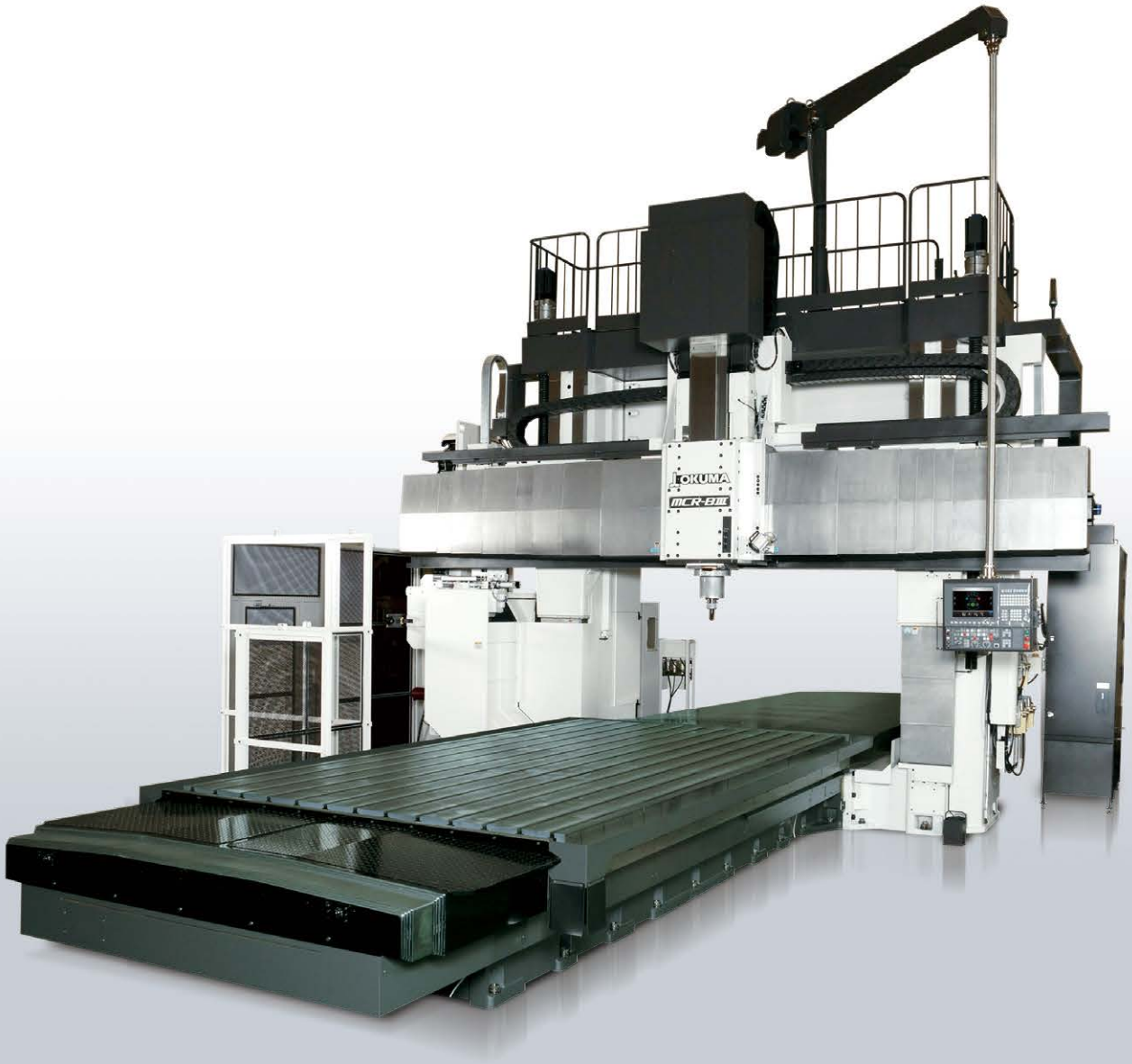
OKUMA

OPEN POSSIBILITIES

MCR-BIII

Double-Column Machining Center
[5-Face Machining]

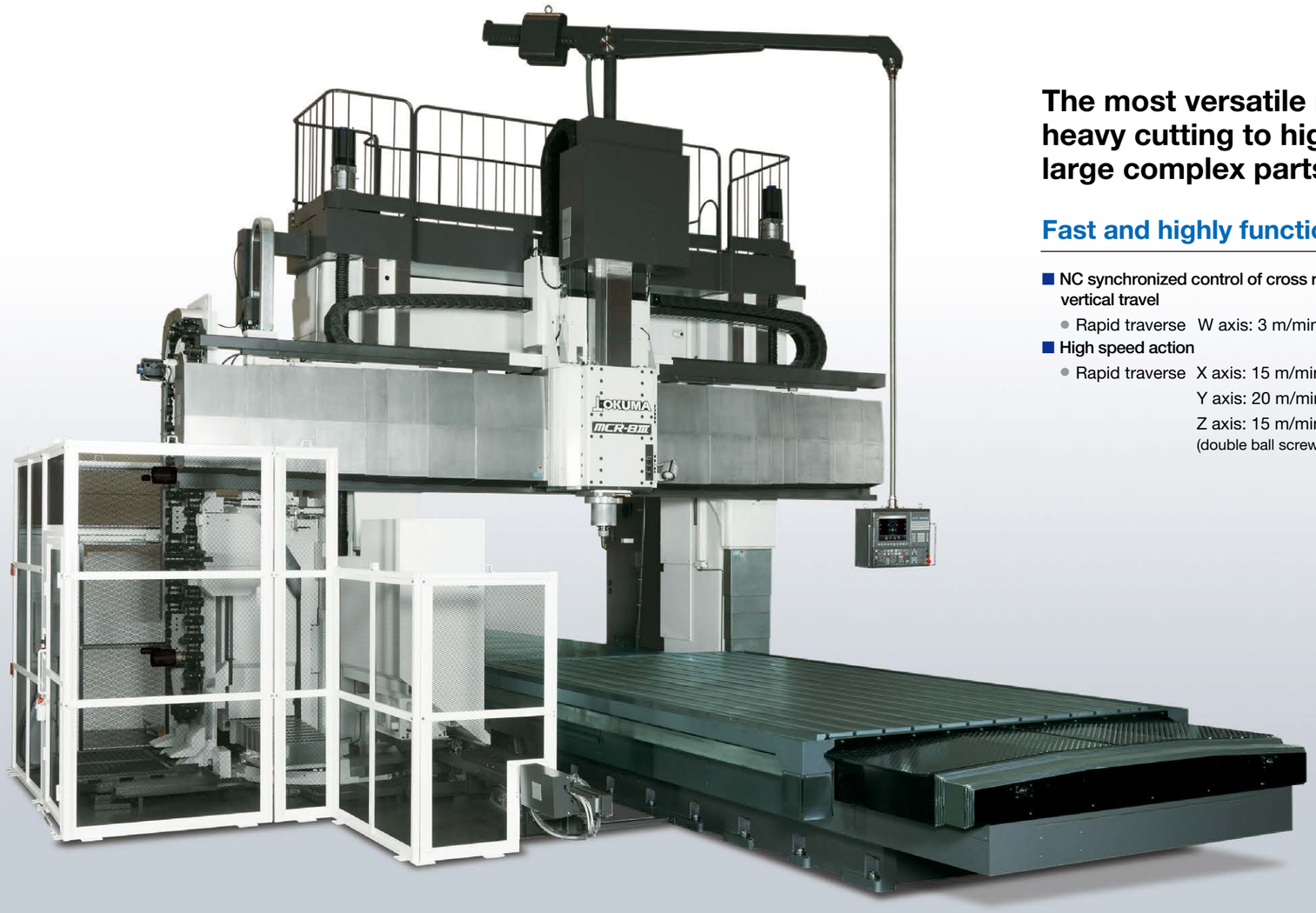


MCR-BIII

Double-Column Machining Center
[5-Face Machining]

Intelligent Technology | Thermo-Friendly Concept | Collision Avoidance System | Machining Navi | SERVO NAVI

A world-class double-column machining center



The most versatile machine for all machining processes, from heavy cutting to high-accuracy finishing for die/mold jobs and large complex parts.

Fast and highly functional

- **NC synchronized control of cross rail vertical travel**
  - Rapid traverse W axis: 3 m/min
- **High speed action**
  - Rapid traverse X axis: 15 m/min
    Y axis: 20 m/min
    Z axis: 15 m/min
    (double ball screw)
- **Lots of attachment heads**
  - Wide variety of changeable attachment heads
  - Wide range of spindle speeds
  - Arbitrary angle slope machining
    1˚ (0.0001˚ indexing: Optional)
- **Required for streamlined die/mold machining**
  - Hyper-Surface (Optional)
  - X, Y, Z-axis feed cooling (Optional)
  - Fast continuous cutting feeds: Max 20 m/min (Optional)

Safe and comfortable operating environment

- **Full-enclosure shielding**
- **Full machine length chip disposal possible**

Photographs used in this brochure may show optional equipment.
Not showing full-enclosure shielding and other items.

Okuma double-column machining centers with highly rigid and accurate construction

Big parts machining expertise. This machine was engineered with Okuma's field-proven experience of building in exceptional power, rigidity, and smooth operation to assure close tolerances over time and high production. The shudder free design means heavy-duty face milling and flawless fine boring—superb for fast and highly accurate machining of dies and molds. Parts that had to be cut on several machines can be finished on one MCR-BⅢ for dramatic savings in prep times for each process. And the ATC, AAC, and APC for continuous operations provide even greater productivity.

Rock-solid double-column construction: Key to closer tolerances and greater rigidity

Heavy cutting of big parts at extremely high accuracies comes 'natural' to the set of stiff, square columns straddling the solid bed which supports the table. Virtually chatter-free rigidity under vertical, horizontal or torsional loads. Result: Okuma high accuracy.

Long crossrail guideways ensure high accuracy and long life.

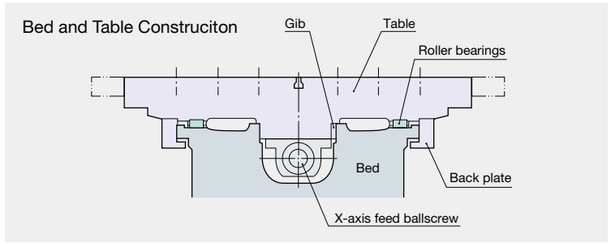
The extra long upper and lower vertical guideways on the crossrail present a stable structure that ensures longer service life and rigidity. The wide spindlehead guides are highly rigid rectangular sliding faces.

