OKUMA

MULTUS B300

Intelligent Multitasking Machine

MULTUS B300

The Multitasking Wizard

Will cast a multitude of spells on your applications.
The MULTUS B300 — a machinist gifted with technical wizardry.
Now you will have totally awesome powers of production.


OKUMA
MULTUS B300

Welcome to Okuma's award-winning answer to multitasking—the intelligent way to improve part quality and throughput—in surprisingly less time and cost.

Note: Machine front covers used in this brochure are for trade fair display purposes.

47th
Top Ten New
Products Award

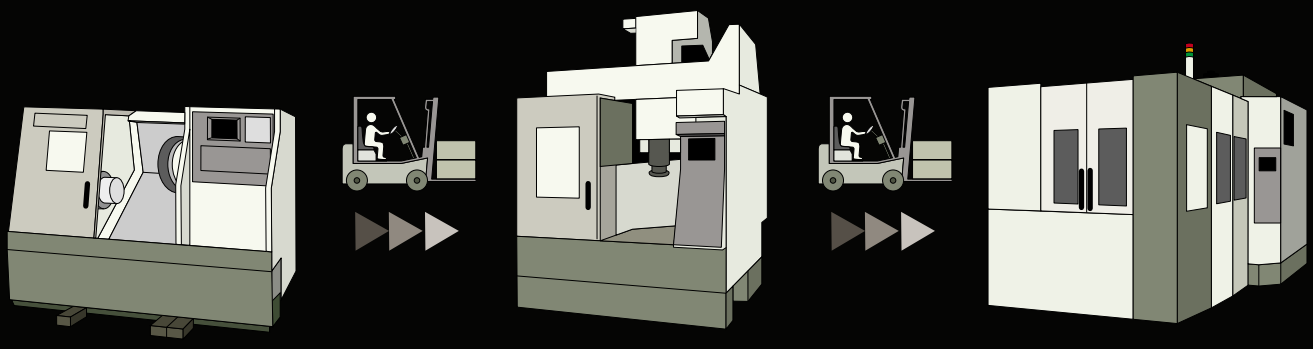
Thermal Deformation Compensation System
Thermo-Friendly
Concept

A Collision-
Free Machine
Collision Avoidance System

The MULTUS B300 is a Japan Energy Conservation tax incentive qualified machine.

The ultimate fusion of turn-mill operations

A divided production line



NC lathe

Vertical machining center

Horizontal machining center

Turning, V/H machining center, material handling operations consolidated into 1 machine

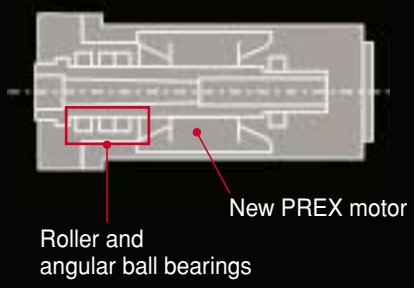
Shorter deliveries, more effective use of floor space—plus the elimination of parts in waiting between operations, fewer setups, less labor, etc—result in higher machine utilization. Customers truly benefit from much less time needed for process control and drastically reduced overall operating costs.

Machine configuration

Powerful, compact turret

- Compactness and high output with new PREX motor
- Highly rigid roller bearings for live tool spindle (front bearings)

■ Motor output 6,000 min-1 spec: 11 kW
10,000 min-1 spec: 16 kW



B-axis indexing: 225°
(minimum control angle: 0.001°)

Newly developed PREX motor

- High efficiency by reducing roller heat (120% compared with previous model)
- Small rotor with inertia reduced by half significantly reduces acceleration and deceleration times

0→10,000 min-1 0.8 sec

Machining

Turning
- Max 5,000 min-1
- VAC 15/11 kW (20/15 hp)

OD machining
Heavy-duty: 3 mm²
Cutting speed: 100 m/min
Cutting depth : 6 mm
Feedrate: 0.5 mm/rev

Carbide drilling
ø40 oil hole drilling
Cutting speed: 100 m/min
Feedrate: 0.2 mm/rev

(Workpiece material S45C)

S B300

g capability

Live-tool machining

- Max 6,000 min^{-1}
- PREX 11/7.5 kW (15/10 hp)

●Milling

ø20 Carbide roughing end mill (7 blades)

Cut volume:	360 cm^3/min
Cutting speed:	250 m/min
Cutting depth :	8 × 20 mm
Feedrate:	0.08 mm/blade

●Drilling

ø25 Carbide drill

Cutting speed:	70 m/min
Feedrate:	0.27 mm/rev

(Workpiece material S45C)

Highly rigid bed and guideways

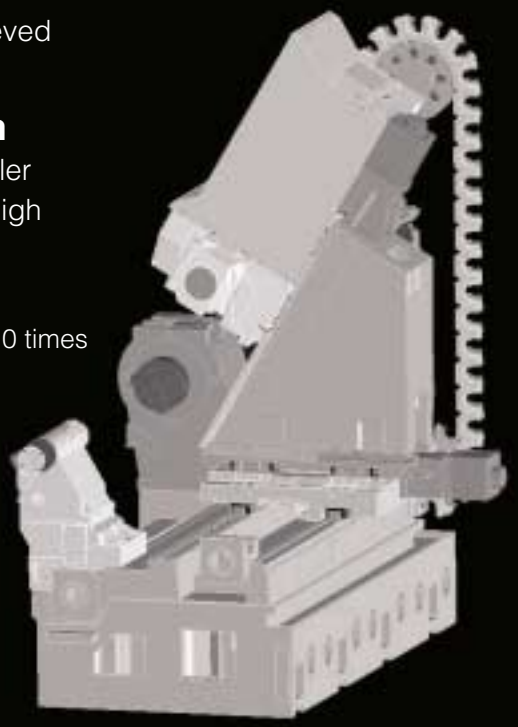
■ Bed

Stable machining achieved with wide, rigid bed

■ Guideway system

Featuring X-Y-Z-axis roller guides designed with high rigidity, antiwear, and vibration damping

