,000.000 MT. (revolvin 961 (37.83) -A63 -60 ent tools: ø1 om gauge lir (22)	12 (tailstock) No.5 (g center) 1,359.5 (53.52) 30 (5.12)) ne) tt) - 22/15/11	22/15 (20 mi (30/20/15)	- (30/20)			
ТС	Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia Max tool dia Max tool length Max tool weight Main spindle motor Opposing spindle motor Milling tool spindle motor	m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp) r kW (hp) pr kW (hp)	(tailstock) MT. (revolvin, 1,186 (46.69)	(tailstock) No.5 g center) 1,594 (62.76) - - - 22/15/11 (3 min/15	@90 (3.5 4 22/15 (30 mi (30/20/15) i min/cont)	C: 200 0.001 to - - 4) (w/o adjac 00 (15.75) (fr 10 22/15 (30/20) (30/20) n/cont)	(tailstock) b, B: 30 1,000.000 MT. (revolvin 961 (37.83) -A63 -A63 -0 ent tools: ø1 om gauge lin (22) (30 min/con	12 (tailstock) No.5 og center) 1,359.5 (53.52) 30 (5.12)) ne) tt) - 22/15/11 (3 min/15	22/15 (20 mi (30/20/15) min/cont)	- - (30/20) n/cont)			
тс	Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool shank Max tool length Max tool length Main spindle motor Opposing spindle motor	m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) mm (in.) kg (lb) kW (hp) kW (hp)	(tailstock) MT. (revolvin, 1,186 (46.69)	(tailstock) No.5 g center) 1,594 (62.76) - - 22/15/11 (3 min/15 (: 5.2, Z: 4.6	ø90 (3.5 4 22/15 (30 mi (30/20/15) min/cont) , Y: 3.5, B: 3.	C: 200 0.001 to - - HSK 4) (w/o adjac 00 (15.75) (fr 10 22/15 (30/20) n/cont) 0	(tailstock) b, B: 30 1,000.000 MT. (revolvin 961 (37.83) -A63 10 ent tools: ø1 om gauge lin (22) (30 min/con	12 (tailstock) no.5 og center) 1,359.5 (53.52) 30 (5.12)) ne) tt) - 22/15/11 (3 min/15 x: 5.2, XB: 3.5	22/15 (20 mi (30/20/15) min/cont) , ZA:4.6, ZB:	- - (30/20) n/cont) 3.5			
ТС	Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia Max tool dia Max tool length Max tool weight Main spindle motor Opposing spindle motor Milling tool spindle motor	m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp) r kW (hp) pr kW (hp)	(tailstock) MT. (revolvin, 1,186 (46.69)	(tailstock) No.5 g center) 1,594 (62.76) - - 22/15/11 (3 min/15 (: 5.2, Z: 4.6	@90 (3.5 4 22/15 (30 mi (30/20/15) i min/cont)	C: 200 0.001 to - - HSK 4) (w/o adjac 00 (15.75) (fr 10 22/15 (30/20) n/cont) 0	(tailstock) b, B: 30 1,000.000 MT. (revolvin 961 (37.83) -A63 -A63 -0 ent tools: ø1 om gauge lir (22) (30 min/con XA (XA: 6.9, .)	12 (tailstock) ng center) 1,359.5 (53.52) 30 (5.12)) ne) tt) - 22/15/11 (3 min/15 x: 5.2, XB: 3.5 XB: 4.7, ZA:6	22/15 (20 mi (30/20/15) min/cont) , ZA:4.6, ZB: 1, ZB: 4.7)(C	- - (30/20) n/cont) 3.5 BBC 1,00			
ТС	Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia Max tool dia Max tool length Max tool weight Main spindle motor Opposing spindle motor Milling tool spindle motor	m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp) r kW (hp) pr kW (hp)	(tailstock) MT. (revolvin, 1,186 (46.69)	(tailstock) No.5 g center) 1,594 (62.76) - - 22/15/11 (3 min/15 (: 5.2, Z: 4.6	ø90 (3.5 4 22/15 (30 mi (30/20/15) min/cont) , Y: 3.5, B: 3.	C: 200 0.001 to - - HSK 4) (w/o adjac 00 (15.75) (fr 10 22/15 (30/20) n/cont) 0	(tailstock) b, B: 30 1,000.000 MT. (revolvin 961 (37.83) -A63 -A63 -0 ent tools: ø1 om gauge lir (22) (30 min/con XA (XA: 6.9, .)	12 (tailstock) 1,359.5 (53.52) 30 (5.12)) 1e) - 22/15/11 (3 min/15 x: 5.2, XB: 3.5 XB: 4.7, ZA:6 (6.1) (DBC 1,	22/15 (20 mi (30/20/15) min/cont) , ZA:4.6, ZB: .1, ZB: 4.7)(D 500), Y: 3.5, F	- - (30/20) n/cont) 3.5 BBC 1,00			
ТС	Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia Max tool length Max tool length Max tool weight Main spindle motor Opposing spindle motor Milling tool spindle motor X, Z, Y, B axis motor	m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp) r kW (hp) pr kW (hp) kW (hp)	(tailstock) MT. (revolvin, 1,186 (46.69)	(tailstock) No.5 g center) 1,594 (62.76) - - 22/15/11 (3 min/15 (: 5.2, Z: 4.6 (: 6.9, Z: 6.1	ø90 (3.5 4 22/15 (30 mi (30/20/15) i min/cont) , Y: 3.5, B: 3, , Y: 4.7, B: 4.	C: 200 0.001 to - - HSK 4) (w/o adjac 00 (15.75) (fr 10 22/15 (30/20) n/cont) 0 0	(tailstock) b, B: 30 1,000.000 MT. (revolvin 961 (37.83) -A63 10 ent tools: ø1 om gauge lir (22) (30 min/con XA (XA: 6.9, /4.6	12 (tailstock) Ing center) 1,359.5 (53.52) 30 (5.12)) ne) - 22/15/11 (3 min/15 5.2, XB: 3.5 XB: 4.7, ZA:6 (6.1) (DBC 1, (Y: 4.7, (Y: 4.7,	22/15 (20 mi (30/20/15) min/cont) , ZA:4.6, ZB: 1, ZB: 4.7)(D 500), Y: 3.5, I B: 4.0)	- - (30/20) n/cont) 3.5 BBC 1,00 3: 3.0			
TC	Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool shank Max tool length Max tool length Main spindle motor Opposing spindle motor Opposing spindle motor X, Z, Y, B axis motor W-axis motor	m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp) kW (hp) kW (hp) kW (hp)	(tailstock) MT. (revolvin, 1,186 (46.69)	(tailstock) No.5 g center) 1,594 (62.76) - - 22/15/11 (3 min/15 (: 5.2, Z: 4.6 (: 6.9, Z: 6.1	ø90 (3.5 4 22/15 (30 mi (30/20/15) min/cont) , Y: 3.5, B: 3. , Y: 4.7, B: 4. 3.5 (4.7)	C: 200 0.001 to - HSK 4) (w/o adjac 00 (15.75) (fr 10 22/15 (30/20) n/cont) 0 0 1 4.6 (6.1)	(tailstock) b, B: 30 1,000.000 MT. (revolvin 961 (37.83) -A63 10 ent tools: ø1 om gauge lir (22) (30 min/con (XA: 6.9, ) /4.6 2.8 (3.7)	12 (tailstock) No.5 (g center) 1,359.5 (53.52) 30 (5.12)) ne) tt) - 22/15/11 (3 min/15 x: 5.2, XB: 3.5 XB: 4.7, ZA:6 (6.1) (DBC 1, (Y: 4.7, (tailstock)	22/15 (20 mi (30/20/15) min/cont) , ZA:4.6, ZB: .1, ZB: 4.7)(D 500), Y: 3.5, F	- - (30/20) n/cont) 3.5 BBC 1,00 3: 3.0			
TC lotor	Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia Max tool length Max tool length Main spindle motor Opposing spindle motor Milling tool spindle motor X, Z, Y, B axis motor W-axis motor Coolant motor (50Hz/60	m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp) kW (hp) kW (hp) kW (hp)	(tailstock) MT. (revolvin, 1,186 (46.69)	(tailstock) No.5 g center) 1,594 (62.76) (62.76) (62.76) (62.76) (52.76) (52.75) (5.2, Z: 4.6 (5.2, Z: 4.6 (5.2, Z: 6.1) (tailstock)	ø90 (3.5 4 22/15 (30 mi (30/20/15) min/cont) , Y: 3.5, B: 3. , Y: 4.7, B: 4. 3.5 (4.7) 0.25/0.25 ((	C: 200 0.001 to - HSK 4) (w/o adjac 00 (15.75) (fr 10 22/15 (30/20) n/cont) 0 0 1 4.6 (6.1)	(tailstock) b, B: 30 1,000.000 MT. (revolvin 961 (37.83) -A63 10 ent tools: ø1 om gauge lir (22) (30 min/con (XA: 6.9, ) /4.6 2.8 (3.7)	12 (tailstock) No.5 (g center) 1,359.5 (53.52) 30 (5.12)) ne) tt) - 22/15/11 (3 min/15 x: 5.2, XB: 3.5 XB: 4.7, ZA:6 (6.1) (DBC 1, (Y: 4.7, (tailstock) (0.73/1.0) x3	22/15 (20 mi (30/20/15) min/cont) , ZA:4.6, ZB: .1, ZB: 4.7)(D 500), Y: 3.5, [ B: 4.0) 3.5 (4.7)	- - (30/20) n/cont) 3.5 BBC 1,00 3: 3.0			
TC lotor	Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool length Max tool length Max tool weight Main spindle motor Opposing spindle motor Milling tool spindle motor X, Z, Y, B axis motor W-axis motor	m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp) kW (hp) kW (hp) kW (hp)	(tailstock) MT. (revolvin, 1,186 (46.69)	(tailstock) No.5 g center) 1,594 (62.76) (62.76) (62.76) (62.76) (52.76) (52.75) (5.2, Z: 4.6 (5.2, Z: 4.6 (5.2, Z: 6.1) (tailstock)	ø90 (3.5 4 22/15 (30 mi (30/20/15) min/cont) , Y: 3.5, B: 3. , Y: 4.7, B: 4. 3.5 (4.7)	C: 200 0.001 to - HSK 4) (w/o adjac 00 (15.75) (fr 10 22/15 (30/20) n/cont) 0 0 1 4.6 (6.1)	(tailstock) b, B: 30 1,000.000 MT. (revolvin 961 (37.83) -A63 10 ent tools: ø1 om gauge lir (22) (30 min/con (XA: 6.9, ) /4.6 2.8 (3.7)	12 (tailstock) No.5 (g center) 1,359.5 (53.52) 30 (5.12)) ne) tt) - 22/15/11 (3 min/15 x: 5.2, XB: 3.5 XB: 4.7, ZA:6 (6.1) (DBC 1, (Y: 4.7, (tailstock) (0.73/1.0) x3	22/15 (20 mi (30/20/15) min/cont) , ZA:4.6, ZB: 1, ZB: 4.7)(D 500), Y: 3.5, I B: 4.0)	- - (30/20) n/cont) 3.5 BBC 1,00 3: 3.0			
TC lotor	Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia Max tool length Max tool length Main spindle motor Opposing spindle motor Milling tool spindle motor X, Z, Y, B axis motor W-axis motor Coolant motor (50Hz/60	m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kg (b) kW (hp) r kW (hp) r kW (hp) kW (hp) kW (hp) kW (hp)	(tailstock) MT. (revolvin 1,186 (46.69) 	(tailstock) No.5 g center) 1,594 (62.76) - - 22/15/11 (3 min/15 (: 5.2, Z: 4.6 (: 6.9, Z: 6.1) tailstock) 2,955	ø90 (3.5 4 22/15 (30 mi (30/20/15) min/cont) , Y: 3.5, B: 3. , Y: 4.7, B: 4. 3.5 (4.7) 0.25/0.25 ((	C: 200 0.001 to - - HSK 4 4) (w/o adjac 00 (15.75) (fr 10 22/15 (30/20) n/cont) 0 0 0 0 0 0 0 1 22/15 (30/20) (30/20) (30/20) (30/20) (30/20) 0 0 0 0 0 0 0 0 0 0 0 0 0	(tailstock) b, B: 30 1,000.000 MT. (revolvin 961 (37.83) -A63 -A63 -0 ent tools: ø1 om gauge lir (22) (30 min/con XA (XA: 6.9, /4.6 2.8 (3.7) 1, 0.55/0.75 (	12 (tailstock) No.5 (g center) 1,359.5 (53.52) 30 (5.12)) ne) tt) - 22/15/11 (3 min/15 x: 5.2, XB: 3.5 XB: 4.7, ZA:6 (6.1) (DBC 1, (Y: 4.7, (tailstock) (0.73/1.0) x3	22/15 (20 mi (30/20/15) min/cont) , ZA:4.6, ZB: 1, ZB: 4.7)(D 500), Y: 3.5, [B: 4.0) 3.5 (4.7) 119.29)	- (30/20) n/cont) 3.5 JBC 1,00 3: 3.0 4.6 (6			
TC lotor	Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia Max tool length Max tool weight Main spindle motor Opposing spindle motor Milling tool spindle motor X, Z, Y, B axis motor W-axis motor Coolant motor (50Hz/60 Height Floor space	m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp) r kW (hp) r kW (hp) r kW (hp) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp)	(tailstock) MT. (revolvin 1,186 (46.69) 	(tailstock) No.5 g center) 1,594 (62.76) 22/15/11 (3 min/15 (: 5.2, Z: 4.6 (: 6.9, Z: 6.1) tailstock) 2,955 DBC 1,000:	090 (3.5 4 22/15 (30 mi (30/20/15) 5 min/cont) , Y: 3.5, B: 3. , Y: 4.7, B: 4. 3.5 (4.7) 0.25/0.25 (( (116.34) 4,925 × 2,999)	C: 200 0.001 to - - HSK 4 4) (w/o adjac 00 (15.75) (fr 10 22/15 (30/20) n/cont) 0 0 0 0 0 0 0 1 22/15 (30/20) (30/20) (30/20) (30/20) (30/20) 0 0 0 0 0 0 0 0 0 0 0 0 0	(tailstock) b, B: 30 1,000.000 MT. (revolvin 961 (37.83) -A63 -A63 -0 ent tools: ø1 om gauge lir (22) (30 min/con XA (XA: 6.9, /4.6 2.8 (3.7) 1, 0.55/0.75 (	12 (tailstock) No.5 (g center) 1,359.5 (53.52) 30 (5.12)) ne) (53.52) 30 (5.12)) ne) (53.52) 30 (5.12)) ne) (53.52) (	22/15 (20 mi (30/20/15) min/cont) , ZA:4.6, ZB: 1, ZB: 4.7)(D 500), Y: 3.5, I B: 4.0) 3.5 (4.7) 119.29) 4,925 × 3,01	- (30/20) n/cont) 3.5 JBC 1,00 3: 3.0 4.6 (6			
TC lotor	Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia Max tool length Max tool weight Main spindle motor Opposing spindle motor Milling tool spindle motor X, Z, Y, B axis motor W-axis motor Coolant motor (50Hz/60 Height	m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp) r kW (hp) r kW (hp) r kW (hp) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp)	(tailstock) MT. (revolvin 1,186 (46.69) 	(tailstock) No.5 g center) 1,594 (62.76) 22/15/11 (3 min/15 (: 5.2, Z: 4.6 (: 6.9, Z: 6.1) tailstock) 2,955 DBC 1,000: (193.90	090 (3.5 4 22/15 (30 mi (30/20/15) i min/cont) , Y: 3.5, B: 3. , Y: 4.7, B: 4. 3.5 (4.7) 0.25/0.25 (( (116.34) 4,925 × 2,99 × 117.91)	C: 200 0.001 to - - HSK 4 4) (w/o adjac 00 (15.75) (fr 10 22/15 (30/20) (30/20) (30/20) n/cont) 0 0 0 0 1 - - - - - - - - - - - - -	(tailstock) b, B: 30 1,000.000 MT. (revolvin 961 (37.83) -A63 10 ent tools: ø1 om gauge lin (22) (30 min/con XA (XA: 6.9, 1 /4.6 2.8 (3.7) 1, 0.55/0.75 (	12 (tailstock) 1,359.5 (53.52) 30 (5.12)) re) 22/15/11 (3 min/15 x: 5.2, XB: 3.5 XB: 4.7, ZA:6 (6.1) (DBC 1,4 (c),73/1.0) ×3 3,030 ( DBC 1,000: 4 (193.90)	22/15 (20 mi (30/20/15) min/cont) , ZA:4.6, ZB: 1, ZB: 4.7)(D 500), Y: 3.5, I B: 4.0) 3.5 (4.7) 119.29) 4,925 × 3,011 × 118.82)	- (30/20) n/cont) 3.5 BC 1,00 3: 3.0 4.6 (6 8			
TC lotor	Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia Max tool length Max tool weight Main spindle motor Opposing spindle motor Milling tool spindle motor X, Z, Y, B axis motor W-axis motor Coolant motor (50Hz/60 Height Floor space	m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp) r kW (hp) r kW (hp) r kW (hp) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp)	(tailstock) MT. (revolvin 1,186 (46.69) 	(tailstock) No.5 g center) 1,594 (62.76) 22/15/11 (3 min/15 (: 5.2, Z: 4.6 (: 6.9, Z: 6.1 tailstock) 2,955 DBC 1,000: (193.90 DBC 1,500:	090 (3.5 4 22/15 (30 mi (30/20/15) imin/cont) , Y: 3.5, B: 3. , Y: 4.7, B: 4. 3.5 (4.7) 0.25/0.25 (( (116.34) 4,925 × 2,99 × 117.91) 5,425 × 2,99	C: 200 0.001 to - - HSK 4 4) (w/o adjac 00 (15.75) (fr 10 22/15 (30/20) (30/20) (30/20) n/cont) 0 0 0 0 1 - - - - - - - - - - - - -	(tailstock) b, B: 30 1,000.000 MT. (revolvin 961 (37.83) -A63 10 ent tools: ø1 om gauge lin (22) (30 min/con XA (XA: 6.9, 1 /4.6 2.8 (3.7) 1, 0.55/0.75 (	12 (tailstock) 1,359.5 (53.52) 30 (5.12)) 19 30 (5.12)) 10 30 (5.12)) 10 30 (5.12)) 10 30 (5.12)) 10 30 (5.12)) 10 4 30 (5.12)) 10 4 5.2, XB: 3.5 XB: 4.7, ZA:6 (6.1) (DBC 1, (0.73/1.0) ×3 3,030 ( DBC 1,000: 4 (193.90) DBC 1,500: 5	22/15 (20 mi (30/20/15) min/cont) , ZA:4.6, ZB: 1, ZB: 4.7)(D 500), Y: 3.5, I B: 4.0) 3.5 (4.7) 119.29) 4,925 × 3,01 × 118.82) 5,425 × 3,08	- (30/20) n/cont) 3.5 BC 1,00 3: 3.0 4.6 (6 8			
TC lotor	Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia Max tool length Max tool length Max tool weight Main spindle motor Opposing spindle motor Opposing spindle motor Milling tool spindle motor X, Z, Y, B axis motor W-axis motor Coolant motor (50Hz/60 Height Floor space W × D (tank included)	m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp) r kW (hp) r kW (hp) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp)	(tailstock) MT. (revolvin, 1,186 (46.69) 	(tailstock) No.5 g center) 1,594 (62.76) 22/15/11 (3 min/15 (: 5.2, Z: 4.6 (: 6.9, Z: 6.1) tailstock) 2,955 DBC 1,000: (193.90 DBC 1,500: (213.58)	ø90 (3.5 4 22/15 (30 mi (30/20/15) i min/cont) , Y: 3.5, B: 3, , Y: 4.7, B: 4. 3.5 (4.7) 0.25/0.25 (( (116.34) 4,925 × 2,99 × 117.91) 5,425 × 2,99 × 117.91)	C: 200 0.001 to - - HSK 4 4) (w/o adjac 00 (15.75) (fr 10 22/15 (30/20) n/cont) 22/15 (30/20) n/cont) 0 0 1 4.6 (6.1) 0.33/0.33) × - 5 5	(tailstock) b, B: 30 1,000.000 MT. (revolvin 961 (37.83) -A63 -0 ent tools: ø1 om gauge lir (22) (30 min/con (23) (XA: 6.9, /4.6 2.8 (3.7) 1, 0.55/0.75 (	12 (tailstock) No.5 (g center) 1,359.5 (53.52) 30 (5.12)) 10 10 10 10 10 10 10 10 10 10	22/15 (20 mi (30/20/15) min/cont) , ZA:4.6, ZB: ,1, ZB: 4.7)(C 500), Y: 3.5, I , B: 4.0) 3.5 (4.7) 119.29) 4,925 × 3,01 × 118.82) 5,425 × 3,08 × 121.34)	- (30/20) n/cont) 3.5 BEC 1,00( 3: 3.0 4.6 (6 8 8 2			
ailstock TC Aotor Machine ize	Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia Max tool length Max tool weight Main spindle motor Opposing spindle motor Milling tool spindle motor X, Z, Y, B axis motor W-axis motor Coolant motor (50Hz/60 Height Floor space	m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp) r kW (hp) r kW (hp) r kW (hp) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp)	(tailstock) MT. (revolvin, 1,186 (46.69) 	(tailstock) No.5 g center) 1,594 (62.76) 22/15/11 (3 min/15 (: 5.2, Z: 4.6 (: 6.9, Z: 6.1) tailstock) 2,955 DBC 1,000: (193.90 DBC 1,500: (213.58) BC 1,000: 1	090 (3.5 4 22/15 (30 mi (30/20/15) imin/cont) , Y: 3.5, B: 3. , Y: 4.7, B: 4. 3.5 (4.7) 0.25/0.25 (( (116.34) 4,925 × 2,99 × 117.91) 5,425 × 2,99	C: 200 0.001 to - - HSK 4 4) (w/o adjac 00 (15.75) (fr 10 22/15 (30/20) n/cont) 0 0 1 4.6 (6.1) 0.33/0.33) × 1 5 5 0)	(tailstock) b, B: 30 1,000.000 MT. (revolvin 961 (37.83) -A63 10 ent tools: ø1 om gauge lir (22) (30 min/con (30 min/con 2.8 (3.7) 1, 0.55/0.75 (	12 (tailstock) 1,359.5 (53.52) 30 (5.12)) 19 30 (5.12)) 10 30 (5.12)) 10 30 (5.12)) 10 30 (5.12)) 10 30 (5.12)) 10 4 30 (5.12)) 10 4 5.2, XB: 3.5 XB: 4.7, ZA:6 (6.1) (DBC 1, (0.73/1.0) ×3 3,030 ( DBC 1,000: 4 (193.90) DBC 1,500: 5	22/15 (20 mi (30/20/15) min/cont) , ZA:4.6, ZB: .1, ZB: 4.7)(D 500), Y: 3.5, f B: 4.0) 3.5 (4.7) 119.29) 4,925 × 3,01 × 118.82) 5,425 × 3,08 × 121.34) 6,500 (36,30)	- (30/20) n/cont) 3.5 BBC 1,000 3: 3.0 4.6 (6 8 8 2 0)			

