

**OKK**

Horizontal Machining Center

# HMC SERIES

HMC 400

HMC 500



This high-speed machine features the strongest structural rigidity in its class and attains a rapid feed rate of 63m/min(2480ipm) with 1G acceleration.



## HMC SERIES

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Horizontal Machining Center

# HMC 500

### SPECIFICATIONS

Travel distance: **760x760x800mm** (29.92" (29.92") (31.50") Pallet size: **500x500mm** (19.69" (19.69") Maximum workpiece size: **ø800x1150mm** (31.50" (45.28")  
 Rapid traverse rate: **63000mm/min** (2480ipm) Maximum acceleration: **1G** Number of stored tools: 60tools  
 Maximum tool diameter: **ø170mm** (6.69")

Horizontal Machining Center

# HMC 400

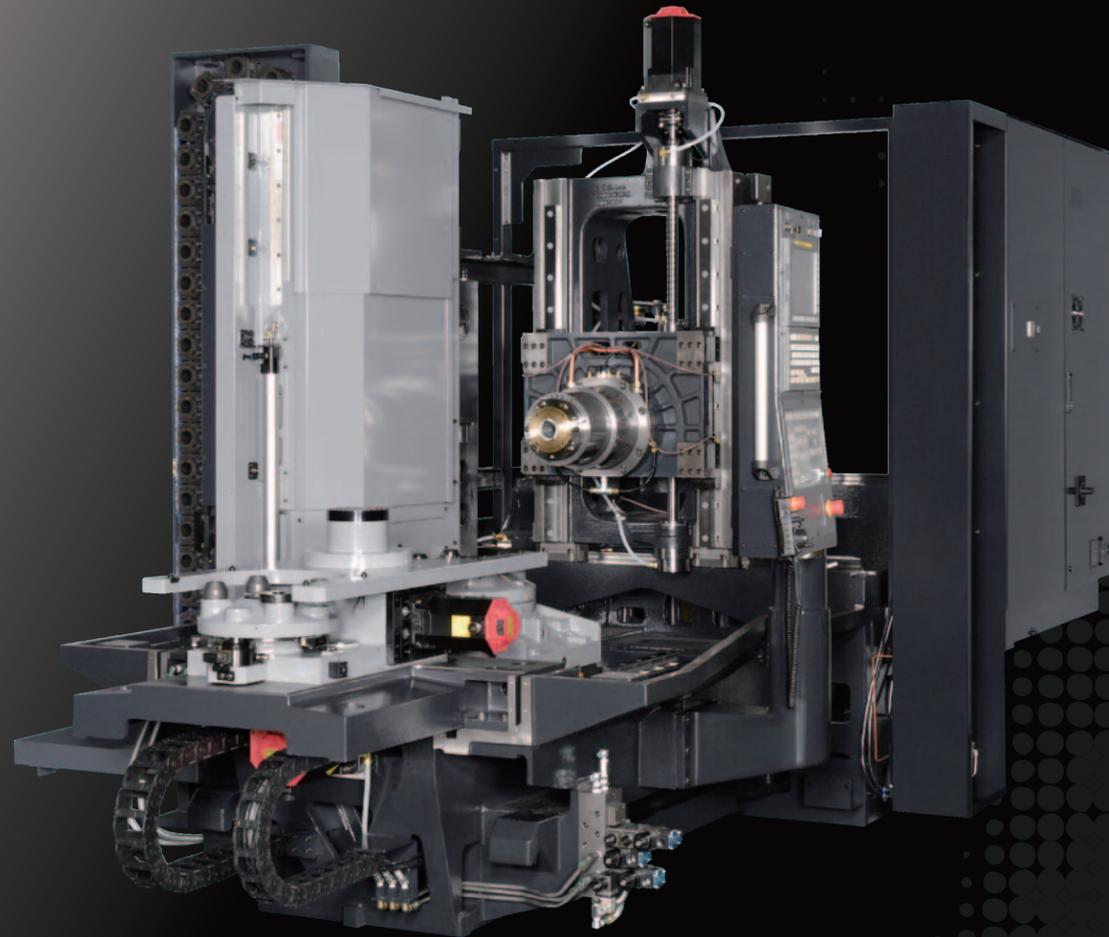
### SPECIFICATIONS

Travel distance: **560x560x690mm** (22.05" (22.05") (27.17") Pallet size: **400x400mm** (15.75" (15.75") Maximum workpiece size: **ø630x920mm** (24.80" (36.22")  
 Rapid traverse rate: **63000mm/min** (2480ipm) Maximum acceleration: **1G** Number of stored tools: 40tools  
 Maximum tool diameter: **ø170mm** (6.69")

Mechanical layout

## Machine design enables high-speed Production

The column mass is optimized to allow movement of 63m/min (2480ipm) rapid feed rate with acceleration of 1G. This combined with a servo driven ATC enables a C-to-C time of 2.8 seconds (HMC400) / 2.9 seconds (HMC500) and large reduction of non-cutting time.