- Roller guide rigidity 2.6-3.0 times that of ball guide

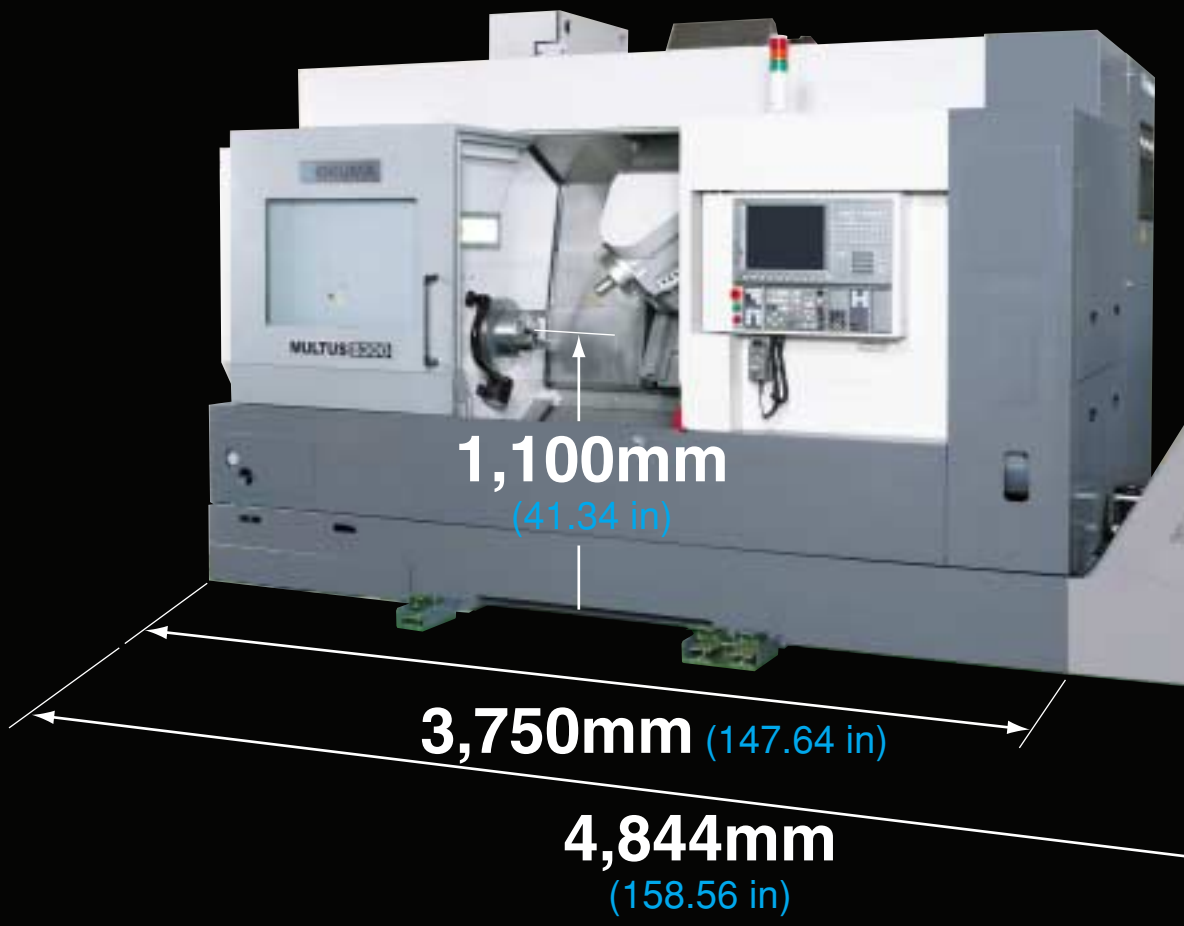


NC Tailstock

- ■ Tailstock positions and thrust settings can be set and changed by program.
- ■ Drastically reduces setup times

Easy to operate

Small footprint

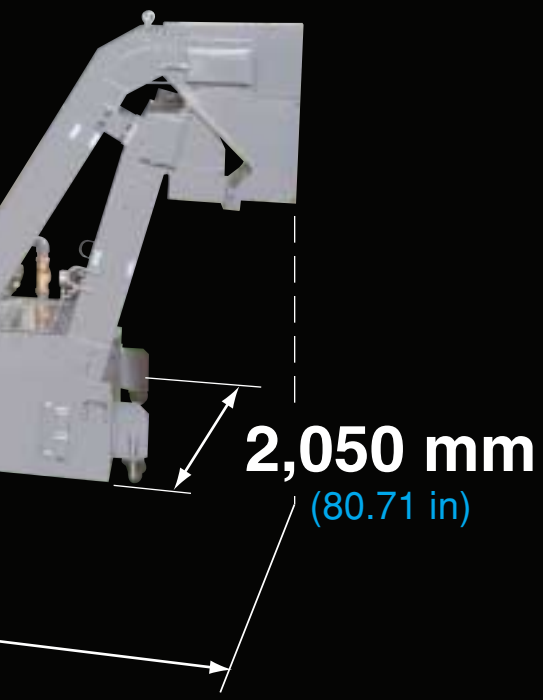


Swivel operation panel

Lightweight door

Portable pulse handle

■ Spindle access: 500 mm (19.69 in)



Easy front maintenance

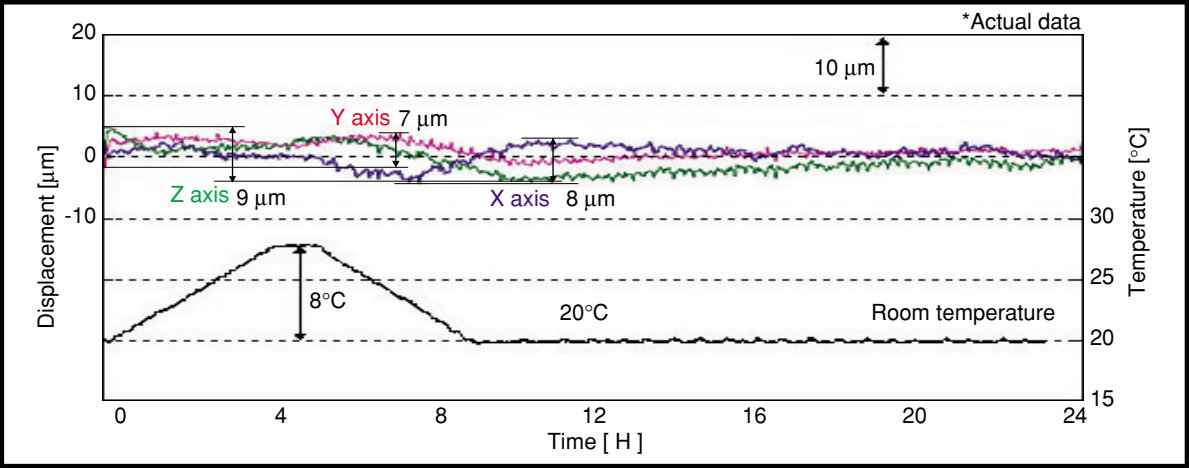
Detachable coolant tank

ATC operation

Accuracy

Thermal deformation over time: less than 10 μm*

Thermal Deformation Compensation System
Thermo-Friendly Concept



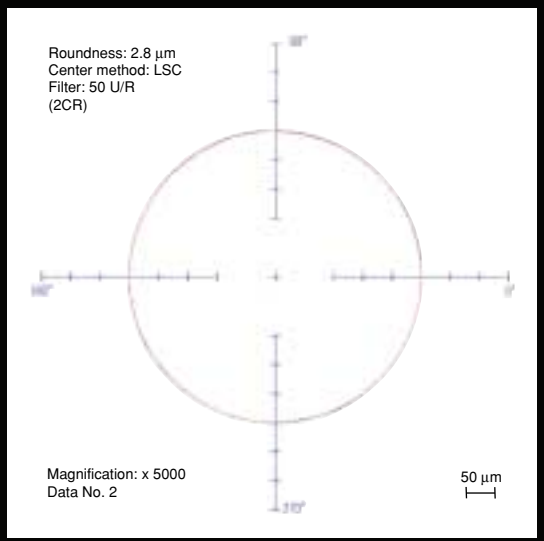
- Cycle time: 15 min
- Operating conditions:

Spindle	3,800 min^{-1}	(2.5 min)
Live-tool	6,000 min^{-1}	(6 min)
	10,000 min^{-1}	(6 min)
Stopped		(0.5 min)

- Coolant

Contouring accuracy (roundness)

2.8 μm
(Actual data)