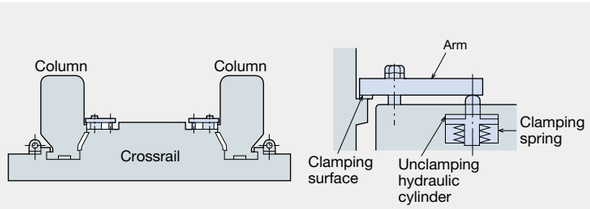
Slide/roller guideways

The table uses a combined roller pack and slideway system to absorb a high level of cutting vibrations. The roller bearings on the ways support the table and workpiece to enable smooth movement and high-accuracy positioning and maintain high accuracy over long periods.

Powerful clamping

Powerful clamping devices that apply the principle of levers are used on crossrail clamps for powerful machining.



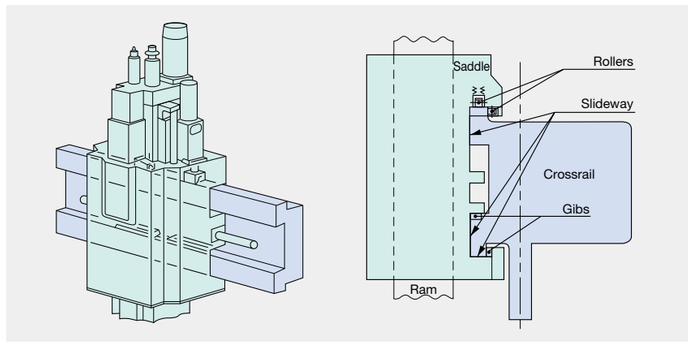


A ram-type spindlehead for super rigidity

With a cross section of 350 x 350 mm (13.78 x 13.78 in.) there's enough rigidity in the square ram-type spindlehead to handle any horizontal cut.

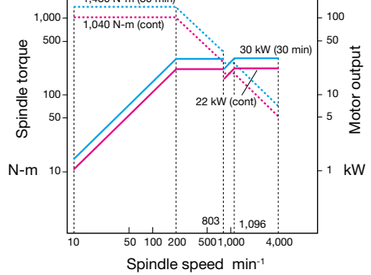
Stability and high-accuracy from the spindlehead ways

Positioning is fast and smooth with the roller-mounted weight balancing system. The sliding surface absorbs cutting vibration, leading to high quality cut surfaces.

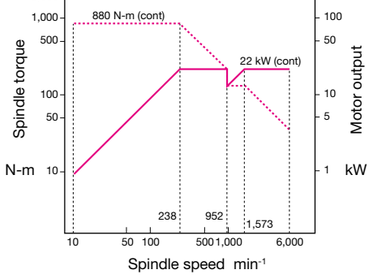


Fast and powerful spindle for a larger machining range

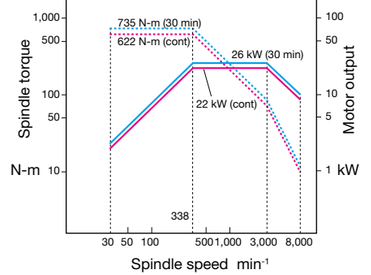
Standard spindle
- Spindle speed .....4,000 min^{-1}
- Max output ..... 30/22 kW (30 min/cont)
- Max torque ..1,430/1,040 N-m (30 min/cont)



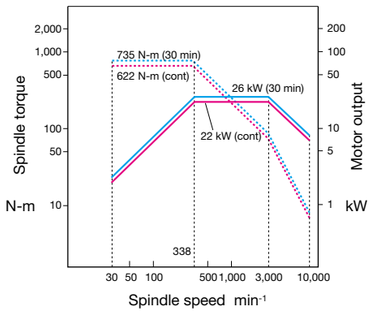
6,000 min^{-1} Spindle (Optional)
- Spindle speed .....6,000 min^{-1}
- Max output ..... 22 kW (cont)
- Max torque .....880 N-m (cont)



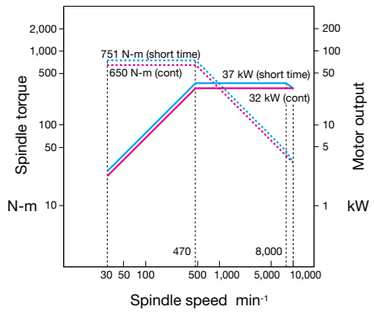
8,000 min^{-1} Spindle (Optional)
- Spindle speed .....8,000 min^{-1}
- Max output ..... 26/22 kW (30 min/cont)
- Max torque ....735/622 N-m (30 min/cont)



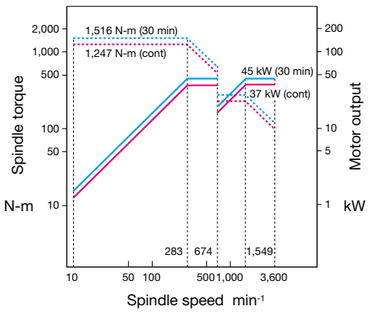
10,000 min^{-1} Spindle (Optional)
- Spindle speed .....10,000 min^{-1}
- Max output ..... 26/22 kW (30 min/cont)
- Max torque .....735/622 N-m (30 min/cont)



10,000 min^{-1} Spindle (Optional)
- Spindle speed .....10,000 min^{-1}
- Max output .....37/32 kW (short time/cont)
- Max torque ...751/650 N-m (short time/cont)



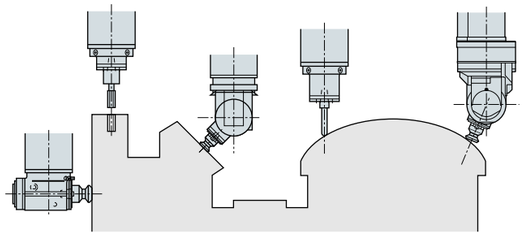
3,600 min^{-1} Spindle (Optional)
- Spindle speed .....3,600 min^{-1}
- Max output ..... 45/37 kW (30 min/cont)
- Max torque ...1,516/1,247 N-m (30 min/cont)



Automation for highly productive and flexible performance

Abundant range of attachment heads

All kinds of shapes can be machined under the best conditions with the abundant variation of attachments.
Many different processes can be performed continuously in auto operation with the auto tool changer (ATC) and auto attachment changer (AAC), greatly increasing productivity.
For oil hole, air hole, thru-spindle coolant, oil mist, and dual contact specifications for each spindle (some specifications not available).



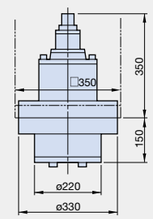
Attachment head variations

Standard spindle	Extension head	L150 4,000 min^{-1} (30 kW), L250 4,000 min^{-1} (22 kW), L350 4,000 min^{-1} (15 kW), L450 4,000 min^{-1} (11 kW)
	90° angular head	L150 3,000 min^{-1} (22 kW),L250 3,000 min^{-1} (22 kW), L470 2,000 min^{-1} (11 kW)
	Special angular head	45° L410 2,000 min^{-1} (22 kW), 30° L480 2,000 min^{-1} (22 kW), 60° L320 2,000 min^{-1} (22 kW)
	Ver/hor swivel head	L280 3,000 min^{-1} (22 kW)
	Universal index head (B-/C-axis)	B-axis: 5°· C-axis: 5° L550 2,000 min^{-1} (15 kW), B-axis: 1°· C-axis: 5° L610 2,000 min^{-1} (10 kW), B-axis: 1°· C-axis: 1° L655 2,000 min^{-1} (10 kW)
High speed spindle	Extension head	L150 6,000 min^{-1} (22 kW), L250 6,000 min^{-1} (22 kW), L350 6,000 min^{-1} (15 kW), L250 8,000 min^{-1} (22 kW), L250 10,000 min^{-1} (22 kW)
	90° angular head	L150 6,000 min^{-1} (11 kW), L250 6,000 min^{-1} (11 kW)
	Special angular head	30° L500 6,000 min^{-1} (7.5 kW)
	Universal index head (B-/C-axis)	B-axis: 5°· C-axis: 5° L610 6,000 min^{-1} (7.5 kW), B-axis: 1°· C-axis: 1° L655 6,000 min^{-1} (7.5 kW), B-axis: 1°· C-axis: 1° L715 8,000 min^{-1} (10 kW, double speed)
	NC-BC universal head	L830 6,000 min^{-1} (26/22 kW) L890 10,000 min^{-1} (15 kW) L945 20,000 min^{-1} (15/11 kW)

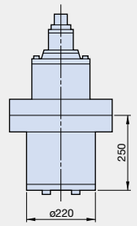
Extension head

Effective in jobs from powerful surface cutting to machining of 3-dimensional shapes and cutting of tall workpieces

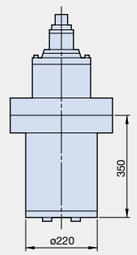
4,000 min^{-1} 30/22 kW



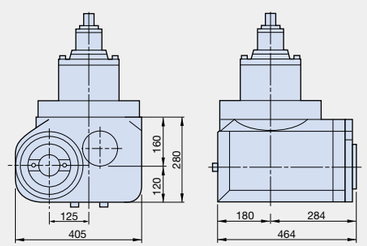
6,000, 8,000 min^{-1} 22 kW



4,000 min^{-1} 15 kW



3,000 min^{-1} 18.5 kW (22 kW for vertical)



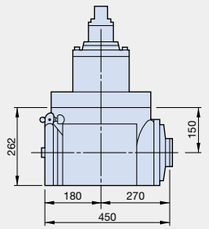
Vertical/horizontal swivel head

Head change unnecessary with upper and side machining

90° angular head

Effective in powerful side machining

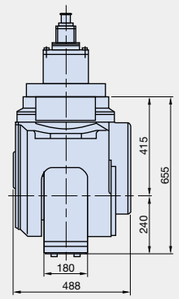
3,000 min^{-1} 22 kW



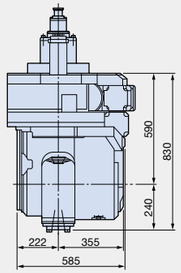
Universal index head (B-/C-axis), NC-BC Universal head

High quality, highly efficient machining from sloped surfaces and multi-sided machining to dies and other curved surfaces

■ Universal index head (B-/C-axis)
B-axis: 1° C-axis: 1° 2,000 min^{-1} 10 kW



■ NC-BC Universal head
6,000 min^{-1} 26/22 kW



* Machine spindle 8,000 min^{-1} specification required

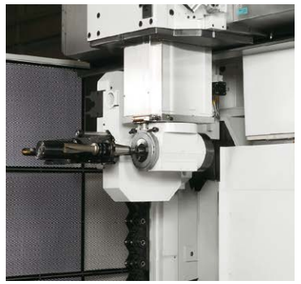
*Note: Please consult for applications which may have restrictions.
■ Coolant applications for above attachments:
(1) Coolant/air blow switchable (optional) (2) Oil-mist coolant preparations (optional)
■ Attachment cooler: Equipped with all above attachments (standard)

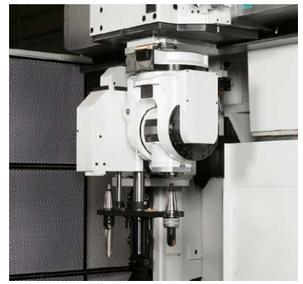
Unit: mm

Fast ATC

One ATC arm performs the changes for both the horizontal and vertical spindles. And with the next tool brought to the standby position during a machining operation, the actual tool change can be done in the shortest time possible.
The ATC can be used with a variety of attachment heads: extension, 90° angular, special angular, and B-/C-axis universal index heads.


