OKUMA

OPEN POSSIBILITIES

# MULTUS B Series

## MULTUS B550
## MULTUS B750

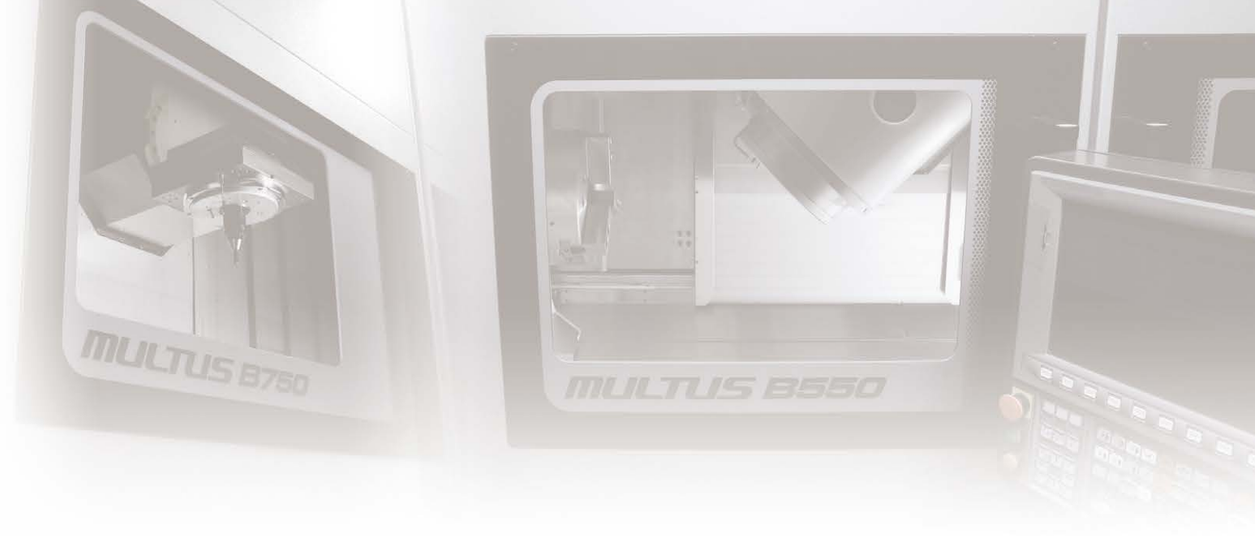
Intelligent Multitasking Machines

# MULTUS B Series

## Intelligent Multitasking Machines

### MULTUS B550/MULTUS B750

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




## See the future of intelligent machining— with multitasking and Okuma Intelligent Technologies

Process-intensive machining that exceeds expectations
with excellent structural design and a next-generation CNC system.

- All processes for large-diameter, long workpieces done on a single machine with a wide array of applications
- Higher productivity than a large lathe and machining center
- Outstanding operability achieved with a control made by machine tool manufacturer

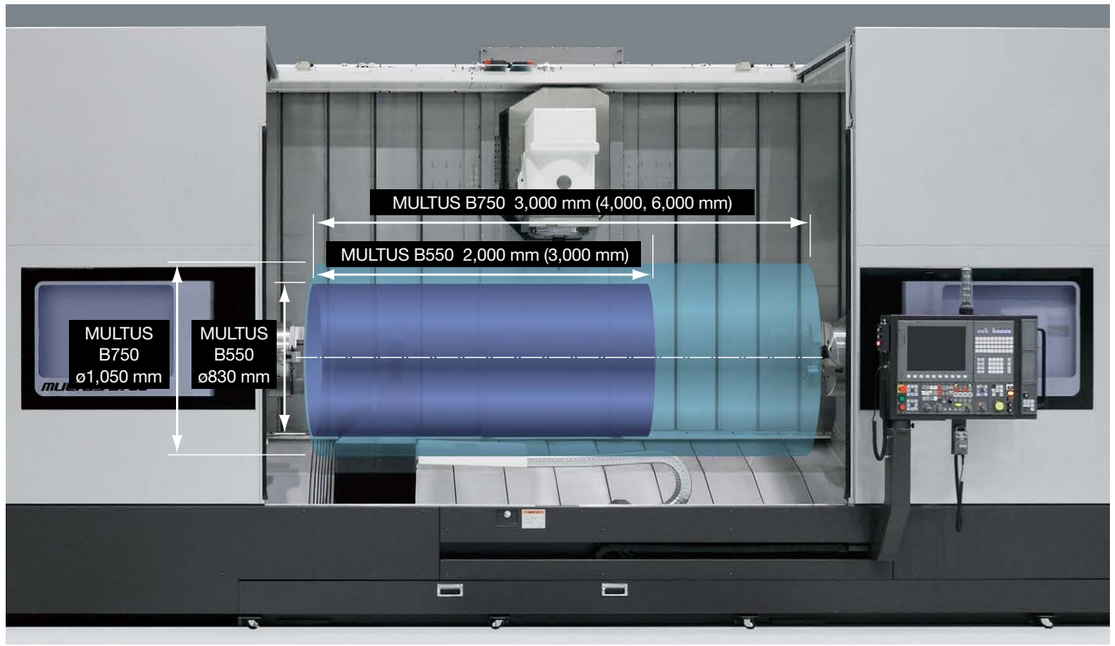
MULTUS B550

MULTUS B750

Photographs used in this brochure may show optional equipment.

# Full process-intensive machining of large-diameter, long workpieces

A large working range that can handle large or long workpieces up to ø1,050 mm and 6,000 mm (MULTUS B750) in length is ensured with an orthogonal 3-axis machine configuration. Rigidity essential for the machining of large parts is achieved with use of diagonal rib structured columns and high-accuracy, high-rigidity spindles. Turning capacity is equivalent to that of a large NC lathe, while milling capacity corresponds to that of a horizontal machining center.




## Largest working range in class

Even large parts can be machined without difficulty thanks to a wide working range produced by large Y-axis travel and strong support capacity.

### Maximum support mass

| | MULTUS B550 | MULTUS B750 |
|---|---|---|
| Double-centered support mass | 1,500 kg | 8,000 kg |
| Double-sided support mass | 1,600 kg | 5,000 kg |

Note: The support mass values are optional specs.
MULTUS B550: BB spindle, opposing BB spindles
MULTUS B750: DBC 6000 + SBB spindle + high thrust tailstock + auto tow-along tailstock, opposing BB spindles
[BB: Big-Bore, SBB: Super Big-Bore]

## Performs full-fledged milling

With an orthogonal 3-axis structure, full-fledged milling that exceeds the capacity of multitasking machines is achieved in milling difficult right angles or drilling with high pitch accuracy.

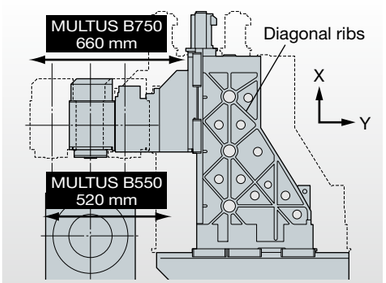


Illustration shows MULTUS B750

### X-axis rigidity maintained during Y-axis movement

A column feed system is used for Y-axis travel. With a rigid and highly stable X-axis structure, the ram extension remains constant at any Y-axis position.

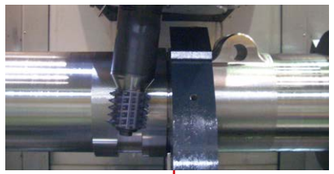


# A single machine performs all the machining operations for a wide variety of applications

## Fully integrated operations for long parts—from inner diameter, outer diameter, and gear machining to high-speed contour shaping

### Flute milling of gears with hob cutter

Gear section machining by mounting a hob cutter on the milling tool spindle and synchronizing (hobbing function: option) with the C-axis at a fixed ratio.
If the Gear Machining Package (option) is used, programming can be done simply by inputting the tool and gear specifications and cutting conditions.



Gear section

### High-speed contour shape machining

With Super-NURBS (option), high speed machining of curved surfaces is achieved in accordance with machine characteristics, based on fine control of tool travel position, speed, acceleration, and changes in acceleration to draw out the maximum performance of the machine.

- Product name: Landing gear model
- Cycle time: 9 h 40 min

Machining with left spindle

### ID super deep hole machining

Long boring bar (option) can be used on either left or right spindle. Handles even deep hole machining of 1 m without interference.

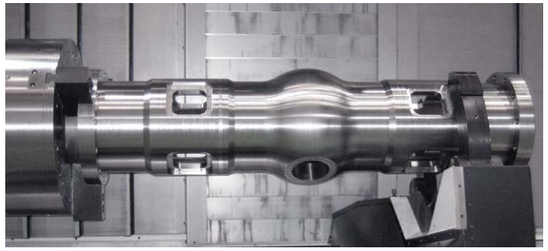
Machining with right spindle

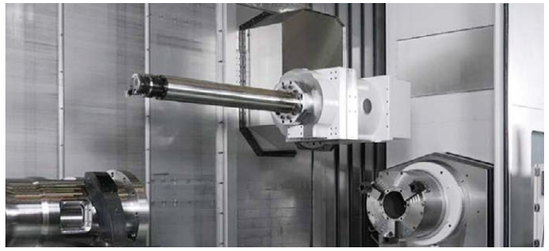
## Full use of opposing spindle and long boring bar for process-intensive boring

### High-accuracy machining with steadyrest

The use of steadyrests suppresses workpiece bending from its own weight and workpiece distortion from cutting force, thus enabling high-accuracy machining.

- Product name: Valve body (hydraulic part)
- Material: S45C
- Cycle time: 1 h 40 min
- Size: ø270 × 1,000 mm
- Machining portion: ID dome section, ID finishing dome section, window section milling





# Cycle times shortened with powerful machining

Equipped with high-power, high-torque turning spindle and milling tool spindle, achieves powerful machining equivalent to a large lathe or machining center. Even large workpieces with much removal stock can be machined with ease. Also handles various types of machining with its abundant product variants, including Big-Bore spindle and M-spindle high speed specifications.

## Turning spindle

Spindle with highly rigid structure combining roller bearings and angular bearings. All types of machining processes can be done, from heavy-duty cutting to processes that demand high quality surface roughness.