- Material: S45C
- Cutting conditions: ø20 endmill

Spindle speed	1,600 min^{-1}
Feedrate	240 mm/min^{-1}

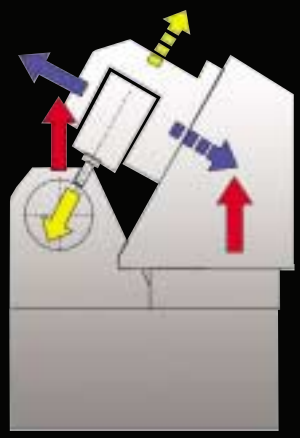
Advanced Thermo-Friendly Concept

Simple construction for thermal deformation

Designed to equalize ambient temperatures

Highly accurate Thermal Deformation Compensation technology

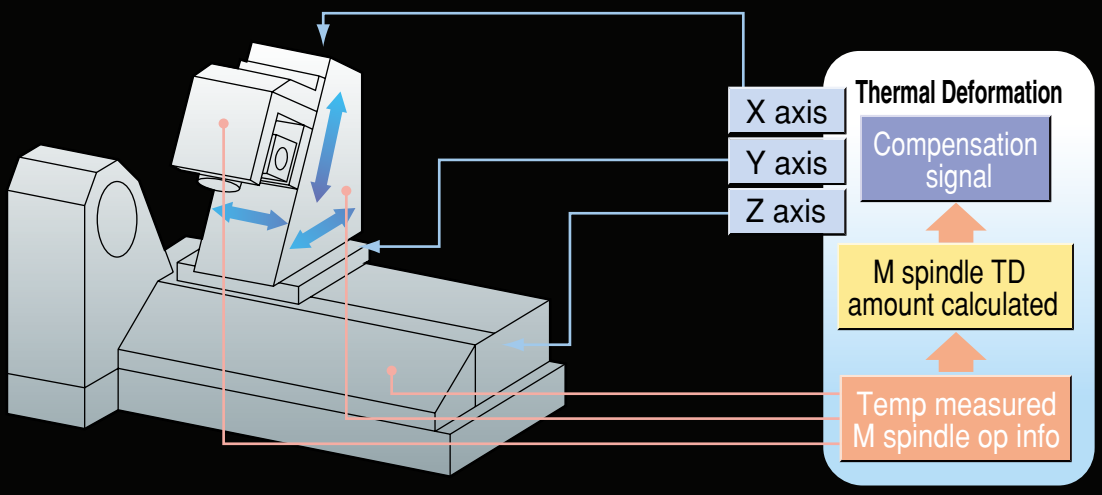
- Overall control of thermal deformation in each unit
- 0.1 µm control in real time
- High accuracy machining in general environments



TAS-S [Thermo Active Stabilizer — Spindle]

Thermal deformation on live tool spindle controlled on X, Y, and Z axes

High accuracy control whether milling or turning



TAS-C [Thermo Active Stabilizer — Construction]

Overall control of thermal deformation on headstock, bed, column, and turret

Machine is optimally controlled to maintain high machining accuracy, even when there are changes in ambient temperature.

A world's first—collision prevention in auto or manual operating modes.

Collision Avoidance System*

Novice operators feel safer—get jobs done quicker!

A Collision-Free Machine
Collision Avoidance System

*[CAS—a standard feature with the MULTUS B300.]

Collision-Free Machining

Automatic operation
- NC movements checked in real time
- Movement stopped before the programmed block containing a collision risk

Manual operation
- Real-time just-ahead checks of manual movements
- Manual movement stopped when collision just ahead detected

Program check
- Fast possible collision checks just prior to actual machining

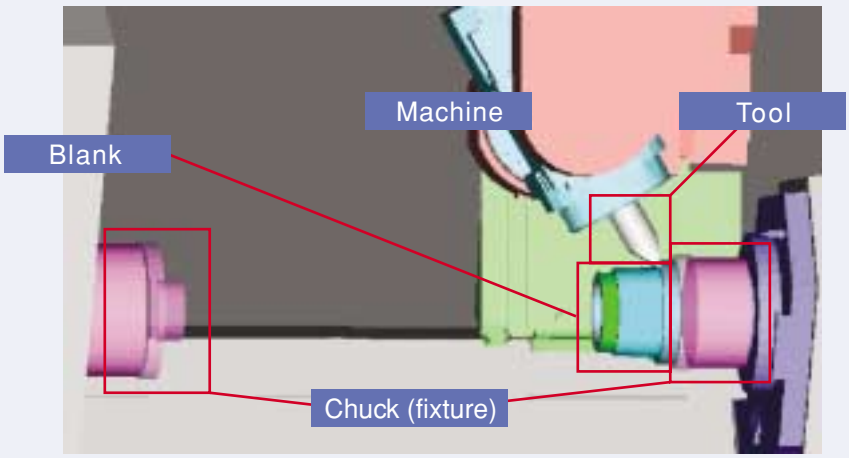
Relax – concentrate on machining

Shorter machine prep times

Shorter trial cuts

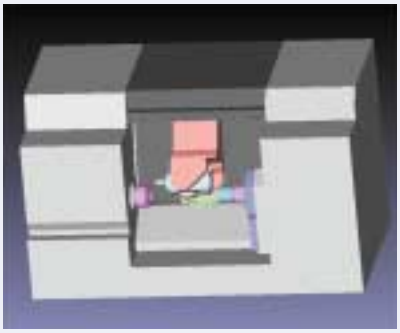
Collisions avoided

Simple input of setup information



Machine (settings done)

- 3D model of machine is registered
- Automatically selected settings for startup



⚠Caution

The Collision Avoidance System (CAS) detects collision per 3D models of the machine components, tools, fixtures, and workpieces stored in the OSP. Thus, if the entered tool, fixture, or workpiece shape differs from their actual dimensions, CAS will not accurately detect possible collisions.

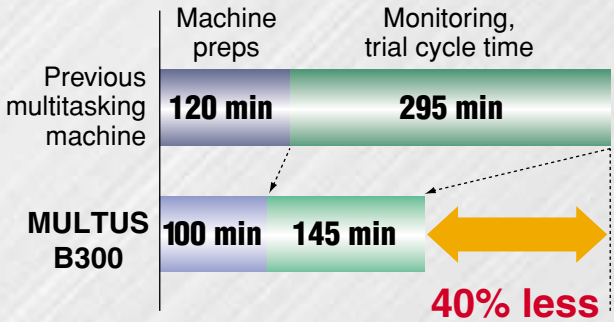
CAS will not function when turned OFF (though machine is ON).

Stops the machine before a collision

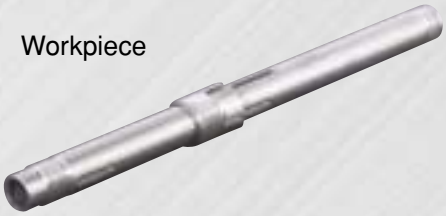
Interference with cover

Interference with tailstock

Significant reduction in machining preparation time



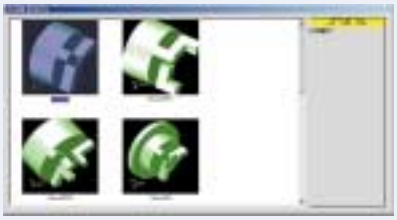
Workpiece



Select chuck (fixture)

- 3D models of standard chucks already stored
- Select from a stored 3D model

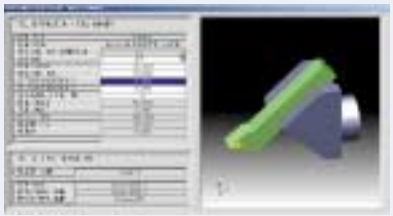
3D models (STL format) created with CAD can also be read.



Select tools

- 3D models of standard tools already stored
- Select from a stored 3D model

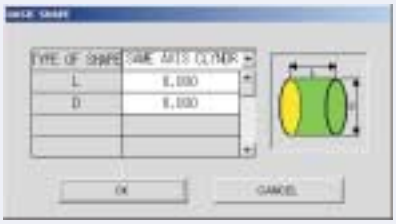
3D models (STL format) created with CAD and input tool profiles can also be read.



