OKUMA

OPEN POSSIBILITIES

Double-Column Machining Center

MCR-C

[5-Face Machining]

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MCR-C

[5-Face Machining]

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

High power, high torque, high productivity

Heavy industries continue to experience growth in global markets. Okuma's MCR-C is a high performance machine that provides greater productivity in the machining of large, high-accuracy components.

The MCR-C is equipped with a high power spindle capable of heavy-duty cutting. That power is fully displayed with a solid machine structure and fast axis feeds, achieving significant improvements in machining performance including reduced non-cutting times.

The Thermo-Friendly Concept, one of Okuma's original Intelligent Technologies, helps to eliminate the accuracy problems from thermal deformation that are characteristic of large machines. By minimizing the amount of thermal deformation to ensure stable machining quality, production costs are greatly reduced.

Okuma is a manufacturer of both machine and control, and so can deliver impressive value to customers. The MCR-C double-column machining center for 5-face machining fulfills these high-level concepts to achieve the highest productivity.

Photographs used in this brochure may show optional equipment.

With the high machining capacity and accuracy required for highly efficient production

Machining capacity (S50C steel)

High output extension head
(spindle bore: ø130, L250)
1,210 cm³/min

ø250 face mill	10-blade
● Cutting Speed	188 m/min
● Cut Width x depth	8 × 175 mm
● Feedrate	864 mm/min (0.36 mm/blade)

High output 90° angular head
(spindle bore: ø130, L270)
1,075 cm³/min

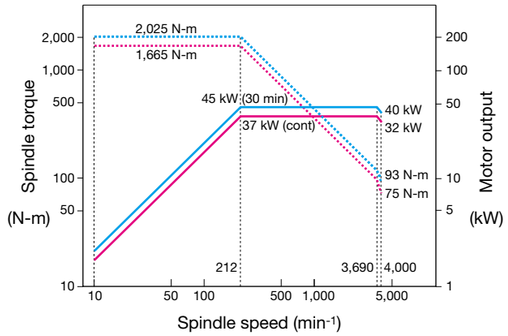
ø250 face mill	10-blade
● Cutting Speed	188 m/min
● Cut Width x depth	8 × 175 mm
● Feedrate	768 mm/min (0.32 mm/blade)

* High output specifications are optional.
Note: The “actual data” referred to above for this brochure represent examples, and may not be obtained due to differences in specifications, tooling, cutting, and other conditions.

Highly rigid ram (420 × 425 mm) enables heavy-duty cutting

The spindlehead has a ram-type structure with the largest cross section, 420 × 425 mm, of any of Okuma's double-column series machines. It thus possesses the rigidity to deal with powerful cutting, even with the horizontal spindle.

- Spindle power
  - ・Spindle taper .... 7/24 taper No. 50
  - ・Spindle speed... Standard: 4,000 min^{-1} (gear)
  - ・Spindle motor... 45/37 kW 2,025 N-m



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

Highly efficient, expansive multitasking operations

- Uses the same attachment heads as the MCR-BⅢ, with their wide variety
- Highly efficient machining with attachment head auto changer
- High output and torque provides highly efficient roughing operations
- Rapid traverse...X axis: 24 m/min
  Y axis: 24 m/min
  Z axis: 15 m/min
  W axis: 3 m/min
  *Speeds may vary depending on the machine size.

Highly rigid ram-type spindlehead

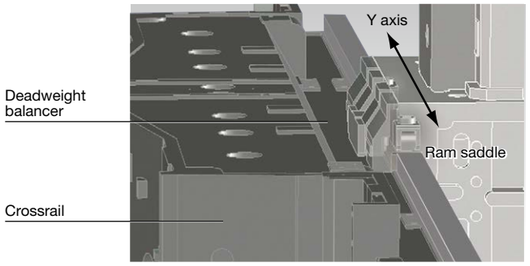
(Spindle ram vertical movement: Z axis)

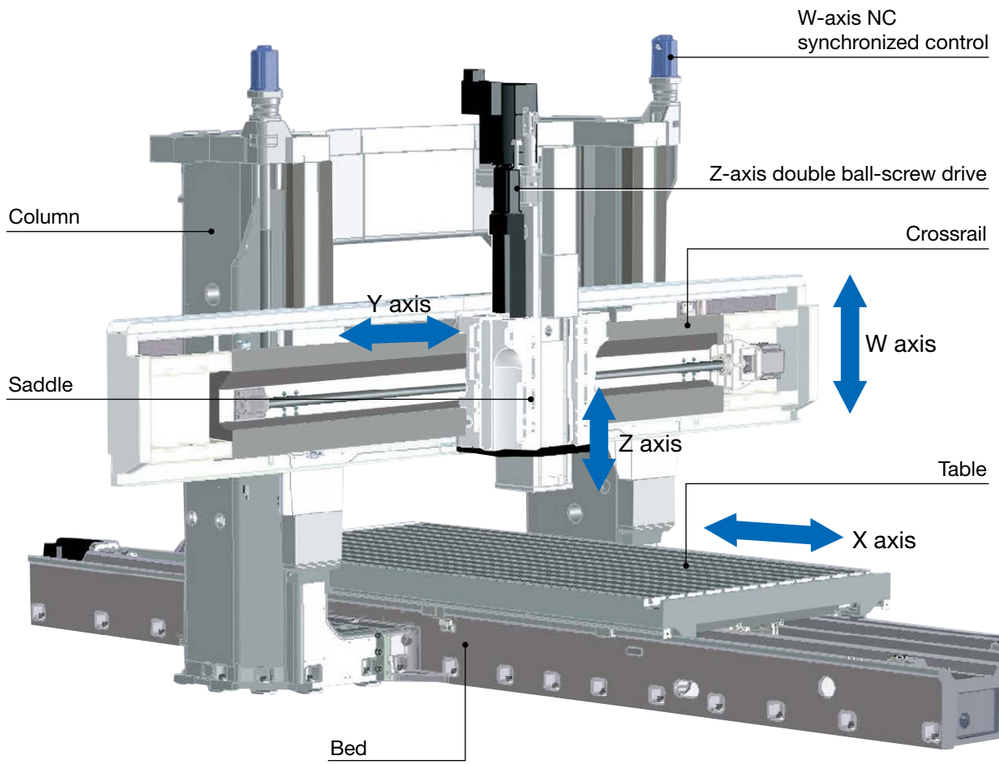
- Rigid ram spindlehead...Ram: 420 × 425 mm (16.54 × 16.73 in.)
- Z-axis travel...1,050 mm (41.34 in.) [Opt: 1,250 mm (49.21 in.)]

Spindlehead (ram saddle) guideway

(Spindle saddle left/right movement: Y axis)

The spindlehead guideway has a highly rigid rectangular cross-sectional geometry. It is also supported by a self-weight balancing device via a roller on the crossrail. High quality machined surfaces and fast, accurate movements are obtained with these structures.