\*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

							S U4000					
Item				SC		SW		SC		SW		
			1500	2000	1500	2000	1500	2000	1500	2000		
Capacity	Swing over saddle	mm (in.)		-	(25.59)	1		ø650 (25.59),		· · · · /		
	Distance between center	rs mm (in.)	1,500	2,000	1,500	2,000	1,500	2,000	1,500	2,000		
			(59.06)	(78.74)	(59.06)	(78.74)	(59.06)	(78.74)	(59.06)	(78.74)		
	Max machining dia	mm (in.)			(25.59)			9650 (25.59) <sup>*1</sup>				
	Max machining length	mm (in.)	1,500	2,000	1,500	2,000	1,500	2,000	1,500	2,000		
			(59.06)	(78.74)	(59.06)	(78.74)	(59.06)	(78.74)	(59.06)	(78.74)		
Travels	X axis	mm (in.)		· · · · · · · · · · · · · · · · · · ·	27.36)			r: 695 (27.36)		<u>,` /</u>		
	Z axis	upper: mm (in.)	1,600	2,100	1,600	2,100	1,600	2,100	1,600	2,100		
	-	lower: mm (in.)	(62.99)	(82.68)	(62.99)	(82.68)	(62.99)	(82.68)	(62.99)	(82.68)		
				_		1,461	1,961	1,524 <sup>*2</sup> 2,045*				
						(57.52)	(72.20)	(60.00) (80.51)				
	Y axis			1	,	(±150 (5.91))	)					
	W axis	mm (in.)		_	1,554	2,054		_	1,524*2	2,024*3		
					(61.18)	(80.87)			(60.00)	(79.69)		
	B-axis / indexing angle	degree				+210 (min co	Ŭ	,				
	C-axis / indexing angle	degree			360	(min control	led angle 0.0	0001)				
Spindle	Spindle speed	min <sup>-1</sup>				45 to	4,200					
	Spindle speed ranges				2 auto ra	nges (2-spee	d 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 speed	min <sup>-1</sup>		-	45 to	4,200		-	38 to	3,800		
spindle*4	Spindle speed ranges				2 auto	ranges			2 auto	ranges		
				-	(2-spee	ed motor		-	(2-spee	ed motor		
					coil sw	/itching)			coil sw	/itching)		
	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)		
Furret	Туре			ŀ	11	. ,	H1, Lo	wer: V12	Upper: H1,	Lower: V1		
tool spindle)	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.)					(1.57)					
	Milling tool spindle	min <sup>-1</sup>					12,000					
	Milling tool spindle speed				2 auto rai	nges (2-spee	,	switching)				
Feedrates	Feedrates		V. 50 7. 50	V 50 7 40						V. FO 7.		
				1X 50 7 40	X·50 7·50		X·50 7·50	X·50 7·40	X·50 7·50			
	X, Z, Y axes	apport m/mm	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: 4 Y: 40		
		lower: m/min	Y: 40	X: 50, Z: 40 Y: 40	,X: 50, Z: 50, Y: 40 -	, X: 50, Z: 40, Y: 40	Y: 40	Y: 40	Y: 40	Y: 40		
			Y: 40	X: 50, Z: 40, Y: 40	Y: 40	Y: 40	Y: 40 X: 25, Z: 40	,X: 50, Z: 40, Y: 40 X: 25, Z: 30	Y: 40 X: 25, Z: 40	Y: 40 X: 25, Z: 3		
	X, Z, Y axes	lower: m/min	Y: 40	Y: 40	,X: 50, Z: 50, Y: 40 - 30	,X: 50, Z: 40, Y: 40	Y: 40 X: 25, Z: 40	Y: 40 X: 25, Z: 30	Y: 40	Y: 40		
	X, Z, Y axes	lower: m/min	Y: 40	Y: 40	Y: 40	Y: 40	Y: 40 X: 25, Z: 40	Y: 40 X: 25, Z: 30	Y: 40 X: 25, Z: 40	Y: 40 X: 25, Z: 3		
	X, Z, Y axes	lower: m/min m/min	Y: 40	Y: 40	Y: 40	Y: 40 20 C: 200	Y: 40 X: 25, Z: 40 (tails	Y: 40 X: 25, Z: 30	Y: 40 X: 25, Z: 40	Y: 40 X: 25, Z: 3		
Failstock	X, Z, Y axes Feedrates W-axis Feedrates C, B axis	lower: m/min m/min min <sup>-1</sup>	Y: 40 1 (tails	Y: 40	- - 30	Y: 40 20 C: 200 0.001 to	Y: 40 X: 25, Z: 40 (tails ), B: 30 1,000.000	Y: 40 X: 25, Z: 30	Y: 40 X: 25, Z: 40	Y: 40 X: 25, Z:		
Tailstock	X, Z, Y axes Feedrates W-axis Feedrates C, B axis Cutting feedrate	lower: m/min m/min min <sup>-1</sup>	Y: 40 (tails	Y: 40	- - 30	Y: 40 20 C: 200	Y: 40 X: 25, Z: 40 (tails 0, B: 30 1,000.000 MT.	Y: 40 X: 25, Z: 30 12 stock)	Y: 40 X: 25, Z: 40	Y: 40 X: 25, Z:		
Failstock	X, Z, Y axes Feedrates W-axis Feedrates C, B axis Cutting feedrate	lower: m/min m/min min <sup>-1</sup> mm/rev	Y: 40 (tails	Y: 40	- - 30	Y: 40 20 C: 200 0.001 to	Y: 40 X: 25, Z: 40 (tails 0, B: 30 1,000.000 MT.	Y: 40 X: 25, Z: 30 12 stock) No.5	Y: 40 X: 25, Z: 40	Y: 40 X: 25, Z:		
Tailstock	X, Z, Y axes Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore	lower: m/min m/min min <sup>-1</sup>	Y: 40 (tails MT. (revolvin	Y: 40	- - 30	Y: 40 20 C: 200 0.001 to	Y: 40 X: 25, Z: 40 (tails ), B: 30 1,000.000 MT. (revolvir	Y: 40 X: 25, Z: 30 12 stock) No.5 ng center)	Y: 40 X: 25, Z: 40	Y: 40 X: 25, Z:		
	X, Z, Y axes Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore	lower: m/min m/min min <sup>-1</sup> mm/rev	Y: 40 (tails MT. (revolvin 1,594	Y: 40	- - 30	Y: 40 20 C: 200 0.001 to - -	Y: 40 X: 25, Z: 40 (tails 0, B: 30 1,000.000 MT. (revolvir 1,359.5	Y: 40 X: 25, Z: 30 12 stock) No.5 ng center) 1,961	Y: 40 X: 25, Z: 40	Y: 40 X: 25, Z:		
	X, Z, Y axes Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel	lower: m/min m/min min <sup>-1</sup> mm/rev	Y: 40 (tails MT. (revolvin 1,594	Y: 40	- - 30	Y: 40 20 C: 200 0.001 to - - HSK	Y: 40 X: 25, Z: 40 (tails ), B: 30 1,000.000 MT. (revolvir 1,359.5 (53.52)	Y: 40 X: 25, Z: 30 12 stock) No.5 ng center) 1,961	Y: 40 X: 25, Z: 40	Y: 40 X: 25, Z:		
	X, Z, Y axes Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank	lower: m/min m/min min <sup>-1</sup> mm/rev mm (in.)	Y: 40 (tails MT. (revolvin 1,594	Y: 40	Y: 40 - 30	Y: 40 20 C: 200 0.001 to - - HSK	Y: 40 X: 25, Z: 40 (tails 0, B: 30 1,000.000 MT. (revolvir 1,359.5 (53.52) -A63 0	Y: 40 X: 25, Z: 30 2 stock) No.5 ig center) 1,961 (77.20)	Y: 40 X: 25, Z: 40	Y: 40 X: 25, Z:		
	X, Z, Y axes Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools	lower: m/min m/min min <sup>-1</sup> mm/rev mm (in.)	Y: 40 (tails MT. (revolvin 1,594	Y: 40	Y: 40 - 30 090 (3.5	Y: 40 20 C: 200 0.001 to - - HSK 4	Y: 40 X: 25, Z: 40 (tails 0, B: 30 1,000.000 MT. (revolvir 1,359.5 (53.52) -A63 0 ent tools: ø1	Y: 40 X: 25, Z: 30 12 stock) No.5 ng center) 1,961 (77.20) 30 (5.12))	Y: 40 X: 25, Z: 40	Y: 40 X: 25, Z:		
	X, Z, Y axes Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Travel Tool shank No. of tools Max tool dia	lower: m/min m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.)	Y: 40 (tails MT. (revolvin 1,594	Y: 40	Y: 40 - 30 090 (3.5	Y: 40 20 C: 200 0.001 to - HSK 4) (w/o adjac 00 (15.75) (fr	Y: 40 X: 25, Z: 40 (tails 0, B: 30 1,000.000 MT. (revolvir 1,359.5 (53.52) -A63 0 ent tools: ø1	Y: 40 X: 25, Z: 30 12 stock) No.5 ng center) 1,961 (77.20) 30 (5.12))	Y: 40 X: 25, Z: 40	Y: 40 X: 25, Z:		
ATC	X, Z, Y axes Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Travel Tool shank No. of tools Max tool dia Max tool length	lower: m/min m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kg (lb)	Y: 40 (tails MT. (revolvin 1,594	Y: 40	- - 30 σ90 (3.5 4	Y: 40 20 C: 200 0.001 to - HSK 4) (w/o adjac 00 (15.75) (fr	Y: 40 X: 25, Z: 40 (tails b, B: 30 1,000.000 MT. (revolvir 1,359.5 (53.52) -A63 -0 ent tools: ø1 om gauge lir (22)	Y: 40 X: 25, Z: 30 12 stock) No.5 ng center) 1,961 (77.20) 30 (5.12)) ne)	Y: 40 X: 25, Z: 40	Y: 40 X: 25, Z:		
ATC	X, Z, Y axes Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia Max tool length Max tool weight	lower: m/min m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) mm (in.)	Y: 40 (tails MT. (revolvin 1,594	Y: 40	Y: 40 - 30 0.000	Y: 40 20 C: 200 - - - 4) (w/o adjac 00 (15.75) (fr 10	Y: 40 X: 25, Z: 40 (tails b, B: 30 1,000.000 MT. (revolvir 1,359.5 (53.52) -A63 -0 ent tools: ø1 om gauge lir (22)	Y: 40 X: 25, Z: 30 12 stock) No.5 ng center) 1,961 (77.20) 30 (5.12)) ne)	Y: 40 X: 25, Z: 40 30	Y: 40 X: 25, Z: 3		
ATC	X, Z, Y axes Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool shank No. of tools Max tool length Max tool length Max tool weight Main spindle motor	lower: m/min m/min mm <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp)	Y: 40 (tails MT. (revolvin 1,594	Y: 40	Y: 40 - 30 090 (3.5 4 22/15	Y: 40 20 C: 200 0.001 to - - HSK 4 4) (w/o adjac 00 (15.75) (fr 10 22/15 (30/20) (30/20)	Y: 40 X: 25, Z: 40 (tails b, B: 30 1,000.000 MT. (revolvir 1,359.5 (53.52) -A63 -0 ent tools: ø1 om gauge lir (22)	Y: 40 X: 25, Z: 30 12 stock) No.5 ng center) 1,961 (77.20) 30 (5.12)) ne)	Y: 40 X: 25, Z: 40 30 22/15	Y: 40 X: 25, Z: 3 20 - - - (30/20)		
ATC	X, Z, Y axes Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia Max tool dia Max tool length Max tool weight Main spindle motor Opposing spindle motor	lower: m/min m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp) kW (hp)	Y: 40 (tails MT. (revolvin 1,594	Y: 40 12 12 12 12 12 12 12 12 12 12	Y: 40 - 30 090 (3.5 4 22/15 (30 mi	Y: 40 20 C: 200 - - 4) (w/o adjac -00 (15.75) (fr 10 22/15 (30/20)	Y: 40 X: 25, Z: 40 (tails b, B: 30 1,000.000 MT. (revolvir 1,359.5 (53.52) -A63 -0 ent tools: ø1 om gauge lir (22)	Y: 40 X: 25, Z: 30 12 stock) No.5 ng center) 1,961 (77.20) 30 (5.12)) ne) 	Y: 40 X: 25, Z: 40 30 22/15 (20 mi	Y: 40 X: 25, Z: 3 20		
ATC	X, Z, Y axes Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool shank No. of tools Max tool length Max tool length Max tool weight Main spindle motor	lower: m/min m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp) kW (hp)	Y: 40 (tails MT. (revolvin 1,594	Y: 40 12 stock) No.5 ng center) 2,094 (82.44) - 22/15/11	Y: 40 - 30 090 (3.5 4 22/15 (30 mi (30/20/15)	Y: 40 20 C: 200 0.001 to - - HSK 4 4) (w/o adjac 00 (15.75) (fr 10 22/15 (30/20) (30/20)	Y: 40 X: 25, Z: 40 (tails b, B: 30 1,000.000 MT. (revolvir 1,359.5 (53.52) -A63 -0 ent tools: ø1 om gauge lir (22)	Y: 40 X: 25, Z: 30 12 stock) No.5 ng center) 1,961 (77.20) 30 (5.12)) ne) tt) - 22/15/11	Y: 40 X: 25, Z: 40 30 22/15 (20 mi (30/20/15)	Y: 40 X: 25, Z: 3 20 - - - (30/20)		
ATC	X, Z, Y axes Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia Max tool dia Max tool dia Max tool weight Main spindle motor Opposing spindle motor Milling tool spindle motor	lower: m/min m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp) kW (hp)	Y: 40	Y: 40 (2 (2 (2 (2 (2 (2 (2 (3 (2 (2 (2 (3 (2 (3 (3 (2 (2 (2 (2 (3 (3 (3 (3 (2 (3 (3 (3 (3 (3 (3 (3 (3 (3 (3	<ul> <li>Y: 40</li> <li>-</li> <li>30</li> <li>∞90 (3.5</li> <li>4</li> <li>22/15</li> <li>(30 mi (30/20/15)</li> <li>min/cont)</li> </ul>	Y: 40 20 C: 200 0.001 to - - HSK 4 4) (w/o adjac 00 (15.75) (fr 10 22/15 (30/20) (30/20) in/cont)	Y: 40 X: 25, Z: 40 (tails b, B: 30 1,000.000 MT. (revolvir 1,359.5 (53.52) -A63 -0 ent tools: ø1 om gauge lir (22)	Y: 40 X: 25, Z: 30 12 stock) No.5 ig center) 1,961 (77.20) 30 (5.12)) ne) it) - 22/15/11 (3 min/15	Y: 40 X: 25, Z: 40 30 22/15 (20 mi (30/20/15) min/cont)	Y: 40 X: 25, Z: 3 20 - - (30/20) n/cont)		
ATC	X, Z, Y axes Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia Max tool dia Max tool length Max tool weight Main spindle motor Opposing spindle motor	lower: m/min m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp) kW (hp)	Y: 40	Y: 40 12 12 12 12 12 12 12 12 12 12	Y: 40 30 30 90 (3.5 4 22/15 (30 mi) (30/20/15) min/cont) , Z: 6.1) (DBC	Y: 40 20 C: 200 0.001 to - - HSK 4 4) (w/o adjac 00 (15.75) (fr 10 22/15 (30/20) (30/20) in/cont)	Y: 40 X: 25, Z: 40 (tails ), B: 30 1,000.000 MT. (revolvir 1,359.5 (53.52) -A63 -0 ent tools: ø1 om gauge lir (22) (30 min/cor	Y: 40 X: 25, Z: 30 12 stock) No.5 ig center) 1,961 (77.20) 30 (5.12)) ne) it) - 22/15/11 (3 min/15 XA: 5.2, XB:	Y: 40 X: 25, Z: 40 30 22/15 (20 mi (30/20/15) min/cont) : 3.5, ZA:4.6	Y: 40 X: 25, Z: 2 20 - - (30/20) n/cont)		
ATC	X, Z, Y axes Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia Max tool dia Max tool dia Max tool weight Main spindle motor Opposing spindle motor Milling tool spindle motor	lower: m/min m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp) kW (hp)	Y: 40	Y: 40 12 12 12 12 12 12 12 12 12 12	<ul> <li>Y: 40</li> <li>30</li> <li>30</li> <li>990 (3.5</li> <li>4</li> <li>22/15</li> <li>(30 mit)</li> <li>(30/20/15)</li> <li>min/cont)</li> <li>, Z: 6.1) (DBC 2,000),</li> </ul>	Y: 40 20 C: 200 0.001 to - - HSK 4 4) (w/o adjac 00 (15.75) (fr 10 22/15 (30/20) (30/20) in/cont)	Y: 40 X: 25, Z: 40 (tails), B: 30 1,000.000 MT. (revolvir 1,359.5 (53.52) -A63 -0 ent tools: ø1 om gauge lir (22) (30 min/cor	Y: 40 X: 25, Z: 30 12 stock) No.5 ng center) 1,961 (77.20) 30 (5.12)) ne) - 22/15/11 (3 min/15 XA: 5.2, XB: .9, XB: 4.7, Z/	Y: 40 X: 25, Z: 40 30 22/15 (20 mi (30/20/15) min/cont) : 3.5, ZA:4.6 A:6.1) (DBC <sup>-</sup>	Y: 40 X: 25, Z: 2 20 		
ATC	X, Z, Y axes Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia Max tool dia Max tool dia Max tool weight Main spindle motor Opposing spindle motor Milling tool spindle motor	lower: m/min m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp) kW (hp) r kW (hp)	Y: 40	Y: 40 12 12 12 12 12 12 12 12 12 12	Y: 40 30 30 90 (3.5 4 22/15 (30 mi) (30/20/15) min/cont) , Z: 6.1) (DBC	Y: 40 20 C: 200 0.001 to - - HSK 4 4) (w/o adjac 00 (15.75) (fr 10 22/15 (30/20) (30/20) in/cont)	Y: 40 X: 25, Z: 40 (tails), B: 30 1,000.000 MT. (revolvir 1,359.5 (53.52) -A63 -0 ent tools: ø1 om gauge lir (22) (30 min/cor	Y: 40 X: 25, Z: 30 12 stock) No.5 ng center) 1,961 (77.20) 30 (5.12)) ne)       	Y: 40 X: 25, Z: 40 30 22/15 (20 mi (30/20/15) min/cont) : 3.5, ZA:4.6 A:6.1) (DBC <sup>-</sup>	Y: 40 X: 25, Z: 3 20 - - (30/20) n/cont)		