## Milling tool spindle

Milling tools with integral motor/spindle offer powerful cutting with high torque output (MULTUS B550: 321 N-m, MULTUS B750: 505 N-m). Ensures optimum rigidity in turning and milling with a roller bearing and angular bearing construction.

| Turning | MULTUS B550 | MULTUS B750 |
|---|---|---|
| | ø160 spindle: integral motor | ø220 spindle: 4-spd gear |
| | | |
| Spindle speed | 3,000 min$^{-1}$ | 2,000 min$^{-1}$ |
| Power | 37/30 kW (30 min/cont) | 37/30 kW (30 min/cont) |
| | ·Heavy cutting: 6.5 mm$^2$ | ·Heavy cutting: 6.5 mm$^2$ |

**OD** (Material: S45C)

| | | |
|---|---|---|
| Cutting | 150 m/min | 150 m/min |
| Depth | 10 mm | 10 mm |
| Feedrate | 0.65 mm/rev | 0.65 mm/rev |

**Insert drill** (Material: S45C)

| | | |
|---|---|---|
| Tool | ø63 carbide drill | ø63 carbide drill |
| Cutting | 180 m/min | 180 m/min |
| Feedrate | 0.25 mm/rev | 0.25 mm/rev |

| Milling | MULTUS B550 | MULTUS B750 |
|---|---|---|
| | Milling tool spindle | Milling tool spindle |
| | | |
| M-spindle speed | 10,000 min$^{-1}$ | 10,000 min$^{-1}$ |
| Power | 37/30/22 kW (3 min/30 min/cont) | 37/30/22 kW (3 min/30 min/cont) |
| | ·Chip volume: 1,000 cm$^3$/min | ·Chip volume: 1,000 cm$^3$/min |

**Face mill** (Material: S45C)

| | | |
|---|---|---|
| Tool | ø80 face mill, 8 blades | ø100 face mill, 10 blades |
| Cutting | 300 m/min | 300 m/min |
| Depth | 5.5 × 56 mm | 5 × 70 mm |
| Feedrate | 2.72 mm/rev | 3.0 mm/rev |
| Chips | 1,000 cm$^3$/min | 1,000 cm$^3$/min |

**Insert drill** (Material: S45C)

| | | |
|---|---|---|
| Tool | ø63 carbide drill | ø63 carbide drill |
| Cutting | 180 m/min | 180 m/min |
| Feedrate | 0.25 mm/rev | 0.25 mm/rev |

**TAP** (Material: S45C)

| | | |
|---|---|---|
| | M36 P4 | M42 P4.5 |



# Highly rigid structure shows its power in machining difficult-to-cut materials

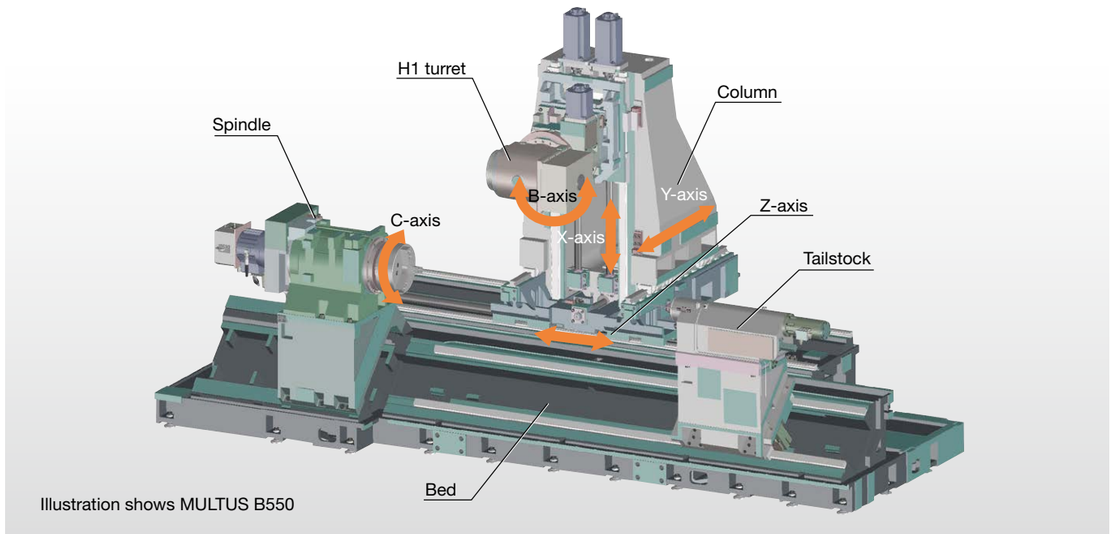


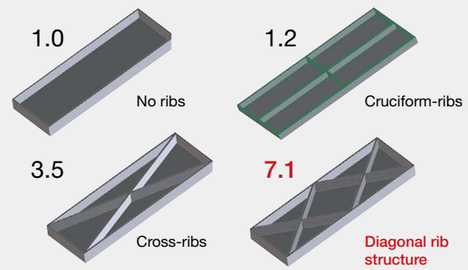

Illustration shows MULTUS B550

## Maintains high accuracy over the long term

Diagonal rib structure used on bed and column. This rigidity is 7 times greater than without ribs. It strongly resists bending and torsion, remaining rigid even with large loads from heavy-duty cutting so that high accuracy is maintained over the long term.

■ Diagonal rib structure casting

● Rigidity comparison sample (rigidity per weight)




## High follow-up accuracy with no positioning error

Large roller guides used on X-, Y-, and Z-axis for superior rigidity, wear resistance, and vibration damping, smooth movement, and accurate positioning. Double ball screws on X-axis eliminate positioning errors from movement direction and provide superb follow capability. In addition, a 3-way guide is used on the MULTUS B750, and straightness is maintained long term with long travel.

## Highly rigid tailstock

The tailstock quill has a large-diameter, highly rigid structure. The workpiece is supported with high thrust for stable support of even massive workpieces.

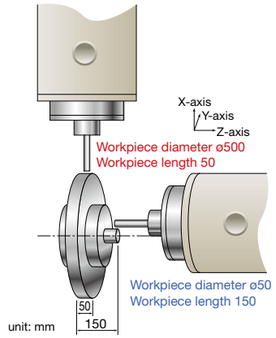
Photo shows MULTUS B750

| | MULTUS B550 | MULTUS B750 |
|---|---|---|
| Built-in quill | MT No. 5 | MT No. 6 |
| Quill stroke | 250 mm | 350 mm |
| Quill diameter | ø130 mm | ø180 mm |
| Movement system | Auto tow-along | Auto tow-along |
| Thrust | 15 kN | 26 kN |

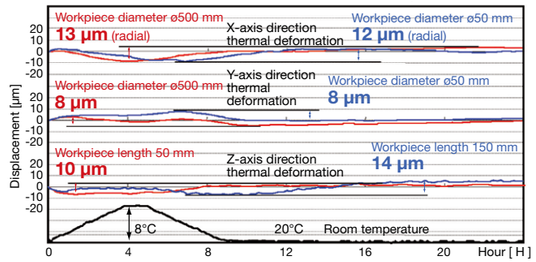
# Large machine with extraordinarily high accuracy

## Thermo-Friendly Concept
**Thermal Deformation–Accurately Controlled**

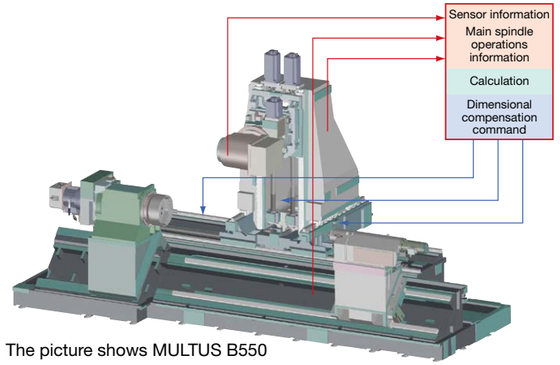
With thermal deformation control matched to the controlled axis position and machining point, dimensional changes from thermal deformation can be minimized regardless of workpiece size. Accurate control is also provided in various usage conditions, such as coolant use or downtime during lunch breaks.




### Thermal deformation over time ≤ 14 µm
(actual data with MULTUS B750)




- Running conditions: Spindle rotation 500 $mm^{-1}$ 24 h
- Room temperature change: Rise of 8° C from 20° C over 4 hours. After 1 hour, decline of 8°C over 4 hours. Coolant added

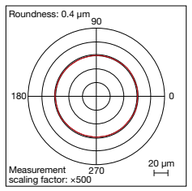


The picture shows MULTUS B550

**TAS-S [Thermo Active Stabilizer – Spindle]**
X-Y-Z axes control thermal deformation of the milling tool spindle

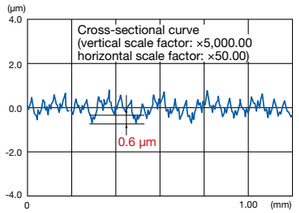
**TAS-C [Thermo Active Stabilizer – Construction]**
Overall control of thermal deformation on headstock, bed, column, and turret

### Roundness 0.4 µm
MULTUS B550 (actual turning data)




- Material : BsB
- Cutting conditions : Spindle speed 2,500 $min^{-1}$
  Feedrate 0.05 mm/rev

### Surface roughness 0.6 µm
(uniformity at tool edge)
MULTUS B550 (actual data)




- Material : BsB
- Cutting conditions : Spindle speed 2,000 $min^{-1}$
  Feedrate 0.05 mm/rev

### B-axis positioning accuracy ±0.0025°
MULTUS B750 (actual data)

### B-axis repeatability ±0.0005°
MULTUS B750 (actual data)

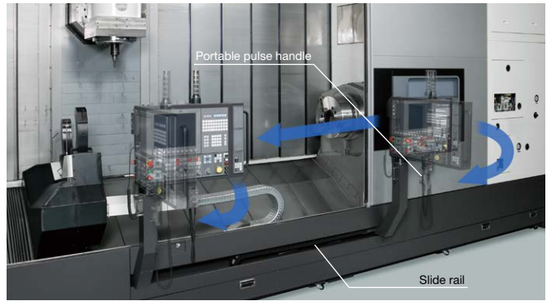
Note: The “actual data” referred to above for this brochure represent examples, and may not be obtained due to differences in specifications, tooling, cutting condition, and others.



# Machine construction with superior operability and maintainability

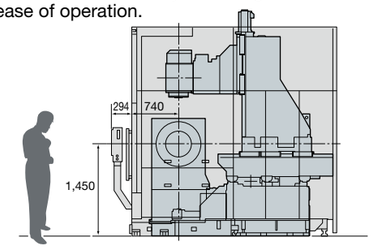
## Mobile operation panel with outstanding ease-of-use

Swivel and slide type operation panel and portable pulse handle are used. The operation panel can be moved freely on a slide rail that spans the entire front of the machine. The use of a portable pulse handle enables smooth movement while checking the tool edge in any location.




## Ease of use at operator’s line of sight

- **Bed and spindle layout for easy accessibility to spindle**
  Easy workpiece mounting and dismounting
  Reduced operator burden, including chip cleaning
- **Vertical X-axis with superior tool edge visibility**
  Tool edge comes to eye line height for ease of visibility and ease of operation.



(with MULTUS B750 and distance between centers of 3000)

## Front maintenance

To make regular maintenance easy to perform, the major oil supply locations are concentrated on the front of the machine. Maintenance is also possible by pulling the chip conveyor out the front.

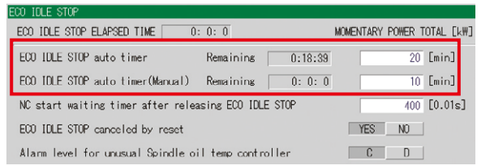
Note: May not be available for certain specifications.