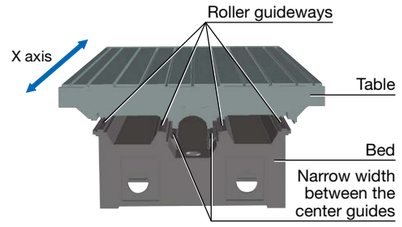




Roller guide system for table guide

(Table front/back movement: X axis)

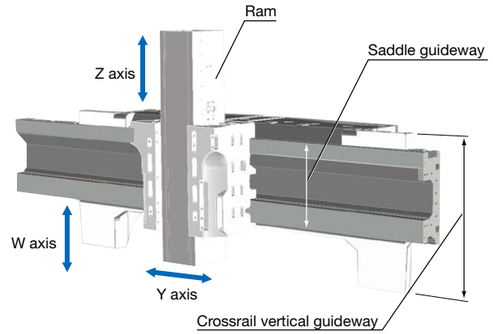
The table moves with a roller guideway and the heavy weight of the table and workpiece is supported with four roller bearings on hardened and ground surfaces. This allows for agile, smooth movements and accurate positioning unaffected by weight changes from heavy workpiece loads.
The layout puts the drive system (ball screw) in the center of the table and narrow, horizontal roller guideways. This can maintain stable, outstanding linear motion straightness over the long term.



Crossrail vertical guideway

(Crossrail vertical movement: W axis)

The extra long upper and lower vertical guideways on the crossrail present a stable structure that ensures longer service life and rigidity.

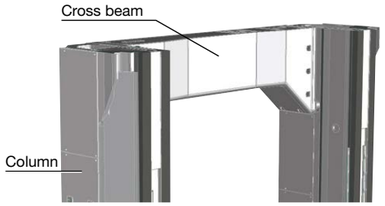


Square double-column construction

The double-column structure with square columns has sufficient rigidity for vertical, horizontal, and twisting loads, withstanding heavy-duty cutting and maintaining high accuracy.

Cross beam optimization

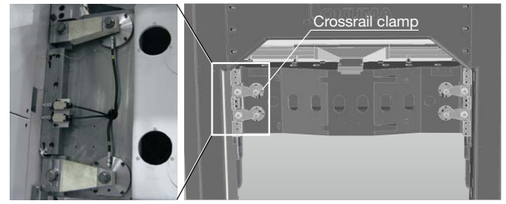
A simple structure is achieved with integration of the top beam and cross beam based on structural analysis for the best design. Stable quality is maintained over long times.



Crossrail clamp

(Crossrail vertical movement: W axis)

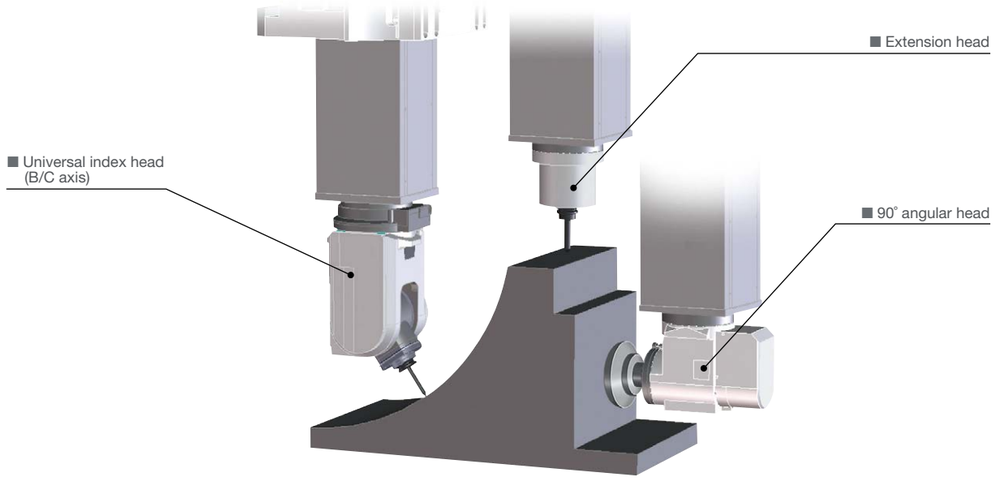
Powerful clamping devices that apply the principle of levers are used on crossrail clamps for powerful machining.



For a wide range of efficient, multitasking applications—to satisfy your need for the right tool

Full array of attachment heads

Machining of all types and all shapes can be done by changing the rich variety of attachment heads.
Auto operation with many continuous processes can be done using an auto tool changer (ATC)
and auto attachment changer (AAC), greatly improving productivity.



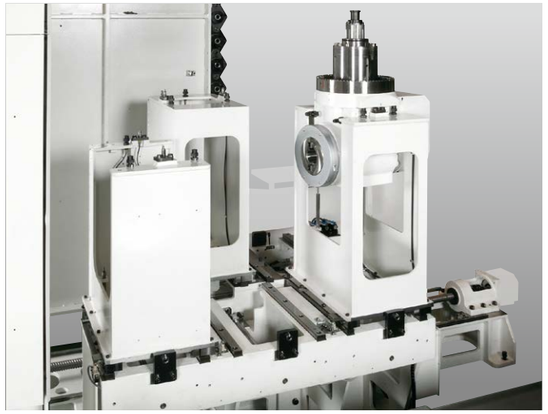
Attachment head variations

Extension head				
	L150	4,000 min^{-1} (45 kW)	6,000 min^{-1} (30 kW)	High output specifications 6,000 min^{-1} (37 kW)
	L250	4,000 min^{-1} (37 kW)	6,000 min^{-1} (26 kW)	High output specifications 4,000 min^{-1} (45 kW), 6,000 min^{-1} (30 kW)
	Others, L350, L450, L500, L600			
90° angular head				
	L150	3,000 min^{-1} (30 kW)	6,000 min^{-1} (22 kW)	
	L250	3,000 min^{-1} (30 kW)	6,000 min^{-1} (22 kW)	
	Others, L355 C-axis: 1 indexing, thru-spindle specs, High output specifications 3,000 min^{-1} (45 kW) L270			
Special angular head				
	30°	2,000 min^{-1} (22 kW)	6,000 min^{-1} (7.5 kW)	
	45°	2,000 min^{-1} (22 kW)		
Universal index head				
	B, C axis: 5 indexing	2,000 min^{-1} (15 kW)	4,000 min^{-1} (15 kW)	6,000 min^{-1} (15 kW)
	B axis: 1 indexing, C axis: 5 indexing	2,000 min^{-1} (15 kW)	4,000 min^{-1} (15 kW)	6,000 min^{-1} (15 kW)
	B, C axis: 1 indexing	2,000 min^{-1} (15 kW)	4,000 min^{-1} (15 kW)	6,000 min^{-1} (15 kW)

*Note: Please consult for applications which may have restrictions.
*Maximum output is shown in parenthesis.
■ 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)

Smaller and faster AAC

Completely automate machining of multiple sides with a variety of spindle heads (attachments) that mount automatically and accept ATC.