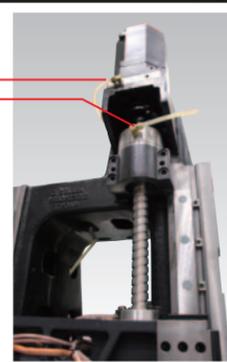
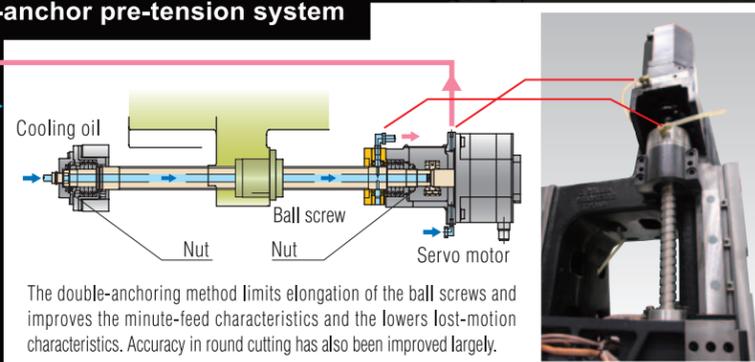


### Core cooling ball screws and Double-anchor pre-tension system



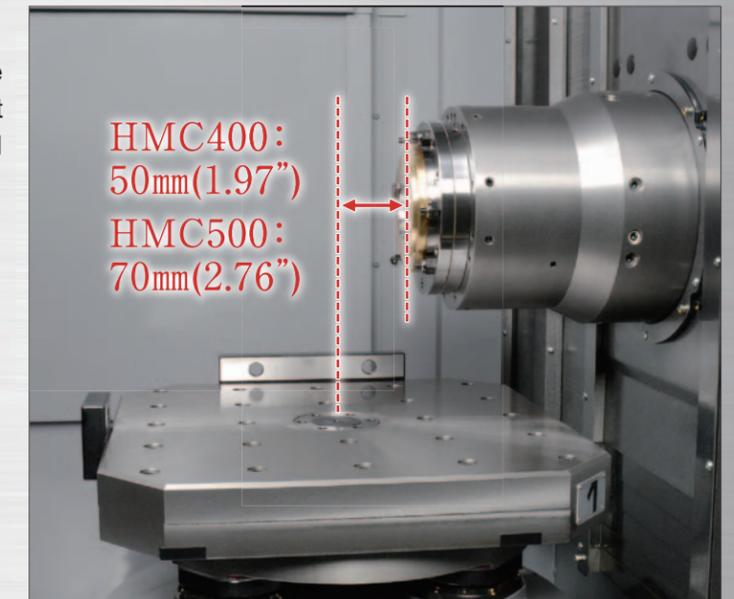
#### Lubrication oil cooler unit

HMC Series uses core cooling ball screws on the X, Y and Z axes. Circulation of cooling oil through the ball screws, around ball screw support housings and motor mounting surfaces reduces the thermal displacement and maintains accuracy during long machining time.



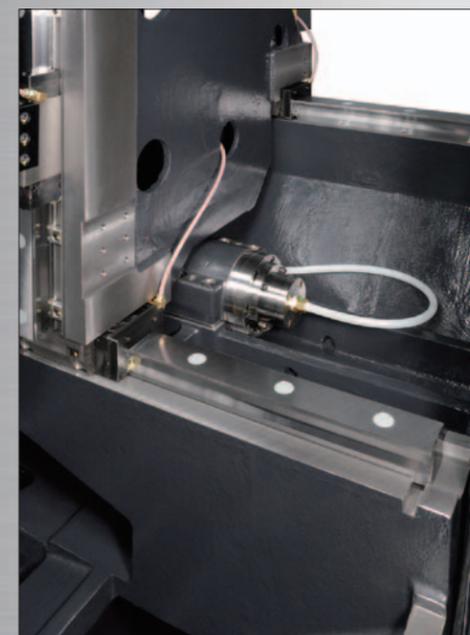
## The spindle nose reaches close to the pallet center

Reducing the minimum distance from the spindle nose to the pallet center makes it with shorter tools producing highly-rigid machining.