## ECO suite plus
**Next-Generation Energy-Saving System**

A suite of energy saving applications for machine tools

### ECO Idling Stop
**Each unit operates only when required**

Auxiliary equipment consume a substantial portion of the power used in a factory. This function enables each of them to be turned off when not needed to reduce power consumption. In addition to when automatic operation is suspended, it is now possible to stop idling during manual operation. Power consumption and carbon dioxide emissions are reduced without conscious effort by the operator.



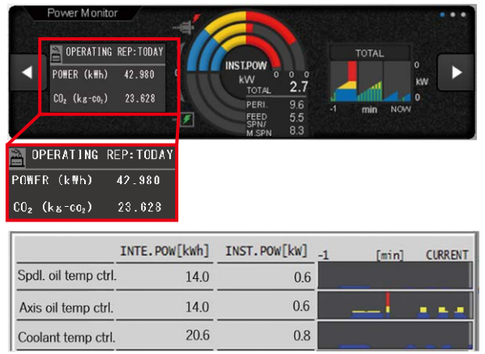

### ECO Operation (option)

Intermittent/continuous operation of chip conveyor and mist collector during operation

### ECO Power Monitor
**On-the-spot check of energy savings**

Spindle, feed axis, and auxiliary equipment power indicators are displayed separately on the OSP operation panel. The operation status of each device and power consumption/ carbon dioxide emissions can be checked on the spot.

- Power Monitor check example

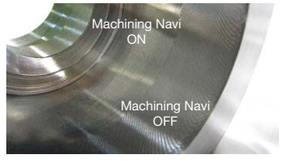


The displayed values are examples.

# Maximizing machine tool performance

### Cutting condition search
## Machining Navi (option)
**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**

### Machining Navi L-$g$Ⅱ (guidance)
**Chatter-free applications for lathes**

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

### Machining Navi T-$g$ (threading)
**Threading chatter can be easily controlled by anyone**

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

**For milling**

### Machining Navi M-$g$Ⅱ+
**Adjust cutting conditions while monitoring the data**
**(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.

### Machining Navi M-$i$
**Simple, auto-mode—leave it to the machine**
**Finding optimum cutting conditions quickly**
**(intelligently optimized spindle speed control)**

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

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

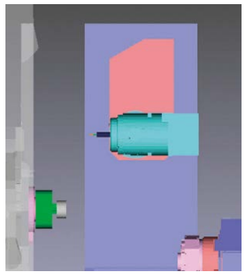
On multitasking machines there is “geometric error,” such as spindle runout, that can have huge effects on machining accuracy. The 5-Axis Auto Tuning System measures geometric error with a touch probe and datum sphere, and tunes multitasking machines for better operating accuracy through compensation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

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

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

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

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.


Virtual machine (advance simulation)

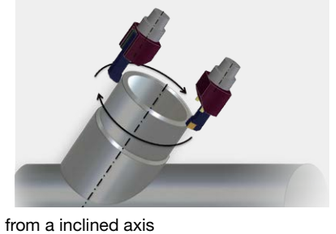
Actual machine



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

## Turn-Cut (option)
**Inclined axis turning**

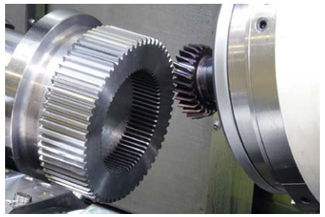
Turn-Cut is an original Okuma technology that enables turning with milling spindle. The circular motion of the feed axis and the spindle indexing angle are simultaneously controlled so that the tool edge is always facing the center of the milling spindle circular motion. Inclined axis turning can be done by inclining the B-axis. Moreover, machining of any diameter can be done with a single tool, enabling inside and outside diameter machining that is larger than the maximum tool diameter. For setting cutting conditions, the machine will recommend the optimum spindle speed if the diameter and roundness of the portion to be machined are specified with the Turn-Cut Guide app (option).

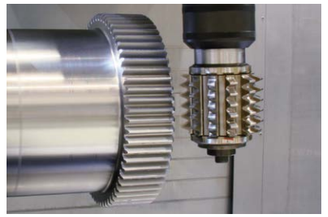


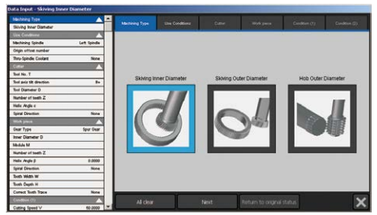
Turning can be done from a inclined axis

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

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


Skiving (OD/ID splines)


Hobbing



Input screen

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

Twenty types of geometrical accuracy, such as hole position and flatness, can be measured on the machine, greatly reducing measurement work. 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.

## Machine Specifications

| | Item | | MULTUS B550 | | | | MULTUS B750 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | C × 2000 | C × 3000 | W × 2000 | W × 3000 | C × 3000 | C × 4000 | C × 6000 | W × 3000 | W × 4000 | W × 6000 |
| Capacity | Swing over saddle | mm (in) | ø830 (32.68) | | | | ø1,050 (41.34) | | | | | |
| | Distance between centers (C), Distance between noses (W) | mm (in) | 2,000 (78.74) | 3,000 (118.11) | 2,544 (100.16) | 3,544 (139.53) | 3,000 (118.11) | 4,000 (157.48) | 6,000 (236.22) | 3,544 (139.53) | 4,544 (178.90) | 6,544 (257.64) |
| | Max machining dia | mm (in) | ø830 (32.68) | | | | ø1,050 (41.34) | | | | | |
| Travel | X-axis | mm (in) | 925 (36.42) | | | | 1,080 (42.52) | | | | | |
| | Z-axis | mm (in) | 2,215 (87.20) | 3,215 (126.57) | 2,215 (87.20) | 3,215 (126.57) | 3,215 (126.57) | 4,215 (165.94) | 6,215 (244.69) | 3,215 (126.57) | 4,215 (165.94) | 6,215 (244.69) |
| | Y-axis | mm (in) | 520 (±260) (20.47 (±10.24)) | | | | 660 (±330) (25.98 (±12.99)) | | | | | |
| | W-axis | mm (in) | – | | 2,100 (82.68) | 3,100 (122.05) | – | | | 3,100 (122.05) | 3,395 (133.66) | 4,595 (180.91) |
| | C-axis | degree | 360 (Min controlled angle 0.001) | | | | 360 (Min controlled angle 0.001) | | | | | |
| | B-axis indexing angle | degree | –30 to +210 (Min controlled angle 0.001) | | | | –30 to +210 (Min controlled angle 0.001) | | | | | |
| Spindle | Speed | $min^{-1}$ | 30 to 3,000 [10 to 2,400] | | | | 11 to 2,000 [14 to 1,500, 10 to 1,000] | | | | | |
| | Speed ranges | | 2 auto ranges (2-step motor coil switching) [4 auto ranges (4 speed gear)] | | | | 4 auto ranges (4 speed gear) [2 auto ranges (2 speed gear)] | | | | | |
| | Nose | | JIS A2-11 | | | | JIS A2-11 [JIS A2-15, A2-20] | | | | | |
| | Tapered bore / Bearing dia | mm (in) | ø112/ø160 [ø130/ø180] (ø4.41/6.3 [ø5.12/ø7.09]) | | | | ø142/ø220 [ø185/ø280, ø275/ø380] (ø5.59/8.66 [ø7.28/ø11.02, ø10.83/ø14.96]) | | | | | |
| Opposing spindle | Speed | $min^{-1}$ | – | | 30 to 3,000 [10 to 2,400] | | – | | | 11 to 2,000 [14 to 1,500] | | |
| | Speed ranges | | – | | 2 auto ranges (2-step motor coil switching) [4 auto ranges (4-speed gear)] | | – | | | 4 auto ranges (4-speed gear) | | |
| | Nose | | – | | JIS A2-11 | | – | | | JIS A2-11 [JIS A2-15] | | |
| | Tapered bore / Bearing dia | mm (in) | – | | ø112/ø160 [ø130/ø180] (ø4.41/ø6.3 [ø5.12/ø7.09]) | | – | | | ø142/ø220 [ø185/ø280] (ø5.59/ø8.66 [ø7.28/ø11.02]) | | |
| Turret (tool spindle) | Type | | H1 | | | | H1 | | | | | |
| | No. of tools | | 1 for both L and M | | | | 1 for both L and M | | | | | |
| | Tool shank dimensions / ID tool shank diameter | mm (in) | □25/ø50 (1×1/ø2) | | | | □32/ø63 (1-1/4 × 1-1/4, ø2-1/2) | | | | | |
| | Speed range | $min^{-1}$ | 40 to 10,000 | | | | 40 to 10,000 | | | | | |
| | Milling tool speed range | | 2 auto ranges (2-step motor coil switching) | | | | 2 auto ranges (2-step motor coil switching) | | | | | |
| | Milling tool spindle torque | N-m | 321/260/191 (3 min/30 min/cont) | | | | 505/300/205 (3 min/30 min/cont) | | | | | |
| Feed rate | Rapid traverse X-, Z-, Y-axis | m/min | X, Z, Y: 40 | | | | X, Z, Y: 40 | X, Y: 40, Z: 30 | | X, Z, Y: 40 | X, Y: 40, Z: 30 | |
| | Rapid traverse W-axis | m/min | – | | 20 | 15 | – | | | 15 | 12 | 10 |
| | Rapid traverse C-, B-axis | $min^{-1}$ | C: 200, B: 30 | | | | C: 100, B: 20 | | | | | |
| Tailstock | Quill diameter | mm (in) | ø130 (5.12) | | – | | ø180 (7.09) | | | – | | |
| | Center taper | | MT No. 5 (Built-in) | | – | | MT No. 6 (Built-in) | | | – | | |
| | Quill travel | mm (in) | 250 (9.84) | | – | | 350 (13.78) | | | – | | |
| ATC | Tool shank / Pull stud | | HSK-A100 [CAPTO C8, BT50/P50TⅡ] | | | | HSK-A100 [CAPTO C8, MAS BT50/P50TⅡ] | | | | | |
| | No. of tools | tool | 40 [80, 160] | | | | 40 [80, 160] | | | | | |
| | Max tool dia | mm (in) | ø130 (5.12) (w/o adjacent tools: ø260 (10.24)) | | | | ø135 (5.31) (w/o adjacent tools: ø300 (11.81)) | | | | | |
| | Max tool length | mm (in) | 600 (23.62) (from the gauge line) | | | | 600 (23.62) (from the gauge line) | | | | | |
| | Max tool mass | kg (lb) | 30 (66) | | | | 30 (66) | | | | | |
| Motor | Spindle motors | kW (hp) | 37/30 (50/40) (30 min/cont) | | Main/opposing: 37/30 (50/40) (30 min/cont) | | 37/30 (50/40) (30 min/cont) [45/37 (30 min/cont)] | | | Main/opposing: 37/30 (50/40) (30 min/cont) [45/37 (30 min/cont)] | | |
| | Milling tool spindle | kW (hp) | 37/30/22 (50/40/30) (3 min/30 min/cont) | | | | 37/30/22 (50/40/30) (3 min/30 min/cont) | | | | | |
| | Axis drive X-, Y-, Z-, B-axis | kW (hp) | X: 5.2 × 2, Z: 5.2, Y: 5.1, B: 4.6 (X: 6.9 × 2, Z: 6.9, Y: 6.8, B:6.1) | | | | X: 5.2 × 2, Z: 5.2, Y: 5.1, B: 4.6 (X: 6.9 × 2, Z: 6.9, Y: 6.8, B:6.1) | | | | | |
| | W-axis | kW (hp) | – | | 4.2 (5.6) | | – | | | 5.2 (6.9) | | |
| | Coolant motor (50/60 Hz) | kW (hp) | 0.25/0.25 × 1, 0.55/0.75 × 4 (0.33/0.33 × 1, 0.7/1 × 4) | | | | 0.25/0.25 × 1, 0.55/0.75 × 4 (0.33/0.33 × 1, 0.7/1 × 4) | | | | | |
| Machine size | Height | mm (in) | 3,307 (130.20) | | | | 3,557 (140.04) | 3,607 (142.01) | 3,610 (142.13) | 3,557 (140.04) | 3,607 (142.01) | 3,610 (142.13) |
| | Floor space (tank included) | mm × mm (in) | 8,030 × 3,258 (316.14 × 128.27) | 9,130 × 3,258 (359.45 × 128.27) | 8,430 × 3,758* (331.89 × 147.95) | 9,730 × 3,758* (383.07 × 147.95) | 9,130 × 3,532 (359.45× 139.06) | 10,555 × 3,532 (415.55 × 139.06) | 13,505 × 3,797 (531.69 × 149.49) | 9,730 × 4,022* (383.07 × 158.35) | 11,155 × 4,022* (439.17 × 158.35) | 13,505 × 4,287* (531.69 × 168.78) |
| | Mass (with CNC) | kg (lb) | 29,500 (64,900) | 33,000 (72,600) | 31,000 (68,200) | 34,000 (74,800) | 40,000 (88,000) | 43,500 (95,700) | 50,000 (110,000) | 44,000 (96,800) | 47,500 (104,500) | 54,500 (119,900) |
| CNC | | | OSP-P300SA | | | | OSP-P300SA | | | | | |