Extension head


90° angular head

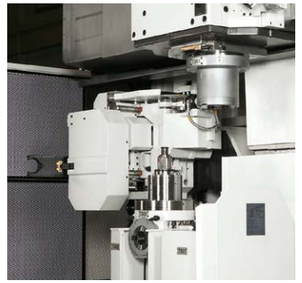

Universal index head

Smaller and faster AAC (Automatic Attachment Changer)

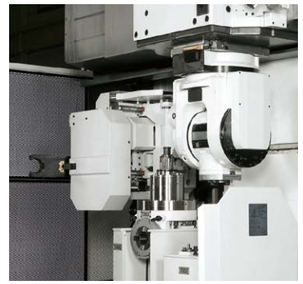
Completely automate machining of multiple sides with a variety of attachment heads that mount automatically and accept ATC.


Auto attachment head change: Attachment station moves near the spindlehead below the crossrail, then attachments are changed.


The attachment head station is set at the rear of the ATC magazine behind the column


Changings heads: extension to 90°angular


Changings heads: extension to BC-axis universal index

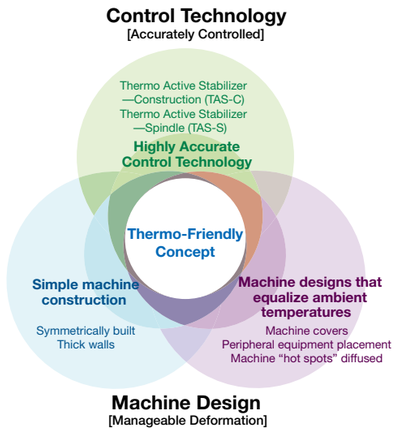

Changings heads: BC-axis universal index to 90°angular

High accuracy is enabled in normal factory environments.

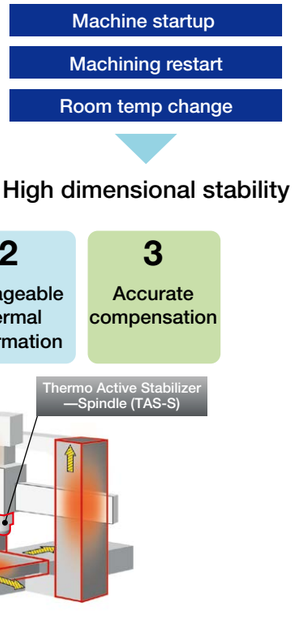
Thermo-Friendly Concept
Manageble Deformation — Accurately Controlled

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.



Super thermostability minimizes machining dimensional changes over time



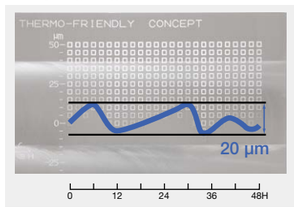
Application effect

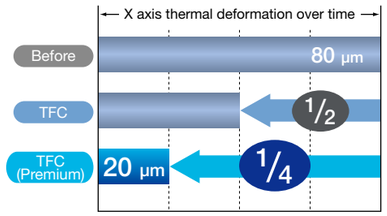
Machining dimensional changes over time reduced 1/4 to 1/3*

*In environments where room temperature changes 9°C over 48 hours

The sample piece on the right was done so that dimensional changes on the micron level due to thermal deformation can be confirmed with the naked eye. After finishing to a flat surface, a row of squares with a progressively shallower machining depth of 5μm each are scored from the top. Two hours later the same machining process is repeated from the right. This machining is done again after another 2 and 4 hours.
With machine thermal deformation (misalignment of position on X axis) from room temperature changes, the changing conditions between the tool edge and workpiece leave visible machining traces. Confirm the high performance of double-column machining centers equipped with the Thermo-Friendly Concept with your own eyes.

● Thermal Matrix





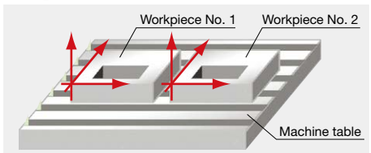
Parts machining

Previous machine

Must find origin every time before machining multi-quantity parts (misalignment from workpiece origin: 100 μm)

With Thermo-Friendly Premium

Confirmation only OK!
(misalignment from workpiece origin: 20 μm)
Huge reduction in zero offsets



Die machining

By minimizing area and corner steps
Manual finishing time 1/3 to 1/2

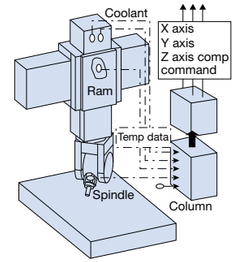
Highly accurate control technology

	Thermo-Friendly Specifications (Optional)	Thermo-Friendly Premium Specifications (Optional)*
Spindle thermal deformation control technology	**Thermo Active Stabilizer—Spindle (TAS-S)** Thermal deformation from spindle rotation controlled with high accuracy.	
Environmental thermal deformation control technology	**Thermo Active Stabilizer—Table (TAS-T)** Deformation from thermal expansion of table is accurately controlled.	**Thermo Active Stabilizer— Construction for large machines (TAS-C²)** TAS-C²: Thermo Active Stabilizer — Table Thermo Active Stabilizer — Construction In addition to TAS-T at the left, the machine is optimally controlled to maintain machining accuracy even when ambient temperatures change.

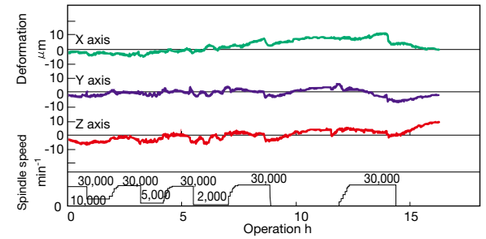
*XYZ axis AbsoScale specs required.

Thermo Active Stabilizer—Spindle: TAS-S

Thermal deformation of the spindle from high spindle speeds is accurately controlled (X, Y, Z axes). Accurate control is also performed in cases of frequent spindle speed changes, and thermal deformation of attachment heads are also controlled.



■ Actual results with TAS-S
(30° angular head, 30,000 min^{-1})



Thermo Active Stabilizer—Table: TAS-T

In multiple of parts machining, placement of the workpiece can cause variation in dimensional accuracy. The Thermo Active Stabilizer-Table controls dimensional changes due to thermal expansion of the table, and stable dimensional accuracy can be obtained no matter where the workpiece is set on the table.

ECO suite
Next-Generation Energy-Saving System

A suite of energy saving applications for machine tools

ECO Idling Stop Accuracy ensured, cooler off

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.
Electricity consumption during non-machining time greatly reduced with "ECO Idling Stop", which shuts down each piece of auxiliary equipment not in use. (Standard application on machines with Thermo-Active Stabilizer—Spindle)

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

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

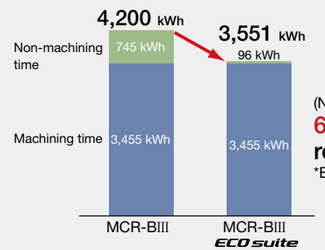
ECO Operation (Optional)

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

Reduction in power consumption (example)

● Operating time 365 h, Non-operating time 115 h
Total 480 h (24 × 20 days)

(Monthly electricity consumption)



(Non-machining time)
649 kWh (87%) reduction!
*ECO Idling Stop benefit

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

Okuma Intelligent Technology exhibits powerful effect on machine shop floors

Collision Avoidance System (Optional)

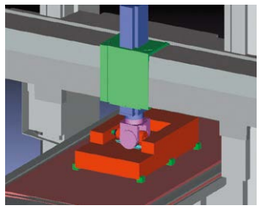
Collision prevention

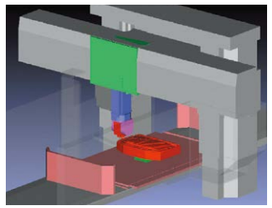
Set-up, first part cycle time greatly reduced

■ "Concentrate on machining" without collision worries

NC controller (OSP) with 3D model data of machine components— workpiece, tool, fixture, spindle, attachment head— performs real time simulation just ahead of actual machine movements. In both automatic operation and manual movements, advance checks are made for interference or collisions and the machine movement is stopped.

Machinists (novice or pro) will benefit from reduced setup and trial cycle times, and the confidence to focus on making parts.





Machining Navi M-gⅡ (Optional)

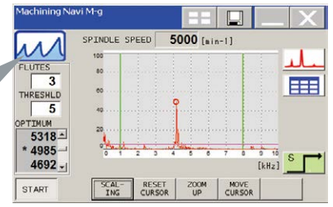
Cutting condition search for milling/machining

Longer tool life and shorter machining times by optimizing cutting conditions

■ Maximizing machine tool performance

Navigates effective measures by detecting and analyzing machining chatter with a microphone attached to the machine. Effects are seen mainly on high rotation chatter with M-gⅡ.

Machining Navi (OSP) provides the answer!

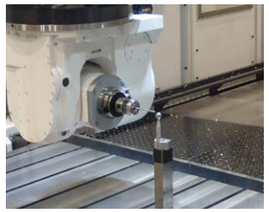


Auto Attachment Head Compensation (Optional)

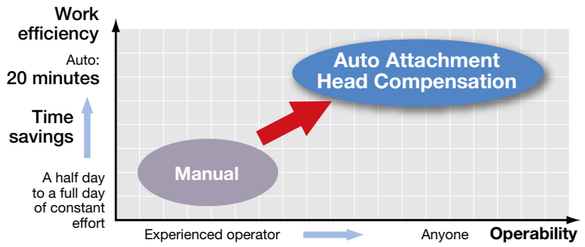
■ Rotation compensation that used to take half day to a full day now done automatically in twenty minutes*

Auto Attachment Head Compensation is a function that is automatically sets attachment head rotation compensation values. It is quick, easy and can be used by anyone. By setting the compensation values, the program commands can be made for tool tip position even with different attachment head type and rotation tilt. Creation of NC programs and machine operation becomes much easier.
Auto Attachment Head Compensation performs this rotation compensation work automatically, enabling automatic setting in 20 minutes* for a task that used to take an experienced operator a half to full day with three attachment heads. High machining accuracy can also be maintained with regular measurements.