Enter blank shapes

- Interactively enter of basic configurations

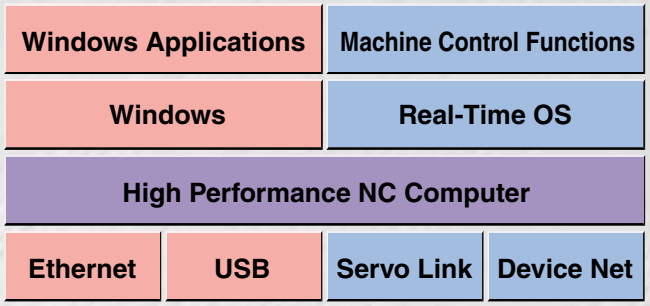
3D models (STL format) created with CAD can also be read.



A Machine Control and Windows Collaboration

OSP-P200

The advanced architecture



A Machine Control and Windows Collaboration

The NC software developed by our "Single Source for Machine & Control" platform continues to provide advanced functions like Collision Avoidance System and other truly innovative control technologies.

A high-performance NC computer in a flat panel

PC-based expandability, highly reliable protection of machine control and data in tough factory environments – to give keep you constantly competitive and operating with optimum efficiency.

Easy-to-use operation panel

Large 15-inch display
- Screen is 2.1 times larger than before
- Huge increase in amount of information that can be displayed

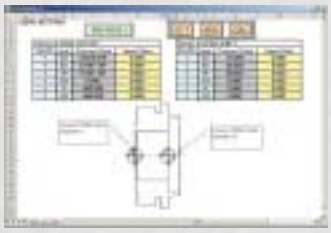
Touch panel
- Direct manipulation of data
- Durable panel resists dirt and scratches

USB ports
- 2 ports are standard. Various devices can be connected, like USB memory sticks for transfer of large NC programs, and bar code readers for production control applications.

One-Touch Spreadsheet (Optional)

Excel file operations
- Now you can use Excel files on an NC controller
- Machining instructions and performance reports can be prepared in Excel; compile instructions and results
- Also get zero offsets, tool offsets, common variables and other settings – from Excel

[Zero offset]



[Tool list]

[Operating ratios]

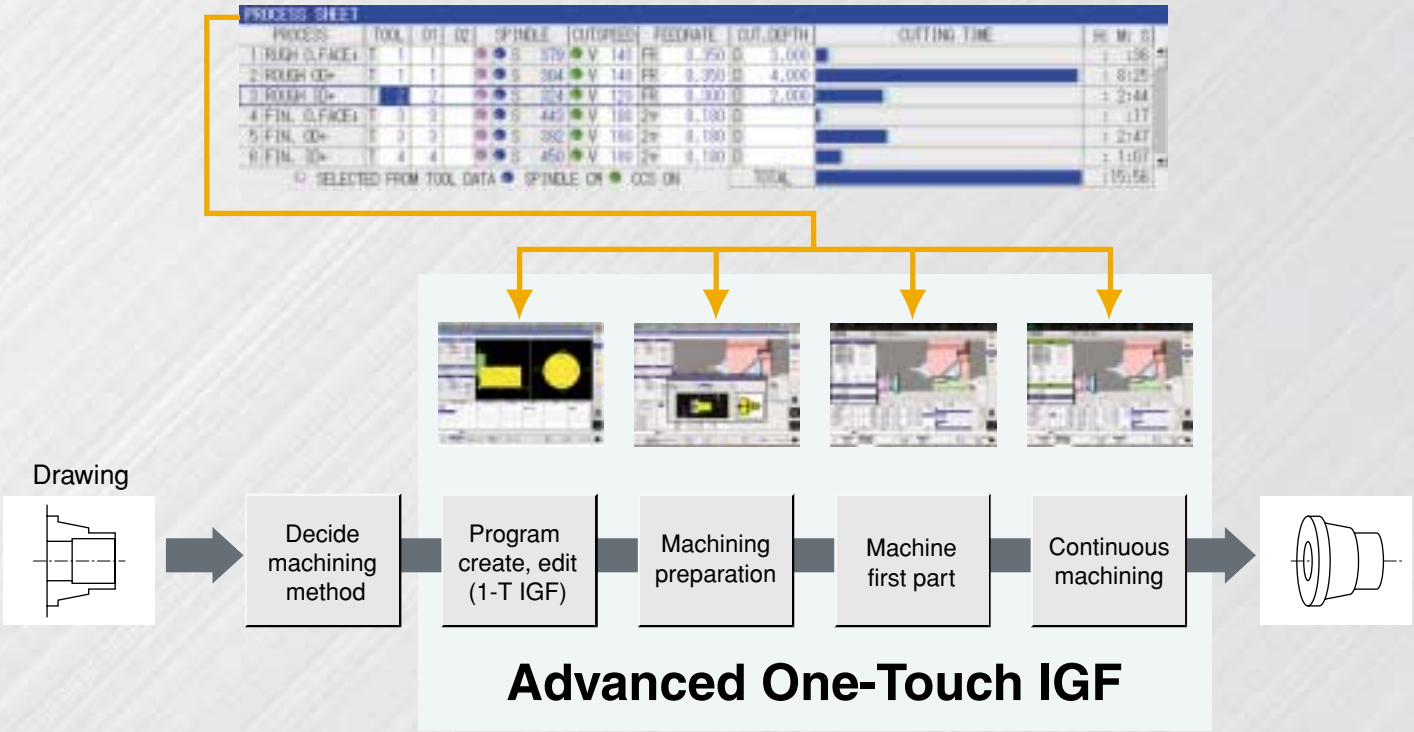
Advanced One-Touch IGF (Optional)

Single screen operations

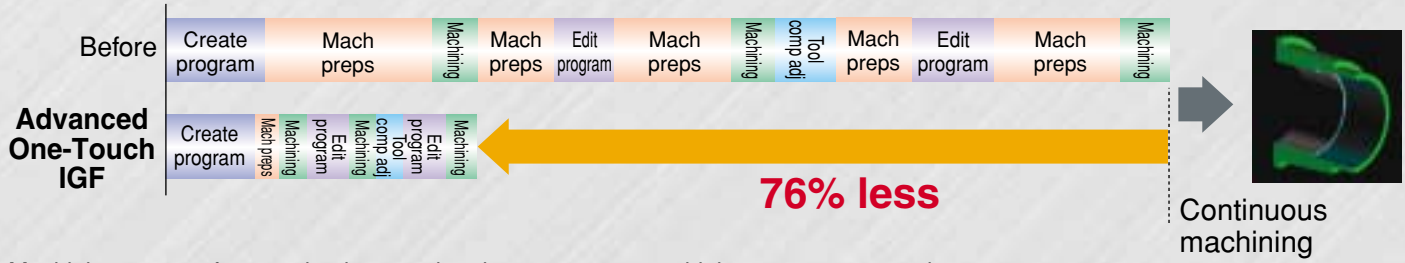
- A single screen shows actual position, simulation, machining prep tables, and more. Mode switchover is eliminated; with minimal screen switchovers and cursor movements.

Operate from machining order tables

- Program create, machining preps; various operations can be done directly from machining order tables
- Operation is simple even without memorizing G/M codes



Input Comparison



Machining preps refer to tasks done to alter the program or machining parameters, such as program store, tool compensation settings, program call-up, and sequence return.