ATC	X, Z, Y axes Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia Max tool dia Max tool dia Max tool weight Main spindle motor Opposing spindle motor Milling tool spindle motor	lower: m/min m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp) kW (hp) r kW (hp)	Y: 40	Y: 40 12 12 12 12 12 12 12 12 12 12	Y: 40 30 30 90 (3.5 4 22/15 (30 mi) (30/20/15) min/cont) , Z: 6.1) (DBC BC 2,000), B: 3.0 (4.0)	Y: 40 20 C: 200 0.001 to - - HSK 4 4) (w/o adjac 00 (15.75) (fr 10 22/15 (30/20) (30/20) in/cont)	Y: 40 X: 25, Z: 40 (tails ), B: 30 1,000.000 MT. (revolvir 1,359.5 (53.52) -A63 -0 ent tools: ø1 om gauge lir (22) (30 min/cor	Y: 40 X: 25, Z: 30 12 stock) No.5 ng center) 1,961 (77.20) 30 (5.12)) ne)       	Y: 40 X: 25, Z: 40 30 22/15 (20 mi (30/20/15) min/cont) : 3.5, ZA:4.6 A:6.1) (DBC <sup>-</sup> ZB: 4.6, Y: 3 4.7, B: 4.0)	Y: 40 X: 25, Z: 3 20 - - (30/20) n/cont)		
ATC	X, Z, Y axes Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia Max tool length Max tool weight Main spindle motor Opposing spindle motor Milling tool spindle motor X, Z, Y, B axis motor W-axis motor	lower: m/min m/min mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp) kW (hp) kW (hp) kW (hp)	Y: 40	Y: 40 (2 (2 (2 (2 (2 (2 (3 (82.44)) (82.44) (82.47) (82	Y: 40       -       30       30       090 (3.5       4       22/15       (30/20/15)       min/cont)       , Z: 6.1) (DBC       BC 2,000),       , B: 3.0 (4.0)       4.6	Y: 40 20 C: 200 0.001 to - - HSK 4) (w/o adjac 00 (15.75) (fr 10 22/15 (30/20) (30/20) in/cont) C 1,500)/ (6.1)	Y: 40 X: 25, Z: 40 (tails ), B: 30 1,000.000 MT. (revolvir 1,359.5 (53.52) -A63 -0 ent tools: ø1 om gauge lir (22) (30 min/cor (30 min/cor (XA: 6 5.2 (6.9) 2.8 (3.7)	Y: 40 X: 25, Z: 30 12 stock) No.5 ng center) 1,961 (77.20) 30 (5.12)) ne) 30 (5.12)) ne) 30 (5.12)) ne) 30 (5.12)) ne) 30 (5.12)) (77.20) 30 (5.12)) 10 (0) 30 (5.12) 10 (0) 30	Y: 40 X: 25, Z: 40 30 22/15 (20 mi (30/20/15) min/cont) : 3.5, ZA:4.6 A:6.1) (DBC <sup>-</sup> ZB: 4.6, Y: 3 4.7, B: 4.0)	Y: 40 X: 25, Z: 20 - - (30/20) n/cont) 1,500), 3.5, B: 3.0		
ATC Motor	X, Z, Y axes Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia Max tool length Max tool weight Main spindle motor Opposing spindle motor Milling tool spindle motor X, Z, Y, B axis motor W-axis motor Coolant motor (50Hz/60H	lower: m/min m/min mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp)	Y: 40	Y: 40 12 stock) No.5 ng center) 2,094 (82.44) (82.44) 22/15/11 (3 min/15 Z: 4.6 (X: 6.9 5.2 (6.9) (D Y: 3.5 (4.7) (tailstock)	Y: 40 - 30 -	Y: 40 20 C: 200 0.001 to - - HSK 4 (w/o adjac 00 (15.75) (fr 10 22/15 (30/20) (30/20) in/cont) C 1,500)/	Y: 40 X: 25, Z: 40 (tails ), B: 30 1,000.000 MT. (revolvir 1,359.5 (53.52) -A63 -0 ent tools: ø1 om gauge lir (22) (30 min/cor (30 min/cor (XA: 6 5.2 (6.9) 2.8 (3.7)	Y: 40 X: 25, Z: 30 12 stock) No.5 ng center) 1,961 (77.20) 30 (5.12)) ne) 30 (5.12)) ne) 40 5 (5.12)) ne) 5 (5.12) 10 6 (1) (77.20) 30 (5.12)) 10 (77.20) 30 (5.12) (77.20) 30 (5.12) (77.20) 30 (5.12) (77.20) (77.2	Y: 40 X: 25, Z: 40 30 22/15 (20 mi (30/20/15) min/cont) : 3.5, ZA:4.6 A:6.1) (DBC - ZB: 4.6, Y: 3 4.7, B: 4.0) 4.6	Y: 40 X: 25, Z: 20 - - (30/20) n/cont) 1,500), 3.5, B: 3.0		
ATC Motor Machine	X, Z, Y axes Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia Max tool dia Max tool weight Main spindle motor Opposing spindle motor Milling tool spindle motor X, Z, Y, B axis motor W-axis motor Coolant motor (50Hz/60H Height	lower: m/min m/min mm/rev mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp)	Y: 40 (tails MT. (revolvin 1,594 (62.76) X: 5.2, 7 2.8 (3.7)	Y: 40 12 12 12 12 12 12 12 12 12 12	<ul> <li>Y: 40</li> <li>30</li> <li>30</li> <li>∞90 (3.5</li> <li>4</li> <li>22/15</li> <li>(30 min</li> <li>(30/20/15)</li> <li>min/cont)</li> <li>Z: 6.1) (DBC 2,000)</li> <li>BEC 2,000)</li> <li>BE 3.0 (4.0)</li> <li>4.6</li> <li>0.25/0.25 (0</li> <li>(116.34)</li> </ul>	Y: 40 20 C: 200 0.001 to - - HSK 4 4) (w/o adjac 00 (15.75) (fm 10 22/15 (30/20) (30/20) in/cont) C 1,500)/ (6.1) 0.33/0.33) × 1	Y: 40 X: 25, Z: 40 (tails ), B: 30 1,000.000 MT. (revolvir 1,359.5 (53.52) -A63 0 ent tools: ø1 om gauge lir (22) (30 min/cor (30 min/cor (32, (6.9) 2.8 (3.7)) 1, 0.55/0.75	Y: 40 X: 25, Z: 30 12 stock) No.5 ng center) 1,961 (77.20) 30 (5.12)) ne) 30 (5.12)) ne) 22/15/11 (3 min/15 XA: 5.2, XB: 9, XB: 4.7, Z/ (DBC 2,000), (ZE: 6.1, Y: (tailstock) (0.73/1.0) ×3 3,030 (	Y: 40 X: 25, Z: 40 30 22/15 (20 mi (30/20/15) min/cont) : 3.5, ZA:4.6 A:6.1) (DBC - ZB: 4.6, Y: 3 4.7, B: 4.0) 4.6 119.29)	Y: 40 X: 25, Z: 3 20 		
ATC Motor Machine	X, Z, Y axes Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia Max tool dia Max tool dia Max tool weight Main spindle motor Opposing spindle motor Milling tool spindle motor X, Z, Y, B axis motor X-axis motor Coolant motor (50Hz/60H Height Floor space	lower: m/min m/min mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp)	Y: 40 (tails MT. (revolvin 1,594 (62.76) X: 5.2, 7 2.8 (3.7)	Y: 40 Vo.5 No.5 No.5 No.5 No.5 No.5 Sig center) 2,094 (82.44) 22/15/11 (3 min/15 Z: 4.6 (X: 6.9 5.2 (6.9) (D Y: 3.5 (4.7) (tailstock) 2,955 ( DBC 1,500: :	Y: 40 - 30 - ∞90 (3.5 - 4 22/15 (30 mi (30/20/15) min/cont) , Z: 6.1) (DBC 2000), B: 3.0 (4.0) BC 2,000), B: 3.0 (4.0) - 0.25/0.25 (0 (116.34) 5,425 × 2,99	Y: 40 20 C: 200 0.001 to - - HSK 4 4) (w/o adjac 00 (15.75) (fm 10 22/15 (30/20) (30/20) in/cont) C 1,500)/ (6.1) 0.33/0.33) × 1	Y: 40 X: 25, Z: 40 (tails ), B: 30 1,000.000 MT. (revolvir 1,359.5 (53.52) -A63 0 ent tools: ø1 om gauge lir (22) (30 min/cor (30 min/cor (32, (6.9) 2.8 (3.7)) 1, 0.55/0.75	Y: 40 X: 25, Z: 30 12 stock) No.5 ng center) 1,961 (77.20) 30 (5.12)) ne) 30 (5.12)) ne) 40 52/15/11 (3 min/15 XA: 5.2, XB: 9, XB: 4.7, Z/ (DBC 2,000), (ZB: 6.1, Y: (tailstock) (0.73/1.0) ×3 3,030 ( DBC 1,500: 5	Y: 40 X: 25, Z: 40 30 22/15 (20 mi (30/20/15) min/cont) : 3.5, ZA:4.6 A:6.1) (DBC ZB: 4.6, Y: 2 4.7, B: 4.0) 4.6 119.29) 5,425 × 3,082	Y: 40 X: 25, Z: 3 20 		
ATC Motor Machine	X, Z, Y axes Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia Max tool dia Max tool weight Main spindle motor Opposing spindle motor Milling tool spindle motor X, Z, Y, B axis motor W-axis motor Coolant motor (50Hz/60H Height	lower: m/min m/min mm/rev mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp)	Y: 40	Y: 40 Vo.5 Vo.5 Vo.5 Vo.5 Vo.5 Vo.5 Vo.6	Y: 40           -           30           30           22/15           (30/20/15)           min/cont)           , Z: 6.1) (DBC           BC 2,000),           BC 2,000),           BC 2,000),           BC 2,000),           4.6           0.25/0.25 (()           (116.34)           5,425 × 2,99           × 117.91)	Y: 40 20 C: 200 0.001 to - - HSK 4 4) (w/o adjac 00 (15.75) (fr 10 22/15 (30/20) (30/20) in/cont) C 1,500)/ (6.1) 0.33/0.33) × 1 5	Y: 40 X: 25, Z: 40 (tails ), B: 30 MT. (revolvir 1,359.5 (53.52) -A63 -0 ent tools: ø1 om gauge lir (22) (30 min/cor (22) (30 min/cor 2.8 (3.7) 1, 0.55/0.75	Y: 40 X: 25, Z: 30 12 stock) No.5 ng center) 1,961 (77.20) 30 (5.12)) ne) - 22/15/11 (3 min/15 XA: 5.2, XB: 9, XB: 4.7, Z/ (DEC 2,000), (ZE 6.1, Y: (tailstock) (0.73/1.0) ×3 3,030 ( DBC 1,500: 5 (213.58 >	Y: 40 X: 25, Z: 40 30 22/15 (20 mi (30/20/15) min/cont) : 3.5, ZA:4.6 A:6.1) (DBC <sup>-</sup> ZB: 4.6, Y: 3 4.7, B: 4.0) 4.6 119.29) 5,425 × 3,08 × 385.25)	Y: 40 X: 25, Z: 3 20 		
ATC Motor Machine	X, Z, Y axes Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia Max tool dia Max tool dia Max tool weight Main spindle motor Opposing spindle motor Milling tool spindle motor X, Z, Y, B axis motor X-axis motor Coolant motor (50Hz/60H Height Floor space	lower: m/min m/min mm/rev mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp)	Y: 40	Y: 40 V: 40 No.5 Ig center) 2,094 (82.44) (82.44) 22/15/11 (3 min/15 Z: 4.6 (X: 6.9 5.2 (6.9) (D Y: 3.5 (4.7) (tailstock) 2,955   DBC 1,500: (213.58 DBC 2,000:	<ul> <li>Y: 40</li> <li>-</li> <li>30</li> <li>30</li> <li>22/15</li> <li>(30 mi/cont)</li> <li>(30/20/15)</li> <li>min/cont)</li> <li>X: 6.1) (DBC</li> <li>(30/20/15)</li> <li>min/cont)</li> <li>X: 6.1) (DBC</li> <li>0.25/0.25 ((116.34)</li> <li>0.25/0.25 (2.99)</li> <li>× 117.91)</li> <li>6,175 × 2,99</li> </ul>	Y: 40 20 C: 200 0.001 to - - HSK 4 4) (w/o adjac 00 (15.75) (fr 10 22/15 (30/20) (30/20) in/cont) C 1,500)/ (6.1) 0.33/0.33) × 1 5	Y: 40 X: 25, Z: 40 (tails ), B: 30 MT. (revolvir 1,359.5 (53.52) -A63 -0 ent tools: ø1 om gauge lir (22) (30 min/cor (22) (30 min/cor 2.8 (3.7) 1, 0.55/0.75	Y: 40 X: 25, Z: 30 12 stock) No.5 ng center) 1,961 (77.20) 30 (5.12)) ne) 30 (5.12)) ne) 4 (3 min/15 XA: 5.2, XB: .9, XB: 4.7, Z/ (DBC 2,000), (ZB: 6.1, Y: (tailstock) (0.73/1.0) ×3 3,030 ( DBC 1,500: 5 (213.58 > DBC 2,000: 6	Y: 40 X: 25, Z: 40 30 22/15 (20 mi (30/20/15) min/cont) : 3.5, ZA:4.6 A:6.1) (DBC - ZB: 4.6, Y: 3 4.7, B: 4.0) 4.6 119.29) 5,425 × 3,08: × 385.25) 6,175 × 3,08:	Y: 40 X: 25, Z: 3 20 		
Tailstock ATC Motor Machine size	X, Z, Y axes Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia Max tool length Max tool length Max tool weight Main spindle motor Opposing spindle motor Milling tool spindle motor X, Z, Y, B axis motor W-axis motor Coolant motor (50Hz/60H Height Floor space W × D (tank included)	lower: m/min m/min mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp) kW (hp)	Y: 40	Y: 40 Vo.5 Vo.5 Vo.5 Vo.5 Vo.5 Vo.6	Y: 40           -           30           30           2015           30           22/15           (30/20/15)           min/cont)           ,Z: 6.1) (DBC           BEC 2,000),           B: 3.0 (4.0)           4.6           0.25/0.25 (till           (116.34)           5,425 × 2,99           × 117.91)           6,175 × 2,99           × 117.91)	Y: 40 20 C: 200 0.001 to - - HSK 4 4) (w/o adjac 00 (15.75) (fr 10 22/15 (30/20) (30/20) in/cont) C 1,500)/ (6.1) 0.33/0.33) × 1 5 5	Y: 40 X: 25, Z: 40 (tails ), B: 30 MT. (revolvir 1,359.5 (53.52) -A63 0 ent tools: ø1 om gauge lir (22) (30 min/cor (23) (30 min/cor 2.8 (3.7) 1, 0.55/0.75	Y: 40 X: 25, Z: 30 I2 stock) No.5 ng center) 1,961 (77.20) 30 (5.12)) ne) 30 (5.12)) ne) 40 (77.20) 30 (5.12)) ne) 40 (77.20) 30 (5.12)) ne) 40 (77.20) 30 (5.12)) ne) 40 (77.20) 30 (5.12)) ne) 40 (77.20) 30 (5.12)) ne) 40 (77.20) 30 (5.12)) ne) 40 (77.20) (77.20)	Y: 40 X: 25, Z: 40 30 22/15 (20 mi (30/20/15) min/cont) : 3.5, ZA:4.6 A:6.1) (DBC - ZB: 4.6, Y: 2 4.7, B: 4.0) 4.6 119.29) 5,425 × 3,08: × 385.25) 5,175 × 3,08: × 121.34)	Y: 40 X: 25, Z: 3 20 		
ATC Motor Machine	X, Z, Y axes Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore Travel Tool shank No. of tools Max tool dia Max tool dia Max tool dia Max tool weight Main spindle motor Opposing spindle motor Milling tool spindle motor X, Z, Y, B axis motor X-axis motor Coolant motor (50Hz/60H Height Floor space	lower: m/min m/min mm/rev mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp)	Y: 40	Y: 40 V: 40 No.5 Ig center) 2,094 (82.44) (82.44) 22/15/11 (3 min/15 Z: 4.6 (X: 6.9 5.2 (6.9) (D Y: 3.5 (4.7) (tailstock) 2,955   DBC 1,500: (213.58 DBC 2,000:	Y: 40           -           30           30           090 (3.5           4           22/15           (30/20/15)           min/cont)           Z: 6.1) (DBC           BEC 2,000),           B: 3.0 (4.0)           4.6           0.25/0.25 ((116.34)           5,425 × 2,999           × 117.91)           6,175 × 2,991           × 100 (37,400)	Y: 40 20 C: 200 0.001 to - - HSK 4 (w/o adjac 00 (15.75) (fr 10 22/15 (30/20) (30/20) in/cont) C 1,500)/ (6.1) 0.33/0.33) × 1 5 5 0)	Y: 40 X: 25, Z: 40 (tails ), B: 30 1,000.000 MT. (revolvir 1,359.5 (53.52) -A63 -0 ent tools: ø1 om gauge lir (22) (30 min/cor (23) (30 min/cor 2.8 (3.7) , 0.55/0.75	Y: 40 X: 25, Z: 30 12 stock) No.5 ng center) 1,961 (77.20) 30 (5.12)) ne) 30 (5.12)) ne) 4 (3 min/15 XA: 5.2, XB: .9, XB: 4.7, Z/ (DBC 2,000), (ZB: 6.1, Y: (tailstock) (0.73/1.0) ×3 3,030 ( DBC 1,500: 5 (213.58 > DBC 2,000: 6	Y: 40 X: 25, Z: 40 30 22/15 (20 mi (30/20/15) min/cont) : 3.5, ZA:4.6 A:6.1) (DBC <sup>-</sup> ZB: 4.6, Y: 3 4.7, B: 4.0) 4.6 119.29) 5,425 × 3,08: × 385.25) 5,175 × 3,08: × 121.34) 8,000 (39,60	Y: 40 X: 25, Z: 3 20 		