* Depth includes opposing spindle cooler [ ]: Option

* Depth includes opposing spindle cooler [ ]: Option

## Standard Specifications and Accessories

| | MULTUS B550 | MULTUS B750 |
|---|---|---|
| Headstock | JIS A2-11 (37/30 kW 3,000 $min^{-1}$) Integral spindle/motor | JIS A2-11 (37/30 kW 2,000 $min^{-1}$) Gear spindle |
| Milling tool spindle | 37/30/22 kW 10,000 $min^{-1}$ | |
| Turret | H1 ATC | |
| Tailstock | Built-in quill, MT No. 5, Auto tow-along | Built-in quill, MT No. 6, Auto tow-along |
| Auto tool changer | 40-tool magazine HSK-A100 | |
| Coolant system | Detachable coolant tank, pump motor: 0.25/0.25 (50/60 Hz) kW × 1, 0.55/0.75 (50/60 Hz) kW × 4, Milling tool spindle, through spindle specifications | |
| Full-enclosure shielding | DBC 2000: manual, DBC 3000: front door auto open/close | Front door auto open/close (safety tape SW included) |
| In-machine work lamp | LED | |
| Foundation pads, jack screws | ○ | |
| Hand tools | ○ | |
| CNC | OSP-P300SA | |
| Operating panel | 15-inch color TFT display | |
| Pulse handle | 1 pc, portable | |
| Other | Thermo Active Stabilizer – Spindle (TAS-S), Thermo Active Stabilizer – Construction (TAS-C), Collision Avoidance System<br>B-axis NC control, C-axis control, Synchonized Tapping | |

## Standard chuck sizes

| | | Main / Opposing spindle | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Chuck OD | 12-inch | | 15-inch | | 18-inch | | 21-inch | | 24-inch | |
| | Chuck type | Hollow | Solid | Hollow | Solid | Hollow | Solid | Hollow | Solid | Hollow | Solid |
| MULTUS B550 | Standard spindle A2-11 | ● | | ● | ● | | ● | | ● | | ● |
| | Big-Bore spindle A2-11 | | | ● | ● | ● | ● | ● | ● | ● | ● |
| MULTUS B750 | Standard spindle A2-11 | | | | ● | ● | | | | | |
| | Big-Bore spindle A2-15 | | | | | ● | | | | | ● |

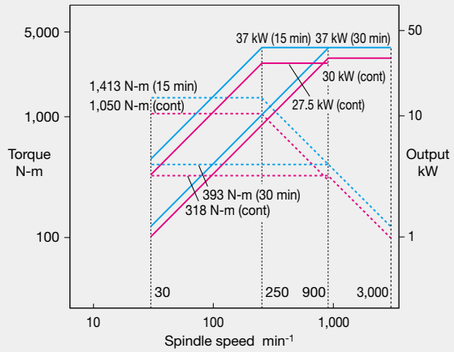
Boxes with no dots ● require consultation.

## Spindle Torque/Output Diagrams

〈MULTUS B550〉

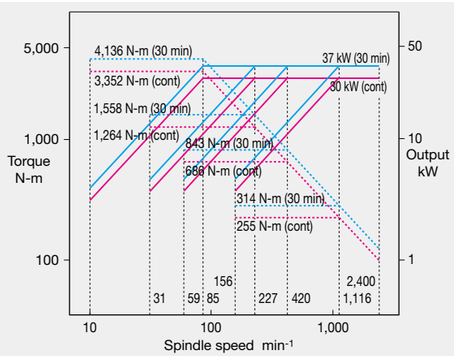
### Standard spindle (MULTUS B550 Main, Opposing)

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




### Big-Bore spindle (MULTUS B550 Main, Opposing)

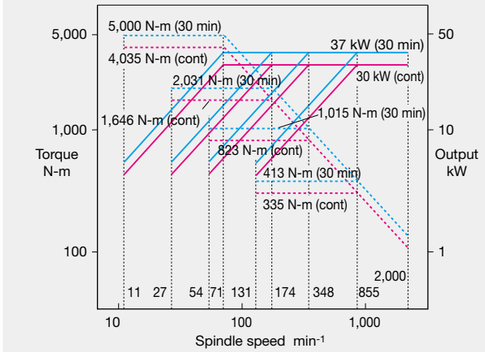
Spindle speed 2,400 min$^{-1}$
Output 37/30 kW (30 min/cont)
Torque 4,136/3,352 N-m (30 min/cont)




〈MULTUS B750〉

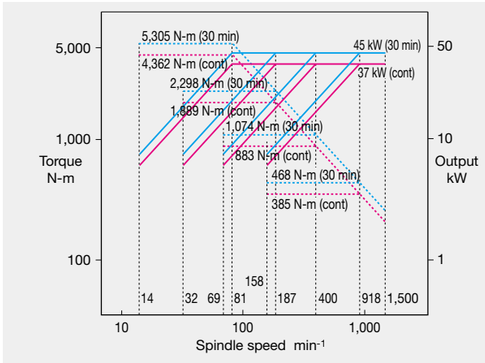
### Standard spindle (MULTUS B750 Main, Opposing)

Spindle speed 2,000 min$^{-1}$
Output 37/30 kW (30 min/cont)
Torque 5,000/4,035 N-m (30 min/cont)



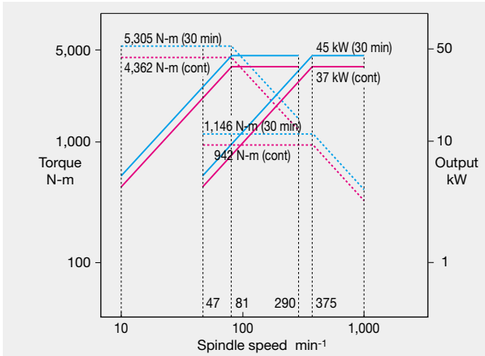

### Big-Bore spindle (MULTUS B750 Main, Opposing)

Spindle speed 1,500 min$^{-1}$
Output 45/37 kW (30 min/cont)
Torque 5,305/4,362 N-m (30 min/cont)




### Super Big-Bore spindle (MULTUS B750 Main)

Spindle speed 1,000 min$^{-1}$
Output 45/37 kW (30 min/cont)
Torque 5,305/4,362 N-m (30 min/cont)



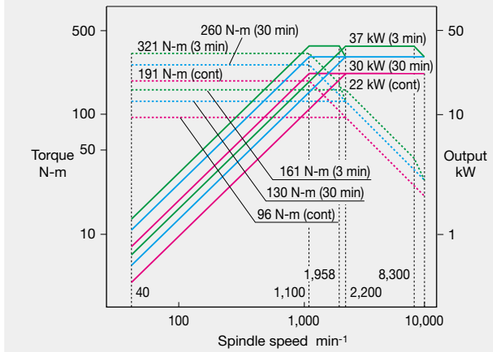



## Milling Tool Spindle Torque/Output Diagrams

〈MULTUS B550〉

### Milling tool spindle

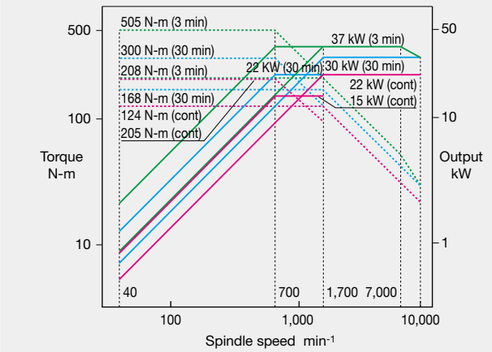
Spindle speed 10,000 min$^{-1}$
Output 37/30/22 kW (3 min/30 min/cont)
Torque 321/260/191 N-m (3 min/30 min/cont)