Machine Specifications

Specifications				MULTUS B300		
				T	C*1	W*2
●Capacity	Swing over saddle		mm (in.)	ø630 (ø24.80) (Y=0)		
	Max machining dia		mm (in.)	ø630 (ø24.80)		
	Distance between centers		mm (in.)	900 (ø35.43)		
●Travels	X axis		mm (in.)	580 (+560~-20) {22.83 (+22.05~-0.79)}		
	Z axis		mm (in.)	935 (ø36.8)		
	Y axis		mm (in.)	160 (+80~-80) {62.99 (+3.15~-3.15)}		
	W axis		mm (in.)	–		1,000 (39.37)
	C axis		degree	360 [Min controlled angle 0.001]		
	B axis indexing angle		degree	-30~195 [Min controlled angle 0.001]		
●Main spindle	Spindle speed		min-1	38~5,000		
	Speed ranges	(VAC coil switching)		Auto 2-speed		
	Spindle nose			JIS A2-6		
	Tapered bore / Bearing dia		mm (in.)	ø62 / ø100 (ø2.44 / ø3.94)		
●Opposing spindle	Spindle speed		min-1	–		38~5,000
	Speed ranges	(VAC coil switching)		–		Auto 2-speed
	Spindle nose			–		JIS A2-6
	Tapered bore / Bearing dia		mm (in.)	–		ø62 / ø100 (ø2.44 / ø3.94)
●Turret	Type			H1-ATC		
	No. of tools			1 for both L- and M-tools		
	Tool shank / Boring bar shank dia		mm (in.)	□25 / ø40 (□1 / ø1-1/2)		
●Live-tool spindle	Speed range		min-1 {rpm}	50~6,000 (10,000*)		
	Max torque (3 min/cont)		N·m (ft-lbf)	65.7/41.8 (48.49/30.85) [57.3 / 38.2 (42.29 / 28.19)*]		
	Live tool spindle dia		mm (in.)	ø70 (ø2.76)		
●Feeds	Cutting feed command range		mm/rev (ipr)	0.001~1,000 (0.00004~39.37)		
	Rapid traverse		mm/min (rpm)	X: 40,000 (1,575)	Z: 40,000 (1,575)	Y: 26,000 (1,024)
				–		W: 20,000 (787)
			min-1 {rpm}	C: 200	B: 30	
●NC tailstock	Center size			–	MT No. 5	–
	Tailstock travel		mm (in.)	–	1,000 (39.37)	–
●ATC	Tool shank / Pull stud			HSK-A63 (CAPTO C6*)		
	No. of tools			20 (40*, 60*)		
	Max tool dia		mm (in.)	ø90 [ø130 w/o adjacent tools] (ø3.54 [ø5.12])		
	Max tool length		mm (in.)	300 (from gauge line) (11.81)		
	Max tool weight		kg (lb)	10 (22)		
●Motors	Main spindle	(20 min/cont)	kW (hp)	VAC 15 / 11 (20 / 15)		
	Opposing spindle	(20 min/cont)	kW (hp)	–		VAC 15 / 11 (20 / 15)
	Live-tool spindle	(5 min/cont)	kW (hp)	PREX 11 / 7.5 (15 / 10) [PREX 16 / 11 (22 / 15)*]		
	Z axis		kW (hp)	BL4.5 (6)		
	X axis		kW (hp)	BL4.5 (6)		
	Y axis		kW (hp)	BL2.8 (4)		
	W axis		kW (hp)	–	BL3.3 (4) (NC tailstock)	BL2.8 (4)
	Coolant pump		kW (hp)	0.8 (1)		
●Machine size	Height		mm (in.)	2,600 (102.36)		
	Floor space		mm (in.)	4,340 x 2,050 (170.86 x 80.7)		
	Weight		kg (lb)	9,700 (21,340)	10,000 (22,000)	10,300 (22,660)
●CNC	Okuma			OSP-P200		

*1. Tailstock *2. Opposing spindle *Optional

■Opposing spindle (W specs)

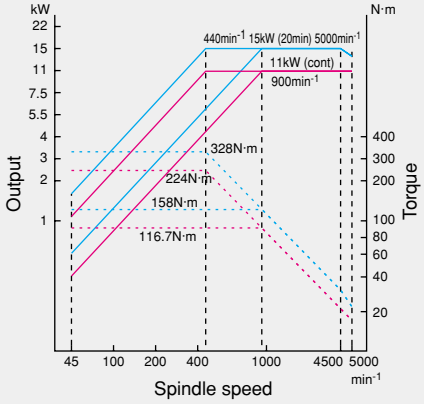
Machining capacity

- Max 5,000 min-1
- VAC 15/11 kW (20/15 hp)
- OD machining

Heavy-duty: 2.5 mm2 (0.004 in.2)
Cutting speed: 100 m/min (328 fpm)
Cutting depth: 5 mm (0.20 in.)
Feedrate: 0.5 mm/rev (0.02 ipm)

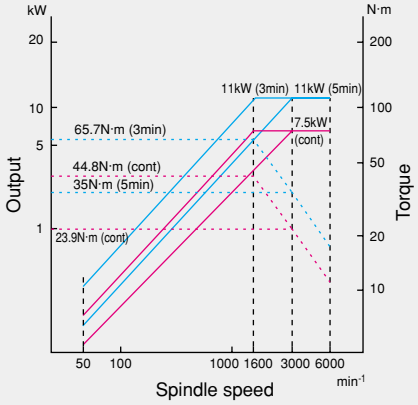
Main spindle moter output/torque

- Rotation MAX 5,000 min^{-1}
- Output 15/11 kW (20/15 hp) (20 min/cont)
- Torque 328 N·m (242.06 ft-lbt)



Live tool output/torque

- Rotation MAX 6,000 min^{-1}
- Output 11/7.5 kW (15/10 hp) (5 min/cont)
- Torque 65.7 N·m (48.49 ft-lbt)



■Optional

Optional accessories and specifications

Spindle	Big-bore: ø120 (22/15 kW 3,800 min^{-1})
	High output: ø100 (22/15 kW 5,000 min^{-1})
Live-tool spindle	HSK-A63 10,000 min^{-1} (oil mist)
	CAPTO C6 6,000 min^{-1} (grease)
	CAPTO C6 10,000 min^{-1} (oil mist)
ATC tools	40
	60
Touch setter	Touch setter M
	Touch setter A
In-process gauging	
Parts catcher	
Coolant	
Auto door	
AbsoScale	X, Ys, Z
Chip disposal	Chip conveyor (right discharge)
Steadyrest	Relieving
	Fixed pressure
In-machine	Work ejector (loader)
Bar feeder	
Loader	OGL10
	OGL30
Mist collector	
Oil skimmer	
Thru-coolant	
Thru-air blow	

Touch setter

Auto cutting-point measurement and tool offset/breakage detection

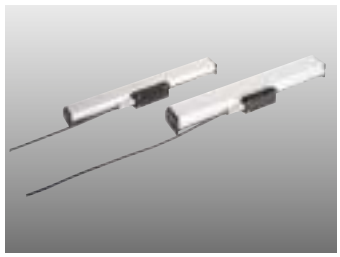
In-process work gauging

By ATC-delivered, high-precision wireless touch sensor — for superb auto work gauging (dual dia/radius gauging).