Fast NC-ATC

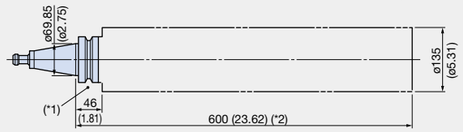
A single tool change arm automatically changes magazine tools for both the vertical and horizontal spindles. The next tool to be used is brought to the standby position during cutting, so that tools can be changed in the shortest possible time.

ATC is available for all types of angular head (30°, 45°) and universal index head (B/C axis) in addition to extension head and 90° angular heads.

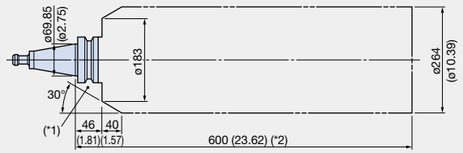
ATC tool dimensions

Unit : mm (in.)

● **Maximum adjacent tool size**
The maximum tool size is determined by the neighboring tool size

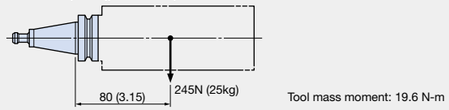


● **Maximum non-adjacent tool size**
This is the maximum tool size when there are no tools on either side of a tool.



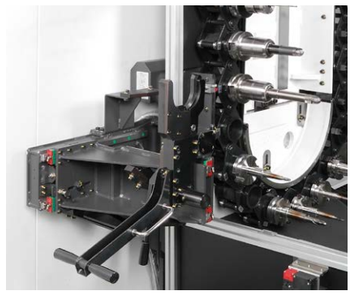
● **Maximum ATC tool mass moment**
29.4 N-m (25 kg×120 mm)

● **Maximum ATC tool mass moment with high-speed movement**
19.6 N-m (25 kg×80 mm)



Note: Tools with tool weight moments over 29.4 N-m can not be used.
ATC with high speed movement can be done with tools of 19.6 N-m
(*1): Commercially available milling chucks may interfere with ATC arm and other tools. Prior to use, confirm size dimensions with the tool manufacturer (brochure, etc).
(*2): When raised column specs are not selected, an interlock is set so that the ATC cannot function within 50 mm from the lower limit of the W axis to prevent interference with the AAC unit.

Magazine tool load/unload device



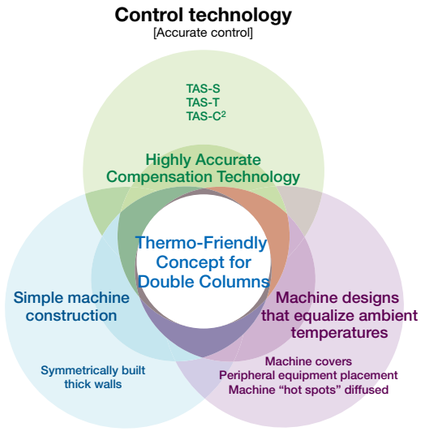
Magazine tool loading and unloading can be done safely and easily.

From theory to effective machine applications, Okuma's "Intelligent Technology"

Manageable Deformation — Accurately Controlled
Thermo-Friendly Concept

Eliminate waste with the Thermo-Friendly Concept

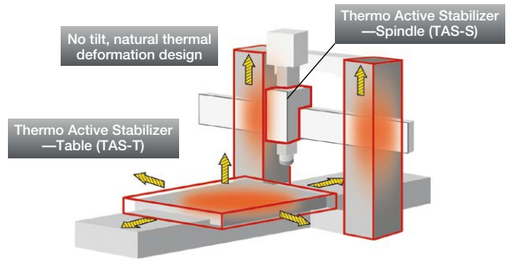
In addition to maintaining high dimensional accuracy when room temperature changes, Okuma's Thermo-Friendly Concept provides high dimensional accuracy during machine startup and machining restart. To stabilize thermal deformation, warming-up time is shortened and the burden of dimensional correction during machining restart is reduced.



Machine startup
Machining restart
Room temp change

High dimensional stability

1	2	3
Minimal thermal deformation	Manageable thermal deformation	Accurate compensation



[Manageable Deformation] [Accurately Controlled]

Integrated machine design and control technology

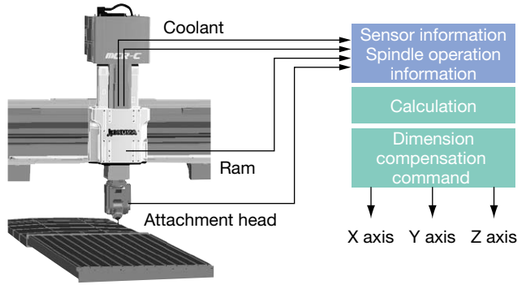
The Thermo-Friendly Concept plays a principal role in our machine design. With simple machine designs and construction that equalize ambient temperatures, deformation is predictable, and complex torsion or tilting is controlled.
Highly accurate compensation technology with the OSP controller developed by Okuma accurately controls thermal deformation from room temperature changes, spindle thermal deformation from frequently changing spindle speeds, and inconsistent thermal deformation from coolant temperature.
With the Thermo-Friendly Concept (Manageable Deformation—Accurately Controlled), Okuma products provide unrivaled dimensional stability.

	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.

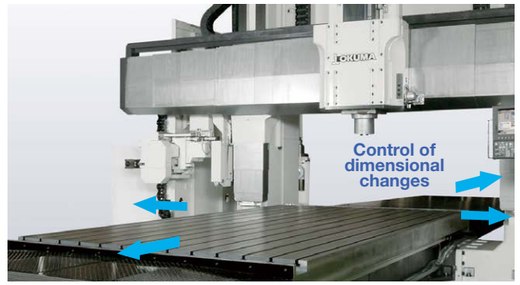
Thermo Active Stabilizer—Spindle (TAS-S)

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.



Thermo Active Stabilizer—Table (TAS-T)

In machining large workpieces, things like hole pitch deviation may become larger due to thermal expansion. Thermo Active Stabilizer—Table controls dimensional changes from thermal expansion of the table to obtain stable dimensional accuracies of even large components.



Next-Generation Energy-Saving System
ECO suite

A suite of energy saving applications for machine tools.