 $^{\star}$  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

							S U5000					
ltem			15	SC	1SW		23	SC	25	SW		
			1500	2000	1500	2000	1500	2000	1500	2000		
Capacity	Swing over saddle	mm (in.)		ø650	(25.59)		Upper:	ø650 (25.59),	Lower: ø32	0 (12.60)		
	Distance between center	s mm (in.)	1,500	2,000	1,500	2,000	1,500	2,000	1,500	2,000		
			(59.06)	(78.74)	(59.06)	(78.74)	(59.06)	(78.74)	(59.06)	(78.74		
	Max machining dia	mm (in.)		ø650	(25.59)		Upper: ø	650 (25.59)*1	, Lower: ø32	20 (12.60)		
	Max machining length	mm (in.)	1,500	2,000	1,500	2,000	1,500	2,000	1,500	2,000		
		(59.06)	(78.74)	(59.06)	(78.74)	(59.06)	(78.74)	(59.06)	(78.74			
Fravels	X axis	mm (in.)			27.36)		Uppe	r: 695 (27.36)	, Lower: 235	5 (9.25)		
	Z axis	upper: mm (in.)	1,600	2,100	1,600	2,100	1,600	2,100	1,600	2,100		
		· · · · · · · · · · · · · · · · · · ·	(62.99)	(82.68)	(62.99)	(82.68)	(62.99)	(82.68)	(62.99)	(82.68		
	-	()	(=====)	()	()	1,461	1,961	1,524	2,024			
		lower: mm (in.)			-		(57.52)	(72.20)	(60.00)	(79.69		
	Y axis	Y axis mm (in.)				300 (11 81)	(±150 (5.91))		(00100)	1 (. 0.00		
	Waxis	mm (in.)			1,554	2,054	(= : : : : : (: : : : : : : : : : : : :		1,500	2,000		
			-	-	(61.18)	(80.87)		-	(59.06)	(78.74		
	B-axis / indexing angle	degree				+210 (min co	ntrolled and	o 0 001)	(00.00)	1 (10.14		
	× ×	×				) (min control		,				
	C-axis / indexing angle	degree			300		3,000	001)				
pindle	Spindle speed	min <sup>-1</sup>					,					
	Spindle speed ranges				2 auto ra	nges (2-spee		switching)				
	Spindle nose shape						2-11					
<u> </u>	Taper bore	mm (in.)					(4.41)					
	Bearing dia	mm (in.)					(6.30)					
)pposing	Spindle speed	min <sup>-1</sup>	-	-		3,000		-	38 to	3,800		
spindle*2	Spindle speed ranges					ranges				ranges		
			-	-		ed motor		-		ed motor		
						/itching)				/itching)		
	Spindle nose shape		-	-	JIS /	A2-11		-		A2-8		
	Taper bore	mm (in.)	-	-	ø112	(4.41)		-	ø80	(3.15)		
	Bearing dia	mm (in.)	-	-	ø160	(6.30)		-	ø120	(4.72)		
urret	Туре			F	11			H1, Lov	ver: V12			
ool spindle)	No. of tools			L/I	M: 1 Upper: L / M: 1				1, Lower: 1	2		
	Tool shank dimensions	mm (in.)				□25			,			
				□25 (1 × 1)								
	II) tool shank diameter	mm (in.) I				ø40 i	1.57)					
	ID tool shank diameter Milling tool spindle	mm (in.) min <sup>-1</sup>					1.57)					
	Milling tool spindle	min <sup>-1</sup>			2 auto ra	50 to	12,000	switching)				
- - eedrates	Milling tool spindle Milling tool spindle speed	min <sup>-1</sup> I ranges	V: 50 7: 50	V: 50 7:40		50 to nges (2-spee	12,000 d motor coil		V: 50 7: 50	V. 50 7:		
eedrates	Milling tool spindle Milling tool spindle speed Feedrates	min <sup>-1</sup>	X: 50, Z: 50, Y: 40	X: 50, Z: 40, Y: 40	X: 50, Z: 50	50 to nges (2-spee ,X: 50, Z: 40,	12,000 d motor coil X: 50, Z: 50,		X: 50, Z: 50, Y: 40	,X: 50, Z: Y: 40		
eedrates	Milling tool spindle Milling tool spindle speed	min <sup>-1</sup> I ranges upper: m/min	X: 50, Z: 50, Y: 40	Y: 40		50 to nges (2-spee	12,000 d motor coil X: 50, Z: 50, Y: 40	X: 50, Z: 40, Y: 40	Y: 40	Y: 40		
eedrates	Milling tool spindle Milling tool spindle speed Feedrates X, Z, Y axes	min <sup>-1</sup> I ranges upper: m/min lower: m/min	Y: 40	Y: 40	X: 50, Z: 50 Y: 40	50 to nges (2-spee ,X: 50, Z: 40, Y: 40	12,000 d motor coil X: 50, Z: 50, Y: 40 X: 25, Z: 40	X: 50, Z: 40,	Y: 40 X: 25, Z: 40	Y: 40 X: 25, Z:		
Feedrates	Milling tool spindle Milling tool spindle speed Feedrates	min <sup>-1</sup> I ranges upper: m/min	Y: 40	Y: 40 3	X: 50, Z: 50 Y: 40	50 to nges (2-spee ,X: 50, Z: 40,	12,000 d motor coil X: 50, Z: 50, Y: 40 X: 25, Z: 40	X: 50, Z: 40, Y: 40 X: 25, Z: 30 8	Y: 40	Y: 40		
eedrates	Milling tool spindle Milling tool spindle speed Feedrates X, Z, Y axes Feedrates W-axis	min <sup>-1</sup> I ranges upper: m/min lower: m/min m/min	Y: 40	Y: 40	X: 50, Z: 50 Y: 40	50 to nges (2-spee ,X: 50, Z: 40, Y: 40 20	12,000 d motor coil X: 50, Z: 50, Y: 40 X: 25, Z: 40 (tails	X: 50, Z: 40, Y: 40 X: 25, Z: 30	Y: 40 X: 25, Z: 40	Y: 40 X: 25, Z:		
eedrates	Milling tool spindle Milling tool spindle speed Feedrates X, Z, Y axes Feedrates W-axis Feedrates C, B axis	min <sup>-1</sup> Hranges upper: m/min lower: m/min m/min min <sup>-1</sup>	Y: 40	Y: 40 3	X: 50, Z: 50 Y: 40	50 to nges (2-spee ,X: 50, Z: 40, Y: 40 20 C: 200	12,000 d motor coil X: 50, Z: 50, Y: 40 X: 25, Z: 40 (tails , B: 30	X: 50, Z: 40, Y: 40 X: 25, Z: 30 8	Y: 40 X: 25, Z: 40	Y: 40 X: 25, Z:		
	Milling tool spindle Milling tool spindle speed Feedrates X, Z, Y axes Feedrates W-axis Feedrates C, B axis Cutting feedrate	min <sup>-1</sup> I ranges upper: m/min lower: m/min m/min	Y: 40 { (tails	Y: 40	X: 50, Z: 50 Y: 40	50 to nges (2-spee ,X: 50, Z: 40, Y: 40 20 C: 200	12,000 d motor coil X: 50, Z: 50, Y: 40 X: 25, Z: 40 (tails , B: 30 1,000.000	X: 50, Z: 40, Y: 40 X: 25, Z: 30 8 ttock)	Y: 40 X: 25, Z: 40	Y: 40 X: 25, Z:		
	Milling tool spindle Milling tool spindle speed Feedrates X, Z, Y axes Feedrates W-axis Feedrates C, B axis	min <sup>-1</sup> Hranges upper: m/min lower: m/min m/min min <sup>-1</sup>	Y: 40 { (tails	Y: 40 	X: 50, Z: 50 Y: 40 - 30	50 to nges (2-spee ,X: 50, Z: 40, Y: 40 20 C: 200	12,000 d motor coil X: 50, Z: 50, Y: 40 X: 25, Z: 40 (tails , B: 30 1,000.000 MT.	X: 50, Z: 40, Y: 40 X: 25, Z: 30 8 tock) No.5	Y: 40 X: 25, Z: 40	Y: 40 X: 25, Z:		
	Milling tool spindle Milling tool spindle speed Feedrates X, Z, Y axes Feedrates W-axis Feedrates C, B axis Cutting feedrate Tapered bore	min <sup>-1</sup> I ranges upper: m/min lower: m/min m/min min <sup>-1</sup> mm/rev	Y: 40 (tails MT. (Bui	Y: 40 3 tock) No.5 It-in)	X: 50, Z: 50 Y: 40 - 30	50 to nges (2-spee ,X: 50, Z: 40, Y: 40 20 C: 200 0.001 to	12,000 d motor coil X: 50, Z: 50, Y: 40 X: 25, Z: 40 (tails , B: 30 1,000.000 MT. (Bui	X: 50, Z: 40, Y: 40 X: 25, Z: 30 8 tock) No.5 It-in)	Y: 40 X: 25, Z: 40	Y: 40 X: 25, Z:		
	Milling tool spindle Milling tool spindle speed Feedrates X, Z, Y axes Feedrates W-axis Feedrates C, B axis Cutting feedrate	min <sup>-1</sup> Hranges upper: m/min lower: m/min m/min min <sup>-1</sup>	Y: 40 (tails MT. (Bui 1,554	Y: 40 3 tock) No.5 It-in) 2,054	X: 50, Z: 50 Y: 40 - 30	50 to nges (2-spee ,X: 50, Z: 40, Y: 40 20 C: 200 0.001 to	12,000 d motor coil X: 50, Z: 50, Y: 40 X: 25, Z: 40 (tails , B: 30 1,000.000 MT. (Bui 1,359.5	X: 50, Z: 40, Y: 40 X: 25, Z: 30 8 tock) No.5 It-in) 1,961	Y: 40 X: 25, Z: 40	Y: 40 X: 25, Z		
	Milling tool spindle         Milling tool spindle speed         Feedrates         X, Z, Y axes         Feedrates W-axis         Feedrates C, B axis         Cutting feedrate         Tapered bore         Travel	min <sup>-1</sup> I ranges upper: m/min lower: m/min m/min min <sup>-1</sup> mm/rev	Y: 40 (tails MT. (Bui	Y: 40 3 tock) No.5 It-in)	X: 50, Z: 50 Y: 40 - 30	50 to nges (2-spee ,X: 50, Z: 40, Y: 40 20 C: 200 0.001 to -	12,000 d motor coil X: 50, Z: 50, Y: 40 X: 25, Z: 40 (tails , B: 30 1,000.000 MT. (Bui 1,359.5 (53.52)	X: 50, Z: 40, Y: 40 X: 25, Z: 30 8 tock) No.5 It-in)	Y: 40 X: 25, Z: 40	Y: 40 X: 25, Z:		
ailstock	Milling tool spindle         Milling tool spindle speed         Feedrates         X, Z, Y axes         Feedrates W-axis         Feedrates C, B axis         Cutting feedrate         Tapered bore         Travel         Tool shank	min <sup>-1</sup> I ranges upper: m/min lower: m/min m/min min <sup>-1</sup> mm/rev mm (in.)	Y: 40 (tails MT. (Bui 1,554	Y: 40 3 tock) No.5 It-in) 2,054	X: 50, Z: 50 Y: 40 - 30	50 to nges (2-spee ,X: 50, Z: 40, Y: 40 20 C: 200 0.001 to - - HSK	12,000 d motor coil X: 50, Z: 50, Y: 40 X: 25, Z: 40 (tails , B: 30 1,000.000 MT. (Bui 1,359.5 (53.52) -A63	X: 50, Z: 40, Y: 40 X: 25, Z: 30 8 tock) No.5 It-in) 1,961	Y: 40 X: 25, Z: 40	Y: 40 X: 25, Z:		
ailstock	Milling tool spindle         Milling tool spindle speed         Feedrates         X, Z, Y axes         Feedrates W-axis         Feedrates C, B axis         Cutting feedrate         Tapered bore         Travel         Tool shank         No. of tools	min <sup>-1</sup> I ranges upper: m/min lower: m/min m/min min <sup>-1</sup> mm/rev mm (in.) tools	Y: 40 (tails MT. (Bui 1,554	Y: 40 3 tock) No.5 It-in) 2,054	X: 50, Z: 50 Y: 40 - - 30	50 to nges (2-spee ,X: 50, Z: 40, Y: 40 20 C: 200 0.001 to - - HSK 4	12,000 d motor coil X: 50, Z: 50, Y: 40 X: 25, Z: 40 (tails , B: 30 1,000.000 MT. (Bui 1,359.5 (53.52) -A63 0	X: 50, Z: 40, Y: 40 X: 25, Z: 30 8 tock) No.5 It-in) 1,961 (77.20)	Y: 40 X: 25, Z: 40	Y: 40 X: 25, Z		
ailstock	Milling tool spindle         Milling tool spindle speed         Feedrates         X, Z, Y axes         Feedrates W-axis         Feedrates C, B axis         Cutting feedrate         Tapered bore         Travel         Tool shank         No. of tools         Max tool dia	min <sup>-1</sup> I ranges upper: m/min lower: m/min m/min <sup>-1</sup> mm/rev mm (in.) tools mm (in.)	Y: 40 (tails MT. (Bui 1,554	Y: 40 3 tock) No.5 It-in) 2,054	X: 50, Z: 50 Y: 40 - - 30 - - - - - - - - - - - - - - - -	50 to nges (2-spee ,X: 50, Z: 40, Y: 40 20 C: 200 0.001 to - - HSK 4) (w/o adjac	12,000 d motor coil X: 50, Z: 50, Y: 40 X: 25, Z: 40 (tails , B: 30 1,000.000 MT. (Bui 1,359.5 (53.52) -A63 0 ent tools: Ø1	X: 50, Z: 40, Y: 40 X: 25, Z: 30 8 tock) No.5 It-in) 1,961 (77.20) 30 (5.12))	Y: 40 X: 25, Z: 40	Y: 40 X: 25, Z		
ailstock	Milling tool spindle         Milling tool spindle speed         Feedrates         X, Z, Y axes         Feedrates W-axis         Feedrates C, B axis         Cutting feedrate         Tapered bore         Travel         Tool shank         No. of tools         Max tool dia         Max tool length	min <sup>-1</sup> I ranges upper: m/min lower: m/min m/min min <sup>-1</sup> mm/rev mm (in.) tools	Y: 40 (tails MT. (Bui 1,554	Y: 40 3 tock) No.5 It-in) 2,054	X: 50, Z: 50 Y: 40 - - 30 - - - - - - - - - - - - - - - -	50 to nges (2-spee ,X: 50, Z: 40, Y: 40 20 C: 200 0.001 to - - HSK 4	12,000 d motor coil X: 50, Z: 50, Y: 40 X: 25, Z: 40 (tails , B: 30 1,000.000 MT. (Bui 1,359.5 (53.52) -A63 0 ent tools: Ø1	X: 50, Z: 40, Y: 40 X: 25, Z: 30 8 tock) No.5 It-in) 1,961 (77.20) 30 (5.12))	Y: 40 X: 25, Z: 40	Y: 40 X: 25, Z		
ailstock	Milling tool spindle         Milling tool spindle speed         Feedrates         X, Z, Y axes         Feedrates W-axis         Feedrates C, B axis         Cutting feedrate         Tapered bore         Travel         Tool shank         No. of tools         Max tool dia	min <sup>-1</sup> I ranges upper: m/min lower: m/min m/min <sup>-1</sup> mm/rev mm (in.) tools mm (in.)	Y: 40 (tails MT. (Bui 1,554	Y: 40 3 tock) No.5 It-in) 2,054	X: 50, Z: 50 Y: 40 - - 30 090 (3.5 4	50 to nges (2-spee ,X: 50, Z: 40, Y: 40 20 C: 200 0.001 to - - - HSK 4 (w/o adjac 00 (15.75) (fr	12,000 d motor coil X: 50, Z: 50, Y: 40 X: 25, Z: 40 (tails , B: 30 ,000.000 MT. (Bui 1,359.5 (53.52) -A63 0 ent tools: ø1 pm gauge lin (22)	X: 50, Z: 40, Y: 40 X: 25, Z: 30 8 tock) No.5 It-in) 1,961 (77.20) 30 (5.12)) ie)	Y: 40 X: 25, Z: 40	Y: 40 X: 25, Z		
āilstock NTC	Milling tool spindle         Milling tool spindle speed         Feedrates         X, Z, Y axes         Feedrates W-axis         Feedrates C, B axis         Cutting feedrate         Tapered bore         Travel         Tool shank         No. of tools         Max tool dia         Max tool weight         Main spindle motor	min <sup>-1</sup> I ranges upper: m/min lower: m/min m/min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) mm (in.)	Y: 40 (tails MT. (Bui 1,554	Y: 40 3 tock) No.5 It-in) 2,054	X: 50, Z: 50 Y: 40 - - 30 - - - - - - - - - - - - - - - -	50 to nges (2-spee ,X: 50, Z: 40, Y: 40 20 C: 200 0.001 to - - HSK 4) (w/o adjac 4) (w/o adjac 00 (15.75) (fr 10 37/30 (49/40)	12,000 d motor coil X: 50, Z: 50, Y: 40 X: 25, Z: 40 (tails , B: 30 ,000.000 MT. (Bui 1,359.5 (53.52) -A63 0 ent tools: ø1 pm gauge lin (22)	X: 50, Z: 40, Y: 40 X: 25, Z: 30 8 tock) No.5 It-in) 1,961 (77.20) 30 (5.12)) ie)	Y: 40 X: 25, Z: 40 30	Y: 40 X: 25, Z: 20 - -		
āilstock NTC	Milling tool spindle         Milling tool spindle speed         Feedrates         X, Z, Y axes         Feedrates W-axis         Feedrates C, B axis         Cutting feedrate         Tapered bore         Travel         Tool shank         No. of tools         Max tool dia         Max tool length         Max tool weight	min <sup>-1</sup> d ranges upper: m/min lower: m/min m/min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kg (lb)	Y: 40 (tails MT. (Bui 1,554	Y: 40 3 tock) No.5 It-in) 2,054	X: 50, Z: 50 Y: 40 - - 30 - - - - - - - - - - - - - - - -	50 to nges (2-spee ,X: 50, Z: 40, Y: 40 20 C: 200 0.001 to - - - HSK 4 (w/o adjac 00 (15.75) (fr	12,000 d motor coil X: 50, Z: 50, Y: 40 X: 25, Z: 40 (tails , B: 30 ,000.000 MT. (Bui 1,359.5 (53.52) -A63 0 ent tools: ø1 pm gauge lin (22)	X: 50, Z: 40, Y: 40 X: 25, Z: 30 8 tock) No.5 It-in) 1,961 (77.20) 30 (5.12)) ie)	Y: 40 X: 25, Z: 40	Y: 40 X: 25, Z 20		
āilstock NTC	Milling tool spindle         Milling tool spindle speed         Feedrates         X, Z, Y axes         Feedrates W-axis         Feedrates C, B axis         Cutting feedrate         Tapered bore         Travel         Tool shank         No. of tools         Max tool dia         Max tool weight         Main spindle motor	min <sup>-1</sup> I ranges upper: m/min lower: m/min m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp)	Y: 40 (tails MT. (Bui 1,554	Y: 40 3 tock) No.5 It-in) 2,054	X: 50, Z: 50 Y: 40 - - 30 - - - - - - - - - - - - - - - -	50 to nges (2-spee ,X: 50, Z: 40, Y: 40 20 C: 200 0.001 to - - HSK 4) (w/o adjac 4) (w/o adjac 00 (15.75) (fr 10 37/30 (49/40)	12,000 d motor coil X: 50, Z: 50, Y: 40 X: 25, Z: 40 (tails , B: 30 ,000.000 MT. (Bui 1,359.5 (53.52) -A63 0 ent tools: ø1 pm gauge lin (22)	X: 50, Z: 40, Y: 40 X: 25, Z: 30 8 tock) No.5 It-in) 1,961 (77.20) 30 (5.12)) ie)	Y: 40 X: 25, Z: 40 30 22/15/11	Y: 40 X: 25, Z 20		
āilstock NTC	Milling tool spindle         Milling tool spindle speed         Feedrates         X, Z, Y axes         Feedrates W-axis         Feedrates C, B axis         Cutting feedrate         Tapered bore         Travel         Tool shank         No. of tools         Max tool dia         Max tool weight         Main spindle motor	min <sup>-1</sup> I ranges upper: m/min m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp) kW (hp)	Y: 40 (tails MT. (Bui 1,554	Y: 40 3 tock) No.5 (t-in) 2,054 (80.87) -	X: 50, Z: 50 Y: 40 - - 30 - - - - - - - - - - - - - - - -	50 to nges (2-spee ,X: 50, Z: 40, Y: 40 20 C: 200 0.001 to - - HSK 4) (w/o adjac 4) (w/o adjac 4) (w/o adjac 100 (15.75) (fr 10 37/30 (49/40) (42/30)	12,000 d motor coil X: 50, Z: 50, Y: 40 X: 25, Z: 40 (tails , B: 30 ,000.000 MT. (Bui 1,359.5 (53.52) -A63 0 ent tools: ø1 pm gauge lin (22)	X: 50, Z: 40, Y: 40 X: 25, Z: 30 8 tock) No.5 It-in) 1,961 (77.20) 30 (5.12)) ie) t) -	Y: 40 X: 25, Z: 40 30 22/15/11	Y: 40 X: 25, Z 20 - - (30/20/1)		
āilstock ATC	Milling tool spindle         Milling tool spindle speed         Feedrates         X, Z, Y axes         Feedrates W-axis         Feedrates C, B axis         Cutting feedrate         Tapered bore         Travel         Tool shank         No. of tools         Max tool length         Max tool weight         Main spindle motor         Opposing spindle motor	min <sup>-1</sup> I ranges upper: m/min m/min m/min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) mm (in.) kg (lb) kW (hp) kW (hp)	Y: 40 (tails MT. (Bui 1,554	Y: 40 3 tock) No.5 It-in) 2,054 (80.87) - 22/15/11	X: 50, Z: 50 Y: 40 - - - - - - - - - - - - - - - - - - -	50 to nges (2-spee ,X: 50, Z: 40, Y: 40 20 C: 200 0.001 to - - HSK 4) (w/o adjac 4) (w/o adjac 4) (w/o adjac 100 (15.75) (fr 10 37/30 (49/40) (42/30)	12,000 d motor coil X: 50, Z: 50, Y: 40 X: 25, Z: 40 (tails , B: 30 ,000.000 MT. (Bui 1,359.5 (53.52) -A63 0 ent tools: ø1 pm gauge lin (22)	X: 50, Z: 40, Y: 40 X: 25, Z: 30 8 tock) No.5 It-in) 1,961 (77.20) 30 (5.12)) ie) t) - 22/15/11	Y: 40 X: 25, Z: 40 30 22/15/11 (20 mi	Y: 40 X: 25, Z: 20 - - (30/20/17		
āilstock NTC	Milling tool spindle         Milling tool spindle speed         Feedrates         X, Z, Y axes         Feedrates W-axis         Feedrates C, B axis         Cutting feedrate         Tapered bore         Travel         Tool shank         No. of tools         Max tool length         Max tool weight         Main spindle motor         Opposing spindle motor	min <sup>-1</sup> d ranges upper: m/min lower: m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kW (hp) kW (hp) kW (hp)	Y: 40 (tails MT. (Bui 1,554 (61.18)	Y: 40 3 tock) No.5 It-in) 2,054 (80.87) - 22/15/11 (3 min/15	X: 50, Z: 50 Y: 40 - - - - - - - - - - - - - - - - - - -	50 to nges (2-spee ,X: 50, Z: 40, Y: 40 20 C: 200 0.001 to - HSK 4 4) (w/o adjac 00 (15.75) (fr 10 37/30 (49/40) (42/30) in/cont)	12,000 d motor coil X: 50, Z: 50, Y: 40 X: 25, Z: 40 (tails , B: 30 ,000.000 MT. (Bui 1,359.5 (53.52) -A63 0 ent tools: ø1 pm gauge lin (22)	X: 50, Z: 40, Y: 40 X: 25, Z: 30 8 tock) No.5 It-in) 1,961 (77.20) 30 (5.12)) ie) t) - 22/15/11 (3 min/15	Y: 40 X: 25, Z: 40 30 22/15/11 (20 mi (30/20/15)	Y: 40 X: 25, Z: 20 - - (30/20/17 n/cont)		
āilstock NTC	Milling tool spindle         Milling tool spindle speed         Feedrates         X, Z, Y axes         Feedrates W-axis         Feedrates C, B axis         Cutting feedrate         Tapered bore         Travel         Tool shank         No. of tools         Max tool length         Max tool length         Main spindle motor         Opposing spindle motor         Milling tool spindle motor	min <sup>-1</sup> I ranges upper: m/min m/min m/min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) mm (in.) kg (lb) kW (hp) kW (hp)	Y: 40 (tails MT. (Bui 1,554 (61.18)	Y: 40 3 tock) No.5 It-in) 2,054 (80.87) - 22/15/11 (3 min/15 Z: 4.6 (X: 6.9,	X: 50, Z: 50 Y: 40 	50 to nges (2-spee ,X: 50, Z: 40, Y: 40 20 C: 200 0.001 to - HSK 4 4) (w/o adjac 00 (15.75) (fr 10 37/30 (49/40) (42/30) in/cont)	12,000 d motor coil X: 50, Z: 50, Y: 40 X: 25, Z: 40 (tails , B: 30 1,000.000 MT. (Bui 1,359.5 (53.52) -A63 0 ent tools: ø1 om gauge lin (22) (30 min/con	X: 50, Z: 40, Y: 40 X: 25, Z: 30 8 tock) No.5 It-in) 1,961 (77.20) 30 (5.12)) ie) t) - 22/15/11 (3 min/15 XA: 5.2, XB:	Y: 40 X: 25, Z: 40 30 22/15/11 (20 mi (30/20/15) min/cont) : 3.5, ZA:4.6	Y: 40 X: 25, Z: 20 - - (30/20/17 n/cont)		