CAPTO C6

Sandvik quick-change tooling system

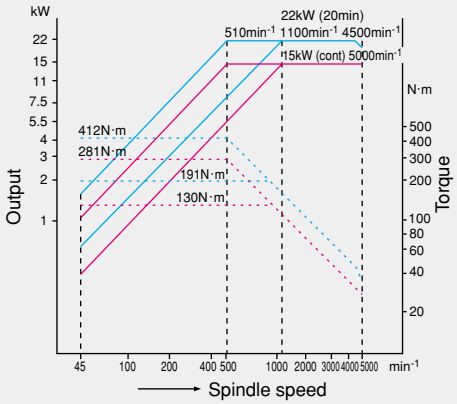
AbsoScale



Okuma high-speed/resolution [0.1 μm] optical absolute position encoders improve machining accuracy by avoiding ball-screw thermal expansion and backlash.

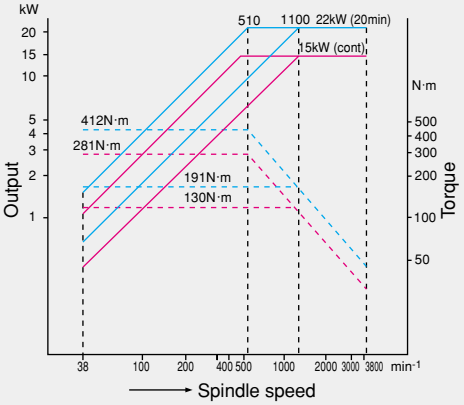
High output specs

- Rotation MAX 5,000 min^{-1}
- Output 22/15 kW (29/20 hp) (20 min/cont)
- Torque 412 N·m (304.06 ft-lbt)



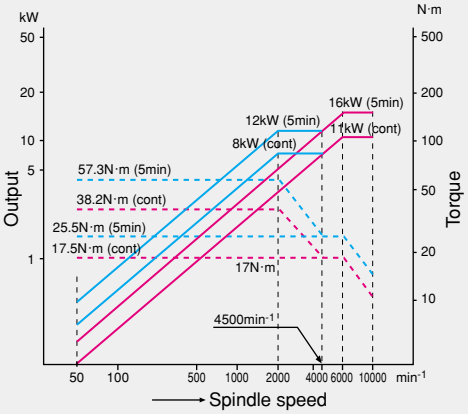
Big-bore specs

- Rotation MAX 3,800 min^{-1}
- Output 22/15 kW (29/20 hp) (20 min/cont)
- Torque 412 N·m (304.06 ft-lbt)

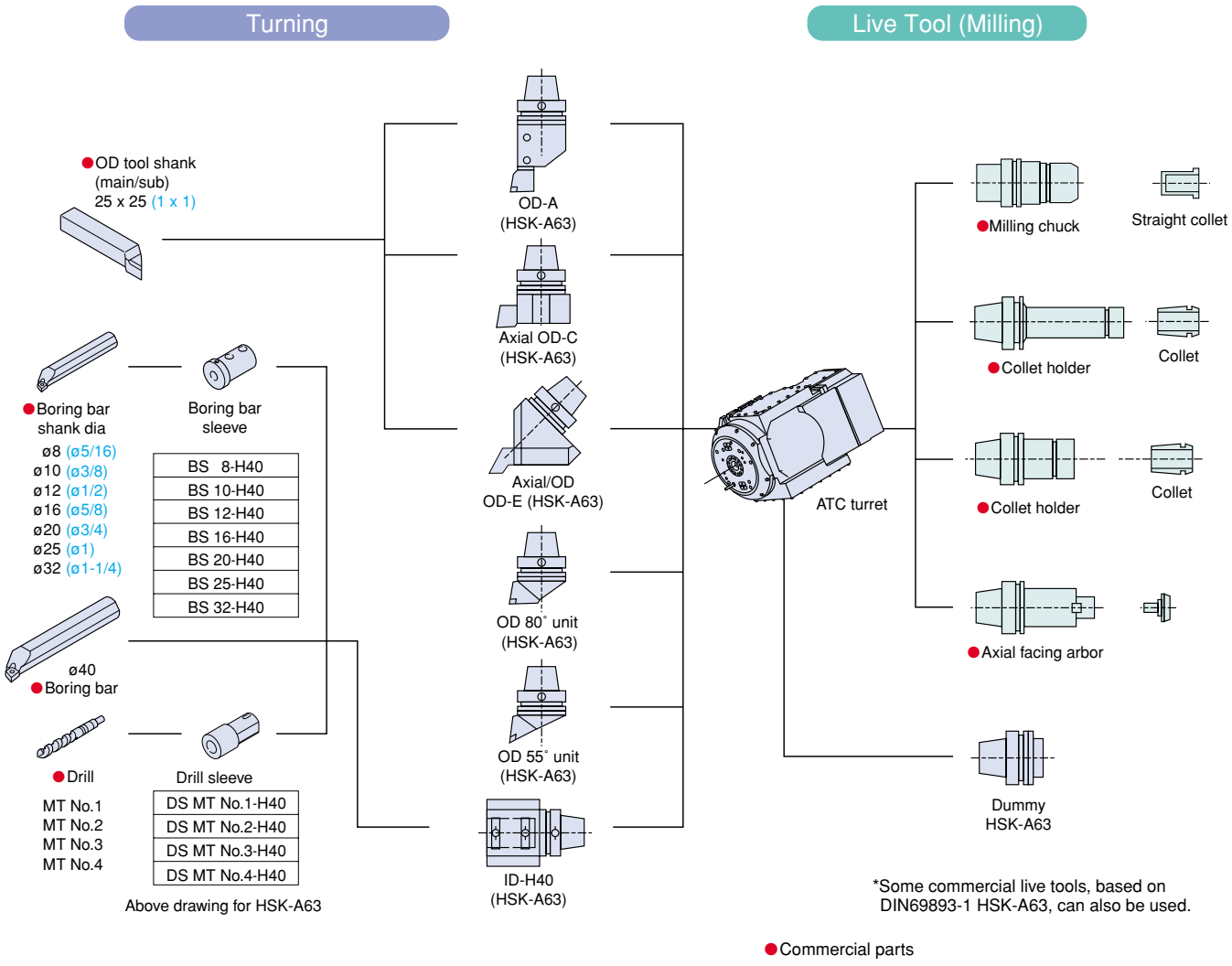


High-speed live tool spindle

- Rotation MAX 10,000 min^{-1}
- Output 16/11 kW (21/15 hp) (5 min/cont)
- Torque 57.3 N·m (42.29 ft-lbt)



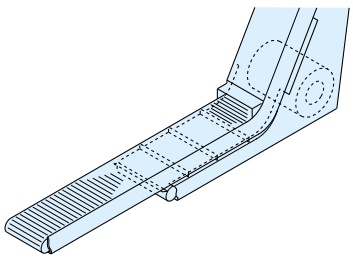
Tooling System (HSK A63)



Chip Conveyors

■ Recommend specs

● Hinge scraper + drum filter
- For cast iron and steel
- Coolant filtered from aluminum or cast iron chips (long or short)



*Machined raised 50 mm (1.96 in.)
*Standard filter unit becomes unnecessary

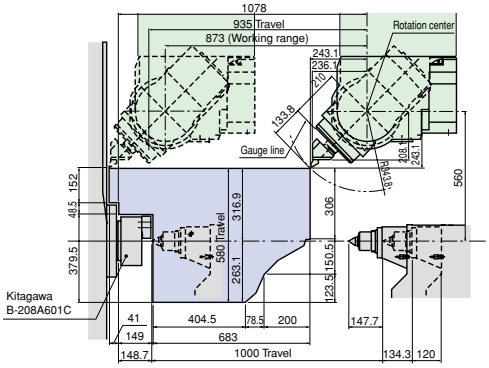
● Hinge
- General applications (steel)