ECO Idling Stop
Auto cooler turnoff, with accuracy assured

Introducing the world's first application designed to stop machine tool idling — with no loss to accuracy. By using Okuma's Thermo-Friendly Concept, the OSP control monitors milling and turning spindle cooling status, and automatically turns off their coolers when cooling is complete.
ECO Idling Stop also carefully stops peripheral equipment, so as power consumption and other hidden costs reduce, the benefits increase with longer machining preparation and other noncutting wait times. (A standard feature on machines with TAS-S)

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/linked operation of chip conveyor, or mist collector during machining

ECO Hydraulics (Optional)
Energy-saving hydraulic unit using servo control technology

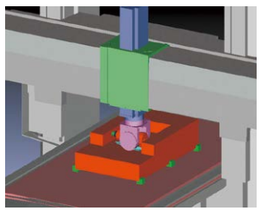
Okuma's Intelligent Technologies enhance machine shop performance

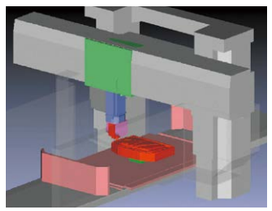
Collision prevention

Collision Avoidance System (Optional)

Allowing operators to focus on making parts

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.



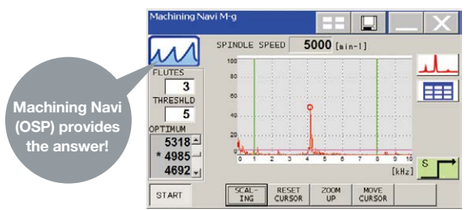


Cutting condition search for milling/machining

Machining Navi M-$g\mathrm{II}$ (Optional)

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-$g\mathrm{II}$.



Optimized Servo Control

SERVONAVI

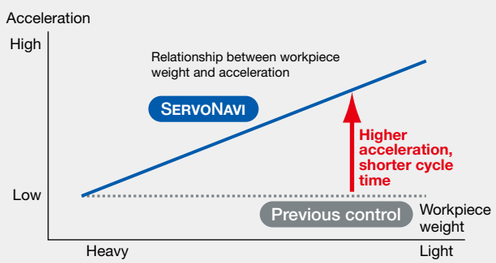
Achieves long term accuracy and surface quality

SERVONAVI AI (Automatic Identification)

- Cycle time shortened with faster acceleration

Work Weight Auto Setting

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 servo parameters, including acceleration, to the optimum values. Cycle times are shortened with no changes to machining accuracy.



SERVONAVI SF (Surface Fine-tuning)

- Maintains machining accuracy and surface quality

Reversal Spike Auto Adjustment

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.

- Contributes to longer machine life

Vibration Auto Adjustment

When aging changes machine performance, noise, vibration, crease marks, or fish scales may appear. VAA can quickly eliminate noise and vibration even from machines with years of operation.

- Maintaining high quality machined surfaces on dies/molds

Deflection Auto Adjustment

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 positioning error (amount of bending) has changed as a result of changes over time.

Okuma's merging "Machine & Control" technologies deliver faster, more accurate machining

Providing real-world features that machine shops really need

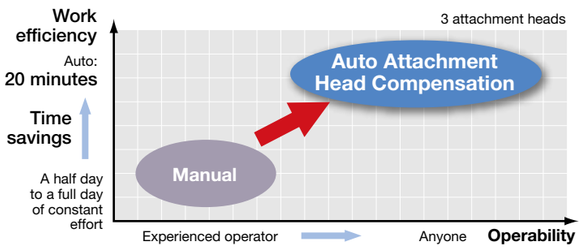
Auto Attachment Head Compensation (Optional)

Rotation compenstion 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.

*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.



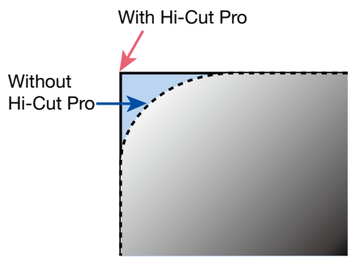
Note: AAHC requires Okuma's auto gauging and auto zero offset functions (with touch probe).

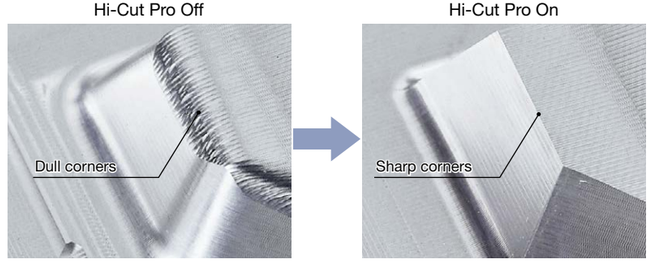
Hi-Cut Pro (standard)

Shorter cutting times and highly accurate machining

A speed and acceleration controller to make sharper corners and smoother arcs—ideal for the extra accurate and quicker cycle time jobs.

- With Hi-Cut Pro



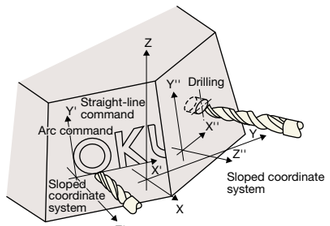


Many functions for a wider range of applications

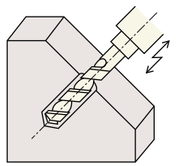
The Okuma NC makes it all possible. Things impossible on non-NC machines like User Task for example, are programmable like on a PC; making for a tremendous range of machining center applications.

Slope machining (Optional)

The slope surface coordinate system lets you use coordinate change 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 sloped coordinate system can be used to adjust the tool play.



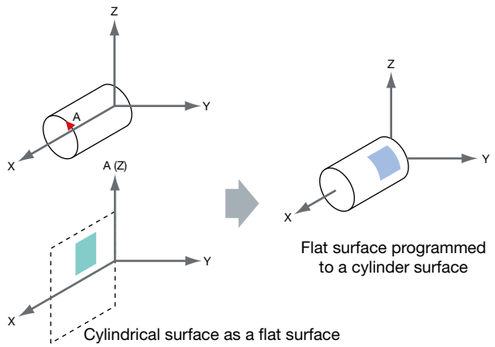
Sloped coordinate system



Slopes are programmed as straight X-Y planes.

Cylindrical side machining (Optional)

Cylindrical surface machining can be done by changing the rotary axis into a linear axis imagined as a flat surface.