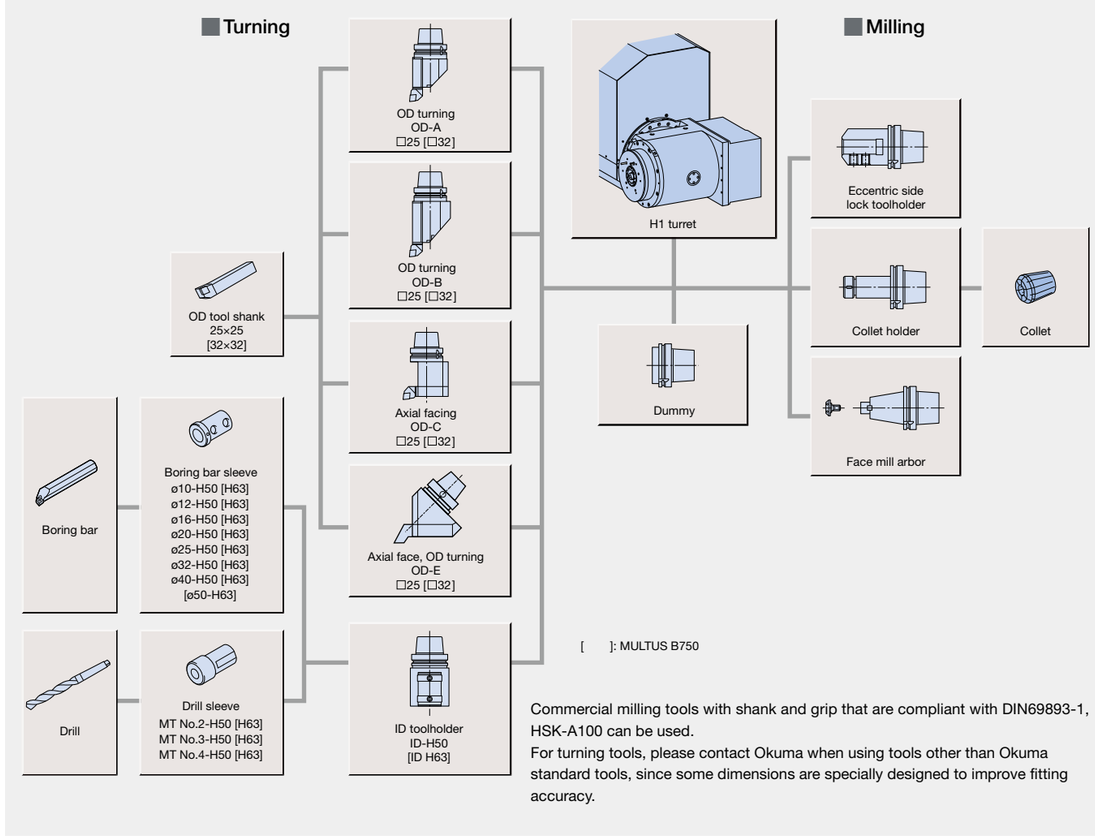

〈MULTUS B750〉

### Milling tool spindle

Spindle speed 10,000 min$^{-1}$
Output 37/30/22 kW (3 min/30 min/cont)
Torque 505/300/205 N-m (3 min/30 min/cont)




## Tooling System (HSK-A100)




Commercial milling tools with shank and grip that are compliant with DIN69893-1, HSK-A100 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.

## Optional Specifications and Accessories

| | MULTUS B550 | MULTUS B750 |
|---|---|---|
| Big-Bore spindle | ø180 A2-11 2,400 min$^{-1}$<br>37/30 kW (30 min/cont) | ø280 A2-15 1,500 min$^{-1}$<br>45/37 kW (30 min/cont) |
| Super Big-Bore spindle | — | ø380 A2-20 1,000 min$^{-1}$<br>45/37 kW (30 min/cont) |
| Opposing spindle | ø160 A2-11 3,000 min$^{-1}$<br>37/30 kW (30 min/cont) | ø220 A2-11 2,000 min$^{-1}$<br>37/30 kW (30 min/cont) |
| Opposing Big-Bore spindle | ø180 A2-11 2,400min$^{-1}$<br>37/30 kW (30 min/cont) | ø280 A2-15 1,500 min$^{-1}$<br>45/37 kW (30 min/cont) |
| High-power spindle motor | — | 45/37 kW (30 min/cont) |
| Tool shank | CAPTO C8, MAS BT50 BIG-PLUS® | |
| High pressure coolant | 7 MPa | |
| Turret high/low pressure switch | L/M thru high/low pressure switch, M peripheral low pressure | |
| Lubrication monitor | B-1, B-2 (w/ warning lamp), C-1, C-1 (w/ warning lamp) | |
| ATC magazine capacity | 80, 160 tools | |
| Chip conveyor | Hinge type, scraper type, drum filter type | |
| Chip bucket | | |
| Coolant sludge prevention | Oil skimmer attachment, magnetic separator attachment | |
| Touch Setter | A (Auto) | |
| In-process workpiece gauging | | |
| AbsoScale | X-Y-Z axes | |
| Air blower (air blast) | Chuck, tailstock, turret, and spindle bore | |
| Coolant blower | Shower coolant system, within spindle | |
| Coolant sensor | Level sensor, pressure sensor, flow sensor | |
| Coolant tank | With line filter, with reverse wash filter, with thickener bag filter | |
| Mist collector | | |
| Steadyrest | | |
| Long boring bar specifications | — | ATC or manual |
| High-accuracy C-axis control | | |
| Dust-proofing | Spindle air purge | |
| 5-Axis Auto Tuning System | Standard kit, High spec kit | |
| NC Gage | Standard kit, High spec kit | |
| Temperature regulator | Coolant, hydraulic oil, spindle temperature | |
| Hydraulic chuck | Solid chuck, hollow chuck | |
| Workpiece stopper in spindle | | |
| Chuck auto open/close | With confirmation | |
| Chuck high/low pressure switch | | |
| Chucking error sensor | | |
| Chuck internal sizing stopper | | |
| Front door auto open/close | Tape SW, area sensor | — |
| Dual palm start buttons (door close interlock) | | |
| Tailstock quill auto advance/retract | With confirmation | |
| Tailstock thrust high/low pressure switch | | |
| Movable tailstock | Self-travelling | |
| Coolant gun | | |
| Workrest | | |
| Loader | | |

### Opposing spindle

Powerful machining is achieved with opposing spindle capacity equivalent to main spindle.

| | MULTUS B550 | MULTUS B550 (Big-Bore specs) | MULTUS B750 | MULTUS B750 (Big-Bore specs) |
|---|---|---|---|---|
| Spindle speed | 3,000 min$^{-1}$ | 2,400 min$^{-1}$ | 2,000 min$^{-1}$ | 1,500 min$^{-1}$ |
| Spindle nose | JIS A2-11 | JIS A2-11 | JIS A2-11 | JIS A2-15 |
| Spindle/bore dia | ø160/ø112 mm | ø180/ø130 mm | ø220/ø142 mm | ø280/ø185 mm |
| Spindle motor | 37/30 kW | 37/30 kW | 37/30 kW | 45/37 kW |



## Optional Specifications and Accessories

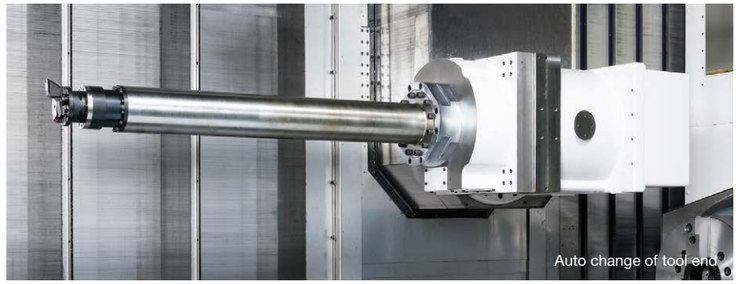
### Long boring bar specifications

**(MULTUS B750)**

With B-axis rotation for main /oppossed spindle applications

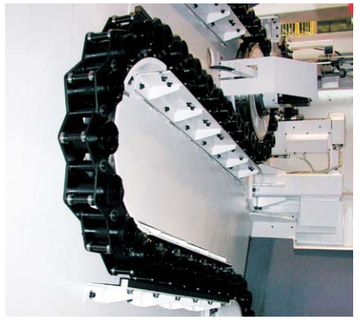
- Boring bar diameter × length

| | |
|---|---|
| Tool end fixed: | ø130 mm × 1,270 mm (ø5.12 in × 50 in) |
| Auto change of tool end: | ø120 mm × 1,000 mm (ø4.72 in × 39.37 in) |


Auto change of tool end

### Large capacity ATC

Standard 40 tools. 80-tool, 160-tool capacity optional.

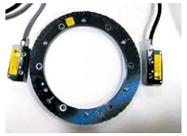


### Self-traveling hydraulic steadyrest

High efficiency machining of long workpieces.

### AbsoScale/DD encoder

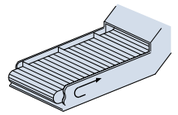
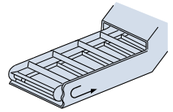
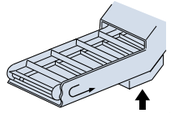
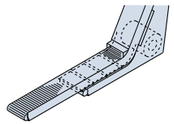
[AbsoScale]
High speed, high resolution optical positioner. Not affected by ball screw thermal expansion or backlash, for improved finishing accuracy.



[DD encoder]
High accuracy, high resolution rotary encoder for high accuracy C-axis control.

### Various chip conveyors

■ Chip conveyor types and applications

| Name | Hinge | Scraper | Magnetic scraper | Hinge + scraper with drum filter |
|---|---|---|---|---|
| Application | ● For steel | ● For castings | ● For castings | ● For steel, castings, nonferrous metal |
| Features | ● General use | ● Easy for maintenance<br>● Blade scraper | ● Suitable for sludge<br>● Not suitable for nonferrous metals | ● Filtration of long and short chips and coolant |
| Shape |  |  |  Magnet |  |

Note: The machine may need to be raised (platform) depending on the type of chip conveyor.

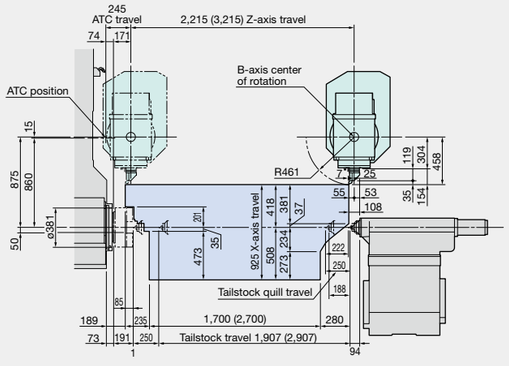
# Working Ranges (HSK specs)

## MULTUS B550 Tailstock Specifications

Unit: mm

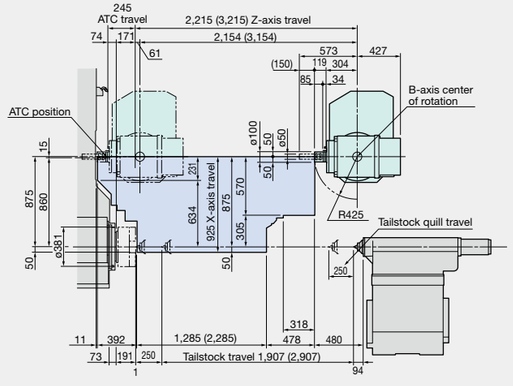
### OD-A, B-axis 90˚

Distance between centers: 2,000 (3,000)