## Highly rigid structure

The HMC Series utilizes a wide column and highly rigid roller guides. This produces great aluminum machining performance and also the machining of a wider range of workpieces, including cast iron.



Highly rigid roller guides

## Improved reliability

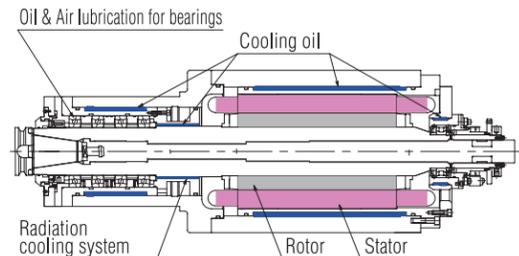
The X-axis and Z-axis HMC400 shutters are a single-plate construction. HMC500 is single Z and double X axis. This design eliminates the risk of binding during cutting and achieves an improvement in the reliability.



**Spindle**

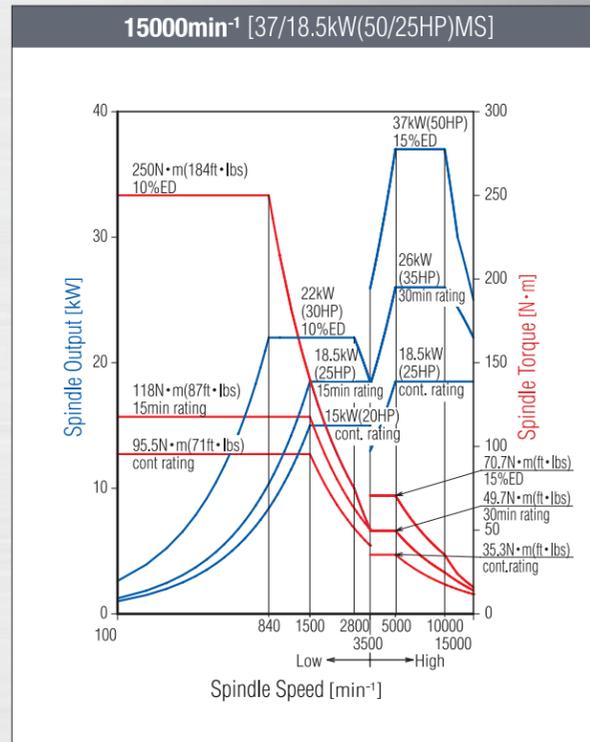
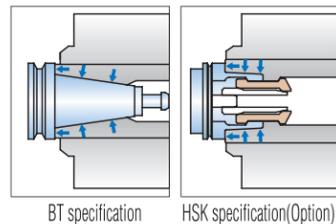
The spindle bearings are oil-air lubricated. Circulating temperature controlled oil in the casing around the spindle housing reducing the growth of the spindle. Furthermore, OKK's unique radiant cooling system prevents the conduction of heat generated from the motor into the spindle.

**Standard spindle 15000min<sup>-1</sup>**



**Dual contact tool BT type (Standard)**

Improvements in rigidity of tools have been Achieved contact faces of spindle-nose and tool holders flange. This has a great effect not only for heavy load machining but also high speed machining. (The performance is different due to the cutting tools and cutting conditions.)