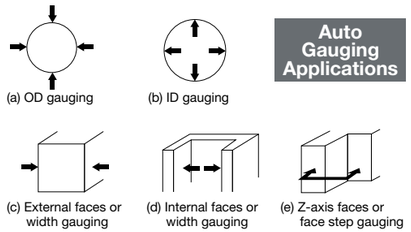
Flat surface programmed to a cylinder surface

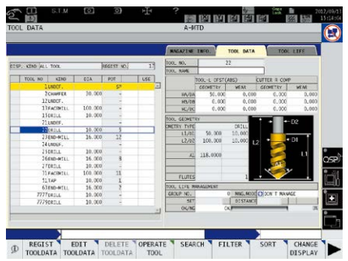
Cylindrical surface as a flat surface

Automated / untended operation

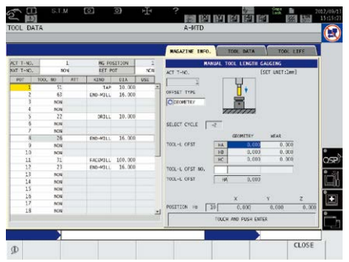
Tool monitoring	Auto tool length offset	(touch sensor)
	Tool breakage detection	(incl. auto tool length compensation)
	Tool life management	(by calculating cutting time)
Auto gauging	Auto gauging	(touch probe)
	Auto zero offsets	(incl. gauging)
Machining monitoring	Overload monitoring	(incl. adaptive control by MOP)
Auto power on/off	Warm-up	
	Power shutoff	
External M signal	(Cycle operation with various external equipment)	

Auto Gauging Applications





Tool management

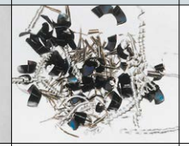


Manual gauging

Smooth discharge of large amounts of chips

Recommended specifications for chip discharge

○ : Recommended △ : Conditionally recommended

Material		Steel, stainless steel	Cast iron	Aluminum, titanium, non-ferrous metal	Mixed (general)*5	Special blank materials
Chip shape						Ceramic, carbon, class, etc.
In-machine chip conveyor	Full length gutters (Std)	○	○	○ (*4 Chip flusher)	○	○
	Hinge type	○	○	○	○	—
Collection conveyor	Hinge type	○	○ (*3 Wet)	—	○	—
	2-step (*1) (with drum filter)	△ (*2)	△ (*2)	○	△ (*2)	—

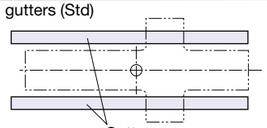
*1. Hinged + scraper type *2. When there are many fine chips
*3. Coolant tank with magnetic separator *4. Chip flusher is an optional specification
*5. General-purpose applications: steel, stainless steel, cast iron

Note: Do not use oil-based coolant which is a fire hazard.

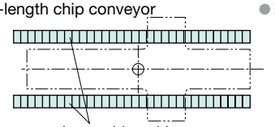
Example of chip conveyor placement

In-machine chip discharge

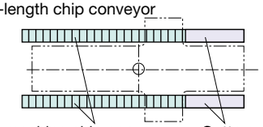
● Full length gutters (Std)



● Hinged full-length chip conveyor

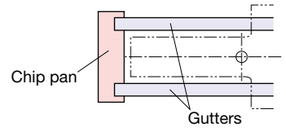


● Hinged half-length chip conveyor

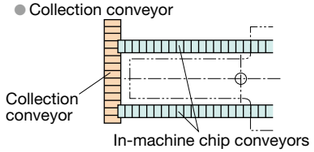


Off-machine chip discharge

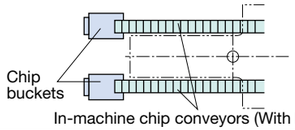
● Chip pan



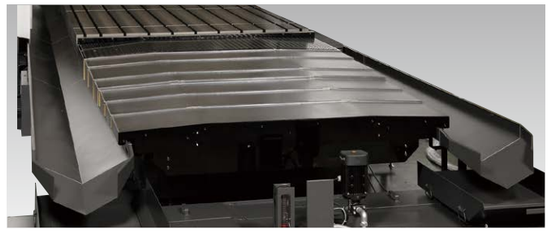
● Collection conveyor



● Chip buckets



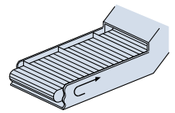
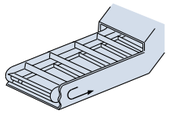
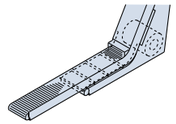
Note: Conveyor chip discharge direction (rear), off-machine chip conveyor discharge direction (operation side, magazine side), chip coolant tank position, etc. can be combined to match space. Please consult with your Okuma sales representative to confirm final arrangements.



Full length gutter

Coolant tank + lift-up conveyor

Collection conveyor chip discharge (lift-up conveyors)

Type	Hinge	Scraper	Hinge + scraper (with drum filter)
Shape			

Standard Accessories

Main motor and standard electricals	
Main spindle and gear box cooler	Oil controller
Extension head	4,000 min^{-1}, L150, 45 kW
Synchronized NC W-axis	
Hydraulic unit	
Z axis double ball screw	
Full length gutter	Both machine sides
ATC air blower (blast)	
Spindle air curtain	
Magazine tool loader	
ATC magazine safety fence	
Column slideway covers	
Crossrail clamp system	
Seesaw pendant operation panel	Elevation: 600 mm
Work lamp	LED
Status indicator	3-color LED
Door interlock	
Tool kit	
Tapered bore cleaning bar	
Tool box	

Kit Specifications

Machine kit specs Kit	S	A	P	AP
Attachment head ATC	●	●	●	●
Attachment head auto attaching/indexing unit (AAC)		●		●
Attachment head manual tool changing	●	●	●	●
Attachment head coolant lines	●	●	●	●
Auto pallet changer (APC) preparations			●	●
X-axis 2.0-m travel extension (side shuttle APC)			●	●