ailstock TC	Milling tool spindle         Milling tool spindle speed         Feedrates         X, Z, Y axes         Feedrates W-axis         Feedrates C, B axis         Cutting feedrate         Tapered bore         Travel         Tool shank         No. of tools         Max tool length         Max tool length         Main spindle motor         Opposing spindle motor         Milling tool spindle motor	min <sup>-1</sup> d ranges upper: m/min lower: m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kW (hp) kW (hp) kW (hp)	Y: 40 (tails MT. (Bui 1,554 (61.18)	Y: 40 3 tock) No.5 [t-in] 2,054 (80.87) 22/15/11 (3 min/15 Z: 4.6 (X: 6.9, 5.2 (6.9) (D	X: 50, Z: 50 Y: 40 	50 to nges (2-spee ,X: 50, Z: 40, Y: 40 20 C: 200 0.001 to - HSK 4 4) (w/o adjac 00 (15.75) (fr 10 37/30 (49/40) (42/30) in/cont)	12,000 d motor coil X: 50, Z: 50, Y: 40 X: 25, Z: 40 (tails , B: 30 1,000.000 MT. (Bui 1,359.5 (53.52) -A63 0 ent tools: ø1 com gauge lin (22) (30 min/con	X: 50, Z: 40, Y: 40 X: 25, Z: 30 8 tock) No.5 It-in) 1,961 (77.20) 30 (5.12)) ee) t) - 22/15/11 (3 min/15 XA: 5.2, XB: 9, XB: 4.7, Z/	Y: 40 X: 25, Z: 40 30 22/15/11 (20 mi (30/20/15) min/cont) 3.5, ZA:4.6 A:6.1) (DBC 1	Y: 40 X: 25, Z: 20 - - (30/20/17 n/cont) 1,500),		
ailstock TC	Milling tool spindle         Milling tool spindle speed         Feedrates         X, Z, Y axes         Feedrates W-axis         Feedrates C, B axis         Cutting feedrate         Tapered bore         Travel         Tool shank         No. of tools         Max tool length         Max tool length         Main spindle motor         Opposing spindle motor         Milling tool spindle motor	min <sup>-1</sup> d ranges upper: m/min lower: m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kW (hp) kW (hp) kW (hp)	Y: 40 (tails MT. (Bui 1,554 (61.18)	Y: 40 3 tock) No.5 [t-in] 2,054 (80.87) 22/15/11 (3 min/15 Z: 4.6 (X: 6.9, 5.2 (6.9) (D	X: 50, Z: 50 Y: 40 	50 to nges (2-spee ,X: 50, Z: 40, Y: 40 20 C: 200 0.001 to - HSK 4 4) (w/o adjac 00 (15.75) (fr 10 37/30 (49/40) (42/30) in/cont)	12,000 d motor coil X: 50, Z: 50, Y: 40 X: 25, Z: 40 (tails , B: 30 1,000.000 MT. (Bui 1,359.5 (53.52) -A63 0 ent tools: ø1 com gauge lin (22) (30 min/con	X: 50, Z: 40, Y: 40 X: 25, Z: 30 8 tock) 1,961 (77.20) 30 (5.12)) e) t) - 22/15/11 (3 min/15 XA: 5.2, XB 9, XB: 4.7, Z/ (DBC 2,000),	Y: 40 X: 25, Z: 40 30 22/15/11 (20 mi (30/20/15) min/cont) : 3.5, ZA:4.6 A:6.1) (DBC 1 ZB: 4.6, Y: 3	Y: 40 X: 25, Z: 20 - - (30/20/17 n/cont) 1,500),		
ailstock TC	Milling tool spindle         Milling tool spindle speed         Feedrates         X, Z, Y axes         Feedrates W-axis         Feedrates C, B axis         Cutting feedrate         Tapered bore         Travel         Tool shank         No. of tools         Max tool length         Max tool weight         Main spindle motor         Opposing spindle motor         Milling tool spindle motor         X, Z, Y, B axis motor	min <sup>-1</sup> I ranges upper: m/min lower: m/min m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp) kW (hp) kW (hp)	Y: 40 (tails MT. (Bui 1,554 (61.18) X: 5.2, 2	Y: 40 3 tock) No.5 It-in) 2,054 (80.87) (80.87) 22/15/11 (3 min/15 Z: 4.6 (X: 6.9, 5.2 (6.9) (D Y: 3.5 (4.7),	X: 50, Z: 50 Y: 40 	50 to nges (2-spee ,X: 50, Z: 40, Y: 40 20 C: 200 0.001 to - HSK 4 4) (w/o adjac 00 (15.75) (fr 10 37/30 (49/40) (42/30) in/cont) C 1,500)/	12,000 d motor coil X: 50, Z: 50, Y: 40 X: 25, Z: 40 (tails , B: 30 ,000.000 MT. (Bui 1,359.5 (53.52) -A63 0 ent tools: ø1 om gauge lin (22) (30 min/con	X: 50, Z: 40, Y: 40 X: 25, Z: 30 8 tock) No.5 It-in) 1,961 (77.20) 30 (5.12)) e) t) - 22/15/11 (3 min/15 XA: 5.2, XB: 9, XB: 4.7, ZY (DBC 2,000), (ZB: 6.1, Y:	Y: 40 X: 25, Z: 40 30 22/15/11 (20 mi (30/20/15) min/cont) : 3.5, ZA:4.6 A:6.1) (DBC † ZB: 4.6, Y: 3 4.7, B: 4.0)	Y: 40 X: 25, Z 20 - - (30/20/11 n/cont) 1,500), 3.5, B: 3.0		
ailstock TC	Milling tool spindle         Milling tool spindle speed         Feedrates         X, Z, Y axes         Feedrates W-axis         Feedrates C, B axis         Cutting feedrate         Tapered bore         Travel         Tool shank         No. of tools         Max tool dia         Max tool weight         Main spindle motor         Opposing spindle motor         X, Z, Y, B axis motor         W-axis motor	min <sup>-1</sup> I ranges upper: m/min lower: m/min m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp) kW (hp) kW (hp) kW (hp)	Y: 40 (tails MT. (Bui 1,554 (61.18) X: 5.2, 2	Y: 40 3 tock) No.5 [t-in] 2,054 (80.87) 22/15/11 (3 min/15 Z: 4.6 (X: 6.9, 5.2 (6.9) (D	X: 50, Z: 50 Y: 40 	50 to nges (2-spee ,X: 50, Z: 40, Y: 40 20 C: 200 0.001 to - - HSK 4 4) (w/o adjac 100 (15.75) (fr 10 37/30 (49/40) (42/30) in/cont) C 1,500)/ (6.1)	12,000 d motor coil X: 50, Z: 50, Y: 40 X: 25, Z: 40 (tails , B: 30 1,000.000 MT. (Bui 1,359.5 (53.52) -A63 0 ent tools: ø1 pm gauge lin (22) (30 min/con (XA: 6. 5.2 (6.9) 2.8 (3.7)	X: 50, Z: 40, Y: 40 X: 25, Z: 30 8 tock) No.5 It-in) 1,961 (77.20) 30 (5.12)) e) 30 (5.12)) e) t) - 22/15/11 (3 min/15 XA: 5.2, XB: 9, XB: 4.7, Z/ (DBC 2,000), (ZB: 6.1, Y: (tailstock)	Y: 40 X: 25, Z: 40 30 22/15/11 (20 mi (30/20/15) min/cont) : 3.5, ZA:4.6 A:6.1) (DBC † ZB: 4.6, Y: 3 4.7, B: 4.0)	Y: 40 X: 25, Z 20 - - (30/20/17 n/cont)		
äilstock TC Aotor	Milling tool spindle         Milling tool spindle speed         Feedrates         X, Z, Y axes         Feedrates W-axis         Feedrates C, B axis         Cutting feedrate         Tapered bore         Travel         Tool shank         No. of tools         Max tool length         Max tool weight         Main spindle motor         Opposing spindle motor         X, Z, Y, B axis motor         X, Z, Y, B axis motor         W-axis motor         Coolant motor (50Hz/60Hz/60Hz/60Hz/60Hz/60Hz/60Hz/60Hz/6	min <sup>-1</sup> I ranges upper: m/min lower: m/min m/min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp)	Y: 40 (tails MT. (Bui 1,554 (61.18) X: 5.2, 2	Y: 40 3 tock) No.5 It-in) 2,054 (80.87) 22/15/11 (3 min/15 Z: 4.6 (X: 6.9, 5.2 (6.9) (D Y: 3.5 (4.7), (tailstock)	X: 50, Z: 50 Y: 40 	50 to nges (2-spee ,X: 50, Z: 40, Y: 40 20 C: 200 0.001 to - HSK 4 4) (w/o adjac 00 (15.75) (fr 10 37/30 (49/40) (42/30) in/cont) C 1,500)/	12,000 d motor coil X: 50, Z: 50, Y: 40 X: 25, Z: 40 (tails , B: 30 1,000.000 MT. (Bui 1,359.5 (53.52) -A63 0 ent tools: ø1 pm gauge lin (22) (30 min/con (XA: 6. 5.2 (6.9) 2.8 (3.7)	X: 50, Z: 40, Y: 40 X: 25, Z: 30 8 tock) No.5 It-in) 1,961 (77.20) 30 (5.12)) e) 30 (5.12)) e) t) c) t) c) t) c) c) t) c) c) c) c) c) c) c) c) c) c) c) c) c)	Y: 40 X: 25, Z: 40 30 22/15/11 (20 mi (30/20/15) min/cont) : 3.5, ZA:4.6 A:6.1) (DBC 1 ZB: 4.6, Y: 3 4.7, B: 4.0) 4.6	Y: 40 X: 25, Z 20 - - (30/20/11 n/cont) 1,500), 3.5, B: 3.0		
ailstock TC Aotor	Milling tool spindle         Milling tool spindle speed         Feedrates         X, Z, Y axes         Feedrates W-axis         Feedrates C, B axis         Cutting feedrate         Tapered bore         Travel         Tool shank         No. of tools         Max tool dia         Max tool length         Main spindle motor         Opposing spindle motor         X, Z, Y, B axis motor         X, Z, Y, B axis motor         Coolant motor (50Hz/60H	min <sup>-1</sup> d ranges upper: m/min lower: m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp)	Y: 40 (tails MT. (Bui 1,554 (61.18) X: 5.2, 2 2.8 (3.7) (	Y: 40 3 tock) No.5 [t-in) 2,054 (80.87) 22/15/11 (3 min/15 Z: 4.6 (X: 6.9, 5.2 (6.9) (D Y: 3.5 (4.7), (tailstock) 2,955 (	X: 50, Z: 50 Y: 40 	50 to nges (2-spee ,X: 50, Z: 40, Y: 40 20 C: 200 0.001 to - - HSK 4 (w/o adjac 40 (15.75) (fr 10 37/30 (49/40) (42/30) in/cont) C 1,500)/ (6.1) 0.33/0.33) × 1	12,000 d motor coil X: 50, Z: 50, Y: 40 X: 25, Z: 40 (tails , B: 30 1,000.000 MT. (Bui 1,359.5 (53.52) -A63 0 ent tools: ø1 om gauge lin (22) (30 min/con (22) (30 min/con 2.8 (3.7) , 0.55/0.75 (	X: 50, Z: 40, Y: 40 X: 25, Z: 30 8 tock) No.5 It-in) 1,961 (77.20) 30 (5.12)) ie) 30 (5.12)) ie) t) 22/15/11 (3 min/15 XA: 5.2, XB: 9, XB: 4.7, Z/ (DBC 2,000), (ZB: 6.1, Y: (tailstock) 0.73/1.0) ×3 3,030 (	Y: 40 X: 25, Z: 40 30 22/15/11 (20 mi (30/20/15) min/cont) 3.5, ZA:4.6 A:6.1) (DBC ZB: 4.6, Y: 3 4.7, B: 4.0) 4.6 119.29)	Y: 40 X: 25, Z: 20 - - - (30/20/17 n/cont) 1,500), 3.5, B: 3.0 (6.1)		
ailstock TC Aotor	Milling tool spindle         Milling tool spindle speed         Feedrates         X, Z, Y axes         Feedrates W-axis         Feedrates C, B axis         Cutting feedrate         Tapered bore         Travel         Tool shank         No. of tools         Max tool length         Max tool length         Max tool spindle motor         Opposing spindle motor         Milling tool spindle motor         X, Z, Y, B axis motor         X, Z, Y, B axis motor         W-axis motor (50Hz/60H         Height         Floor space	min <sup>-1</sup> I ranges upper: m/min lower: m/min m/min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kg (lb) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp)	Y: 40 (tails MT. (Bui 1,554 (61.18) X: 5.2, 2 2.8 (3.7) (	Y: 40 3 tock) No.5 It-in) 2,054 (80.87) 22/15/11 (3 min/15 Z: 4.6 (X: 6.9, 5.2 (6.9) (D Y: 3.5 (4.7), (tailstock) 2,955 ( DBC 1,500: 5	X: 50, Z: 50 Y: 40 	50 to nges (2-spee ,X: 50, Z: 40, Y: 40 20 C: 200 0.001 to - - HSK 4 (w/o adjac 40 (15.75) (fr 10 37/30 (49/40) (42/30) in/cont) C 1,500)/ (6.1) 0.33/0.33) × 1	12,000 d motor coil X: 50, Z: 50, Y: 40 X: 25, Z: 40 (tails , B: 30 1,000.000 MT. (Bui 1,359.5 (53.52) -A63 0 ent tools: ø1 om gauge lin (22) (30 min/con (22) (30 min/con 2.8 (3.7) , 0.55/0.75 (	X: 50, Z: 40, Y: 40 X: 25, Z: 30 8 tock) No.5 It-in) 1,961 (77.20) 30 (5.12)) ie) 30 (5.12)) 30 (	Y: 40 X: 25, Z: 40 30 22/15/11 (20 mi (30/20/15) min/cont) 3.5, ZA:4.6 A:6.1) (DBC ZB: 4.6, Y: 2 4.7, B: 4.0) 4.6 119.29) 5,530 × 3,082	Y: 40 X: 25, Z: 20 - - - (30/20/17 n/cont) 1,500), 3.5, B: 3.0 (6.1)		
ailstock TC Лotor Лachine	Milling tool spindle         Milling tool spindle speed         Feedrates         X, Z, Y axes         Feedrates W-axis         Feedrates C, B axis         Cutting feedrate         Tapered bore         Travel         Tool shank         No. of tools         Max tool dia         Max tool length         Main spindle motor         Opposing spindle motor         X, Z, Y, B axis motor         X, Z, Y, B axis motor         Coolant motor (50Hz/60H	min <sup>-1</sup> d ranges upper: m/min lower: m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp)	Y: 40 (tails (tails (Bui 1,554 (61.18) (61.18) (X: 5.2, 2 2.8 (3.7)	Y: 40 3 tock) No.5 It-in) 2,054 (80.87) 2,055 (90.87) 2,055 (2,054 (2,054) (2,054) (2,054) (2,054) (2,054) (2,054) (2,054) (2,054) (2,054) (2,054) (2,054) (2,054) (2,054) (2,054) (2,054) (2,054) (2,055) (2	X: 50, Z: 50 Y: 40 - - - - - - - - - - - - - - - - - - -	50 to nges (2-spee ,X: 50, Z: 40, Y: 40 20 C: 200 0.001 to - - HSK 4 4) (w/o adjac 100 (15.75) (fr 10 37/30 (49/40) (42/30) in/cont) C 1,500)/ (6.1) 0.33/0.33) × 1 5	12,000 d motor coil X: 50, Z: 50, Y: 40 X: 25, Z: 40 (tails , B: 30 1,000.000 MT. (Bui 1,359.5 (53.52) -A63 0 ent tools: ø1 om gauge lin (22) (30 min/con (XA: 6. 5.2 (6.9) 2.8 (3.7) , 0.55/0.75 (	X: 50, Z: 40, Y: 40 X: 25, Z: 30 8 tock) No.5 It-in) 1,961 (77.20) 30 (5.12)) e) t) - 22/15/11 (3 min/15 XA: 5.2, XB: 9, XB: 4.7, Z/ (DBC 2,000), (ZB: 6.1, Y: (tailstock) 0.73/1.0) x3 3,030 ( DBC 1,500: 5 (217.72 )	Y: 40 X: 25, Z: 40 30 22/15/11 (20 mi (30/20/15) min/cont) 3.5, ZA:4.6 A:6.1) (DBC 1 ZB: 4.6, Y: 3 4.7, B: 4.0) 4.6 119.29) 5,530 × 3,083 × 385.25)	Y: 40 X: 25, Z 20 - - - (30/20/17 n/cont) 1,500), 3.5, B: 3.0 (6.1) 2		
Feedrates Failstock ATC Motor Machine size	Milling tool spindle         Milling tool spindle speed         Feedrates         X, Z, Y axes         Feedrates W-axis         Feedrates C, B axis         Cutting feedrate         Tapered bore         Travel         Tool shank         No. of tools         Max tool length         Max tool length         Max tool spindle motor         Opposing spindle motor         Milling tool spindle motor         X, Z, Y, B axis motor         X, Z, Y, B axis motor         W-axis motor (50Hz/60H         Height         Floor space	min <sup>-1</sup> d ranges upper: m/min lower: m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp)	Y: 40 (tails (tails (Bui 1,554 (61.18) (61.18) (X: 5.2, 2 2.8 (3.7)	Y: 40 3 tock) No.5 It-in) 2,054 (80.87) 2,255 (80.9) 2,255 (80.9) 2,255 (90.0) 2,955 (2,054 (2,054) (2,054) (2,054) (2,054) (2,054) (2,054) (2,054) (2,054) (2,054) (2,054) (2,054) (2,054) (2,054) (2,055) (2,055) (2,055) (2,055) (2,055) (2,055) (2,055) (2,055) (2,055) (2,055) (2,17,7) (3,17,7) (3,17,7) (3,17,7) (3	X: 50, Z: 50 Y: 40 	50 to nges (2-spee ,X: 50, Z: 40, Y: 40 20 C: 200 0.001 to - - HSK 4 4) (w/o adjac 100 (15.75) (fr 10 37/30 (49/40) (42/30) in/cont) C 1,500)/ (6.1) 0.33/0.33) × 1 5	12,000 d motor coil X: 50, Z: 50, Y: 40 X: 25, Z: 40 (tails , B: 30 1,000.000 MT. (Bui 1,359.5 (53.52) -A63 0 ent tools: ø1 om gauge lin (22) (30 min/con (XA: 6. 5.2 (6.9) 2.8 (3.7) , 0.55/0.75 (	X: 50, Z: 40, Y: 40 X: 25, Z: 30 8 tock) No.5 It-in) 1,961 (77.20) 30 (5.12)) e) t) - 22/15/11 (3 min/15 XA: 5.2, XB 9, XB: 4.7, Z/ (DBC 2,000), (ZB: 6.1, Y: (tailstock) 0.73/1.0) ×3 3,030 ( DBC 1,500: 5 (217.72 > DBC 2,000: 6	Y: 40 X: 25, Z: 40 30 22/15/11 (20 mi (30/20/15) min/cont) 3.5, ZA:4.6 A:6.1) (DBC 1 ZB: 4.6, Y: 3 4.7, B: 4.0) 4.6 119.29) 5,530 × 3,08: < 385.25) 5,280 × 3,08:	Y: 40 X: 25, Z: 20 - - (30/20/17 n/cont) 1,500), 3.5, B: 3.0 (6.1) 2		
Failstock ATC Motor Machine	Milling tool spindle         Milling tool spindle speed         Feedrates         X, Z, Y axes         Feedrates W-axis         Feedrates C, B axis         Cutting feedrate         Tapered bore         Travel         Tool shank         No. of tools         Max tool dia         Max tool length         Main spindle motor         Opposing spindle motor         Milling tool spindle motor         X, Z, Y, B axis motor         Coolant motor (50Hz/60Height         Height         Floor space         W × D (tank included)	min <sup>-1</sup> d ranges upper: m/min lower: m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp)	Y: 40 (tails MT. (Bui 1,554 (61.18) X: 5.2, 7 2.8 (3.7) (	Y: 40 3 tock) No.5 It-in) 2,054 (80.87) 2,255 (80.9) 2,255 (80.9) 2,255 (80.9) 2,255 (80.9) 2,255 (80.9) 2,255 (90.7) 2,955 (21.7) (21.7) (21.7)	X: 50, Z: 50 Y: 40 	50 to nges (2-spee ,X: 50, Z: 40, Y: 40 20 C: 200 0.001 to - HSK 4 4) (w/o adjac 00 (15.75) (fr 10 37/30 (49/40) (42/30) in/cont) C 1,500)/ (6.1) 0.33/0.33) × 1 5 5	12,000 d motor coil X: 50, Z: 50, Y: 40 X: 25, Z: 40 (tails , B: 30 1,000.000 MT. (Bui 1,359.5 (53.52) -A63 0 ent tools: ø1 om gauge lin (22) (30 min/con (XA: 6, 5.2 (6.9) 2.8 (3.7) , 0.55/0.75 (	X: 50, Z: 40, Y: 40 X: 25, Z: 30 8 tock) No.5 It-in) 1,961 (77.20) 30 (5.12)) ie) t) - 22/15/11 (3 min/15 XA: 5.2, XB 9, XB: 4.7, Z/ (DBC 2,000), (ZB: 6.1, Y: (tailstock) 0.73/1.0) ×3 3,030 ( DBC 1,500: £ (247.24 s)	Y: 40 X: 25, Z: 40 30 22/15/11 (20 mi (30/20/15) min/cont) : 3.5, ZA:4.6 A:6.1) (DBC 1 ZB: 4.6, Y: 3 4.7, B: 4.0) 4.6 119.29) 5,530 × 3,08: × 385.25) 5,280 × 3,08: × 121.34)	Y: 40 X: 25, Z: 20 - - (30/20/17 n/cont) 1,500), 3.5, B: 3.0 (6.1) 2 2		
Tailstock ATC Motor Machine	Milling tool spindle         Milling tool spindle speed         Feedrates         X, Z, Y axes         Feedrates W-axis         Feedrates C, B axis         Cutting feedrate         Tapered bore         Travel         Tool shank         No. of tools         Max tool length         Max tool length         Max tool spindle motor         Opposing spindle motor         Milling tool spindle motor         X, Z, Y, B axis motor         X, Z, Y, B axis motor         W-axis motor (50Hz/60H         Height         Floor space	min <sup>-1</sup> d ranges upper: m/min lower: m/min min <sup>-1</sup> mm/rev mm (in.) tools mm (in.) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp) kW (hp)	Y: 40 (tails MT. (Bui 1,554 (61.18) X: 5.2, 2 2.8 (3.7) ( 1 1 1 2.8 (3.7) ( 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Y: 40 3 tock) No.5 It-in) 2,054 (80.87) 2,255 (80.9) 2,255 (80.9) 2,255 (90.0) 2,955 (2,054 (2,054) (2,054) (2,054) (2,054) (2,054) (2,054) (2,054) (2,054) (2,054) (2,054) (2,054) (2,054) (2,054) (2,055) (2,055) (2,055) (2,055) (2,055) (2,055) (2,055) (2,055) (2,055) (2,055) (2,17,7) (3,17,7) (3,17,7) (3,17,7) (3	X: 50, Z: 50 Y: 40 	50 to nges (2-spee ,X: 50, Z: 40, Y: 40 20 C: 200 0.001 to - HSK 4 4) (w/o adjac 00 (15.75) (fr 10 37/30 (49/40) (42/30) in/cont) C 1,500)/ (6.1) 0.33/0.33) × 1 5 5 5	12,000 d motor coil X: 50, Z: 50, Y: 40 X: 25, Z: 40 (tails , B: 30 1,000.000 MT. (Bui 1,359.5 (53.52) -A63 0 ent tools: ø1 om gauge lin (22) (30 min/con 2.8 (3.7) , 0.55/0.75 (	X: 50, Z: 40, Y: 40 X: 25, Z: 30 8 tock) No.5 It-in) 1,961 (77.20) 30 (5.12)) e) t) - 22/15/11 (3 min/15 XA: 5.2, XB 9, XB: 4.7, Z/ (DBC 2,000), (ZB: 6.1, Y: (tailstock) 0.73/1.0) ×3 3,030 ( DBC 1,500: 5 (217.72 > DBC 2,000: 6	Y: 40 X: 25, Z: 40 30 22/15/11 (20 mi (30/20/15) min/cont) 3.5, ZA:4.6 A:6.1) (DBC <sup>+</sup> ZB: 4.6, Y: 3 4.7, B: 4.0) 4.6 119.29) 5,530 × 3,083 × 385.25) 5,280 × 3,088 × 121.34) 8,300 (40,26	Y: 40 X: 25, Z 20 - - (30/20/11 n/cont) 1,500), 3.5, B: 3.0 (6.1) 2 2 2 0)		