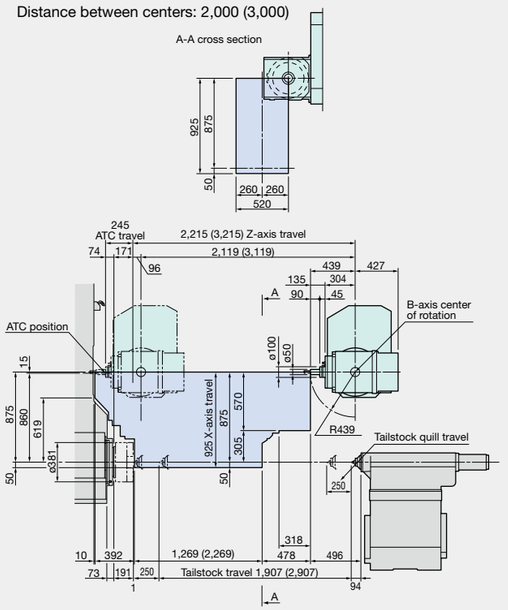

### ID-A, B-axis 0˚

Distance between centers: 2,000 (3,000)



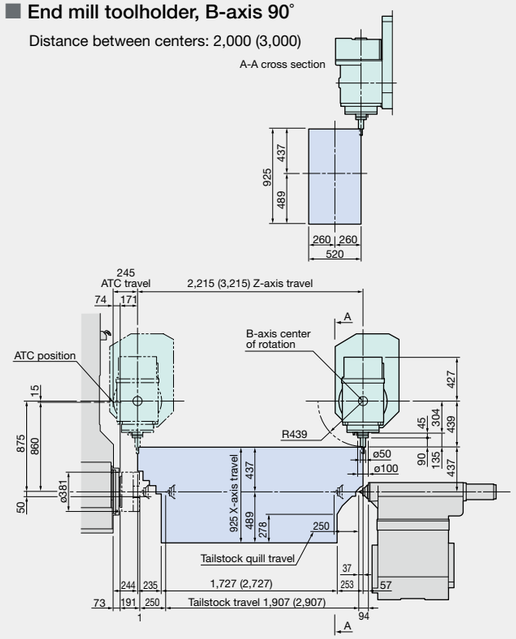

### End mill toolholder, B-axis 0˚

Distance between centers: 2,000 (3,000)




### End mill toolholder, B-axis 90˚

Distance between centers: 2,000 (3,000)



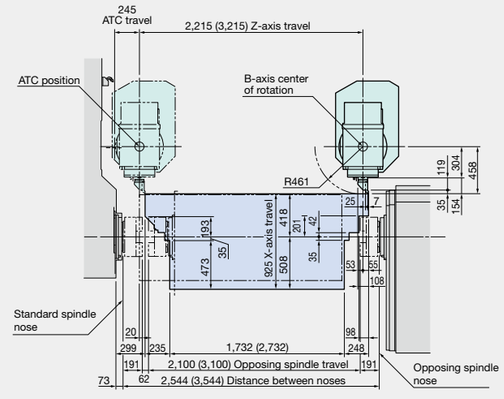



## MULTUS B550 Opposing spindle specs

Unit: mm

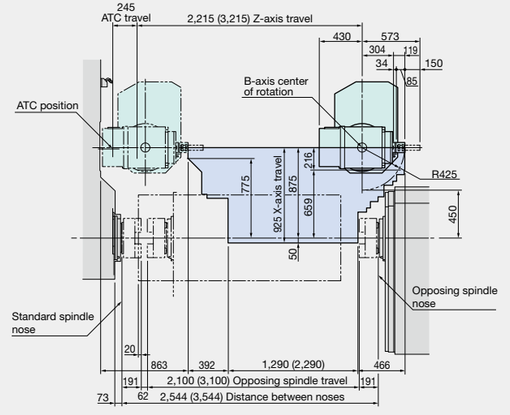
### OD-A, B-axis 90°

Distance between noses: 2,544 (3,544)



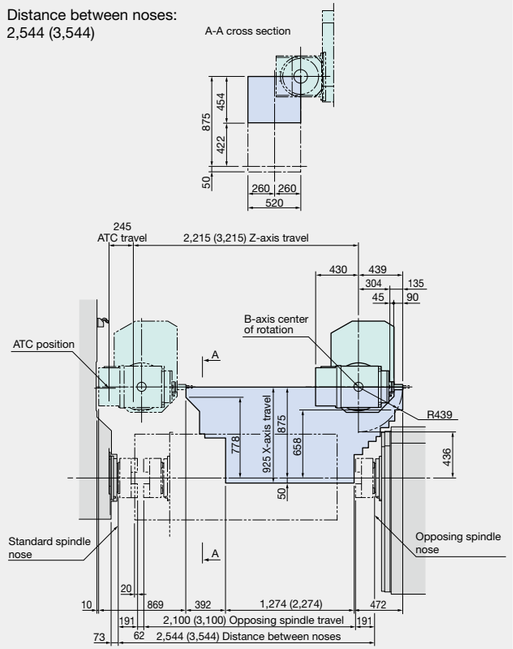

### ID, B-axis 180°

Distance between noses: 2,544 (3,544)



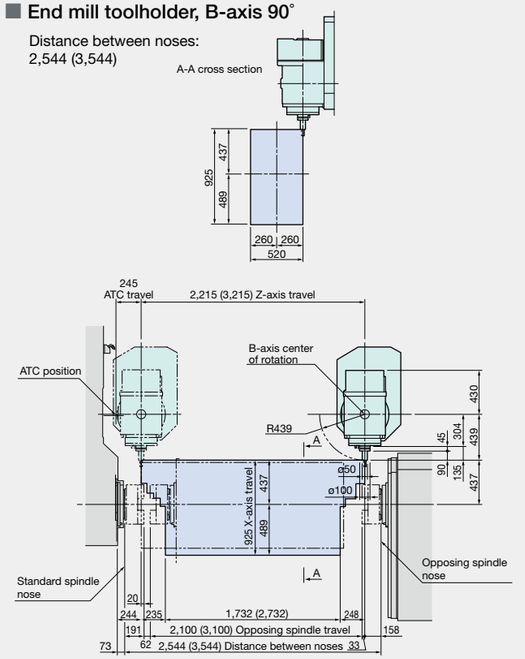

### End mill toolholder, B-axis 180°

Distance between noses: 2,544 (3,544)




### End mill toolholder, B-axis 90˚

Distance between noses: 2,544 (3,544)

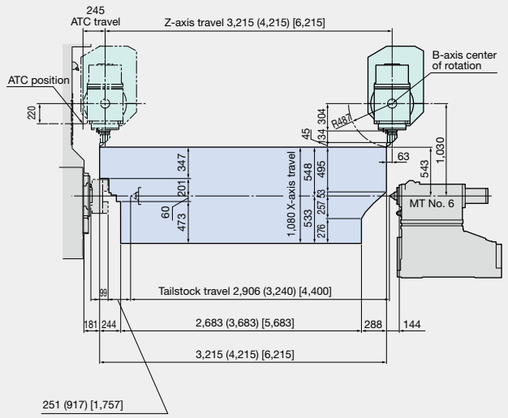


## MULTUS B750 Tailstock Specifications

Unit: mm

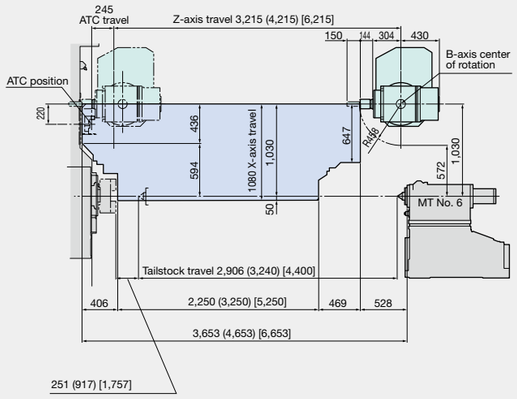
### OD-A, B-axis 90˚

Distance between centers 3,000 (4,000) [6,000]



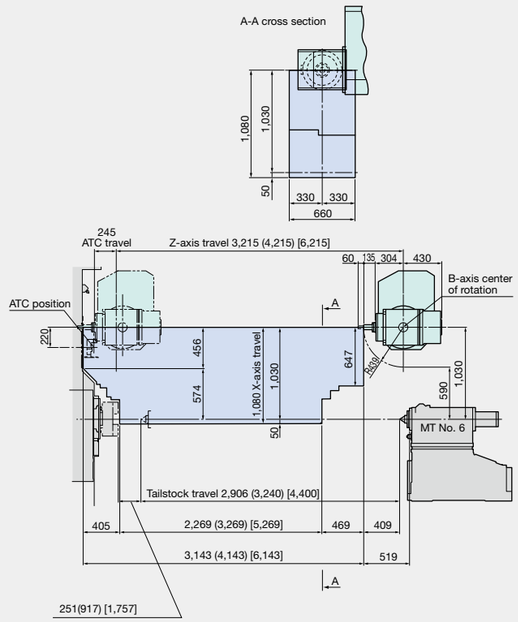

### ID, B-axis 0˚

Distance between centers 3,000 (4,000) [6,000]



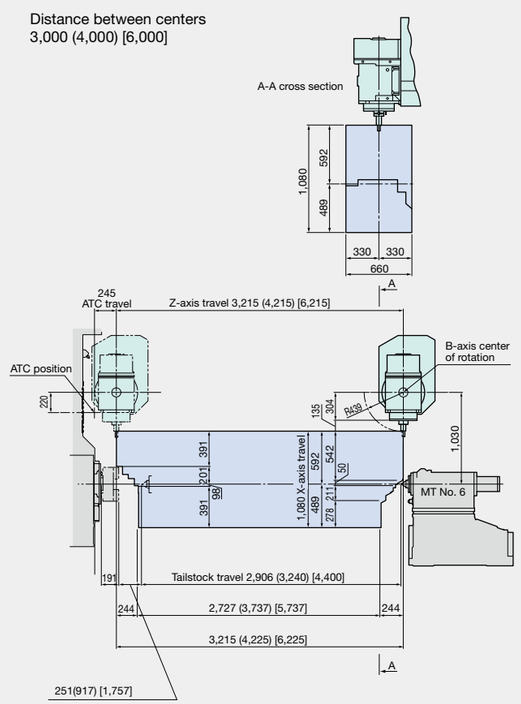

### End mill toolholder, B-axis 0˚

Distance between centers
3,000 (4,000) [6,000]




### End mill toolholder, B-axis 90˚

Distance between centers
3,000 (4,000) [6,000]