Note: The time needed for automatic settings differs with the attachment head.



The datum sphere is fixed to the table and measurement preparations are completed by simply positioning the attachment head with attached touch probe near the top of the datum sphere.



Note: AAHC requires Okuma's auto gauging and auto zero offset functions (with touch probe).

SERVONAVI

Optimized Servo Control

Achieves long term accuracy and surface quality

■ SERVONAVI AI (Automatic Identification)

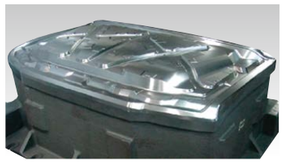
- **Work Weight Auto Setting**

Cycle time shortened with faster acceleration

On table travel type machining centers, the table feed acceleration with the previous system was the same regardless of weight, such as workpieces and fixtures loaded on the table.

Work Weight Auto Setting estimates the weight of the workpiece and fixture on the table and automatically sets the linear axis servo parameters, including acceleration, to the optimum values. Cycle times are shortened with no changes to machining accuracy.

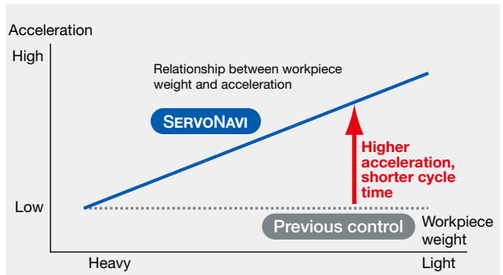
Comparison of press die finishing times



▶ Cycle time reduced 12%

- Previous: About 13 h
- SERVONAVI: About 11.5 h

Simulated comparison.
Especially beneficial for dies requiring sculptured surface shaping.



■ SERVONAVI SF (Surface Fine-tuning)

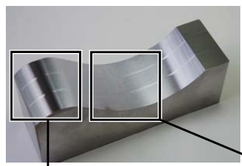
- **Reversal Spike Auto Adjustment**

Maintains machining accuracy and surface quality

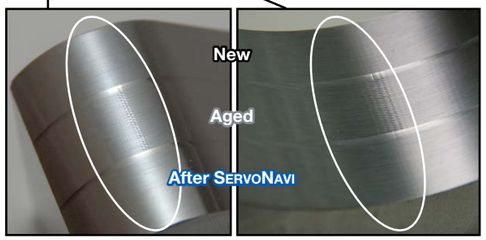
Slide resistance changes with length of time machine tools are utilized, and discrepancies occur with the servo parameters that were the best when the machine was first installed. This may produce crease marks at motion reversals and affect machining accuracy (part surface quality).

Reversal Spike Auto Adjustment maintains machining accuracy by switching servo parameters to the optimum values matched to changes in slide resistance.

Comparison of machined surface quality



- Workpieces Material: NAK80
- Cutting conditions
  Speed: 10,000 min^{-1}
  Cutting feed rate: 2,500 mm/min
  Cutting depth: 0.1 mm
  ø30-mm ball-nose end mill (2-flute)



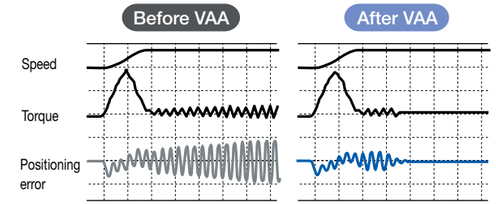
- **Vibration Auto Adjustment**

Contributes to longer machine life

When aging changes machine performance, noise, vibration, crease marks, or fish scales may appear.

Vibration Auto Adjustment can quickly eliminate noise and vibration even from machines with years of operation.

Comparison of following error during feed shaft movement



◆ MCR-B Ⅲ(30 × 50) X-axis rapid traverse positioning time
[rapid traverse: 15 m/min]

- **Deflection Auto Adjustment**

Maintaining high quality machined surfaces on dies/molds

With fast accleration/deceleration in the machining of dies and molds, etc, positioning error due to bending (ball screw expansion/contraction) can affect the machined surface quality.

Deflection Auto Adjustment maintains the surface quality of die/mold machined surfaces by automatically adjusting the servo parameters to match the amount of bending, even when the amount of bending of the ball screw has changed and positioning error has occurred as a result of changes over time.

Fast and accurate die/mold machining

High-speed machining

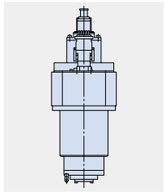
- Spindle speed — 10,000 to 30,000 min^{-1}
- Continuous cutting feed speed — Max 20 m/min
- High-speed NC — Fast contouring Hyper-Surface
  In addition to the features provided by Super-NURBS, Hyper-Surface automatically "corrects", machining data to improve workpiece surface quality.

High-accuracy machining

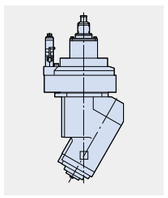
- Thermo-Friendly Premium Specs (Optional)
- SERVONAVI
- Auto Attachment Head Compensation
- Feed axis Deflection Auto Adjustment

Spindleheads with built-in attachment heads

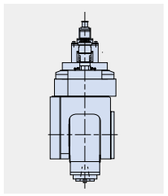
■ Extension head
15,000 min^{-1} (11.2 kW)
20,000 min^{-1} (15 kW)

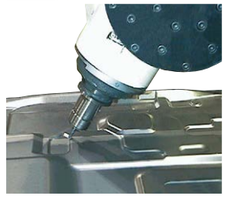


■ 30° anglular head
10,000 min^{-1} (11 kW)
30,000 min^{-1} (11 kW)



■ Universal index head
10,000 min^{-1} (7.5 kW)
20,000 min^{-1} (15 kW)





Press die machining

■ High speed, high accuracy machining of 3-dimensional die/mold shapes with B, C axis universal index head and NC-BC universal head

- Workpieces — Auto press die (automobile hood interior)
  Material: FC250
  Size: 1,700 x 1,200 x 600
- Cutting conditions — Spindle speed 20,000 min^{-1}
  Cutting feedrate 20 m/min
  ø30 CBN ball-nose end mill
- Cycle time — About 9 hours

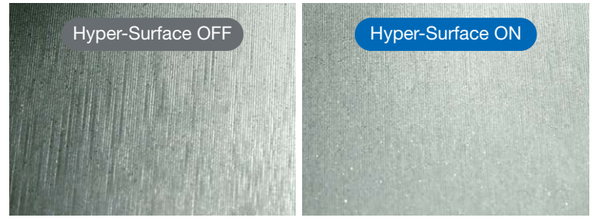
Powerful software for superb support of die/mold applications

■ Hyper-Surface (Optional)
With auto machining data compensation

Crease marks and uneven edges attributable to machining data are reduced and machined surface quality is improved, reducing the time for hand polished finishing.

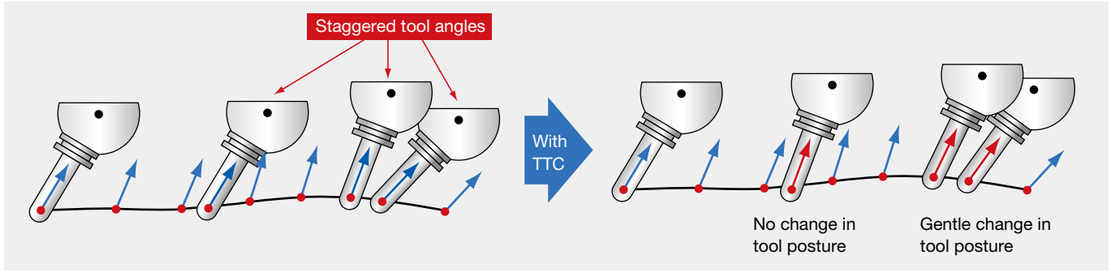
In addition to the Curve Adaptive Acceleration Control featured in the previous Super-NURBS function, the new Hyper-Surface — while maintaining the required shape accuracy — automatically compensates for those edges and adjacent cutter path positioning errors caused by remnants of "disturbances" found in the CAM machining data. Surface quality can be easily improved, and hand finishing times reduced.

- Automatically compensates for deviation between adjacent tool paths



■ Simultaneous 5-Axis Tool Tilt Compensation (Optional)

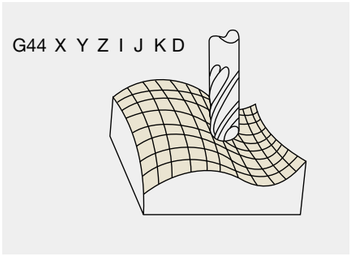
The tool angle on a workpiece (tool tilt) in 5-axis machining will change on a waving surface. CAM processing errors will cause the tool to stagger with unnecessary accel/decel and reverse angles during axis feed. Simul 5-Axis TTC will keep feedrates steady with a smooth sequence of commands to automatically correct tool tilt angles-resulting in shorter cycle times and smoother surface finishes.



■ Parameter F1 digit (Optional)

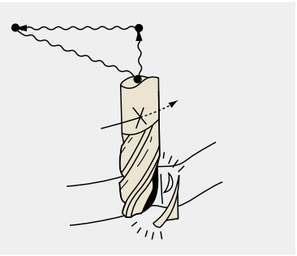
When it is difficult to program feedrates for die-making and you need different feedrates for specific cutting patterns, you can simply program using feedrate numbers. Choose either the rotary switch or the keyboard type F1 parameters.

■ 3-D tool compensation (Optional)



See 3-dimensional tool offsets by commanding the I, J, and K offset directions with the coordinates.

■ Mid-block restart (Optional)



Resume cutting either from the beginning or midway into a desired block.

Various applications for higher productivity and comfortable operation

Many functions for a wider range of applications

The Okuma NC makes it all possible. Things impossible on non-NC machines like User Task for example, are programmable like on a PC; making for a tremendous range of machining center applications.

Geometric change (Optional)

1 Programmable mirror image
Mirror image operations can be command programmable as well as handled by switching.

2 Drawing enlarge/reduce
Using the points commanded by local coordinates, the drawings produced by a part program can be enlarged or reduced with this function.

User Tasks

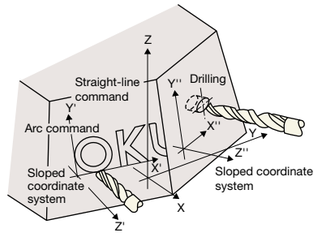
Variables can be used with arithmetic and branch commands to create a program. Then similar jobs can be patternized. And math functions with equations can be made for profiling and 3-D geometric applications. (Additional common variables [Std 200 increased to 1000 sets], and I/O variables are optional.)