Optional Specifications

	cilications	
Big-Bore spindle	MULTUS U3000	4,200 min <sup>-1</sup> A2-8 ø140 22/1
	MULTUS U4000	3,000 min <sup>-1</sup> A2-11 ø160 32/2
Opposing spindle		1S Big-Bore 4,200 min <sup>-1</sup> A2-8
	MULTUS U4000	1S Big-Bore 3,000 min <sup>-1</sup> A2-11
B-axis indexing		NC-B axis
Lower turret	la ut	V12 multitasking 6,000 min <sup>-1</sup> PREX
High pressure coo	lant	Upper turret, upper + lower turret
Tailstock	atom	1S: NC tailstock, 2S: hydraulic quill
Tailstock sleeve sy	stem	Built-in type MT No. 4 CAPTO C6
Tool shank profile ATC tool magazine	oonooity	80 tools, 120 tools, 180 tools (matrix
Chip conveyor	capacity	Drum filter type, hinge type, scraper
Conveyor-related of	ontions	Chip conveyor torque limiter (alarm
Conveyor related t	optiono	conveyor
Chip buckets		L type, H type
Coolant sludge pre	evention	Oil skimmer mounted
High pressure coo	lant unit	7MPa
Turret high/low pre	essure switch	L/M thru high/low pressure switch, I M peripheral high/low pressure swit
Lower turret coola switch	nt high/low pressure	
Lubrication monito	or	B-2 (w/ warning lamp)
Cover-related optic		Upper door auto open/close, front d
Front cover auto o devices	pen/close safety	Safety tape switch
Dual palm start bu interlock)	ttons (door close	
Front cover open/o	close inchina	
Chuck auto open/o		Chuck auto open/close confirm, chu
ondon dato opon/		miss detection (main, opposing)
Tailstock-related o	otions	Tailstock quill auto advance/retract of
Opposing spindle		
Air blower (blast) c		Chuck air blower, tailstock air blowe Turret air blower (L/M thru-spindle d M periphery only) Lower turret air blower (internal pipi
Coolant blower (bl	ast) options	Shower coolant (main/opposing: A, coolant (A, B)
Dust-proofing		Spindle air purge (main, opposing), Ball screw double wiper ( $X + Y + Z$ ,
5-Axis Auto Tuning	g System	Standard kit, High spec kit
NC gage		Standard kit, High spec kit
In-process work g	auging	Renishaw
Touch setter		M (manual), A (auto)
Workrest		
Work stopper in sp		
Chuck internal sizi		Main, opposing
Additional coolant	pump	0.8 kW
Coolant tank		Thickener back, line filter, reverse cl
Coolant sensor		Level detection, flow sensor, Level +
Coolant gun moun	ited	
Steadyrest		1S: Self-propelled (no relieving), 2S:
Mist collector High accuracy opt	ions	AbsoScale (Xa axis, Xb axis, Ya axis
Bar feeder		temperature)
Work sizing stoppe	er	Upper turret, lower turret
Parts catcher-relat		Main spindle side eject, opposing s
		Workpiece eject conveyor (finished
Workpiece unload	er	
Loader		OGL10-P, OGL30-P, OGL50-P
CNC		High class (B axis contouring)

\*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.

/15 kW (30 min/cont) /22 kW (20 min/cont) ø140 22/15 kW (30 min/cont) ø160 32/22 kW (20 min/cont)

( 5.5/3.7 kW (2 min/cont)

ll (self-propelled)

rix)

er type

n C at detection), intermittent feed chip conveyor, machine linked chip

, M peripheral low pressure; L/M thru high/low pressure switch; /itch

door auto open/close, auto open/close on both upper + front door

huck high/low pressure switch (re-gripping) (main, opposing), chucking

t confirmation, tailstock thrust high/low switch

ver, spindle ID air blower (main, opposing) during rotation only, L/M thru-spindle during rotation/M periphery,

bing, common coolant nozzle) A, B), thru-spindle coolant blower (main/opposing: A, B), ceiling shower

, guideway double wiper (X + Y + Z, X + Y + Z + Xb + Zb) , X + Y + Z + Xb + Zb)

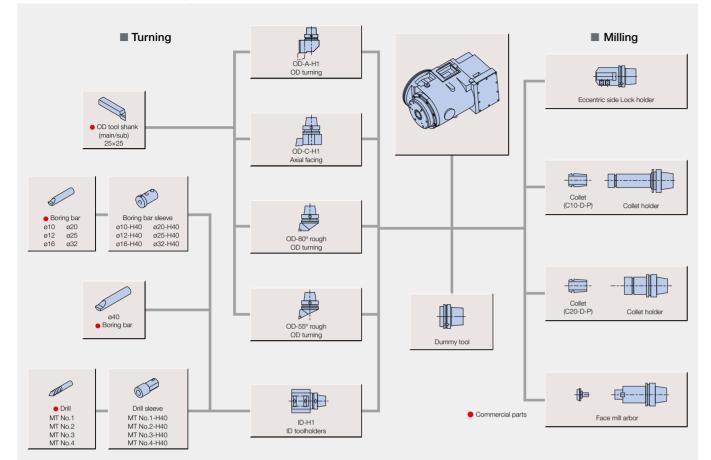
cleaning filter + flow sensor

S: lower turret, lower cross-slide

kis, Za axis), temperature regulator (coolant, hydraulic oil, spindle

spindle side eject, Workpiece ejector (spring type, air type) I parts right)

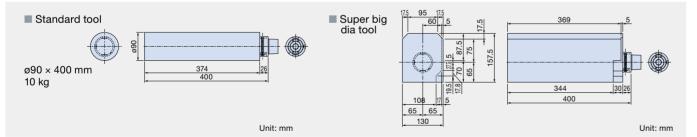
# Upper Turret Tooling System (HSK-A63)



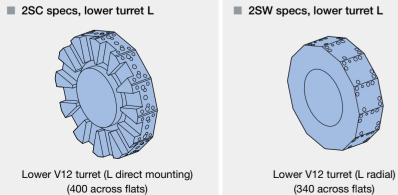
Commercial milling tools with shank and grip that are compliant with DIN 69893-1, HSK-A63 can be used For turning tools, please contact Okuma when using tools other than Okuma standard tools, since some dimensions are specially designed to improve fitting accuracy. Outside toolholders A and C are for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

# stored in the tool magazine

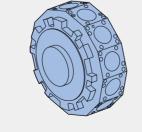
# MaxTool Dimensions



# Lower turret for each specification



(340 across flats)



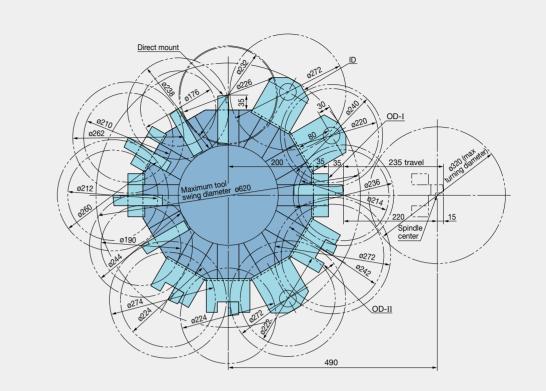
2SW specs, lower turret M

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

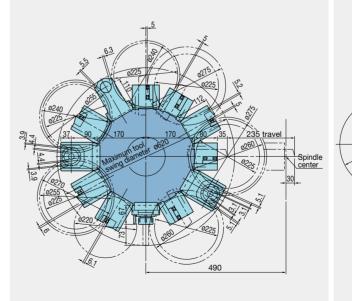
\*Lower turret multitasking is only with opposing spindle specifications

# Tool interference drawing

2SC Lower turret (OD)



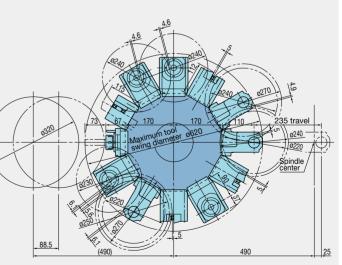
2SW Lower turret (OD)



Unit: mm

Unit<sup>,</sup> mm

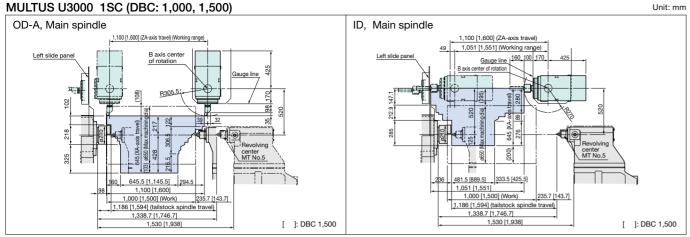
2SW Lower turret (ID)



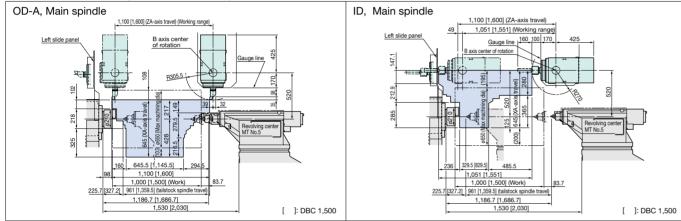
Unit: mm

# Working Range

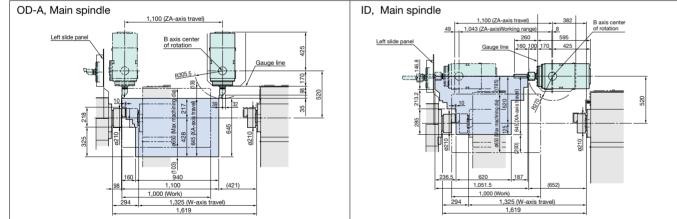
# MULTUS U3000 1SC (DBC: 1,000, 1,500)



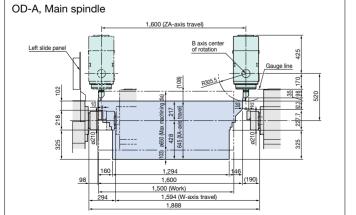
## MULTUS U3000 2SC (DBC: 1,000, 1,500)

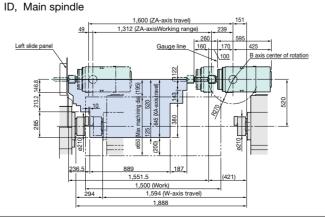


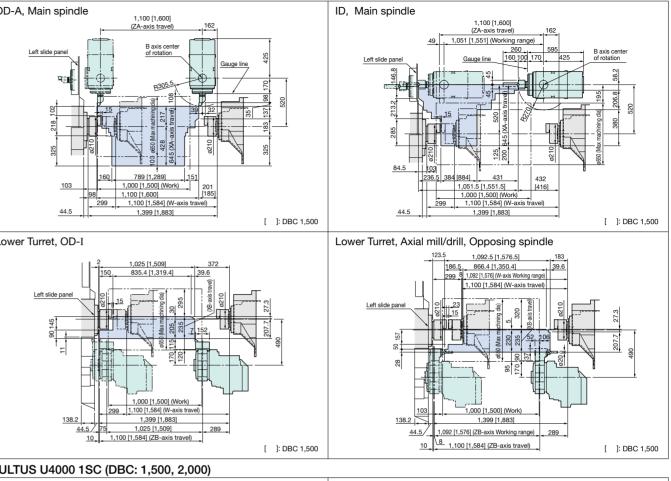
# MULTUS U3000 1SW (DBC: 1,000)

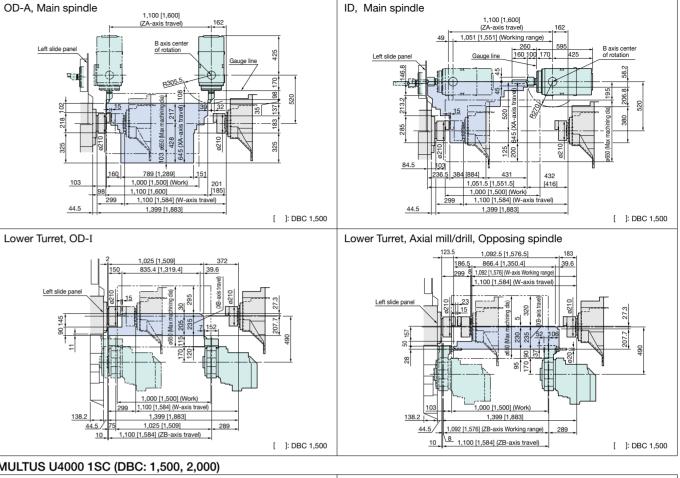


# MULTUS U3000 1SW (DBC: 1,500)



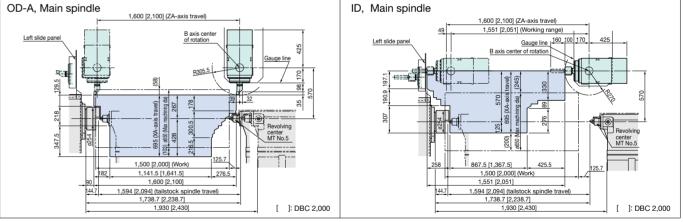




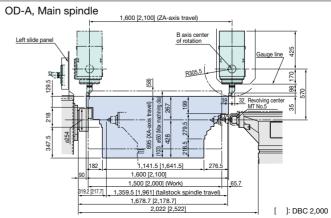


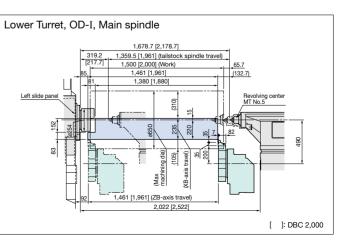
MULTUS U4000 1SC (DBC: 1.500, 2.000)

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



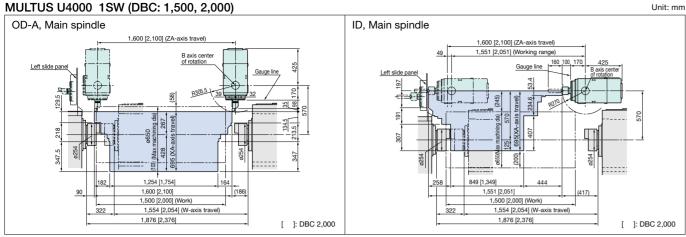
# MULTUS U4000 2SC (DBC: 1,500, 2,000)



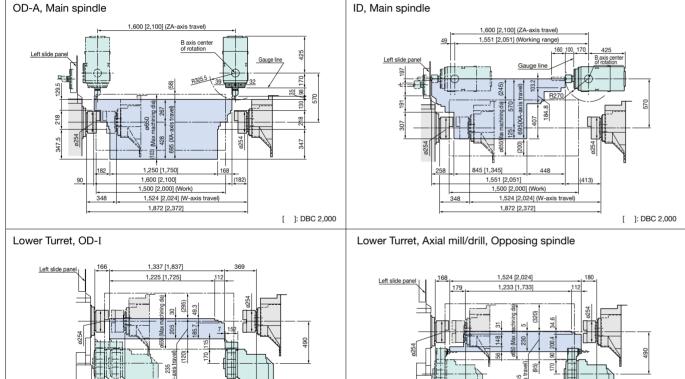


# Working Range

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



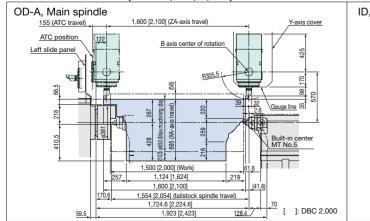
# MULTUS U4000 2SW (DBC: 1,500, 2,000)





[ ]: DBC 2,000

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

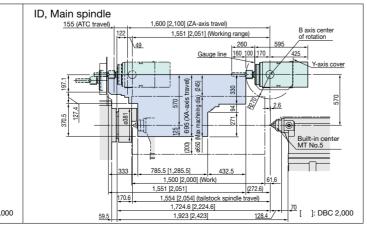


1,524 [2,024] (W-axis travel)

187 1,337 [1,837] (ZB-axis Working range) 286

1,872 [2,372] (Distance between noses)

1,524 [2,024] (ZB-axis travel)



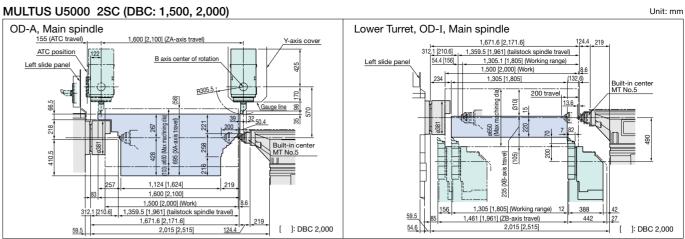
1.500 [2.000] (Work

1,872 [2,372] (Distance betw

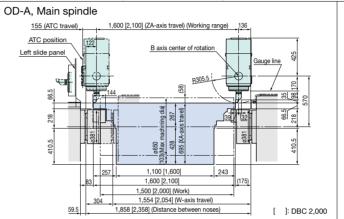
1,524 [2,024] (W-axis travel)

[ ]: DBC 2,000

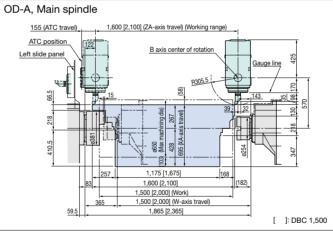
1,524 [2,024] (ZB-axis travel) (ZB-axis Working range) 286



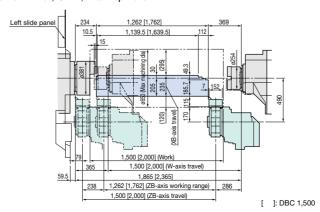
## MULTUS U5000 1SW (DBC: 1,500, 2,000)



## MULTUS U5000 2SW (DBC: 1.000, 1.500)



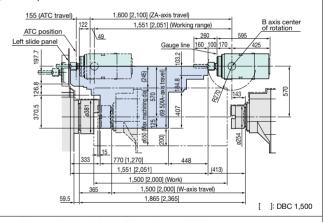
# Lower Turret, OD-I, Main spindle



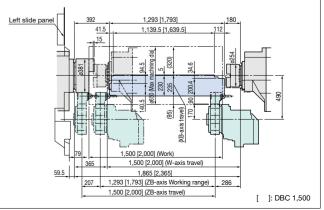


### ID, Main spindle 155 (ATC travel) 1,600 [2,100] (ZA-axis travel) B axis center 1.551 [2.051] (Working range) ATC position 260 Left slide panel Gauge line 160 100 170 425 523 1,551 [2,051] 1.500 [2.000] (Work) 1,554 [2,054] (W-axis travel) 304 1,858 [2,358] (Distance between noses) 59.5 [ ]: DBC 2,000