Seesaw pendant operation panel


3 LED work lamps below the crossrail

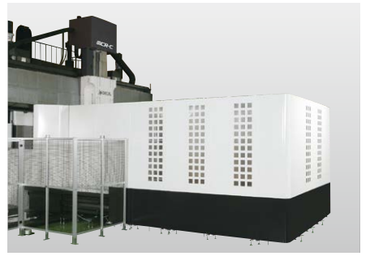

Full length gutter


ATC magazine safety fence

Optional Specifications

Automatic pallet changer	2-pallet side shuttle (2.0 m extension in X-axis travel)	Attachment head accelerator preps	
		Angle head preps	
Average continuous cutting with limited upper feedrate	X, Y, Z: 6 m/min, X, Y: 10 m/min, Z: 6 m/min	Auto attachment changer (AAC)	3 stations to 7 stations
		Attachment head	Please consult
Optional Z-axis travel	1,250 mm	Thermo-Friendly specifications	TAS-S, TAS-T Premium (includes TAS-S)
Coolant system			
Coolant tank	500 L, 1000 L	Dust-proofing	
Coolant heater/cooler		NC rotary tables	NC rotary table, inclined rotary table
Oil skimmer		Mist collector	
Filtration system		Dust collector	
Semi-dry machining		Full-enclosure shielding	Column front/back covers, w/o ceiling
Thru-spindle coolant *1	High/low pressure switch (2 MPa, 7 MPa)		With ceiling (auto open/close)
Centralized coolant application		AbsoScale detection *2	X-Y-Z axes, X-Y axes
Coolant pump	0.75 kW, 1.1 kW	Auto tool length compensation & breakage detection	Touch sensor system, Laser sensor system
Oil mist coolant	Eyeball nozzle		
Oil-hole coolant system	Simple system, High/low pressure switch (2 MPa)	Auto gauging & auto zero offset	Touch probe
Chip air blower (blast)		In-machine conveyors	Full length, lift-up type Half length, lift-up type Full length gutter + gutter chip flusher
ATC tool magazine capacity	80, 100, 120, 180 tools		
ATC tools	Tool weigth (35 kg × 100 mm)		
Tool shank profile	CAT 50, DIN 50	Chip flushers	Crossrail shower (L/R column front), front/back gutters with telescopic covers, work wash gun
Spindle speeds (No. 50)	10 to 6,000 min^{-1}		
Pull stud shape	MAS 1, special CAT		
Table T-slot width	20H7, 22H7, 28H7	Collection conveyors	Hinged, hinge + scraper (w/ drum filter) Hinged + magnetic separator
Table cross slot width	Please consult for width depth, pitch		
Optional table width	+300 mm	Chip buckets	L type, H type
High column specs	200-mm increments (please inquire for +400 mm or higher)	Pendant arms	Parallel linked, manual, electric, floor mounted, front/back travel types
Optional W axis travel	Standard travel can accommodate up to +200 mm, +400 mm	Foundation methods	Chemical anchors, no foundation bolts (foundation pad only)
Fire regulations compliance		Machine foundation pit work	50 to 1,400 mm (50 mm units)
Automatic extinguisher		Optional control cabinet positions	
Ram oil pan slush collector		*1. Okuma pull stud required for thru-spindle coolant. *2. Linear scale for X-axis travels 6,700 mm or more (x 65 models and larger).	
Door interlock	Type Ⅱ for double-column machining center (memorandum required)		

Main options

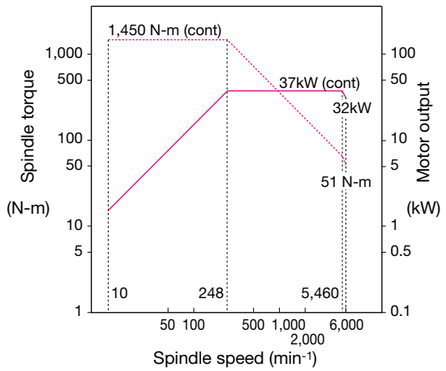


Full enclosure shielding without ceiling


ATC 100 tools

Special spindle speed specs

- Spindle speed 6,000 min^{-1}
- Spindle motor 37kW, 1,450 N-m



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

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

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

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

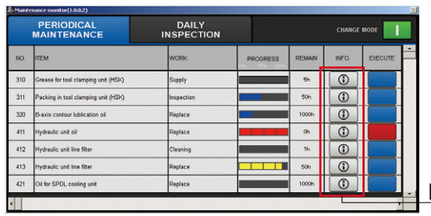
Note: Collision Avoidance System (Optional) shown above.

"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.

Routine inspection support
Maintenance Monitor

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

Increased productivity through visualization of motor power reserve
Spindle Output Monitor

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

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

Automatic saving of recorded alarms
Screen Capture

Easy programing without keying in code
Scheduled Program Editor

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 inputs	8-digit decimal, ±99999.999 to 0.001 mm (3937.0078 to 0.0001 in.), 0.001° Decimal:1 µm, 10 µm, 1 mm (0.0001,1 in.) (1°, 0.01°, 0.001°)
	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 faults
Programming	Program capacity	Program storage capacity: 4 GB; operation backup capacity: 2 MB
	Program operations	Program management, editing, multitasking, scheduled program, fixed cycle, G-/M-code macros, arithmetic, logic statements, math functions, variables, branch commands, coordinate calculate, area calculate, coordinate convert, programming help
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" 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
	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	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 electrical values are needed, select the wattmeter option.

Optional Specifications

Item	Kit Specs	NML E	NML D	3D E	3D D	AOT E	AOT D
Interactive functions							
Advanced One-Touch IGF-M (Real 3-D simulation included)						●	●
Interactive MAP (I-MAP)				●	●		
Programming							
Auto scheduled program update (Scheduled program is standard)		●	●	●	●	●	●
Additional G/M code macros							
Common variables (Std: 200 pcs)	1,000 pcs						
	2,000 pcs						
Program branch; 2 sets							
Program notes (MSG)			●		●		●
Coordinate system selection (Std: 20 sets)	100 sets	●		●		●	
	200 sets		●		●		●
	400 sets						
Helical cutting (within 360 degrees)		●	●	●	●	●	●
3-D circular interpolation							
Synchronized Tapping II							
Arbitrary angle chamfering		●	●	●	●	●	●
Cylindrical side machining							
Slope machining							
Tool max rotational 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 meter, work counter	●	●	●	●	●	●
Hour meters	Power ON, spindle run/NC ON, machining						
Operation end buzzer	With M02, M30, and END commands						
NC work counter	With M02 and M30						
MOP-TOOL	Adaptive control, overload monitor						
Tool life management	Hour meter, No. of workpieces	●	●	●	●	●	●
Energy-saving function ECO suite							
ECO Operation							
ECO Power Monitor	On-machine wattmeter						
Energy-saving hydraulic unit	Inverter system						
	ECO Hydraulics						

Kit full forms: NML: Normal, 3D: Real 3D simulation, E: Economy, D: Deluxe
AOT: Advanced One-Touch IGF-M

* Requires technical consultation

Item	Kit Specs	NML E	NML D	3D E	3D D	AOT E	AOT 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 auto 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 communication							
RS-232-C connector							
DNC-T3							
DNC-B (RS-232C-Ethernet transducer used on OSP side)							
DNC-DT							
DNC-C/Ethernet							
Additional USB ports (Std: 2 ports)							
Automation / untended operation							
Auto power shut-off	M02, END, alarms, work preps done	●	●	●	●	●	●
Warm-up (calendar timer)							
External program selection	Button, rotary switch, BCD (2-digit, 4-digit)						
Cycle time reduction (ignores certain commands)							
High-speed, high-precision							
Thermo-Friendly	TAS-S, TAS-T						
Thermo-Friendly Premium							
AbsoScale detection	X-Y axes, X-Y-Z axes						
Straightness compensation							
0.1 µm control (command unit for linear axes)							
Hyper-Surface	3-axis Type A, type B						
Super-NURBS	5-axis Type A, type B						
Simultaneous 5-axis kit							
Other							
Control cabinet lamp (inside)							
Circuit breaker							
Sequence operation	Sequence stop	●	●	●	●	●	●
Upgraded sequence restart	Mid-block return		●		●		●
Pulse handle	2 pts, 3 pts (Std: 1 pt)						
LCD pulse handle							
External M code	4-point, 8-point						
Collision Avoidance System							
Machining Navi M-gII (cutting condition search)							
One-Touch Spreadsheet							
Block skip	3 sets						
Feed axis retract							
OSP-VPS (virus protection system)							