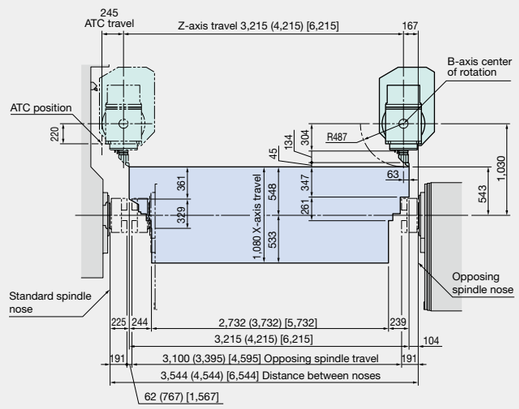



## MULTUS B750 Opposing spindle specs

Unit: mm

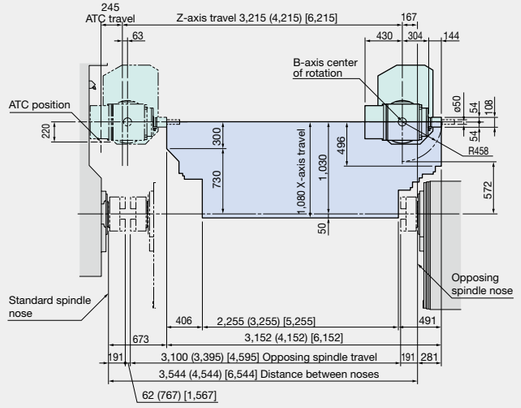
### OD-A, B-axis 90˚

Distance between noses 3,544 (4,544) [6,544]



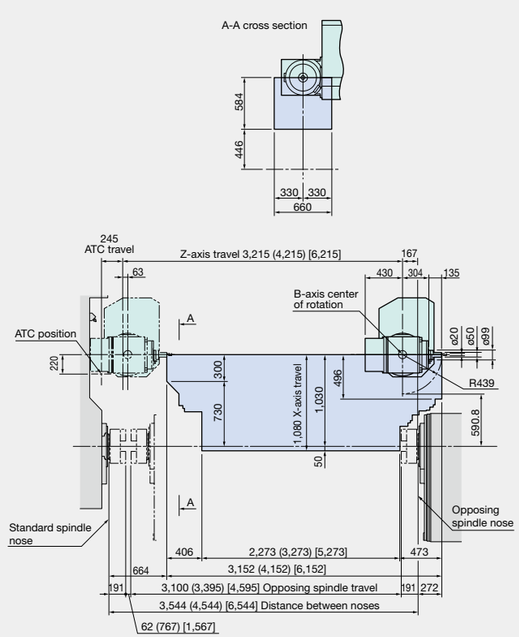

### ID, B-axis 180˚

Distance between noses 3,544 (4,544) [6,544]



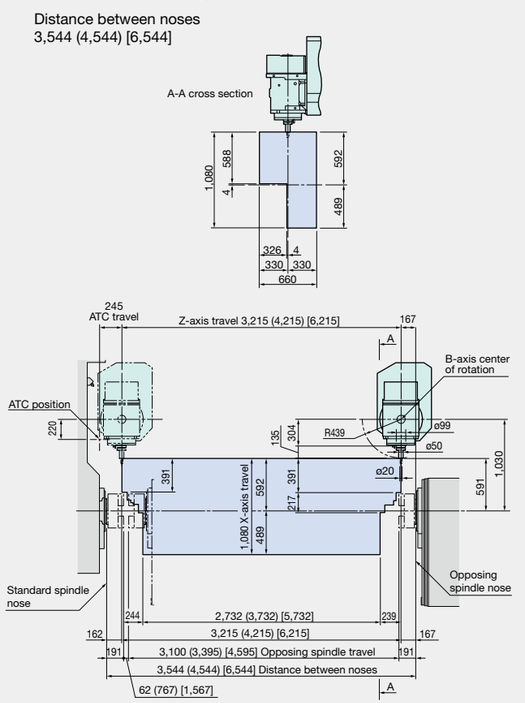

### End mill toolholder, B-axis 180˚

Distance between noses 3,544 (4,544) [6,544]



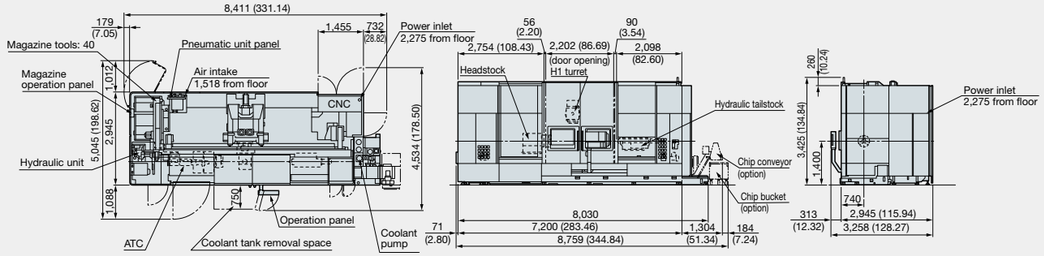

### End mill toolholder, B-axis 90˚

Distance between noses
3,544 (4,544) [6,544]



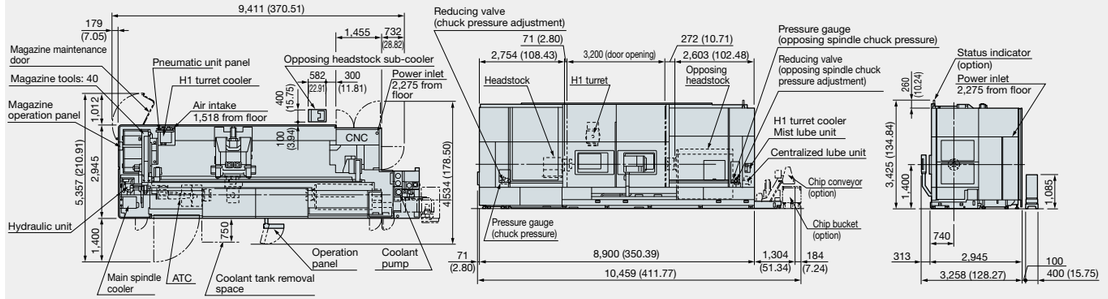
# Dimensional and Installation Drawings

## MULTUS B550 C × 2000




Unit: mm (in)

## MULTUS B550 W × 3000



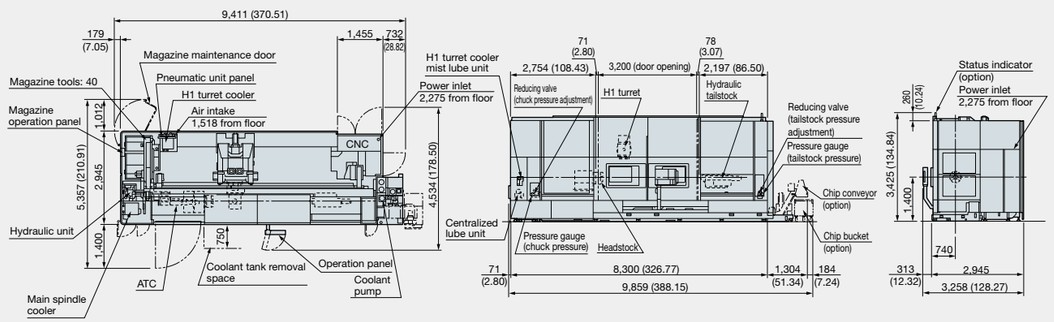

Unit: mm (in)

## MULTUS B550 W × 2000



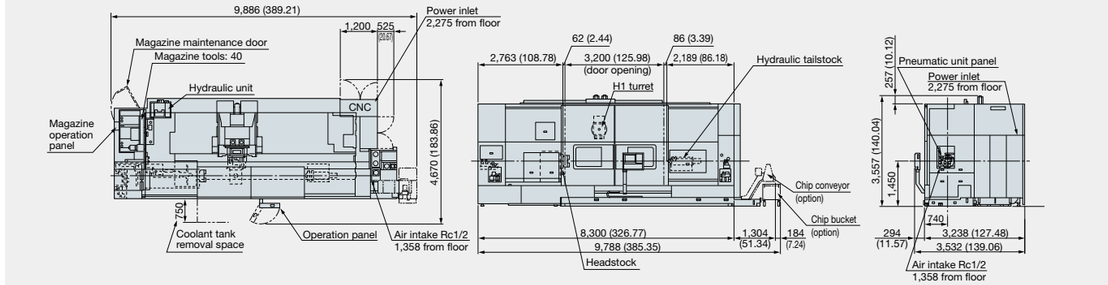

Unit: mm (in)

## MULTUS B550 C × 3000



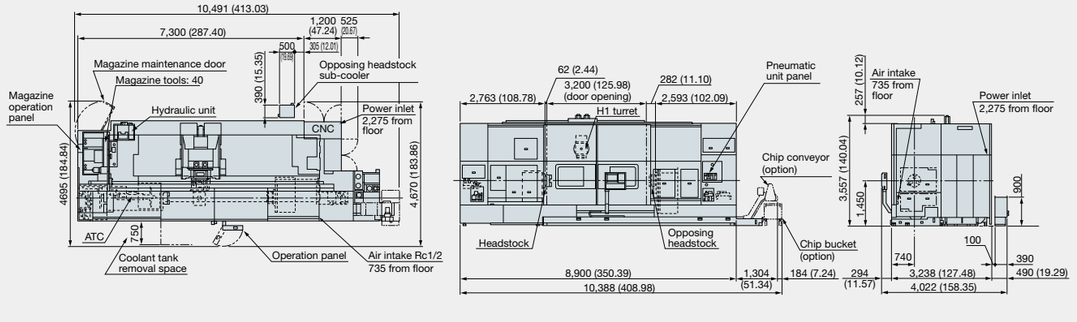

Unit: mm (in)

## MULTUS B750 C × 3000




Unit: mm (in)

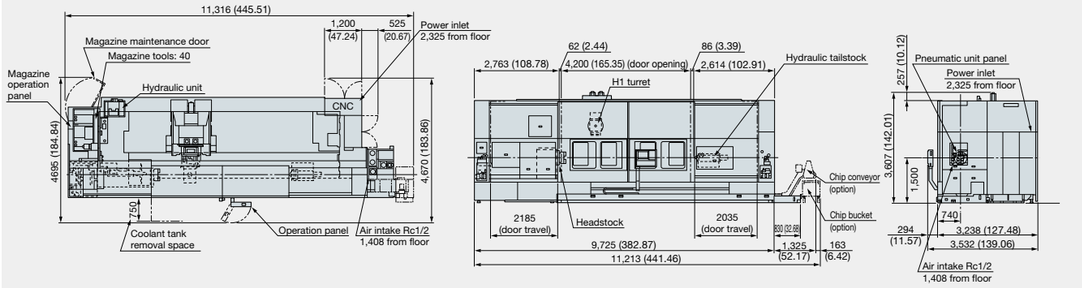
## MULTUS B750 W × 3000




Unit: mm (in)

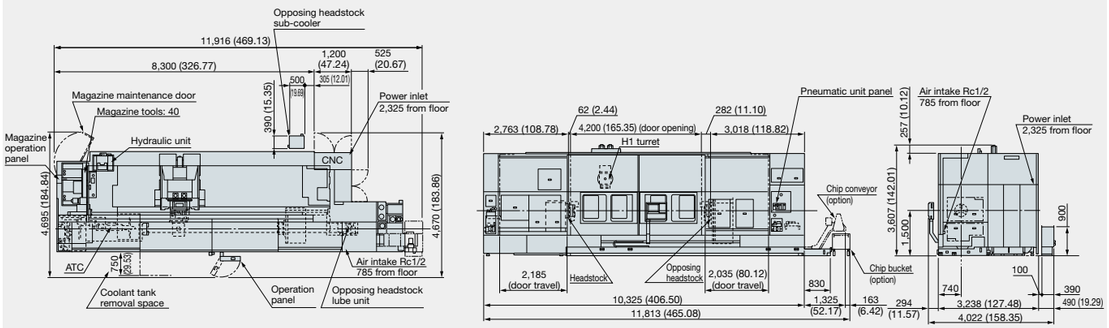
## Dimensional and Installation Drawings