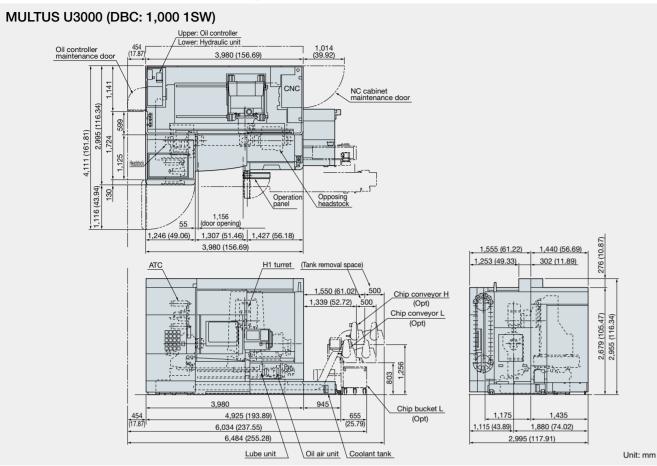




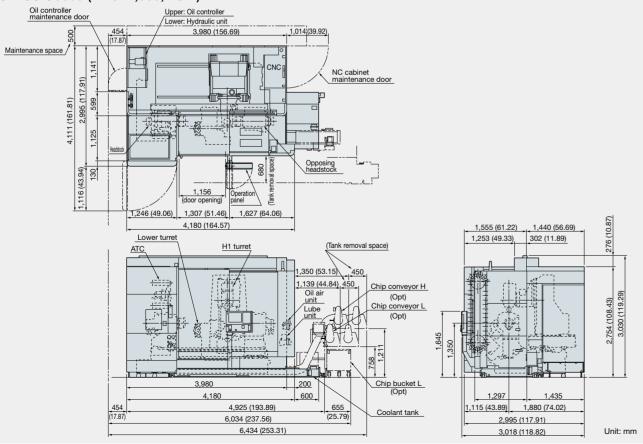




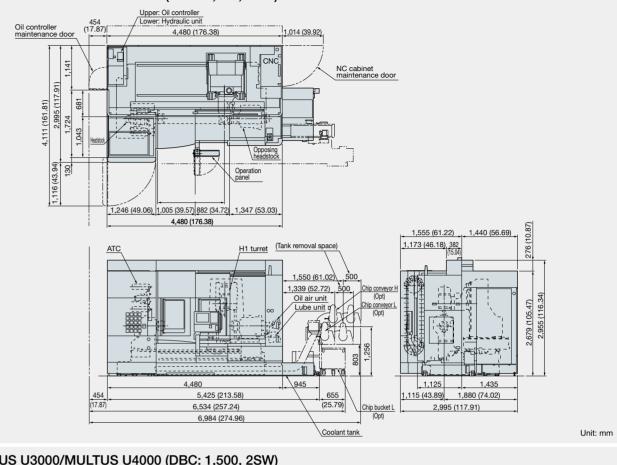
# Dimensional and Installation Drawings

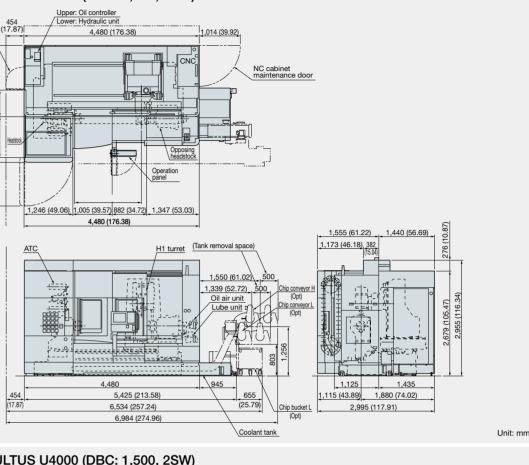


# MULTUS U3000 (DBC: 1,000, 2SW)

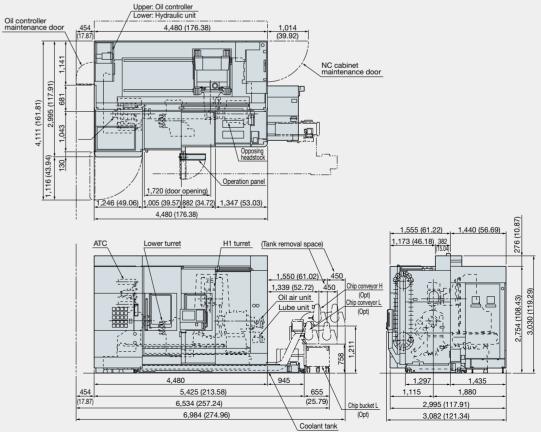


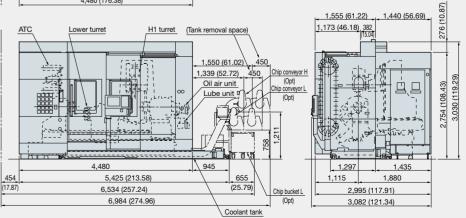
# MULTUS U3000/MULTUS U4000 (DBC: 1,500, 1SW)





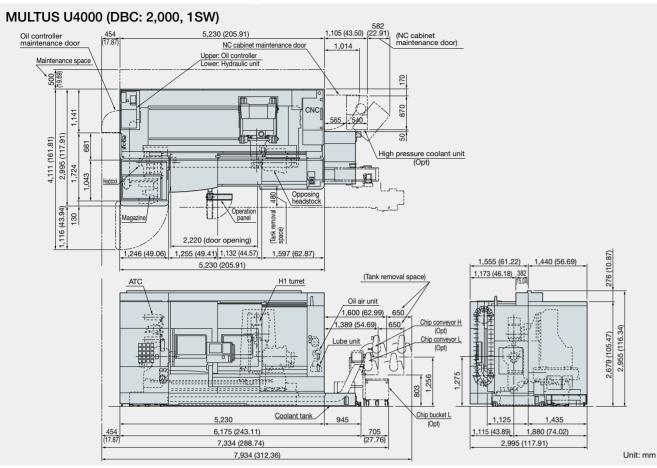
MULTUS U3000/MULTUS U4000 (DBC: 1,500, 2SW)



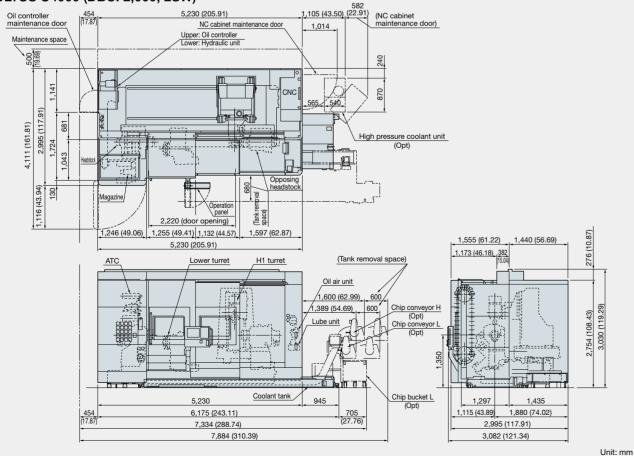


Unit<sup>,</sup> mm

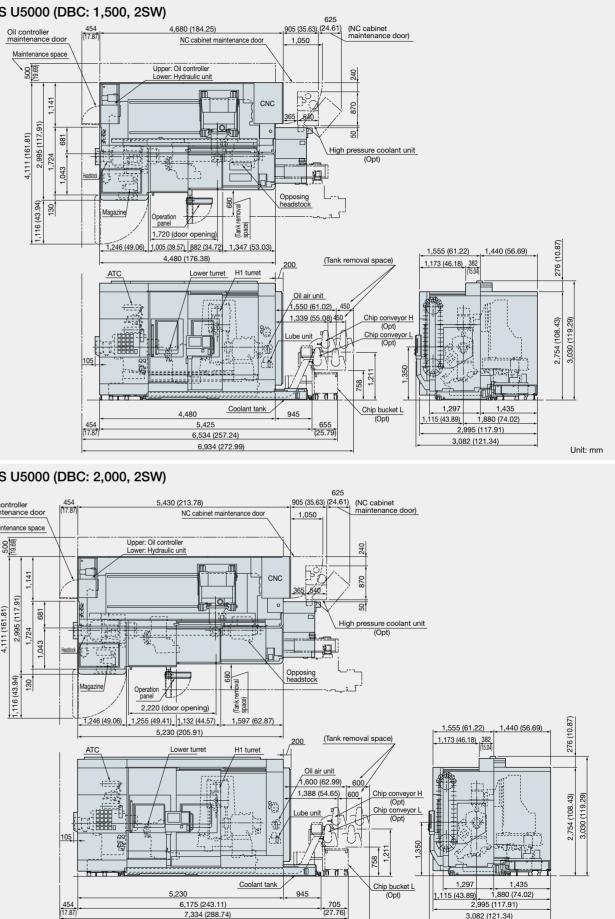
# Dimensional and Installation Drawings



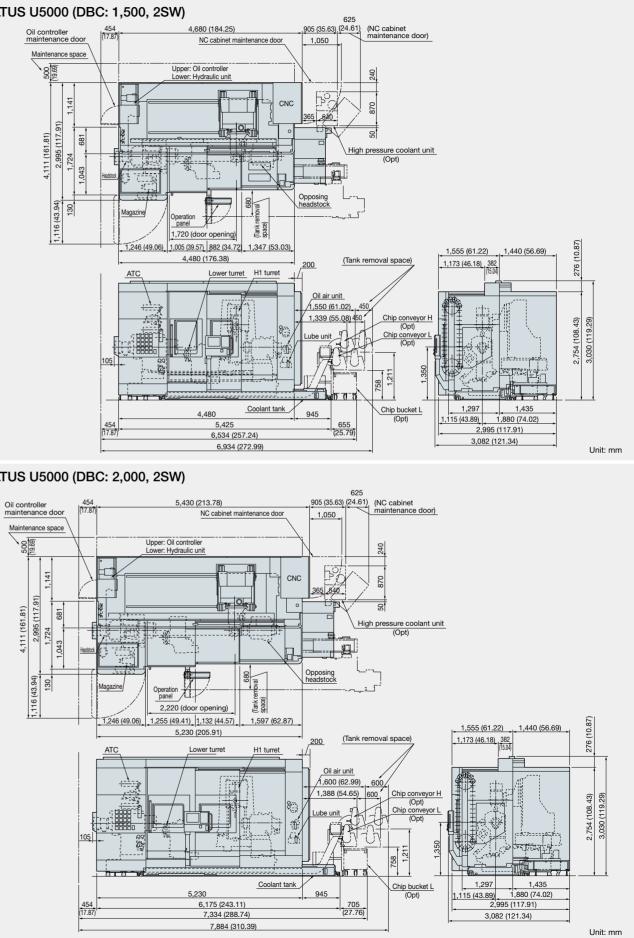
# MULTUS U4000 (DBC: 2,000, 2SW)