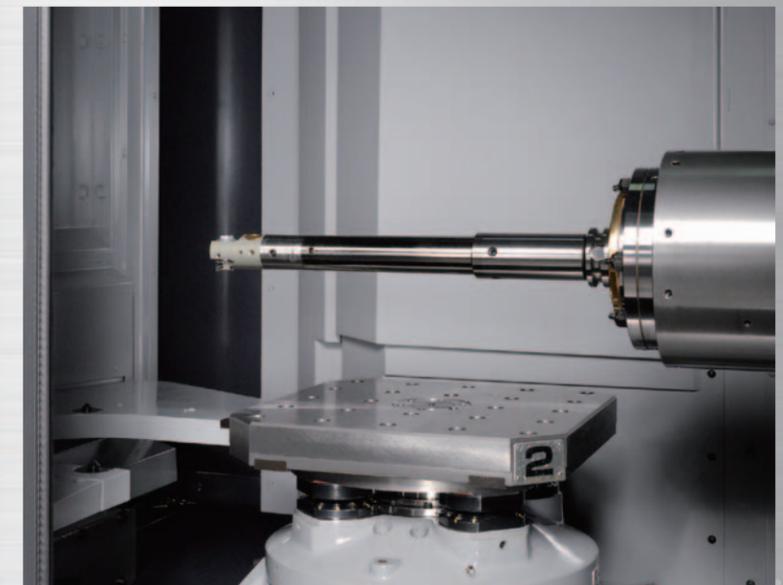


**High-precision Machining in a Shorter Cutting Time**

The maximum tool length enables tooling longer than the pallet allowing deep boring operations without rotating the part. This allows high-precision machining in a shorter cutting time.

\*There is a limit on the diameter of a tool with length of 350mm (13.78")(HMC400) / 475mm (18.70")(HMC500) or longer.

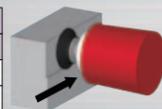
**Max. tool length**  
**HMC400:**  
**450mm (17.72")**  
**HMC500:**  
**550mm (21.65")**



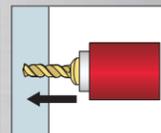
**Table**

**Cutting data**

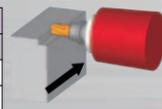
Type of machining	Face milling ø100mm (3.94")x6T	
Machine model	HMC400	HMC500
Spindle speed	800min <sup>-1</sup>	800min <sup>-1</sup>
Width of cut	80mm (3.15")	80mm (3.15")
Depth of cut	4mm (0.16")	4mm (0.16")
Feed rate	1100mm/min (43ipm)	1320mm/min (52ipm)
Cutting amount	352cm <sup>3</sup> /min (21.5in <sup>3</sup> /min)	422cm <sup>3</sup> /min (25.8in <sup>3</sup> /min)
Spindle motor load	95%	83%
Workpiece material	S45C	S45C



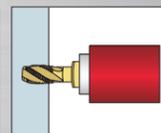
Type of machining	Drill Milling ø26.5mm (1.04")	
Machine model	HMC400	HMC500
Spindle speed	300min <sup>-1</sup>	300min <sup>-1</sup>
Width of cut	26.5mm (1.04")	26.5mm (1.04")
Feed rate	50mm/min (2ipm)	50mm/min (2ipm)
Cutting amount	27.5cm <sup>3</sup> /min (1.7in <sup>3</sup> /min)	27.5cm <sup>3</sup> /min (1.7in <sup>3</sup> /min)
Spindle motor load	30%	30%
Workpiece material	S45C	S45C



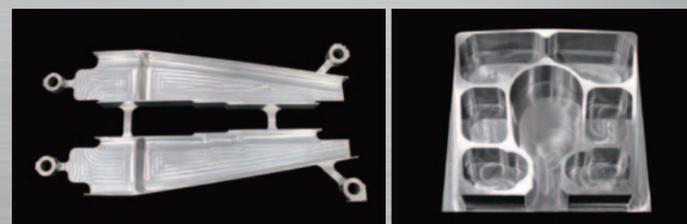
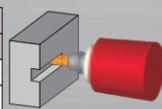
Type of machining	Side milling with End mill ø32mm (1.26")x6T	
Machine model	HMC400	HMC500
Spindle speed	250min <sup>-1</sup>	250min <sup>-1</sup>
Width of cut	25mm (0.98")	15mm (0.59")
Depth of cut	20mm (0.79")	20mm (0.79")
Feed rate	100mm/min (4ipm)	216mm/min (9ipm)
Cutting amount	50cm <sup>3</sup> /min (3.1in <sup>3</sup> /min)	65cm <sup>3</sup> /min (4in <sup>3</sup> /min)
Spindle motor load	42%	36%
Workpiece material	S45C	S45C



Type of machining	Tap Milling M30xP3.5	
Machine model	HMC400	HMC500
Spindle speed	100min <sup>-1</sup>	100min <sup>-1</sup>
Feed rate	350mm/min (14ipm)	350mm/min (14ipm)
Spindle motor load	61%	55%
Workpiece material	S45C	S45C



Type of machining	Slotting with End mill ø32 (1.26")x6T	
Machine model	HMC400	HMC500
Spindle speed	250min <sup>-1</sup>	250min <sup>-1</sup>
Width of cut	32mm (1.26")	32mm (1.26")
Depth of cut	12mm (0.47")	12mm (0.47")
Feed rate	140mm/min (6ipm)	140mm/min (6ipm)
Cutting amount	54cm <sup>3</sup> /min (3.3in <sup>3</sup> /min)	54cm <sup>3</sup> /min (3.3in <sup>3</sup> /min)
Spindle motor load	45%	35%
Workpiece material	S45C	S45C