### MULTUS B750 C × 4000



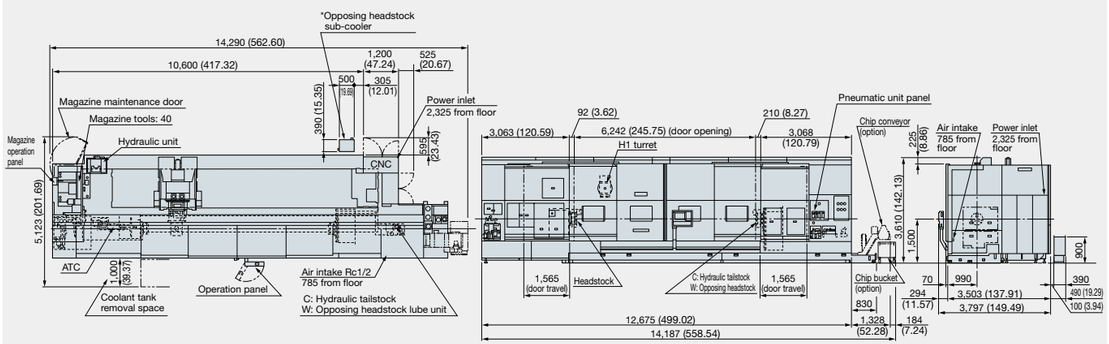

Unit: mm (in)

### MULTUS B750 W × 4000




Unit: mm (in)

### MULTUS B750 C × 6000, W × 6000




*W × 6000 only

Unit: mm (in)



# OSP suite OSP-P300SA

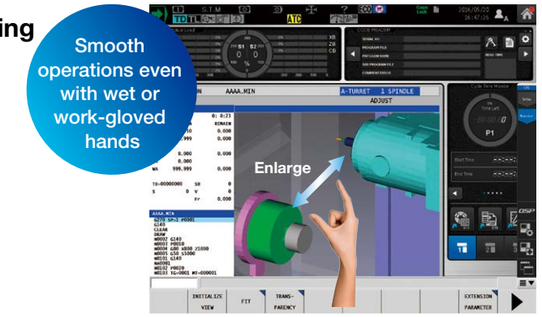
The Next-Generation Intelligent CNC

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

Smart factories are using advanced digitization and networking (IIoT) 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 smartphone

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 smartphone. 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.




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

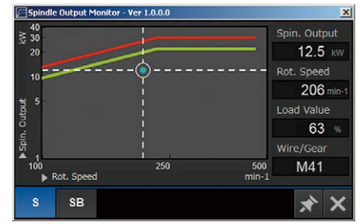
This became possible through the addition of Okuma's machining expertise based on requests we heard from real, machine-shop customers. The brain power packed into the CNC, built by a machine tool manufacturer, will "empower shop floor" management.

### Spindle Output Monitor

S11

Increased productivity through visualization of motor power reserve

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.




### Scheduled Program Editor

S10

Easy programming without keying in code

### E-mail Notification

S15

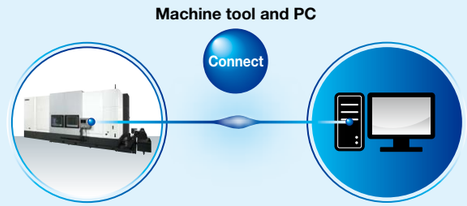
Monitoring utilization status even when away from the machine

## Connect Plan

**Get Connected, Get Started, and Get Innovative with Okuma "*Monozukuri*"**

### Connect, Visualize, Improve

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



## Standard Specifications

| | | |
|---|---|---|
| Basic Specs | Control | Turning: X, Z simultaneous 2-axis, Multitasking: X, Y, Z, B, C simultaneous 5-axis,<br>Spindle control max 4 axes (2 spindles, 2 milling tool spindles) |
| | Position feedback | OSP full range absolute position feedback (zero point return not required) |
| | Min / Max command | ±99999.999 mm, ±99999.999° 8-digit decimal, command unit: 0.001 mm, 0.01 mm, 1 mm, 0.001°, 0.01°, 1° |
| | Feed | Override: 0 to 200% |
| | Spindle control | Direct spindle speed commands override 50~200%, Milling tool override 30-200%, Constant cutting speed,<br>Optimum turning speed designate |
| | Tool commands | 2-digit tool no. + 4-digit tool no. (max tool registration: 1000 sets) |
| | Tool compensation | Tool offset, nose R comp: 20 sets per tool, multi-coordinate tool compensation |
| | Display | 15-inch color display operational panel, multi touch panel operations |
| | Self-diagnostics | Automatic diagnostics and display of program, operation, machine, and NC system problems |
| | Program capacity | Program storage: 4 GB, operation buffer: 2 MB |
| Operations | “suite apps” | Applications to graphically visualize and digitize information needed on the shop floor |
| | “suite operation” | Highly reliable touch panel suited to shop floors. One-touch access to suite apps. |
| | Easy Operation | “Single-mode operation” for a series of operations from a single screen. Easy-to-use operation panel supports complete machine control. |
| | Collision Avoidance System | Prevents interference during manual/automatic operation, easy modeling of shape data<br>(there are limits in interference prevention unit, unit movement) |
| | Programming | Program management, edit, scheduled programs, fixed cycles, special fixed cycles, tool nose R compensation,<br>Slope machining, M-spindle synchronized tapping, fixed drilling cycles, arithmetic operations, logic operations, math functions,<br>Variables, branch statements, auto programming (LAP4), programming help |
| | Machine operations | MDI, manual (rapid traverse, pulse handle), load meter, operations help, alarm help, sequence return, manual interrupt & auto return,<br>Data I/O, easy setting of cycle time reduction |
| | MacMan | Machining Management: machining results, machine utilization, fault data compile & report, external output |
| | Com / Net | USB ports, Ethernet, DNC-T1 |
| High speed/ accuracy | TAS-C | Thermo Active Stabilizer—Construction: corrects machine construction thermal deformation error during shop temperature change. |
| | TAS-S | Thermo Active Stabilizer—Spindle: corrects milling tool spindle thermal deformation error during spindle rotation. |
| | High speed/accuracy | Hi-G control |
| Energy-saving | ECO suite plus | ECO Idling Stop, ECO Power Monitor |
| | Power Regeneration System | Regenerative power is used when the spindle and feed axes decelarate to reduce energy waste. |

### 19-inch operation panel with adjustable angle (option)

# Ergonomically-based, operator-friendly operation panel

### 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.

**19” display ergonomic control panel** (option*)

Adjustable-tilt keyboard

*Standard in certain markets.



## Optional Specifications

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

| Optional | Kit spec | NML E | NML D | 3D E | 3D D | AOT-M E | AOT-M D |
|---|---|---|---|---|---|---|---|
| **Energy saving ECO suite plus** | | | | | | | |
| ECO Operation | Chip conveyor intermittent/linked operation | | | | | | |
| | Mist collector intermittent/linked operation | | | | | | |
| | Spindle power peak cutting | | | | | | |
| ECO Power Monitor | Wattmeter | | | | | | |
| **External Input/Output and Communication Functions** | | | | | | | |
| RS-232C connector | | | | | | | |
| DNC links | DNC-T3 | | | | | | |
| | DNC-C / Ethernet | | | | | | |
| | DNC-DT | | | | | | |
| USB | 2 more ports possible | | | | | | |
| **Automation / Untended Operation** | | | | | | | |
| Auto power shutoff M02, alarm | | | | | | | |
| Warm-up function (by calendar timer) | | | | | | | |
| Tool retract cycle | | | | | | | |
| External program selections | A (pushbutton), 8 types | | | | | | |
| | B (rotary switch), 8 stages | | | | | | |
| | C1 (digital switch), 2-digit BCD | | | | | | |
| | C2 (external input), 4-digit BCD | | | | | | |
| Okuma loader (OGL) interfaces | | Included in Loader specs | | | | | |
| Third party robot and loader interface*1 | TYPE B (machine) | | | | | | |
| | TYPE C (robot and loader) | | | | | | |
| | TYPE D | | | | | | |
| | TYPE E | | | | | | |
| Bar feeders | Interface | | | | | | |
| Cycle time reduction*1 | Operation time reduction | | | | | ● | ● |
| **High-Speed /High-Accuracy Functions** | | | | | | | |
| B-axis NC control | | | | | | | |
| Simultaneous 5-axis kit | Hyper-Surface*3 | | | | | | |
| | Tool center point control Ⅱ | | | | | | |
| | Inverse time feed | | | | | | |
| | DNC-DT | | | | | | |
| | Tool posture command | | | | | | |
| | 3-dimensional coordinate conversion | | | | | | |
| | Herical cutting | | | | | | |
| | Slope machining | | | | | | |
| Pitch error compensation | | | | | | | |
| AbsoScale | X-Y-Z axes | | | | | | |
| Hi-Cut Pro | | | | | | ● | ● |
| Hyper-Surface*3 | Linear axes | | | | | | |
| | Linear and rotational axes | | | | | | |
| 5-Axis Auto Tuning System | Standard, high spec | | | | | | |
| NC Gage | Standard, high spec | | | | | | |
| Tool center point control Ⅱ | | | | | | | |
| Tool tilt command | | | | | | | |
| **Other Functions** | | | | | | | |
| One-Touch Spreadsheet | | | | | | | |
| Gear machining package | | | | | | | |
| Machining Navi [M-*g*Ⅱ+, M-*i*] | | | | | | | |
| Machining Navi [L-*g*Ⅱ, T-*g* threading] | | | | | | | |
| Harmonic Spindle Speed Control (HSSC) | | | | | | ● | ● |
| Spindle dead-slow cutting | | | | | | | |
| Synchronized C-axis control | | | | | | | |
| Y-axis center hight offset | | | | | | | |
| Feed axis retract | | | | | | | |
| Short circuit breaker | | | | | | | |
| External M signals [2 sets, 4 sets, 8 sets, 16 sets] | | | | | | | |
| Edit interlock | | | | | | | |
| OSP-VPS (Virus Protection System) | | | | | | | |
| 19-inch operation panel with adjustable angle | | | | | | | |

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

*1. Engineering discussions required.

*2. With AbsoScale detection specs, ball screw wear detection is possible.

*3. Hyper-Surface and the Collision Avoidance System may not operate simultaneously depending on the part program or the workpiece shape.

MULTUS B Series

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

●The specifications, illustrations, and descriptions in this brochure vary in different markets and are subject to change without notice.
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OKUMA

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