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



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



# The Next-Generation Intelligent CNC OSP Suite osp-p3005A

# Standard Specifications

5-axis machining			
o ano maomining	Multitasking X-Y-Z-B-C simultaneous:5 axes	Threading	Designated lead thread crest, variable lead thread
Spindle axis	Max 4 axes (= 2 axes + 2 rotary tool axes)		Chamfering while thread cutting, thread cutting cycle
Position feedback	OSP full range absolute position detection	Threading slide hold	Temporary stop during threading, excluding G34/G35
No. of control systems	Max 4 systems (= 2 spindles + 2 turrets)	User Task 1	GOTO statement, IF statement, arithmetic operation
2-spindle independent control	Each spindle executes an independent part program		Local variables, system variables
Y axis control	X-Y-Z simultaneous 3 axes, orthogonal Y axis		Common variable (Standard 200 sets)
Override structure	Spindle override 50 to 200%	User Task 2	Sub-programs, functional operation, logical operation
	Milling tool override 30% to 200% (max 300% possible)	Zero shift	Zero offset calculation, and shift according to G code
	Feed override 0 to 200%	Milling programming (mil	ling applications only)
Programmable units	0.0001 mm, 0.001 mm, 0.01 mm, 1 mm, 0.0001°, 0.001°, 0.01°, 1°	Hole drilling fixed cycle	Drilling, boring and tapping
Min input	0.0001 mm, 0.0001°		Fine boring, back boring
Max input	Decimal 9 digits, ±99999.9999 mm (3937.00787 in.)		Deep bore drill cycle gradually decreasing movement
Display/Operating functio	ns	Synchronized tapping	High speed, high accuracy tapping with synchronized
Suite operation	Shop floor suitable; pointing device not required		control of rotation angle and feed shaft position
Suite apps	Instruction manual viewer		Synchronized tapping torque monitor Synchronized deep bore tapping
	Maintenance application	C avia aurobranizad control	Cutting with C axis on both main and opposing spindles
Operation panel	15-inch liquid crystal display	C axis synchronized control	Cutting with Claxis on both main and opposing spindles
	Multi touch panel operations	Programming capacities	0.00
Program editing	Simultaneous edit 2 files in 1 screen	Program storage capacity	2 GB
	Selected part program edit	Operation backup capacity	2 MB
	A/B turret simultaneous editing (2 turret specs)	Machining management	
	Selected range copy, paste, delete	Machining records	Totals and displays machining status per selected main program
	Adds files	Operating records	Machine operating times (power ON, cutting, etc)
	Moves edit pointer (designates top, end and number of lines)		Input of reasons for non-operation
	Arranges sequence numbers	Operating history	Time charts of machine operating status
	Program editing exceeds editing backup capacity	Trouble information	Auto totaling of data required for troubleshooting (alarm history, etc)
File name index display	2 file name indexes displayed in 1 screen	Records, trouble information	Machining, operating, operating history, trouble info
	Sorting (by file names, date and size)	output	Machining, operating, operating history, touble into
Programming	Copies, renames, deletes, protects and verifies programs	Monitoring	
operations	Memory initializing, formatting	Collision Avoidance System	Prevents interference during manual operation
	Memory available display (pie gragh)	eennelen in trendance eyetein	Prevents interference during auto operation
Cohodulad average	Multi-level directory		Easy modeling of shape data
Scheduled programs	Run several programs in a sequence		New path assurance: Prevents interference due to sagging path
Sequence number search	Machine from the specified sequence no.	Load meter display	Feed and spindle axis loads
Manual interrupt, auto return	After manual operations, auto mode restarted from interrupted position		(With peak value hold function)
Sequence return	Return to specified sequence, auto restart from returned point	Chuck barrier	Set up tool off-limit area depending on chuckshape
PLC monitor	Supports maintenance work after machine shutdown	Tailstock spindle barrier	Set up tool off-limit area depending on tailstock shape
	Ladder display, data trace, etc	User regular maintenance	Management of maintenance period with respect to any item
Parameter I/O	Parameter file input/output, verify	External input/output and	1 networking
Easy Operation		Ethernet interface	Ethernet (1000 Mbps)
Single-mode operation	Series of tasks completed on a single screen	USB interface	USB 2.0 interface 2 ch
Tool information	Integrated management of collective tool data for each tool no.	DNC-T1	Ethornot part program transform
	integrated management of conective tool data for each tool ho.	BIGHT	Ethernet part program transfers
management	Setup data shared between machining operation, Advanced	High-speed/high-accurac	· · · •
	Setup data shared between machining operation, Advanced One-Touch IGF (optional), and Collision Avoidance System		· · · •
	Setup data shared between machining operation, Advanced One-Touch IGF (optional), and Collision Avoidance System Multiple tool management for each turret station	High-speed/high-accurated Hi-G control	Positioning acceleration/deceleration conforming to motor's speed/torque characteristics
	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	High-speed/high-accurated Hi-G control Rapid traverse droop	Positioning acceleration/deceleration conforming to motor's speed/torque characteristics Droop control at feedrate command
management	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	High-speed/high-accurated Hi-G control	Positioning acceleration/deceleration conforming to motor's speed/torque characteristics Droop control at feedrate command Dead zone, elastic deformation compensation during travel
management Setup data save	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 saved together with machining program	High-speed/high-accurated Hi-G control Rapid traverse droop Lost motion compensation	Positioning acceleration/deceleration conforming to motor's speed/torque characteristics Droop control at feedrate command Dead zone, elastic deformation compensation during travel direction reversal
management	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	High-speed/high-accurac Hi-G control Rapid traverse droop Lost motion compensation Pitch error compensation	Positioning acceleration/deceleration conforming to motor's speed/torque characteristics Droop control at feedrate command Dead zone, elastic deformation compensation during travel direction reversal Compensates for ball screw pitch error
management Setup data save	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 saved together with machining program Automatic machining of soft jaws with set shape, tools, and	High-speed/high-accurate Hi-G control Rapid traverse droop Lost motion compensation Pitch error compensation TAS-S/H1	cy functions         Positioning acceleration/deceleration conforming to motor's speed/torque characteristics         Droop control at feedrate command         Dead zone, elastic deformation compensation during travel direction reversal         Compensates for ball screw pitch error         Thermal deformation from heat generated during milling tool
management Setup data save Soft jaw machining Easy zero setting	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 saved together with machining program Automatic machining of soft jaws with set shape, tools, and conditions	High-speed/high-accurac Hi-G control Rapid traverse droop Lost motion compensation Pitch error compensation	Positioning acceleration/deceleration conforming to motor's speed/torque characteristics Droop control at feedrate command Dead zone, elastic deformation compensation during travel direction reversal Compensates for ball screw pitch error
management Setup data save Soft jaw machining Easy zero setting SERVONAVI	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 saved together with machining program Automatic machining of soft jaws with set shape, tools, and conditions Auto calculation of zero point offset from jaw and workpiece length Inertia auto setting	High-speed/high-accurate Hi-G control Rapid traverse droop Lost motion compensation Pitch error compensation TAS-S/H1 (spindle)	y functions Positioning acceleration/deceleration conforming to motor's speed/torque characteristics Droop control at feedrate command Dead zone, elastic deformation compensation during travel direction reversal Compensates for ball screw pitch error Thermal deformation from heat generated during milling tool spindle rotation is compensated
management Setup data save Soft jaw machining Easy zero setting SERVONAVI Tool position compensation	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 saved together with machining program Automatic machining of soft jaws with set shape, tools, and conditions Auto calculation of zero point offset from jaw and workpiece length	High-speed/high-accurac Hi-G control Rapid traverse droop Lost motion compensation Pitch error compensation TAS-S/H1 (spindle) TAS-C	Sy functions           Positioning acceleration/deceleration conforming to motor's speed/torque characteristics           Droop control at feedrate command           Dead zone, elastic deformation compensation during travel direction reversal           Compensates for ball screw pitch error           Thermal deformation from heat generated during milling tool spindle rotation is compensated           Corrects thermal deformation error generated during shop temperature changes affecting machine construction
management Setup data save Soft jaw machining Easy zero setting SERVONAVI Tool position compensation Tool command (TD command)	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 saved together with machining program Automatic machining of soft jaws with set shape, tools, and conditions Auto calculation of zero point offset from jaw and workpiece length Inertia auto setting Dimensional errors corrected with cutting conditions Tool orientation, tool comp command based on tool information	High-speed/high-accurac Hi-G control Rapid traverse droop Lost motion compensation Pitch error compensation TAS-S/H1 (spindle) TAS-C (construction)	cy functions           Positioning acceleration/deceleration conforming to motor's speed/torque characteristics           Droop control at feedrate command           Dead zone, elastic deformation compensation during travel direction reversal           Compensates for ball screw pitch error           Thermal deformation from heat generated during milling tool spindle rotation is compensated           Corrects thermal deformation error generated during shop temperature changes affecting machine construction
management Setup data save Soft jaw machining Easy zero setting SERVONAVI Tool position compensation	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 saved together with machining program Automatic machining of soft jaws with set shape, tools, and conditions Auto calculation of zero point offset from jaw and workpiece length Inertia auto setting Dimensional errors corrected with cutting conditions	High-speed/high-accurac Hi-G control Rapid traverse droop Lost motion compensation Pitch error compensation TAS-S/H1 (spindle) TAS-C (construction) Pocket manual functions	provide the second
management Setup data save Soft jaw machining Easy zero setting SERVONAVI Tool position compensation Tool command (TD command)	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 saved together with machining program Automatic machining of soft jaws with set shape, tools, and conditions Auto calculation of zero point offset from jaw and workpiece length Inertia auto setting Dimensional errors corrected with cutting conditions Tool orientation, tool comp command based on tool information	High-speed/high-accurace Hi-G control Rapid traverse droop Lost motion compensation Pitch error compensation TAS-S/H1 (spindle) TAS-C (construction) Pocket manual functions Programming help	y functions     Positioning acceleration/deceleration conforming     to motor's speed/torque characteristics     Droop control at feedrate command     Dead zone, elastic deformation compensation during travel     direction reversal     Compensates for ball screw pitch error     Thermal deformation from heat generated during milling tool     spindle rotation is compensated     Corrects thermal deformation error generated during     shop temperature changes affecting machine construction     (online help)     Explains part program G, M codes, cycle commands, etc
management Setup data save Soft jaw machining Easy zero setting SERVONAVI Tool position compensation Tool command (TD command) Machine operation panel	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 saved together with machining program Automatic machining of soft jaws with set shape, tools, and conditions Auto calculation of zero point offset from jaw and workpiece length Inertia auto setting Dimensional errors corrected with cutting conditions Tool orientation, tool comp command based on tool information	High-speed/high-accurace Hi-G control Rapid traverse droop Lost motion compensation Pitch error compensation TAS-S/H1 (spindle) TAS-C (construction) Pocket manual functions Programming help	provide the second
management Setup data save Soft jaw machining Easy zero setting SERVONAVI Tool position compensation Tool command (TD command) Machine operation panel Programming	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 saved together with machining program           Automatic machining of soft jaws with set shape, tools, and conditions           Auto calculation of zero point offset from jaw and workpiece length           Inertia auto setting           Dimensional errors corrected with cutting conditions           Tool orientation, tool comp command based on tool information           Clear, straightforward machine operation           Linear/circular interpolation           No. of registered tools: Max. 1,000 sets	High-speed/high-accurate Hi-G control Rapid traverse droop Lost motion compensation Pitch error compensation TAS-S/H1 (spindle) TAS-C (construction) Pocket manual functions Programming help Operation help	y functions     Positioning acceleration/deceleration conforming     to motor's speed/torque characteristics     Droop control at feedrate command     Dead zone, elastic deformation compensation during travel     direction reversal     Compensates for ball screw pitch error     Thermal deformation from heat generated during milling tool     spindle rotation is compensated     Corrects thermal deformation error generated during     shop temperature changes affecting machine construction     (online help)     Explains part program G, M codes, cycle commands, etc     Screen menu functions explained     Menu selected operation procedures explained
management Setup data save Soft jaw machining Easy zero setting SERVONAVI Tool position compensation Tool command (TD command) Machine operation panel Programming Basic interpolation Tool compensation	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 saved together with machining program Automatic machining of soft jaws with set shape, tools, and conditions Auto calculation of zero point offset from jaw and workpiece length Inertia auto setting Dimensional errors corrected with cutting conditions Tool orientation, tool comp command based on tool information Clear, straightforward machine operation No. of registered tools: Max. 1,000 sets Tool offset, tool edge R, amount of wear: 20 sets per tool	High-speed/high-accurate Hi-G control Rapid traverse droop Lost motion compensation Pitch error compensation TAS-S/H1 (spindle) TAS-C (construction) Pocket manual functions Programming help Operation help Alarm help	y functions     Positioning acceleration/deceleration conforming     to motor's speed/torque characteristics     Droop control at feedrate command     Dead zone, elastic deformation compensation during travel     direction reversal     Compensates for ball screw pitch error     Thermal deformation from heat generated during milling tool     spindle rotation is compensated     Corrects thermal deformation error generated during     shop temperature changes affecting machine construction     (online help)     Explains part program G, M codes, cycle commands, etc     Screen menu functions explained     Menu selected operation procedures explained
management Setup data save Soft jaw machining Easy zero setting SERVONAVI Tool position compensation Tool command (TD command) Machine operation panel Programming Basic interpolation	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 saved together with machining program           Automatic machining of soft jaws with set shape, tools, and conditions           Auto calculation of zero point offset from jaw and workpiece length           Inertia auto setting           Dimensional errors corrected with cutting conditions           Tool orientation, tool comp command based on tool information           Clear, straightforward machine operation           Linear/circular interpolation           No. of registered tools: Max. 1,000 sets Tool offset, tool edge R, amount of wear: 20 sets per tool           Auto correct of tool nose error	High-speed/high-accurate Hi-G control Rapid traverse droop Lost motion compensation Pitch error compensation TAS-S/H1 (spindle) TAS-C (construction) Pocket manual functions Programming help Operation help Alarm help Energy saving ECO suite	y functions     Positioning acceleration/deceleration conforming     to motor's speed/torque characteristics     Droop control at feedrate command     Dead zone, elastic deformation compensation during travel     direction reversal     Compensates for ball screw pitch error     Thermal deformation from heat generated during milling tool     spindle rotation is compensated     Corrects thermal deformation error generated during     shop temperature changes affecting machine construction     (online help)     Explains part program G, M codes, cycle commands, etc     Screen menu functions explained     Menu selected operation procedures explained     Alarm causes and remedies explained
management Setup data save Soft jaw machining Easy zero setting SERVONAVI Tool position compensation Tool command (TD command) Machine operation panel Programming Basic interpolation Tool compensation	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 saved together with machining program Automatic machining of soft jaws with set shape, tools, and conditions Auto calculation of zero point offset from jaw and workpiece length Inertia auto setting Dimensional errors corrected with cutting conditions Tool orientation, tool comp command based on tool information Clear, straightforward machine operation No. of registered tools: Max. 1,000 sets Tool offset, tool edge R, amount of wear: 20 sets per tool	High-speed/high-accurate Hi-G control Rapid traverse droop Lost motion compensation Pitch error compensation TAS-S/H1 (spindle) TAS-C (construction) Pocket manual functions Programming help Operation help Alarm help Energy saving ECO suite ECO Idling Stop	y functions     Positioning acceleration/deceleration conforming     to motor's speed/torque characteristics     Droop control at feedrate command     Dead zone, elastic deformation compensation during travel     direction reversal     Compensates for ball screw pitch error     Thermal deformation from heat generated during milling tool     spindle rotation is compensated     Corrects thermal deformation error generated during     shop temperature changes affecting machine construction     (online help)     Explains part program G, M codes, cycle commands, etc     Screen menu functions explained     Menu selected operation procedures explained     Alarm causes and remedies explained     Accuracy remains stable with cooler idling stop
management Setup data save Soft jaw machining Easy zero setting SERVONAVI Tool position compensation Tool command (TD command) Machine operation panel Programming Basic interpolation Tool compensation Nose-radius comp (2B) Tool wear compensation	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 saved together with machining program Automatic machining of soft jaws with set shape, tools, and conditions Auto calculation of zero point offset from jaw and workpiece length Inertia auto setting Dimensional errors corrected with cutting conditions Tool orientation, tool comp command based on tool information Clear, straightforward machine operation No. of registered tools: Max. 1,000 sets Tool offset, tool edge R, amount of wear: 20 sets per tool Auto correct of tool nose error (No. of comp sets same as tool comp) Blade tip position compensation due to tool wear amount (No. of comp sets same as tool comp)	High-speed/high-accurate Hi-G control Rapid traverse droop Lost motion compensation Pitch error compensation TAS-S/H1 (spindle) TAS-C (construction) Pocket manual functions Programming help Operation help Alarm help Energy saving ECO suite ECO Idling Stop ECO Power Monitor Other functions Tool compensation function	cy functions           Positioning acceleration/deceleration conforming to motor's speed/torque characteristics           Droop control at feedrate command           Dead zone, elastic deformation compensation during travel direction reversal           Compensates for ball screw pitch error           Thermal deformation from heat generated during milling tool spindle rotation is compensated           Corrects thermal deformation error generated during shop temperature changes affecting machine construction           (online help)           Explains part program G, M codes, cycle commands, etc Screen menu functions explained Menu selected operation procedures explained           Alarm causes and remedies explained           Accuracy remains stable with cooler idling stop           Visualization of power usage           Management of compensation for base, vertical and L-tool
management Setup data save Soft jaw machining Easy zero setting SERVONAVI Tool position compensation Tool command (TD command) Machine operation panel Programming Basic interpolation Tool compensation Nose-radius comp (2B)	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 saved together with machining program Automatic machining of soft jaws with set shape, tools, and conditions Auto calculation of zero point offset from jaw and workpiece length Inertia auto setting Dimensional errors corrected with cutting conditions Tool orientation, tool comp command based on tool information Clear, straightforward machine operation Linear/circular interpolation No. of registered tools: Max. 1,000 sets Tool offset, tool edge R, amount of wear: 20 sets per tool Auto correct of tool nose error (No. of comp sets same as tool comp) Blade tip position compensation due to tool wear amount	High-speed/high-accurate Hi-G control Rapid traverse droop Lost motion compensation Pitch error compensation TAS-S/H1 (spindle) TAS-C (construction) Pocket manual functions Programming help Operation help Alarm help Energy saving ECO suite ECO Idling Stop ECO Power Monitor Other functions	cy functions           Positioning acceleration/deceleration conforming to motor's speed/torque characteristics           Droop control at feedrate command           Dead zone, elastic deformation compensation during travel direction reversal           Compensates for ball screw pitch error           Thermal deformation from heat generated during milling tool spindle rotation is compensated           Corrects thermal deformation error generated during shop temperature changes affecting machine construction           (online help)           Explains part program G, M codes, cycle commands, etc Screen menu functions explained Menu selected operation procedures explained           Alarm causes and remedies explained           Accuracy remains stable with cooler idling stop           Visualization of power usage
management Setup data save Soft jaw machining Easy zero setting SERVONAVI Tool position compensation Tool command (TD command) Machine operation panel Programming Basic interpolation Tool compensation Nose-radius comp (2B) Tool wear compensation Automatic programming	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 saved together with machining program           Automatic machining of soft jaws with set shape, tools, and conditions           Auto calculation of zero point offset from jaw and workpiece length           Inertia auto setting           Dimensional errors corrected with cutting conditions           Tool orientation, tool comp command based on tool information           Clear, straightforward machine operation           Linear/circular interpolation           No. of registered tools: Max. 1,000 sets           Tool offset, tool edge R, amount of wear: 20 sets per tool           Auto correct of tool nose error (No. of comp sets same as tool comp)           Blade tip position compensation due to tool wear amount (No. of comp sets same as tool comp)           Automatically carries out from roughing to finishing	High-speed/high-accurace Hi-G control Rapid traverse droop Lost motion compensation Pitch error compensation TAS-S/H1 (spindle) TAS-C (construction) Pocket manual functions Programming help Operation help Alarm help ECO Idling Stop ECO Power Monitor Compensation functions Tool compensation function for multi control system	cy functions         Positioning acceleration/deceleration conforming to motor's speed/torque characteristics         Droop control at feedrate command         Dead zone, elastic deformation compensation during travel direction reversal         Compensates for ball screw pitch error         Thermal deformation from heat generated during milling tool spindle rotation is compensated         Corrects thermal deformation error generated during shop temperature changes affecting machine construction (online help)         Explains part program G, M codes, cycle commands, etc Screen menu functions explained Menu selected operation procedures explained         Alarm causes and remedies explained         Accuracy remains stable with cooler idling stop         Visualization of power usage         Management of compensation for base, vertical and L-tool index position
management Setup data save Soft jaw machining Easy zero setting SERVONAVI Tool position compensation Tool command (TD command) Machine operation panel Programming Basic interpolation Tool compensation Nose-radius comp (2B) Tool wear compensation Automatic programming (LAP4)	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 saved together with machining program           Automatic machining of soft jaws with set shape, tools, and conditions           Auto calculation of zero point offset from jaw and workpiece length           Inertia auto setting           Dimensional errors corrected with cutting conditions           Tool orientation, tool comp command based on tool information           Clear, straightforward machine operation           Linear/circular interpolation           No. of registered tools: Max. 1,000 sets Tool offset, tool edge R, amount of wear: 20 sets per tool           Auto correct of tool nose error (No. of comp sets same as tool comp)           Blade tip position compensation due to tool wear amount (No. of comp sets same as tool comp)           Automatically carries out from roughing to finishing Generates cutting paths according to material shape	High-speed/high-accurace Hi-G control Rapid traverse droop Lost motion compensation Pitch error compensation TAS-S/H1 (spindle) TAS-C (construction) Pocket manual functions Programming help Operation help Alarm help ECO Idling Stop ECO Power Monitor Compensation functions Tool compensation function for multi control system	protections         Positioning acceleration/deceleration conforming to motor's speed/torque characteristics         Droop control at feedrate command         Dead zone, elastic deformation compensation during travel direction reversal         Compensates for ball screw pitch error         Thermal deformation from heat generated during milling tool spindle rotation is compensated         Corrects thermal deformation error generated during shop temperature changes affecting machine construction (online help)         Explains part program G, M codes, cycle commands, etc Screen menu functions explained Menu selected operation procedures explained         Alarm causes and remedies explained         Accuracy remains stable with cooler idling stop         Visualization of power usage         Management of compensation for base, vertical and L-tool index position (when using a turret with B axis control or tool index)
management Setup data save Soft jaw machining Easy zero setting SERVONAVI Tool position compensation Tool command (TD command) Machine operation panel Programming Basic interpolation Tool compensation Nose-radius comp (2B) Tool wear compensation Automatic programming (LAP4) Taper fixed cycles	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 saved together with machining program Automatic machining of soft jaws with set shape, tools, and conditions Auto calculation of zero point offset from jaw and workpiece length Inertia auto setting Dimensional errors corrected with cutting conditions Tool orientation, tool comp command based on tool information Clear, straightforward machine operation Linear/circular interpolation No. of registered tools: Max. 1,000 sets Tool offset, tool edge R, amount of wear: 20 sets per tool Auto correct of tool nose error (No. of comp sets same as tool comp) Blade tip position compensation due to tool wear amount (No. of comp sets same as tool comp) Automatically carries out from roughing to finishing Generates cutting paths according to material shape Taper machining with 4 patterns: ID, OD/longitudinal, axial face Use feedrate in mm/rev and mm/min together	High-speed/high-accurace Hi-G control Rapid traverse droop Lost motion compensation Pitch error compensation TAS-S/H1 (spindle) TAS-C (construction) Pocket manual functions Programming help Operation help Alarm help ECO Idling Stop ECO Power Monitor Compensation functions Tool compensation function for multi control system	protections         Positioning acceleration/deceleration conforming to motor's speed/torque characteristics         Droop control at feedrate command         Dead zone, elastic deformation compensation during travel direction reversal         Compensates for ball screw pitch error         Thermal deformation from heat generated during milling tool spindle rotation is compensated         Corrects thermal deformation error generated during shop temperature changes affecting machine construction (online help)         Explains part program G, M codes, cycle commands, etc Screen menu functions explained Menu selected operation procedures explained         Alarm causes and remedies explained         Accuracy remains stable with cooler idling stop         Visualization of power usage         Management of compensation for base, vertical and L-tool index position (when using a turret with B axis control or tool index)
management Setup data save Soft jaw machining Easy zero setting SERVONAVI Tool position compensation Tool command (TD command) Machine operation panel Programming Basic interpolation Tool compensation Nose-radius comp (2B) Tool wear compensation Automatic programming (LAP4) Taper fixed cycles mm/min programming	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 saved together with machining program           Automatic machining of soft jaws with set shape, tools, and conditions           Auto calculation of zero point offset from jaw and workpiece length           Inertia auto setting           Dimensional errors corrected with cutting conditions           Tool orientation, tool comp command based on tool information           Clear, straightforward machine operation           Linear/circular interpolation           No. of registered tools: Max. 1,000 sets           Tool offset, tool edge R, amount of wear: 20 sets per tool           Auto correct of tool nose error (No. of comp sets same as tool comp)           Blade tip position compensation due to tool wear amount (No. of comp sets same as tool comp)           Automatically carries out from roughing to finishing Generates cutting paths according to material shape           Taper machining with 4 patterns: ID, OD/longitudinal, axial face           Use feedrate in mm/rev and mm/min together	High-speed/high-accurace Hi-G control Rapid traverse droop Lost motion compensation Pitch error compensation TAS-S/H1 (spindle) TAS-C (construction) Pocket manual functions Programming help Operation help Alarm help ECO Idling Stop ECO Power Monitor Compensation functions Tool compensation function for multi control system	protections         Positioning acceleration/deceleration conforming to motor's speed/torque characteristics         Droop control at feedrate command         Dead zone, elastic deformation compensation during travel direction reversal         Compensates for ball screw pitch error         Thermal deformation from heat generated during milling tool spindle rotation is compensated         Corrects thermal deformation error generated during shop temperature changes affecting machine construction (online help)         Explains part program G, M codes, cycle commands, etc Screen menu functions explained Menu selected operation procedures explained         Alarm causes and remedies explained         Accuracy remains stable with cooler idling stop         Visualization of power usage         Management of compensation for base, vertical and L-tool index position (when using a turret with B axis control or tool index)

# 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.

# Optional Specifications

	Kit spec * 1	L	ML	-	3D	-	T-M		Kit spec	NN		31		AO
ptional		E	D	E	D	E	D	Optional		E	D	Е	D	Е
teractive Program	nming							Energy saving ECO s	suite					
Advanced One-T	ouch IGF-L Multitasking (w/Real 3D)							ECO operation	Chip conveyor intermittent/linked operation					
ogramming									Mist collector intermittent/linked operation					
Circular threading	g								Spindle power peak cutting					
Program notes								External Input/Out	tput and Communication Functions					
User task 2 I/C	) variables, 8 each							RS-232-C connec	ctor					_
Work coordinate								DNC links	DNC-T3					_
system select	50 sets	-	-	-	-	-	-		DNC-C / Ethernet *2		$ \rightarrow$			
	100 sets	-			<u> </u>	<u> </u>	+		DNC-DT		$\rightarrow$			_
1.000.common.v	ariables (200 is standard)	-	-		-	-	$\left  \right $		FL-Net *2					
Thread matching	· /	-	-		-		$\left  \right $	USB	2 additional ports possible		$\rightarrow$			_
		-	<u> </u>	-	+	+	$\vdash$	Automation / Unte			_			_
Threading slide h		-					$\vdash$				,		<u> </u>	_
	speed threading (VSST)		-		<u> </u>	-	$\square$	Auto power shuto						
Inverse time feed						_			(by calendar timer)					
Spindle synchror								Tool retract cycle						
Coordinate conv	ert							External	A (pushbutton), 8 types					
Profile generate								program selections	B (rotary switch), 8 stages					
Flat turning								SCIECTIONS	C1 (digital switch), 2-digit BCD					
Coordinate calcu	lation (with NCYL commands)								C2 (external input), 4-digit BCD					
Coordinate shifti	ng, rotation, copying							Okuma loader (O	GL) interfaces	Incl	udec	d in L	oade	er s
Helical cutting							$\square$	Third party robot	TYPE B (machine)					
Slope machining								and loader	TYPE C (robot and loader)		$ \rightarrow$			
Profile helical cut		-			<u> </u>	<u> </u>	+	interface *2	TYPE D		$\rightarrow$			_
Hobbing	ang .	-	-		-	-	$\left  \right $		TYPEE					
Multi-flute cutter	function	-	-		-		$\left  \right $	Bar feeders	Bar feeder	Inclu	Idad	in m	achir	
		-					$\vdash$	Bar leeders		Inciu	laea	in m	achir	ie
	pordinate conversion							-	Interface only					
onitoring			—					Cycle time	Operation time reduction					
Real 3-D simulat			L					reduction*2		-	_	-	-	_
Cycle time over o	check							High-Speed /High-A	ccuracy Functions					
Load monitor (sp	indle, feed axis)							NC-B axis						
Load monitor no	-load detection (load monitor ordered)							Simultaneous	Super-NURBS		ļ			
Machine StatusL	ogger							5-axis kit	Tool center point control II					
Tool life manager	ment								Inverse time feed					
Tool life prior not	ice								DNC-DT					
Operation end bi	uzzer								Tool posture command					
Work counters	Count only						$\square$		3-dimensional coordinate conversion					
	Cycle stop	-			<u> </u>	<u> </u>	+		Herical cutting		$\rightarrow$			_
	Start disabled	-	1	-	-	-	$\left  - \right $		Slope machining		-		-+	
Hour meters	Power ON	-	-	-	-	-	$\vdash$	Hi-Cut Pro	Ciopo machining				•	
Hour meters	Spindle rotation	-	-	-	-	+	+	Super-NURBS	Linear axes		-	-	-	-
		-	-	-	-	-	+	Super-NURDS					$\rightarrow$	
10	NC operating							01	Linear and rotational axes					
	pnitor (counter, totaling)							Other Functions					_	
NIC work counter	r (Stops at full count with alarm)	6	-	6	-	-		One-Touch Sprea						
	(3-color C type) [A type, B type]							Gear machining p	-					
Status indicator								Machining Navi [N	M-gII+, M-i]					
Status indicator ( easuring		1	uded	l in n	nach	ine s	pecs	Machining Navi [L	g, T-g threading]					
Status indicator	gauging	Incl			1			Harmonic spindle	speed control (HSSC)					
Status indicator easuring In-process work	gauging zero offset by touch sensor	Incl				_		Spindle dead-slov	w cutting					
Status indicator easuring In-process work Z-axis automatic		Incl						Tool contor point						
Status indicator easuring In-process work Z-axis automatic	zero offset by touch sensor	Incl					$\left  \cdot \right $	Tool center point	control II		' I			
Status indicator easuring In-process work Z-axis automatic C-axis automatic Y-axis gauging	zero offset by touch sensor	Incl					Ħ				-		-+	
Status indicator reasuring In-process work Z-axis automatic C-axis automatic Y-axis gauging Gauge data	zero offset by touch sensor	Incl						Tool tilt command	1				$\dashv$	
Status indicator i easuring In-process work Z-axis automatic C-axis automatic Y-axis gauging Gauge data output	zero offset by touch sensor zero offset by touch sensor File output							Tool tilt command Synchronized C-a	axis control					
Status indicator i easuring In-process work Z-axis automatic C-axis gauging Gauge data output Post-process	zero offset by touch sensor zero offset by touch sensor File output Quantitative compensation (five level, seven							Tool tilt command Synchronized C-a Y-axis alignment of	i ixis control compensation					
Status indicator i easuring In-process work Z-axis automatic C-axis automatic Y-axis gauging Gauge data output Post-process work gauging	zero offset by touch sensor zero offset by touch sensor File output Quantitative compensation (five level, seven level)							Tool tilt command Synchronized C-a Y-axis alignment of Short circuit breat	i ixis control compensation ker					
Status indicator i easuring In-process work Z-axis automatic C-axis gauging Gauge data output Post-process	zero offset by touch sensor zero offset by touch sensor File output Quantitative compensation (five level, seven level) BCD							Tool tilt command Synchronized C-a Y-axis alignment of Short circuit breal External M signals	i ixis control compensation					
Status indicator i easuring In-process work Z-axis automatic C-axis automatic Y-axis gauging Gauge data output Post-process work gauging	zero offset by touch sensor zero offset by touch sensor File output Quantitative compensation (five level, seven level) BCD RS-232-C (w/dedicated channel)						Decs	Tool tilt command Synchronized C-a Y-axis alignment of Short circuit breal External M signals Edit interlock	i ixis control compensation ker					

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

IGF-L Multitasking \*2. Engineering discussions required.

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# Ergonomic control panel (Optional\*)

·19" display ·Adjustable-tilt keyboard

\*Standard in certain markets.

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



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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.