● Scraper
- For cast iron
- Easy for maintenance
- Blade scraper

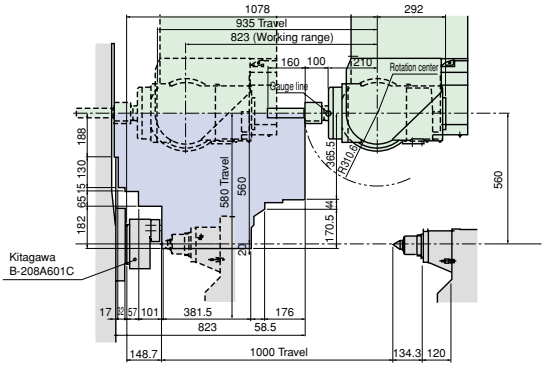
● Magnetic scraper
- For cast iron
- Suitable for sludge

■Main spindle

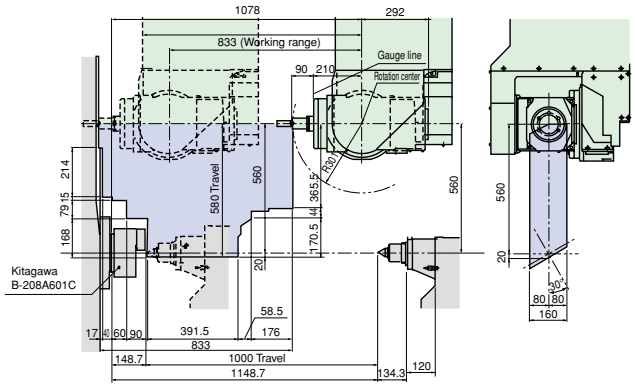
●OD-E (B axis 45°)



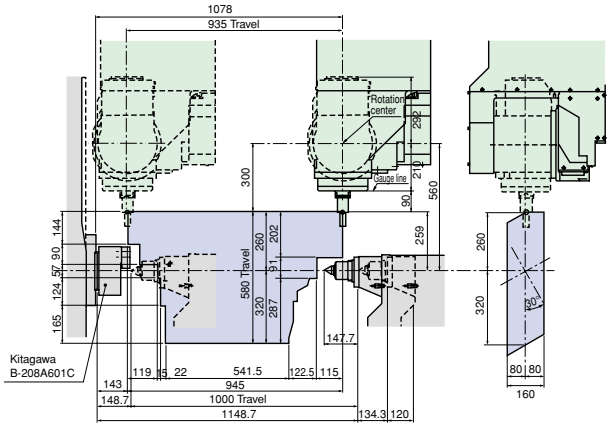
●ID-H40 (B axis 0°)



●End mill holder (B axis 0°)

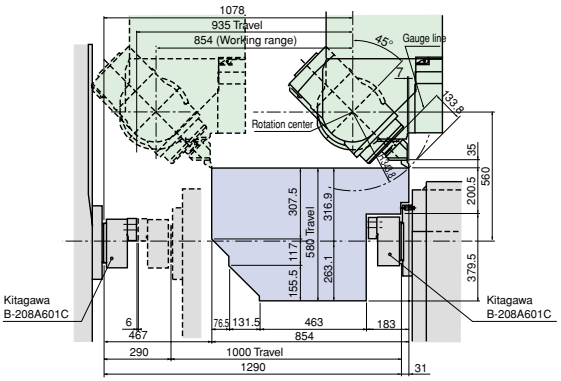


●End mill holder (B axis 90°)

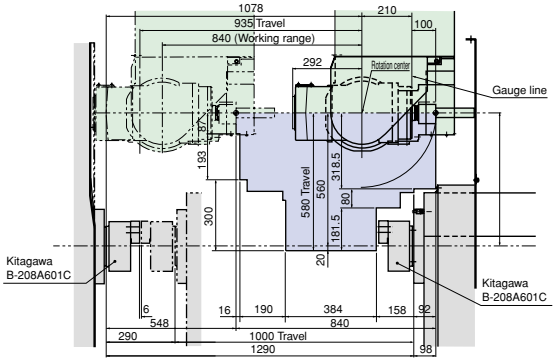


■Opposing spindle

●OD-E (B axis 135°)



●ID-H40 (B axis 180°)



●End mill holder (B axis 180°)

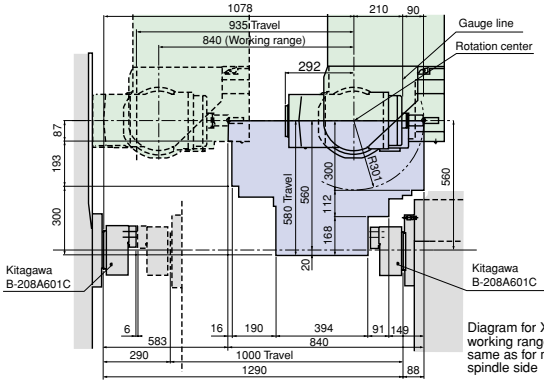


Diagram for X-Y axis working range is same as for main spindle side

●End mill holder (B axis 90°)

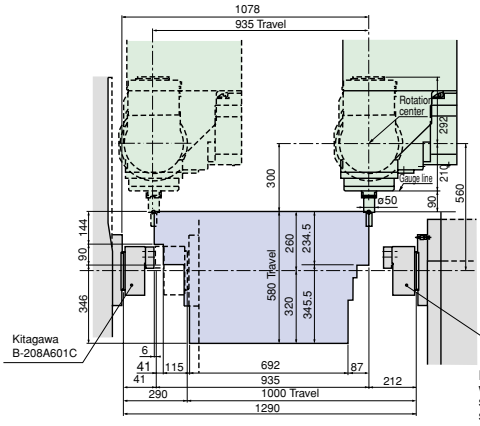


Diagram for X-Y axis working range is same as for main spindle side

OSP-P200L

Standard Specifications

Basic Specs	Control	Turning: X, Z simultaneous 2-axis, Multitasking: X, Y, Z, C simultaneous 4-axis
	Position feedback	OSP full range absolute position feedback (zero point return not required)
	Min / Max inputs	8-digit decimal, ±99999.999 ~0.001 mm (±3937.0078~0.0001 in.), 0.001° Decimal:1 μm, 10 μm, 1 mm (0.0001,1in.) (1°, 0.01°, 0.001°)
	Feed	Override: 0 to 200%
	Spindle control	Direct spindle speed commands (S5) override 50~200% Constant cutting speed, optimum turning speed designate
	Tool comnpensation	Tool selection: 96 sets, tool offset: 96 sets
	Display	15-inch color display operational panel
	Self-diagnostics	Automatic diagnostics and display of program, operation, machine, and NC system problems
	Program capacity	Program storage: 2 GB, operation buffer: 2 MB
Operations	Programing	Program management, edit, multitasking, scheduled programs, fixed cycles, special fixed cycles, tool nose R compensation, slope machining, M-spindle synchronized tapping, fixed drilling cycles, arithmetic functions, logic statements, trig functions, variables, branch statements, auto programming (LAP4), programming help
	Machine operations	MDI, manual (rapid traverse, manual cutting feed, pulse handle), load meter, operations help, alarm help, sequence return, manual interrupt & auto return, threading slide hold, data I/O
	MacMan	Machining Management: machining results, machine utilization, fault data compile & report, external output
Com / Net		USB ports, Ethernet
High speed/accuracy		Hi-G control, B-axis rotation compensation