Workpiece material: A705 Workpiece material: S50C

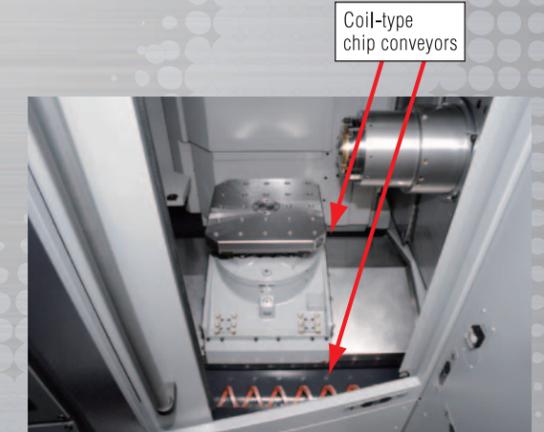
Values shown here are for reference to provide an indication of cutting capability.

**Chip disposal measures**

The standard ceiling shower and two coil-type conveyors on the left- and right-hand side thoroughly remove cutting chips from the machine. The troughs of the coil conveyors shield heat transfer from the cutting chips and coolant to the machine base.



Ceiling shower [Standard]



Coil-type chip conveyors [Standard]

**ATC [Automatic Tool Changer]**

The machine uses a servomotor-driven ATC and magazine, thus providing a stable tool change with excellent durability. A variable-speed ATC function, standard, automatically slows down the ATC turning speed for heavy tools. This allows the tool to be changed smoothly by simply selecting the slow turning speed during tool registration.

**Max. tool diameter:**  
**Ø170mm (6.69")**

**Max. tool length:**  
**HMC400: 450mm (17.72")**  
**HMC500: 550mm (21.65")**

**Max. tool mass:**  
**12kg (26 lbs)**



Foot-operated switch for removing a tool (Standard)



**Maximum workpiece size**

The HMC Series utilizes a table with a multi-clamp pallet system and has an extended maximum workpiece height, easily accommodating automatic fixture interfaces.

	HMC400	HMC500
Xst.	560mm(22.05")	760mm(29.92")
Yst.	560mm(22.05")	760mm(29.92")
Zst.	690mm(27.17")	800mm(31.50")
Pallet size	□400mm(15.75")	□500mm(19.69")
Maximum workpiece size	Ø630mm(24.80")	Ø800mm(31.50")
Maximum workpiece height *1	920mm(36.22")	1150mm(45.28")
Maximum load mass	400kg(882lbs)	700kg(1543lbs)

\*1 The available workpiece height will become lower when a fixture is used.

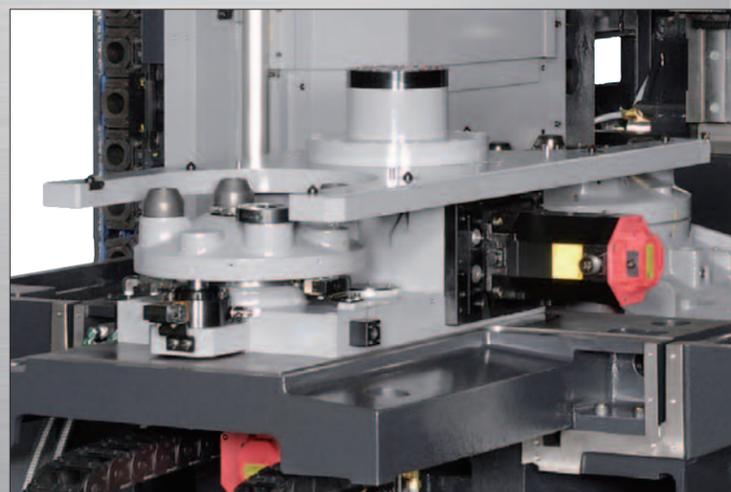
**Maintenance**

All of the maintenance devices are centrally located on operator door side for simple daily inspection.



**APC [Automatic Pallet Changer]**

The APC unit uses a direct-drive lifting and turning mechanism. The unit has been designed for easy expansion to multiple-pallet APC or automatic pallet transfer systems for flexible integration with automation.