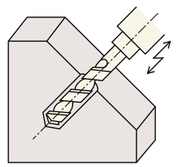
DNC Linkage (Optional)

More packages are ready to help you with jobs like transferring NC programs to building an FMS. These are online machining management software applications that collect and control the required data. Ethernet and RS-232C interfacing with the host computer allows for remote controlled operations.

Slope machining (Optional)

The slope surface coordinate system lets you use coordinate conversion to rotate coordinates to match the cutting plane. Just program sloped surfaces as X-Y planes to machine any surface. The pulse handle feed in the coordinate conversion system can be used to adjust the tool play.

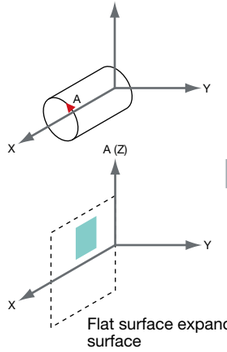


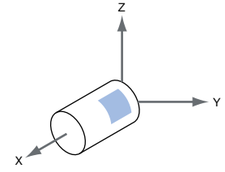


Slopes are programmed as straight X-Y planes.

Cylindrical side machining (Optional)

This is machining on cylindrical side with a regular plane machining image for flat surfaces that displace the rotating axis on a straight axis and develop to cylindrical surfaces.





Machining of cylindrical surfaces can be done with program commands for plane machining.

Flat surface expands to cylindrical surface

Examples of heavy cutting

Atttachment	Material	Tool	Spindle speed min	Cutting Speed m/min (fpm)	Cutting Width mm (in)	Cutting Depth mm (in)	Feedrate mm/blade (in/blade)	Feedrate mm/min (ipm)	Removal Rate cm^3/min (in^3/min)	Power kW (hp)	Ram Extension mm (in)
Extension head L150	S45C	ø200 (ø7.87) face mill	300	188 (617)	140 (5.51)	5 (0.20)	0.3 (0.012)	900 (35.43)	630 (38.44)	24 (32)	780 (30.71)
		ø63 (ø2.48) end mill	400	79 (259)	63 (2.48)	50 (1.97)	0.11 (0.0043)	176 (6.93)	554 (33.81)	26 (35)	500 (19.69)
	FC300	ø200 (ø7.87) face mill	240	150 (492)	140 (5.51)	8 (0.31)	0.32 (0.0126)	756 (29.76)	847 (51.69)	28 (37)	500 (19.69)
		ø63 (ø2.48) end mill	400	79 (259)	63 (2.48)	50 (1.97)	0.14 (0.0055)	252 (9.92)	794 (48.45)	26 (35)	500 (19.69)
Standard 90° angular head	S45C	ø200 (ø7.87) face mill	300	188 (617)	140 (5.51)	5 (0.20)	0.27 (0.0106)	810 (31.89)	567 (34.60)	22 (30)	600 to 800 (23.62 to 31.50)
		ø63 (ø2.48) end mill	400	79 (259)	63 (2.48)	50 (1.97)	0.08 (0.0031)	128 (5.04)	403 (24.59)	20 (27)	700 (27.56)
	FC300	ø200 (ø7.87) face mill	240	150 (492)	140 (5.51)	8 (0.31)	0.24 (0.0094)	576 (22.68)	645 (39.36)	22 (30)	700 to 800 (27.56 to 31.50)
		ø63 (ø2.48) end mill	400	79 (259)	31.5 (1.24)	50 (1.97)	0.21 (0.0083)	336 (13.23)	529 (32.28)	21 (28)	750 (29.53)

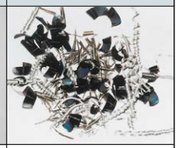
Note: The above are actual examples. Your results may vary due to differences in specifications, tooling and cutting conditions.

Machining example 〈machine tool component〉

- Workpieces: Lathe bed
  Material: FC250
  Size: 1,150 × 900 × 3,000 mm
- Cutting conditions: Spindle speed 4,000 min^{-1}
- Machine major specs: AAC: 3 stations
  ATC: 120 tools
  2-pallet APC

Recommended specifications for chip disposal

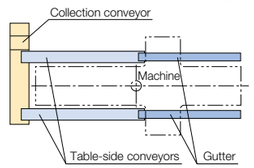
○: Recommended specifications △: Optional specifications

Material		Steel	FC	Aluminum Nonferrousmetal	Mixed (general use)
Chip shape					
In-machine	Hinge type	○	○	○	○
Off-machine (Optional)	Hinge type	○	○ (Dry)	—	△ (*2)
	Scraper type	—		—	—
	Magnet scraper type	—	○ (Wet)	—	—
	Hinge + scraper (with drum filter)	△(*1)	—	○	○ (*3)

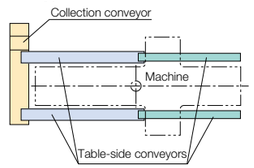
*1. When there are many fine chips *2. When there are few fine chips *3. With magnets Please contact an Okuma sales representative for details.

Example of conveyor placement

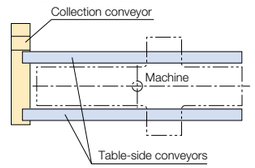
● Column front 3-con type + rear gutter



● 5-con type

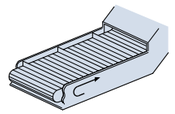
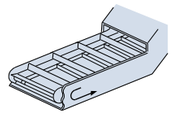
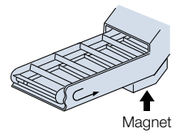
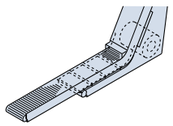


● Full length 3-con type*



* For full length 3-conveyors, the conveyor width becomes narrower—thus recommended for aluminum.

Collection conveyor chip discharge (lift-up)

Name	Hinge type	Scraper type	Magnet scraper type	Hinge + scraper type (with drum filter)
Shape			 Magnet	

Standard Accessories

Spindle speed	10 to 4,000 min^{-1}	Chip air blower (blast)	
Main motor	30/22 kW (30 min/cont)	3-color status indicator	LED signal tower type
Spindle and spindle gear box cooler	Oil controller	Table shape	T slot specifications 24H7
Z axis double ball screw		Tool kit	
Hydraulic unit		Tapered cleaning rod	
ATC air blower		ATC magazine safety fence	
Coolant system		Tool release lever	
Coolant tank	500 L	Tool box	
Coolant nozzle	Universal nozzle	Crossrail screw cover	
Coolant pump	0.75 kW	Column guideway cover	
Ladder and platform		Automatic crossrail positioning	W axis NC (synchronized)
Door interlock			W axis AbsoScale detection
Work lamp	LED	Elevating pendant arm	

Kit Specifications

Kit / Specs		Elevating Crossrail S	A	P	AP
Spindlehead ATC		●	●	●	●
Spindlehead auto clamping/indexing (5° orientation)		—	●	—	●
Spindlehead manual tool changer		●	●	●	●
Auto attachment changer (AAC)		—	●	—	●
Coolant lines for spindlehead		●	●	●	●
ATC tool magazine capacity	32 tools	●	—	●	—
	50 tools	—	●	—	●
Auto pallet changer 2-pallet side loading system (X-axis travel extended 1.5 m)		—	—	●	●

Optional Accessories and Optional Specifications

Item	Type/Dimensions/Remarks
Optional spindle speed	10 to 3,600 min^{-1} (45/37 kW), 10 to 6,000 min^{-1} (22 kW), 30 to 8,000 min^{-1} (26/22 kW), 30 to 10,000 min^{-1} (26/22 kW) 30 to 10,000 min^{-1} (37/32 kW)
AbsoScale detection	X, Y axes; X, Y, Z axes
Thermo-Friendly Concept	TAS-S, TAS-T
Thermo-Friendly Premium	AbsoScale detection required
Optional ATC tool magazine capacity	50, 72, 100, 120, 180 tools
Tool shank/pull stud configuration	Other than standard BT50 + MAS type 2
Optional table T-slots	20^{H7}, 22^{H7}, 28^{H7}
Additional table cross slot	Consult for width x depth and pitch
Optional table shapes	Please consult
Auto pallet changer (APC)	2-pallet front shuttle 2-pallet side shuttle
Coolant system Tanks, pump motors	Tanks: 1,000 L, 1,500 L, 2,000 L Pump 1.1 kW
Sub-table	Please consult
Coolant heater/cooler	
Chip air blower (blast)	Switch w/ coolant
Oil mist coolant	Universal nozzle type
Shower coolant system	
Oil-hole coolant system (ATC OK)	Simple, high/low pressure switch (2 MPa)
Oil skimmer	
Workpiece washing gun	
Foundation methods	Foundation blocks only Chemical anchoring Foundation bolts (500 mm, 800 mm)
Auto attaching attachments heads	Extension head 90° angular head, etc. (see page 5 for details)
Auto attachment changer (AAC)	(see kit specs)
ATC to attachment head	(see kit specs)

Item	Type/Dimensions/Remarks
Attachment head coolant	Universal coolant nozzle (air blower (blast)) switchable) with oil-hole tool supply block Thru-spindle coolant*
NC rotary table	NC rotary table, Inclined rotary table
In-machine chip discharge	Consult for type and preparations (see page 14 for details)
Off machine chip discharge	
Chip buckets	
Work lamp (LED)	Additional spotlight
Operation end buzzer	
Hour meters (2)	Power ON time (w/o reset) Cutting (G1, G2, G3) time (with reset)
Automatic power shutoff device	Movement after M2, M30 execution
CNC cabinet lamp	
Auto zero offset, auto gauging	Touch probe system
Auto tool length compensation	Touch sensor, laser sensor
Tool breakage detection (w/ auto tool length compensation)	w/ T-command spare tool change
Tool life management	w/ T-command spare tool change
Overload monitor (w/ feed adaptive control)	w/ T-command spare tool change
Machine foundation pit work	Please consult
Custom paint color	Please consult
Full-enclosure shielding	Without ceiling With ceiling
Mist collector	
High column	Please consult (200, 400, 600, 800 mm)
Pulse handle with liquid crysta	
Auto Attachment Head Compensation	
Automatic extinguisher	

* Dedicated Okuma pull stud required for thru-spindle coolant

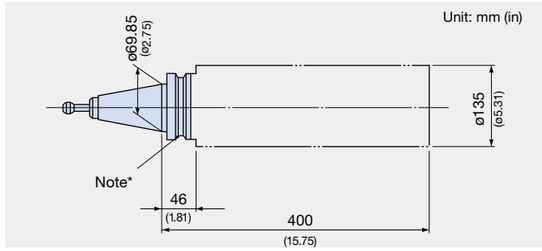
ATC tooling

MAS BT50 tool shank and MAS 2 pull stud can be used. Please consult for other tooling standards.