Working ranges

Machinable area (extension head (L150), 90° angular head (L150) used, tool length = 300 mm)

Unit : mm

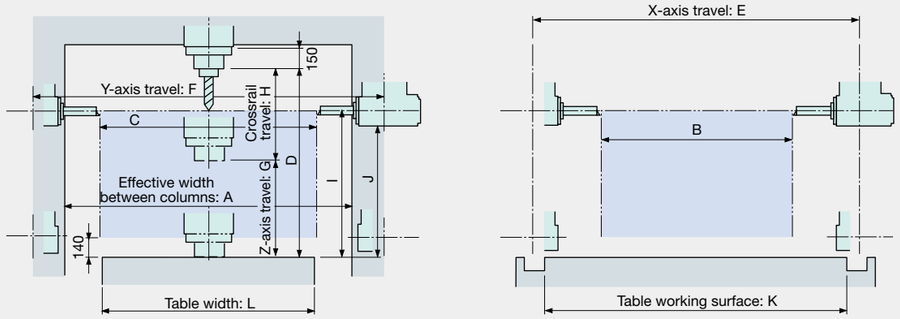
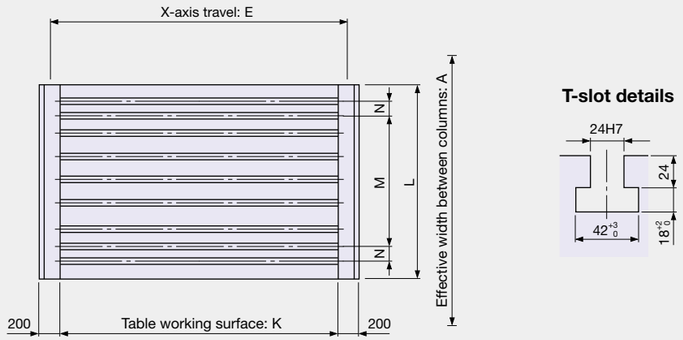


Table dimensions



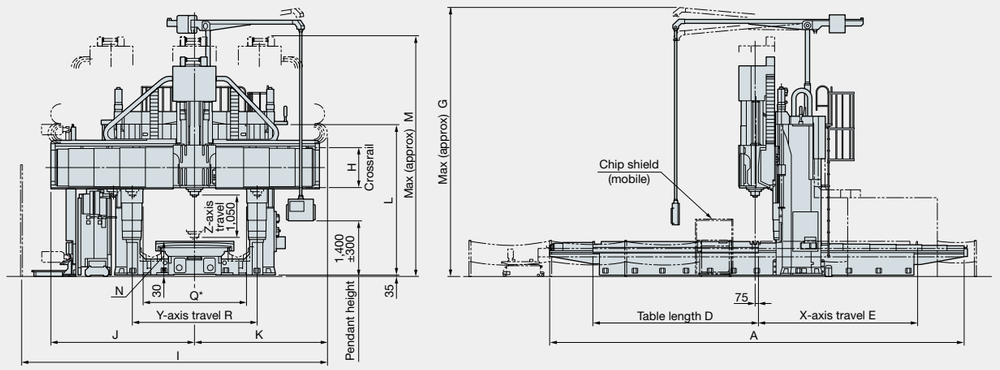
Unit: mm

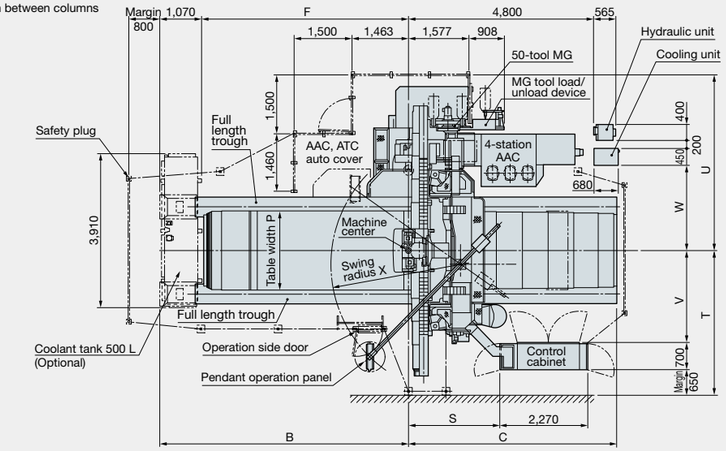
Size	A	B	C	D	E	F	G	H	I	J	K	L	M	N
25×40	2,650	3,240	2,240	0 to 1,650	4,200	3,200	1,050	1,000	1,350	1,538	4,000	2,000	8×200 =1,600	130
25×50		4,240			5,200						5,000			
25×65		5,740			6,700						6,500			
30×50	3,150	4,240	2,740	0 to 1,850	5,200	3,700		1,200	1,550	1,738	5,000	2,500	10×200 =2,000	180
30×65		5,740			6,700						6,500			
30×80		7,240			8,200						8,000			
30×100		9,240			10,200						10,000			
35×50	3,650	4,240	3,240	0 to 1,800	5,200	4,200			1,500	1,688	5,000	3,000	12×200 =2,400	200
35×65		5,740			6,700						6,500			
35×80		7,240			8,200						8,000			
35×100		9,240			10,200						10,000			
35×120		11,240			12,200						12,000			

- Dimensions may change depending on the type of attachment head.
- Dimensions may change depending on options, such as high column specs or optional travel.

Dimensional Drawing / Installation Drawing

Shape and dimensions may differ depending on specifications.





Unit: mm

	Size	A	B	C	D	E	F	G	H	I	J	K	L	M	N
MCR-C 25	25×40	10,730	6,310	5,400	4,400	4,200	5,240	6,720 [6,820]	1,000	7,665 [7,755]	3,700	3,240 [3,330]	3,650	6,030 [6,230]	850
	25×50	12,830	7,360	6,450	5,400	5,200	6,290								
	25×65	16,430	9,160	8,250	6,900	6,700	8,090								
MCR-C 30	30×50	12,830	7,360	6,450	5,400	5,200	6,290	6,900 [7,100]	1,200	8,175 [8,285]	3,950	3,500 [3,610]	4,025	6,280 [6,480]	900
	30×65	16,430	9,160	8,250	6,900	6,700	8,090								
	30×80	19,430	10,660	9,750	8,400	8,200	9,590								
	30×100	23,930	12,910	12,000	10,400	10,200	11,840								
MCR-C 35	35×50	12,830	7,360	6,450	5,400	5,200	6,290			8,685 [8,815]	4,200	3,760 [3,890]			950
	35×65	16,430	9,160	8,250	6,900	6,700	8,090								
	35×80	19,430	10,660	9,750	8,400	8,200	9,590								
	35×100	23,930	12,910	12,000	10,400	10,200	11,840								
	35×120	27,930	14,910	14,000	12,400	12,200	13,840								

	Size	P	Q	R	S	T	U	V	W	X
MCR-C 25	25×40	2,000	2,650	3,200	2,465	3,630	4,425	2,280	2,150	3,050
	25×50									
	25×65									
MCR-C 30	30×50	2,500	3,150	3,700	2,515	3,880	4,675	2,530	2,400	
	30×65									
	30×80									
	30×100									
MCR-C 35	35×50	3,000	3,650	4,200		4,130	4,925	2,780	2,650	
	35×65									
	35×80									
	35×100									
	35×120									

Notes
- Dimensions may change depending on specifications. Please refer to final delivered machine specifications.
- [ ] dimensions for machines with 1,250-mm Z-axis travel.