Optional Specifications

Kit		NML		3D		One-Touch IGF-M	
		E	D	E	D	E	D
New Operation Function							
Advanced One-Touch IGF (multitasking)						●	●
Programming							
Circular threading			●		●		●
User Task 2 I/O variables, eight each							
Tool offsets: 200 sets (Std: 96)							
Common variables: 1000 (Std: 200)							
Thread matching (spindle orientation required)							
Threading slide hold (G34, G35)							
Threading override							
Spindle synchronized tapping (rigid tapping)							
Spindle dead-slow cutting							
Helical cutting							
Multitasking machines	Coordinate conversion	●	●	●	●	●	●
	Profile generation	●	●	●	●	●	●
	Flat turning						
	B-axis slope machining						
Monitoring							
One-Touch Spreadsheet							
Real 3D simulation				●	●	●	●
Cycle time over check		●	●	●	●	●	●
Load monitor (spindle, feed axis)				●	●	●	●
Load monitor no-load detection (effective when load monitor ordered)							
Tool life management			●		●		●
Operation end buzzer							
Chucking miss detection		Included in machine specs					
Work counters	Count only, ( ) pcs						
	Cycle stop, ( ) pcs						
	Start disabled, ( ) pcs						
Hour meters	Power ON						
	Spindle rotation						
	NC operating						
NC operation monitor (counter, totaling)		●	●	●	●	●	●
NC work counter (stops at full count with alarm)							
Operation end lamp (yellow)							
Alarm lamp (red)							
Status indicator (triple lamp) Type C [Type A, Type B]		●	●	●	●	●	●
Gauging							
In-process work gauging		Included in machine specs					
Z-axis auto zero offset (touch sensor)							
C-axis auto zero offset by touch sensor							
Gauging data output, file output							
Post-process work gauging interfaces	Set levels (5-level, 7-level)						
	BCD						
	RS-232-C (dedicated channel)						
Touch setter [M, A]		Included in machine specs					
Y-axis gauging							

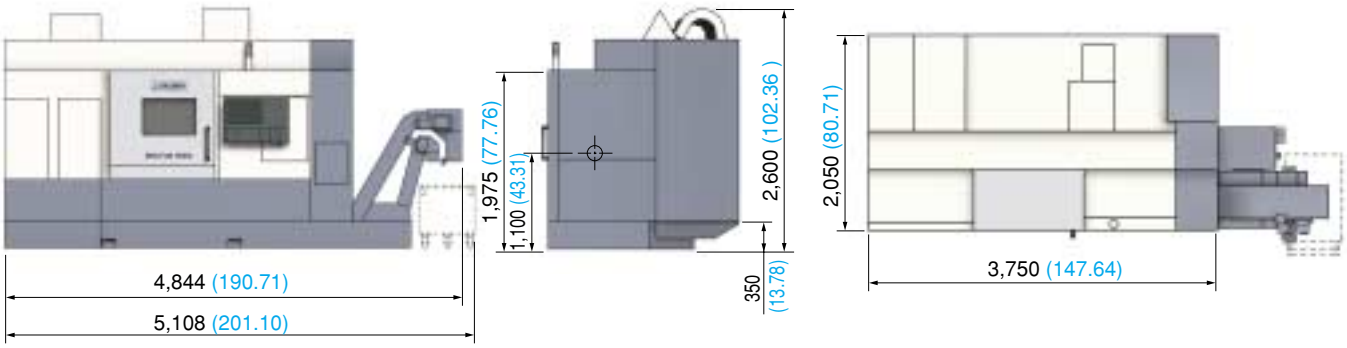
Kit		NML		3D		One-Touch IGF-M	
		E	D	E	D	E	D
External I / O, Communication Functions							
Additional RS-232-C channel [1 chan, 2 chan] (Standard specs iinclude 1 channel)							
USB (additional)	2 additional ports possible						
DNC link	DNC-T3						
	DNC-C / Ethernet *						
	DNC-DT						
	FL-net *						
Automation / Untended Operation							
Spindle orientation, electric			●		●		●
Variable spindle speed control		●	●	●	●	●	●
Auto power shutoff M02, alarm							
Warmup function (by calendar timer)							
Tool retract cycle							
External program selections	A (pushbutton) 8 types						
	B (rotary switch) 8 stages						
	C1 (digital switch) BCD, 2-digit						
	C2 (external input) BCD, 4-digit						
Okuma loader (OGL) interfaces		Included in machine specs					
Third party robot and loader interface *	TYPE B (machine)						
	TYPE C (robot and loader)						
	TYPE D						
	TYPE E						
Bar feeders	Bar feeder	Included in machine specs					
	Interface only Maker Type						
Cycle time reduction *	Operation time reduction	●	●	●	●	●	●
	Spindle rotating chuck open/close						
	Spindle rotating tailstock advance/retract						
High-Speed / High-Accuracy Functions							
Thermal deformation comp (TAS-S, TAS-C)		Included in machine specs					
AbsoScale feedback (X, Y, Z) *							
0.1 μm (0.01 μin.) control *							
Pitch error compensation (X, Y, Z)							
Other Functions							
Short circuit breaker							
External M signals [2 sets, 4 sets, 8 sets, ( )]							

Note 1. NML: normal, 3D: Real 3-D, E: economy, D: deluxe
Note 2. * Requires technical consultation and confirmation with machine specifications

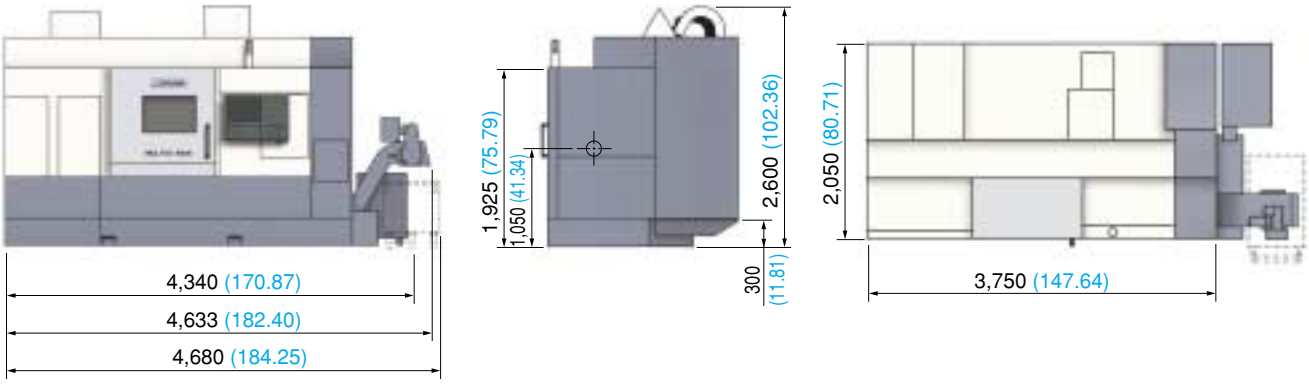
MULTUS B300

Dimensional Drawing / Installation Drawing

● With drum filter conveyor



● With filter unit



OKUMA

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

This product is subject to Japanese government regulations under the Foreign Exchange and Foreign Trade Control Act with regard to strategic goods. When further transport of this product to another country is being considered, prior consultation with Okuma Corporation is required.

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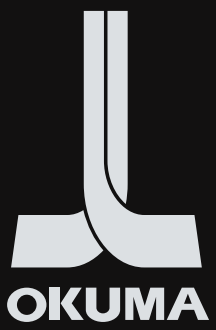
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