[Maximum Tool Dimensions]

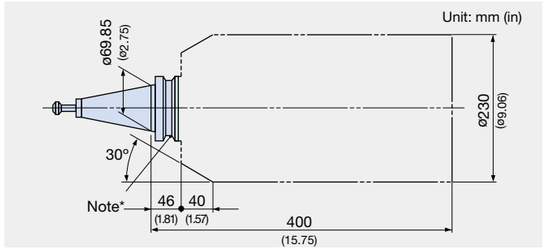
● Maximum adjacent tool size

The maximum tool size is determined by the neighboring tool size



● Maximum non-adjacent tool size

This is the maximum tool size when there are no tools on either side of a tool.



* Note: Commercially available milling chucks may interfere with ATC arm and other tools. Prior to use, confirm size dimensions with the tool manufacturer (brochure, etc).

● Maximum tool mass moment: 29.4 N-m (21.6 ft-lbf)

Tool weight (including shank) must be under 25 kg (55 lb). The center of gravity should be within 120 mm (4.72 in) from the gauge line (at ø69.85 mm [ø2.75 in]).

Note: Tools with a tool mass moment of 29.4 N·m or more cannot be used.
With tools of 19.6 N·m or less, ATC can be used with high-speed operation.

Working ranges [When using an L150 extension head, a 90° angular head, and a 300-mm (11.81 in) tool]

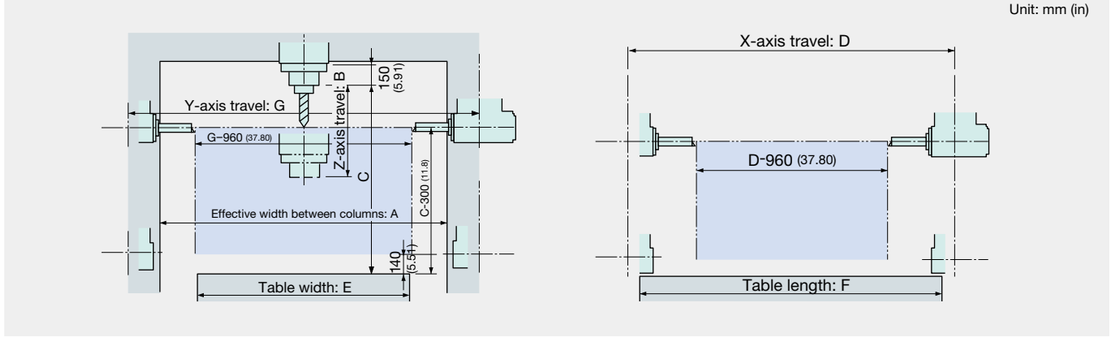
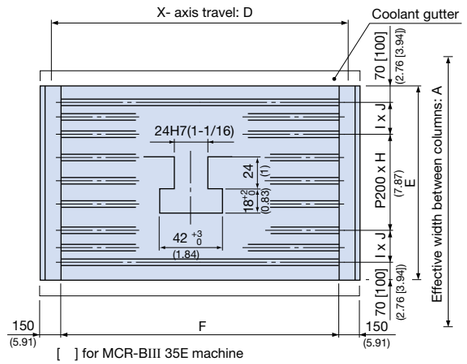


Table dimensions



Type	A	B	C	D	E	F	G	H	I	J
20 x 30 20 x 40 20 x 50	2,050 (80.71)	800 (31.50)	1,350 (53.15)	3,000 (118.11) 4,000 (157.48) 5,000 (196.85)	1,500 (59.06)	2,800 3,800 4,800	2,700 (106.30)	4 (0.16)	140 (5.51)	2 (0.08)
25 x 40 25 x 50 25 x 65 25 x 80	2,550 (100.39)	800 (31.50)	1,650 (69.96)	4,000 (157.48) 5,000 (196.85) 6,500 (255.91) 8,000 (314.96)	2,000 (78.74)	3,800 4,800 6,300 7,800	3,200 (125.98)	8 (0.31)	130 (5.12)	1 (0.04)
30 x 50 30 x 65 30 x 80 30 x 100 30 x 120	3,050 (120.08)	800 (31.50)	1,850 (72.83)	5,000 (196.85) 6,500 (255.91) 8,000 (314.96) 10,000 (393.70) 12,000 (472.44)	2,500 (98.43)	4,800 6,300 7,800 9,800 11,800	3,700 (145.67)	10 (0.39)	180 (7.09)	1 (0.04)
35 x 50 35 x 65 35 x 80 35 x 100 35 x 120	3,550 (139.76)	800 (31.50)	1,800 (70.87)	5,000 (196.85) 6,500 (255.91) 8,000 (314.96) 10,000 (393.70) 12,000 (472.44)	3,000 (118.11)	4,800 6,300 7,800 9,800 11,800	4,200 (165.35)	14 (0.55)	0	0

Unit: mm (in)

OSP suite OSP-P300MA

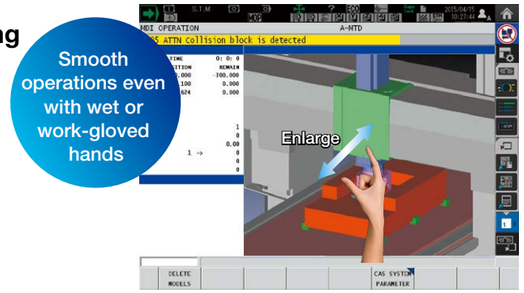
The Next-Generation Intelligent CNC

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

Smart factories implement 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 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.



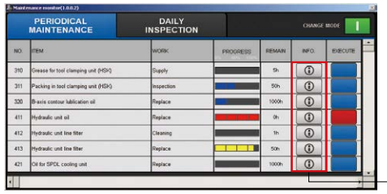
Note: Collision Avoidance System (Optional) shown above.

"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.

Maintenance Monitor
Routine inspection support

The Maintenance Monitor displays items for inspections before starting daily operation and regular inspections and the rough estimate of inspection timing. Touching the [INFO] button displays the PDF instruction manual file of relevant maintenance items.



[INFO] button

Spindle Output Monitor
Increased productivity through visualization of motor power reserve

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

Common Variable Monitor
Comment display for greater ease of use and faster work

Screen Capture
Automatic saving of recorded alarms

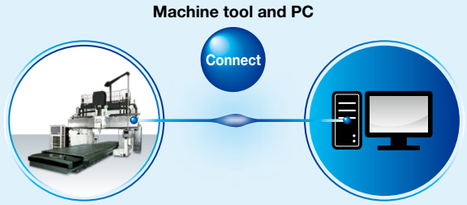
Scheduled Program Editor
Easy programming without keying in code

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	X, Y, Z, W simultaneous 4-axis, spindle control (1 axis)
	Position feedback	OSP full range absolute position feedback (zero point return not required)
	Coordinate functions	Machine coordinate system (1 set), work coordinate system (20 sets)
	Min / Max command	±99999.999 mm, ±9999.9999˚, 8-digit decimal, command unit: 0.001 mm, 0.01 mm, 1mm, 0.0001˚, 0.001˚, 1˚
	Feed	Override: 0 to 200%, rapid traverse override: 0% to 100%
	Spindle control	Direct spindle speed commands, override 30 to 300%, multi-point indexing
	Tool compensation	No. of registered tools: Max 999 sets, tool length/radius compensation: 3 sets per tool
	Display	15-inch color LCD + multi-touch panel operations
	Self-diagnostics	Automatic diagnostics and display of program, operation, machine, and NC system problems
Programming	Program capacity	Program storage: 4 GB, operation buffer: 2 MB
	Program operations	Program management, editing, scheduled program, fixed cycle, G-/M-code macros, arithmetic, logic statements, math functions, variables, branch commands, coordinate calculate, area machining, coordinate convert, programming help
Operations	"suite apps"	Applications to 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" to complete a series of operations Advanced operation panel/graphics facilitate smooth machine control
	Machine operations	MDI, manual (rapid traverse, manual cutting feed, pulse handle), load meter, operation help, alarm help, sequence return, manual interrupt/auto return, pulse handle overlap, parameter I/O, PLC monitor, Easy setting of cycle time reduction
	MacMan	Machining management: machining results, machine utilization, fault data compile & report, external output
Communications / Networking		USB (2 ports), Ethernet
High speed/accuracy specs		Hi-Cut Pro, pitch error compensation, Hi-G control, SERVONAVI
Energy-saving function	ECO suite	ECO Idling Stop *1, ECO Power Monitor *2

*1. Spindle cooler Idling Stop is used on TAS-S machines.
*2. The power display shows estimated values. When precise power values are needed, select the on-machine wattmeter option.

Optional Specifications

Item	Kit specifications	NML E	NML D	3D E	3D D	One-Touch E	One-Touch D
Interactive functions							
Advanced One-Touch IGF-M						●	●
I-MAP				●	●		
Programming							
Auto scheduled program update		●	●	●	●	●	●
G-/M-code macros							
Common variables (Std: 200)	1,000 pcs						
	2,000 pcs						
Program branch 2 sets							
Program notes (MSG)			●		●		●
Coordinate system selection (Std: 20)	100 sets	●		●		●	
	200 sets		●		●		●
	400 sets						
Helical cutting (Within 360 degrees)		●	●	●	●	●	●
3-D circular interpolation							
Synchronized Tapping II							
Arbitrary angle chamfering		●	●	●	●	●	●
Cylindrical side facing							
Slope machining							
Permissible spindle speed setting							
F1-digit feed	4 sets, 8 sets, parameter						
Programmable travel limits (G22, G23)		●	●	●	●	●	●
Skip (G31)							
Axis naming (G14)							
3-D tool compensation							
Tool wear compensation			●		●		●
Drawing conversion	Programmable mirror image (G62)		●		●		●
	Enlarge/reduce (G50, G51)		●		●		●
User task 2	I/O variables, 16 each						
Tape conversion ★							
Leading edge offset ★							
Inverse time feed							
Alignment compensation							
Monitoring							
Real 3-D simulation				●	●	●	●
Simple load monitor	Spindle overload monitor	●	●	●	●	●	●
NC operation monitor	Hour count-up, work counter	●	●	●	●	●	●
Hour meters	Power ON, spindle run-time NC ON time, machining						
Operation end buzzer	With M02, M30, and END commands						
Work counter	M02, M30 counts						
MOP-TOOL	Adaptive control, overload monitor						
Machine Status Logger							
Cutting Status Monitor							
AI Machine Diagnosis Function	Feed axes						
Tool life management	Cutting time and number of tools	●	●	●	●	●	●
Energy-saving function ECO suite							
ECO Operation							
ECO Power Monitor	On-machine wattmeter						
Energy-saving hydraulic unit	Inverter system						
	ECO Hydraulic						