Machine Specifications

Model		MCR-C 25			MCR-C 30				MCR-C 35				
Item		25 × 40	25 × 50	25 × 65	30 × 50	30 × 65	30 × 80	30 × 100	35 × 50	35 × 65	35 × 80	35 × 100	35 × 120
Travel													
X-axis (table front / back)	mm (in.)	4,200 (165.35)	5,200 (204.72)	6,700 (263.78)	5,200 (204.72)	6,700 (263.78)	8,200 (322.83)	10,200 (401.57)	5,200 (204.72)	6,700 (263.78)	8,200 (322.83)	10,200 (401.57)	12,200 (480.31)
Y-axis (spindlehead horizontal)	mm (in.)	3,200 (125.98)			3,700 (145.67)				4,200 (165.35)				
Z-axis (ram vertical)	mm (in.)	1,050 [1,250] (41.34 [49.21])											
W-axis (crossrail vertical)	mm (in.)	1,000 (39.37)			1,200 (47.24)								
Effective width between columns	mm (in.)	2,650 (104.33)			3,150 (124.02)				3,650 (143.70)				
Table to spindle nose	mm (in.)	0 to 1,650 [0 to 1,550]*1 (0 to 64.96 [0 to 61.02])			0 to 1,850 [0 to 1,750]*1 (0 to 72.83 [0 to 68.90])				0 to 1,800 [0 to 1,700]*1 (0 to 70.87 [0 to 66.93])				
Table													
Working surface	mm (in.)	2,000 × 4,000 (78.74 × 157.48)	2,000 × 5,000 (78.74 × 196.85)	2,000 × 6,500 (78.74 × 255.91)	2,500 × 5,000 (98.43 × 196.85)	2,500 × 6,500 (98.43 × 255.91)	2,500 × 8,000 (98.43 × 314.96)	2,500 × 10,000 (98.43 × 393.7)	3,000 × 5,000 (118.11 × 196.85)	3,000 × 6,500 (118.11 × 255.91)	3,000 × 8,000 (118.11 × 314.96)	3,000 × 10,000 (118.11 × 393.7)	3,000 × 12,000 (118.11 × 472.44)
Maximum load	kg (lb)	22,000 (48,400)	27,000 (59,400)	34,000 (74,800)	33,000 (72,600)	43,000 (94,600)	52,000 (114,400)	66,000 (145,200)	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 × 11 (center 200, both ends 130)			24H7 × 13 (center 200, both ends 180)				24H7 × 15 (center 200)				
Height from machine bottom	mm (in.)	850 (33.46)			900 (35.43)				950 (37.40)				
Spindle													
Speed range	min^{-1}	10 to 4,000 [10 to 6,000*2]											
Taper bore		7/24 taper No. 50											
Bearing diameter	mm (in.)	ø100 (3.94) [ø85 (3.35)*2] (High output specifications: ø130 (5.12)*3, ø100 (3.94)*4)											
Feedrates													
Rapid traverse	m/min (ipm)	X-Y: 24, Z: 15 (X-Y: 0.94, Z: 0.59)			X-Y: 24*5, Z: 15 (X-Y: 0.94, Z: 0.59)		X: 20, Y: 24*5, Z: 15 (X: 0.79, Y: 0.94, Z: 0.59)		X-Y: 24*5, Z: 15 (X-Y: 0.94, Z: 0.59)		X: 20, Y: 24*5, Z: 15 (X: 0.79, Y: 0.94, Z: 0.59)		
Feedrate	mm/min (ipm)	1 to 10,000 (0.04 to 394)											
W axis traverse (crossrail)	m/min (ipm)	3 (0.12)											
Automatic Tool Changer													
Tool shank		MAS BT50											
Pull stud		MAS P50T-2											
Tool magazine capacity	tools	50 [80, 100, 120, 180]											
Max tool diameter	mm (in.)	w/ adjacent tools: ø135 (5.31); w/o adjacent tools: ø264 (10.39)											
Max tool length	mm (in.)	600 (23.62)											
Max tool weight	kg (lb)	25 (55)											
Tool selection		Fixed adress											
Motors													
Spindle drive	kW (hp)	VAC 45/37 (60/50) (30 min/cont) [37 (50) cont]*2											
Axis feed drives	kW (hp)	X: 14.0 (19), Y: 9.4 (13), Z: 5.2 × 2 (7 × 2)											
Crossrail traverse drive	kW (hp)	W: 4.6 × 2 (6 × 2)							W: 5.2 × 2 (7 × 2)				
Power Sources													
Electrical power supply	kVA	60*6											
Compressed air supply	L/min (ANR)	650 (0.5 MPa or more)*6											
Machine Size													
Height	mm (in.)	6,720 (264.57)			6,900 (271.65)								
Floor space (machine only)	mm (in.)	7,810 × 10,730 (307.48 × 422.44)	7,810 × 12,830 (307.48 × 505.12)	7,810 × 16,430 (307.48 × 646.85)	8,310 × 12,830 (327.17 × 505.12)	8,310 × 16,430 (327.17 × 646.85)	8,310 × 19,430 (327.17 × 764.96)	8,310 × 23,930 (327.17 × 942.13)	8,835 × 12,830 (347.83 × 505.12)	8,835 × 16,430 (347.83 × 646.85)	8,835 × 19,430 (347.83 × 764.96)	8,835 × 23,930 (347.83 × 942.13)	8,835 × 27,930 (347.83 × 1,099.61)
Weight (machine only)*7	kg (lb)	48,000 (105,600)	55,000 (121,000)	63,000 (138,600)	61,000 (134,200)	70,000 (154,000)	83,000 (182,600)	91,000 (200,200)	68,000 (149,600)	78,000 (171,600)	92,000 (202,400)	102,000 (224,400)	116,000 (255,200)
CNC		OSP-P300MA											

[ ]: Optional

*1. With 250-mm long extension head

*2. 6,000 min^{-1} specs

*3. 4,000 min^{-1} specs

*4. 6,000 min^{-1} specs

*5. Deceleration near both ends of Y-axis travel

*6. Standard specs

*7. With 50-tool magazine, 2-station AAC

MCR-C

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

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