Item	Kit specifications	NML E	NML D	3D E	3D D	One-Touch E	One-Touch D
Gauging							
Auto gauging	Touch probe (G31)	Included in machine specs					
Auto zero offset	Includes auto gauging	Included in machine specs					
Tool breakage detection	Touch sensor (G31) Includes tool offset	Included in machine specs					
Gauging data printout	File output						
Manual gauging (w/o sensor)		●	●	●	●	●	●
Interactive gauging (Touch setter, touch-probe required)							
External I/O, Communications							
RS-232C connector							
DNC-T3							
DNC-B (RS-232C-Ethernet transducer used on OSP side)							
DNC-DT							
DNC-C/Ethernet							
Additional USB (2 ports are standard)							
Automated/untended operation							
Auto power shut-off	With M02 and END alarms Workpiece preps done → off	●	●	●	●	●	●
Warm-up (by calendar timer)							
External program selection	Button type, rotary switch BCD (2-digit, 4-digit)						
Cycle time reduction (Reduced cycle time)							
High-speed, high-precision							
Thermo-Friendly Concept	TAS-S, TAS-T						
Thermo-Friendly Premium TAS-S, TAS-C²	Thermo Active Stabilizer – Spindle						
	Thermo Active Stabilizer – Construction for large machines						
AbsoScale detection	X, Y-axis, X, Y, Z-axis						
Straightness compensation							
0.1 µm control (straight axis command unit)							
Hyper-Surface *1	3-axis Type A, Type B						
Super-NURBS *2	5-axis Type A, Type B						
Simultaneous 5-axis kit							
Operations							
Control cabinet lamp							
Circuit breaker							
Sequence operation	Sequence stop	●	●	●	●	●	●
Upgraded sequence restart	Mid-block return		●		●		●
Pulse handles	2, 3 (1 standard)						
LCD pulse handle							
External M signals	4, 8						
Collision Avoidance System *1 *2							
Machining Navi M-gII (cutting condition search function)							
Excel machining							
Block skip	3 sets						
Feed axis retract							
OSP-VPS (virus protection system)							

Note 1. NML: Normal, 3D: 3D simulation, E: Economy, D: Deluxe
Note 2. ★Technical consultation needed for specifications
*1. There are limitations when Hyper-Surface and Collision Avoidance System are used simultaneously.
*2. There are limitations when Super-NURBS and Collision Avoidance System are used simultaneously.

Machine Specifications (Elevating Crossrail)

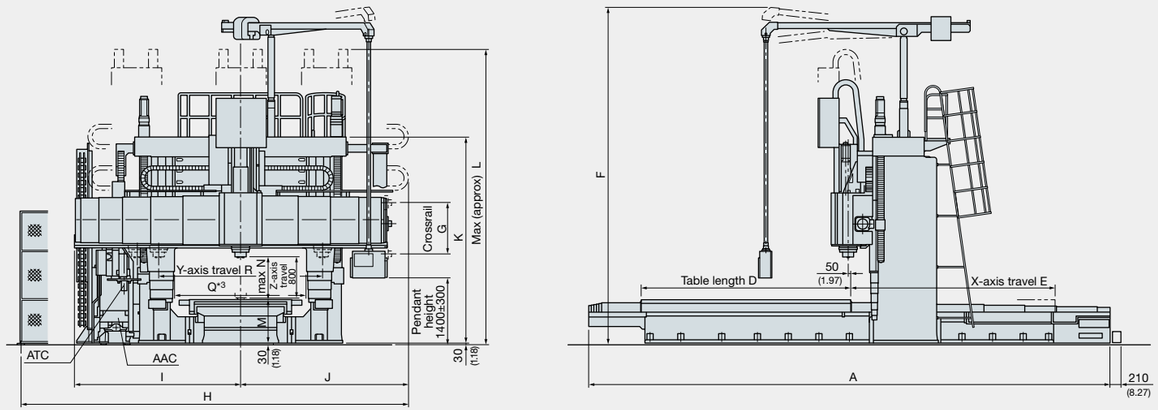
Item	Unit	MCR-BⅢ20E			MCR-BⅢ25E			
		20 × 30	20 × 40	20 × 50	25 × 40	25 × 50	25 × 65	25 × 80
● Travel								
X-axis (table front / back)	mm (in)	3,000 (118.11)	4,000 (157.48)	5,000 (196.85)	4,000 (157.48)	5,000 (196.85)	6,500 (255.91)	8,000 (314.96)
Y-axis (spindlehead horizontal)	mm (in)	2,700 (106.3)			3,200 (125.98)			
Z-axis (ram vertical)	mm (in)	800 [1,000] (31.50 [39.37])						
W-axis (crossrail vertical)	mm (in)	700 (27.56)			1,000 (39.37)			
Effective width between columns	mm (in)	2,050 (80.71)			2,550 (100.39)			
Table to spindle nose *1	mm (in)	0 to 1,350 [0 to 1,250] (0 to 53.15 [0 to 49.21])			0 to 1,650 [0 to 1,550] (0 to 64.96 [0 to 61.02])			
● Table								
Working surface	mm (in)	1,500 × 2,800 (59.06 × 110.24)	1,500 × 3,800 (59.06 × 149.61)	1,500 × 4,800 (59.06 × 188.98)	2,000 × 3,800 (78.74 × 149.61)	2,000 × 4,800 (78.74 × 188.98)	2,000 × 6,300 (78.74 × 248.03)	2,000 × 7,800 (78.74 × 307.09)
Maximum load	kg (lb)	12,000 (26,400)	16,000 (35,200)	20,000 (44,000)	22,000 (48,400)	27,000 (59,400)	34,000 (74,800)	42,000 (92,400)
T-slots Width x No. <center pitch>	mm	24H7 × 9 <center 200 both ends 70>			24H7 ×11 <center 200 both ends 70>			
Height from machine bottom	mm (in)	800 (31.50)			850 (33.46)			
● Spindle								
Speed range	min^{-1}	10 to 4,000 [10 to 3,600, 10 to 6,000, 30 to 8,000, 30 to 10,000, 30 to 10,000]						
Number of speed ranges	Steps	2						
Taper bore		7/24 taper No. 50						
Bearing diameter *2	mm (in)	ø100 (3.94) [Optional: ø85 (3.35)]						
● Feedrates								
Rapid traverse	m/min (ipm)	X: 15, Y: 20 *3, Z: 15 (X: 590.55, Y: 787.40, Z: 590.55)						
Feedrate	mm/min (ipm)	1 to 10,000 (0.04 to 394)						
Crossrail traverse	m/min (ipm)	3 (118.11)						
● Automatic Tool Changer								
Tool shank		MAS BT50						
Pull stud		MAS 2						
Tool magazine capacity	tools	32 *4 [50, 72, 100, 120, 180]						
Max tool diameter	mm (in)	w/ adjacent tools: ø135 (5.31); w/o adjacent tools: ø230 (9.06)						
Max tool length	mm (in)	400 (15.75)						
Max tool weight	kg (lb)	25 (55)						
Tool selection		Fixed adress						
● Motors								
Spindle drive	kW (hp)	30/22 (40/30) (30 min/cont) [Optinal: 45/37 (60/50) (30 min/cont), 22 (30) (cont), 26/22 (35/30) (30 min/cont), 37/32 (50/43) (short time/cont)] *5						
Axis feed drives	kW (hp)	X: 9.4 (12.5), Y: 6.4 (8.5), Z: 4.6 × 2 (6.1 × 2)						
Crossrail traverse drive	kW (hp)	W: 4.6 × 2 (6.1 × 2)						
● Power Sources								
Electrical power supply	kVA	60 (200 V ± 10%, 50/60 Hz) *7						
Compressed air supply	L/min (ANR)	750 (0.5 MPa or more) *7						
● Machine Size								
Height	mm (in)	6,250 (246.06)			6,600 (259.84)			
Floor space (machine only)*7	mm (in)	6,950 × 8,200 (273.62 × 322.83)	6,950 × 10,200 (273.62 × 401.57)	6,950 × 12,200 (273.62 × 480.31)	7,450 × 10,200 (293.31 × 401.57)	7,450 × 12,200 (293.31 × 480.31)	7,450 × 15,800 (293.31 × 622.05)	7,450 × 18,800 (293.31 × 740.16)
Weight (machine only)	kg (lb)	36,000 (79,200)	39,000 (85,800)	42,000 (92,400)	46,000 (101,200)	49,000 (107,800)	54,000 (118,800)	60,000 (132,000)

Item	Unit	MCR-BⅢ30E					MCR-BⅢ35E				
		30 × 50	30 × 65	30 × 80	30 × 100	30 × 120	35 × 50	35 × 65	35 × 80	35 × 100	35 × 120
● Travel											
X-axis (table front / back)	mm (in)	5,000 (196.85)	6,500 (255.91)	8,000 (314.96)	10,000 (393.70)	12,000 (472.44)	5,000 (196.85)	6,500 (255.91)	8,000 (314.96)	10,000 (393.70)	12,000 (472.44)
Y-axis (spindlehead horizontal)	mm (in)	3,700 (145.67)					4,200 (165.35)				
Z-axis (ram vertical)	mm (in)	800 [1,000] (31.50 [39.37])									
W-axis (crossrail vertical)	mm (in)	1,300 (51.18)									
Effective width between columns	mm (in)	3,050 (120.08)					3,550 (139.76)				
Table to spindle nose *1	mm (in)	0 to 1,850 [0 to 1,750] (0 to 72.83 [0 to 68.90])					0 to 1,800 [0 to 1,700] (0 to 70.87 [0 to 66.93])				
● Table											
Working surface	mm (in)	2,500 × 4,800 (98.43 × 188.98)	2,500 × 6,300 (98.43 × 248.03)	2,500 × 7,800 (98.43 × 307.09)	2,500 × 9,800 (98.43 × 385.83)	2,500 × 11,800 (98.43 × 464.57)	3,000 × 4,800 (118.11 × 188.98)	3,000 × 6,300 (118.11 × 248.03)	3,000 × 7,800 (118.11 × 307.09)	3,000 × 9,800 (118.11 × 385.83)	3,000 × 11,800 (118.11 × 464.57)
Maximum load	kg (lb)	33,000 (72,600)	43,000 (94,600)	52,000 (114,400)	66,000 (145,200)	72,600 (159,720)	29,500 (64,900)	37,000 (81,400)	47,000 (103,400)	61,000 (134,200)	65,000 (143,000)
T-slots Width x No. <center pitch>	mm	24H7 ×13 <center 200 both ends 70>					24H7 ×15 <center 200 both ends 100>				
Height from machine bottom	mm (in)	900 (35.43)					950 (37.40)				
● Spindle											
Speed range	min^{-1}	10 to 4,000 [10 to 3,600, 10 to 6,000, 30 to 8,000, 30 to 10,000, 30 to 10,000]									
Number of speed ranges	Steps	2									
Taper bore		7/24 taper No. 50									
Bearing diameter *2	mm (in)	ø100 (3.94) [Optional: ø85 (3.35)]									
● Feedrates											
Rapid traverse	m/min (ipm)	X: 15, Y: 20 *3, Z: 15 (X: 590.55, Y: 787.40, Z: 590.55)									
Feedrate	mm/min (ipm)	1 to 10,000 (0.04 to 394)									
Crossrail traverse	m/min (ipm)	3 (118.11)									
● Automatic Tool Changer											
Tool shank		MAS BT50									
Pull stud		MAS 2									
Tool magazine capacity	tools	32 *4 [50, 72, 100, 120, 180]									
Max tool diameter	mm (in)	w/ adjacent tools: ø135 (5.31); w/o adjacent tools: ø230 (9.06)									
Max tool length	mm (in)	400 (15.75)									
Max tool weight	kg (lb)	25 (55)									
Tool selection		Fixed adress									
● Motors											
Spindle drive	kW (hp)	30/22 (40/30) (30 min/cont) [Optinal: 45/37 (60/50) (30 min/cont), 22 (30) (cont), 26/22 (35/30) (30 min/cont), 37/32 (50/43) (short time/cont)] *5									
Axis feed drives	kW (hp)	X: 9.4 (12.5), Y: 6.4 (8.5), Z: 4.6 × 2 (6.1 × 2) *6					X: 9.4 (12.5), Y: 9.4 (12.5), Z: 4.6 × 2 (6.1 × 2) *6				
Crossrail traverse drive	kW (hp)	W: 4.6× 2 (6.1 × 2)					W: 5.2 × 2 (6.9 × 2)				
● Power Sources											
Electrical power supply	kVA	60 (200 V ± 10%, 50/60 Hz) *7									
Compressed air supply	L/min (ANR)	750 (0.5 MPa or more) *7									
● Machine Size											
Height	mm (in)	6,850 (270)									
Floor space (machine only)*7	mm (in)	7,970 × 12,200 (313.78 × 480.31)	7,970 × 15,800 (313.78 × 622.05)	7,970 × 18,800 (313.78 × 740.16)	7,970 × 23,400 (313.78 × 921.26)	7,970 × 27,400 (313.78 × 1,078.74)	8,700 × 12,200 (342.52 × 480.31)	8,700 × 15,800 (342.52 × 622.05)	8,700 × 18,800 (342.52 × 740.16)	8,700 × 23,200 (342.52 × 913.39)	8,700 × 27,300 (342.52 × 1,074.80)
Weight (machine only)	kg (lb)	56,000 (123,200)	61,000 (134,200)	66,000 (145,200)	73,000 (160,600)	79,800 (175,560)	72,300 (159,060)	84,000 (184,800)	95,800 (210,760)	106,500 (234,300)	120,900 (265,980)

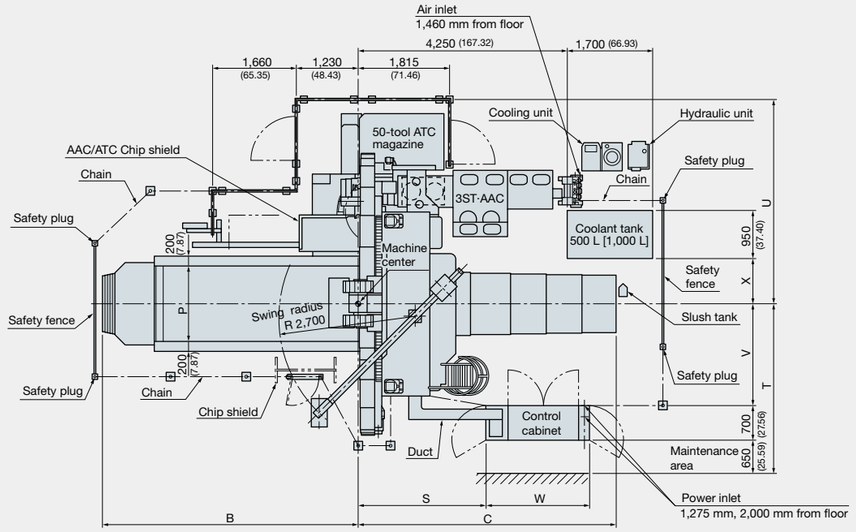
[ ] is optional.
*1. [ ] Numbers when extension head length is 250 mm.
*2. [ ] for 6,000/8,000/10,000 min^{-1}
*3. Decelerates at end of Y-axis travel.
*4. 32-tool ATCs have limitations on 25 or larger machines
*5. [ ] show the values with specifications of 3,600/6,000/8,000/10,000 min^{-1}
*6. X axis motor is 14 kW with 30 × 120, 35 × 120.
*7. Standard specs

Elevating Crossrail (MCR-BⅢ-E)

Dimensional Drawing



Installation Drawing



* Please inquire for safety cover specifications, position and other details

Unit: mm (in)

	Size	A	B	C	D	E	F*1	G	H*1	I	J*1	K	L*1	M
MCR-BⅢ 20	20 × 30	8,200 (322.83)	4,075 (160.43)	4,125 (162.40)	3,100 (122.05)	3,000 (118.11)	6,250 (246.06) 6,300 (248.03)	700 (27.56)	6,950 (273.62) 7,050 (277.56)	2,990 (117.72)	2,900 (114.17) 3,000 (118.11)	3,680 (144.88)	5,590 (220.08) 5,620 (221.26)	800 (31.50)
	20 × 40	10,200 (401.57)	5,075 (199.80)	5,125 (201.77)	4,100 (161.42)	4,000 (157.48)								
	20 × 50	12,200 (480.31)	6,075 (239.17)	6,125 (241.14)	5,100 (200.79)	5,000 (196.85)								
MCR-BⅢ 25	25 × 40	10,200 (401.57)	5,075 (199.80)	5,125 (201.77)	4,100 (161.42)	4,000 (157.48)	6,600 (259.84) 6,650 (261.81)	1,000 (39.37)	7,450 (293.31) 7,580 (298.43)	3,240 (127.56)	3,150 (124.02) 3,280 (129.13)	4,030 (158.66)	5,940 (233.86) 5,970 (235.04)	850 (33.46)
	25 × 50	12,200 (480.31)	6,075 (239.17)	6,125 (241.14)	5,100 (200.79)	5,000 (196.85)								
	25 × 65	15,800 (622.05)	7,875 (310.04)	7,925 (312.01)	6,600 (259.84)	6,500 (255.91)								
	25 × 80	18,800 (740.16)	9,375 (369.09)	9,425 (371.06)	8,100 (318.90)	8,000 (314.96)								
MCR-BⅢ 30	30 × 50	12,200 (480.31)	6,075 (239.17)	6,125 (241.14)	5,100 (200.79)	5,000 (196.85)	6,850 (269.69) 6,950 (273.62)	1,300 (51.18)	7,970 (313.78) 8,050 (316.93)	3,490 (137.40)	3,420 (134.65) 3,500 (137.80)	4,460 (175.59)	6,190 (243.70) 6,220 (244.88)	900 (35.43)
	30 × 65	15,800 (622.05)	7,875 (310.04)	7,925 (312.01)	6,600 (259.84)	6,500 (255.91)								
	30 × 80	18,800 (740.16)	9,375 (369.09)	9,425 (371.06)	8,100 (318.90)	8,000 (314.96)								
	30 × 100	23,400 (921.26)	11,675 (459.65)	11,725 (461.61)	10,100 (397.64)	10,000 (393.70)								
	30 × 120	27,400 (1,078.74)	13,675 (538.39)	13,725 (540.35)	12,100 (476.38)	12,000 (472.44)								
MCR-BⅢ 35	35 × 50	12,200 (480.31)	6,075 (239.17)	6,125 (241.14)	5,100 (200.79)	5,000 (196.85)	6,850 (269.69) 6,950 (237.62)	1,300 (51.18)	8,700 (342.52)	3,945 (155.31)	3,900 (153.54)	4,460 (175.59)	6,190 (243.70) 6,220 (244.88)	950 (37.40)
	35 × 65	15,800 (622.05)	7,875 (310.04)	7,925 (312.01)	6,600 (259.84)	6,500 (255.91)								
	35 × 80	18,800 (740.16)	9,375 (369.09)	9,425 (371.06)	8,100 (318.90)	8,000 (314.96)								
	35 × 100	23,200 (913.39)	11,575 (455.71)	11,625 (457.68)	10,100 (397.64)	10,000 (393.70)								
	35 × 120	27,300 (1,074.80)	13,675 (538.39)	13,725 (540.35)	12,100 (476.38)	12,000 (472.44)								

*1. Upper figures for 4,000 min^{-1}, 6,000 min^{-1}; lower figures for 8,000 min^{-1} or faster spindles
*2. Upper figures for 150-L extension head; lower figures for 250-L extension head
*3. Effective width between columns

Unit: mm (in)

	Size	N*2	P	Q	R	S	T	U	V	W	X
MCR-BⅢ 20	20 × 30	1,350 (53.15) 1,250 (49.21)	1,500 (59.06)	2,050 (80.71)	2,700 (106.30)	2,525 (99.41)	3,360 (132.28)	4,050 (159.45)	2,010 (79.13)	2,070 (81.50)	900 (35.43)
	20 × 40									2,270 (89.37)	
	20 × 50										
MCR-BⅢ 25	25 × 40	1,650 (64.96) 1,550 (61.02)	2,000 (78.74)	2,550 (100.39)	3,200 (125.98)	2,525 (99.41)	3,610 (142.13)	4,300 (169.29)	2,260 (88.98)	2,070 (81.50)	1,150 (45.28)
	25 × 50									2,270 (89.37)	
	25 × 65										
	25 × 80										
MCR-BⅢ 30	30 × 50	1,850 (72.83) 1,750 (68.90)	2,500 (98.43)	3,050 (120.08)	3,700 (145.67)	2,725 (107.28)	3,860 (151.97)	4,550 (179.13)	2,510 (98.82)	2,070 (81.50)	1,400 (55.12)
	30 × 65									2,270 (89.37)	
	30 × 80										
	30 × 100										
	30 × 120										
MCR-BⅢ 35	35 × 50	1,800 (70.87) 1,700 (66.93)	3,000 (118.11)	3,550 (139.76)	4,200 (165.35)	2,725 (107.28)	4,110 (161.81)	4,800 (188.98)	2,760 (108.66)	2,270 (89.37)	1,650 (64.96)
	35 × 65										
	35 × 80										
	35 × 100										
	35 × 120										

* Effective width between columns

MCR-BIII

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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