## User-friendly construction

The operation panel is located on the left-hand side, which enables the operator to see the whole interior of the machine, thus increasing the operator's work efficiency. Furthermore, the front door of the APC opens wide so that the work loading/unloading and setup operations can be easily carried out.



Operator panel and inside of the machine

## Environmental measures

### LED lamps [Standard]

The machine incorporates LED lamps due to their low heat generation and power consumption savings. Furthermore, the LED lamps to save on replacement costs and maintenance.



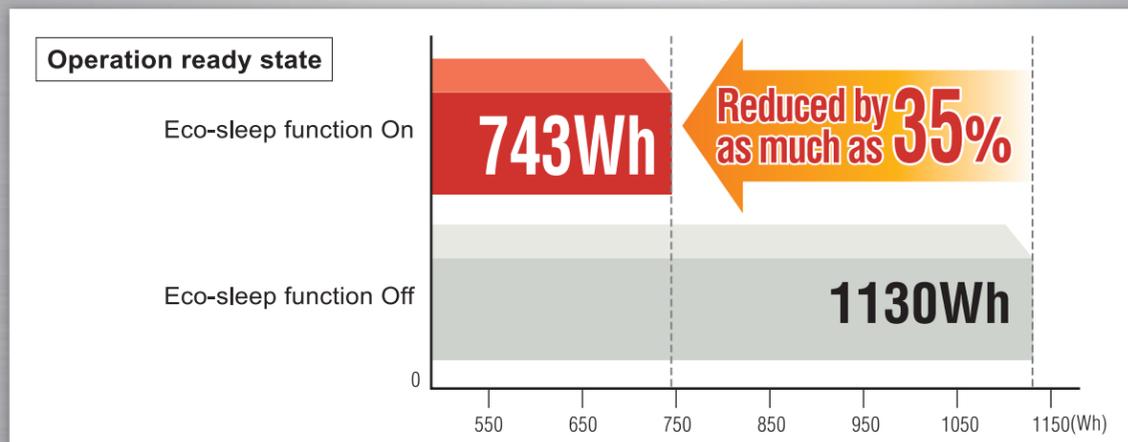
LED lamps [Standard]

### ECO sleep function [Standard]

If the machine remains idle longer than the specified time period, the machine's present mode is switched to a power-saving mode to reduce wasteful consumption of power, air and so on. When the power-saving mode is active, the equipment such as servos and chip conveyors are turned off. It is cancelled automatically when the setup operation is completed i.e. when the doors are closed.

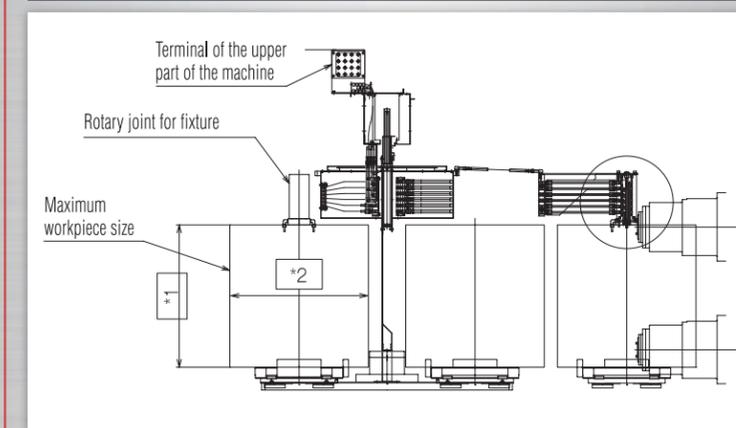
### Power consumption comparison

A power consumption of 1130Wh under normal standby condition is reduced to 743Wh with the eco-sleep function, a reduction of 35%.



## Optional accessories

### Constant auto fixture coupler with rotary joints



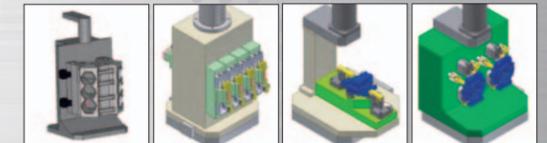
Dimensions of \*1

	HMC400	HMC500
3-port	730mm (28.74")	980mm (38.58")
4-port	700mm (27.56")	950mm (37.40")
6-port	650mm (25.59")	900mm (35.43")
8-port	-	850mm (33.46")

Dimensions of \*2

	HMC400	HMC500
Maximum workpiece size	ø630mm (24.80")	ø800mm (31.50")

### Fixture example



## Lift-up chip conveyor [Option]

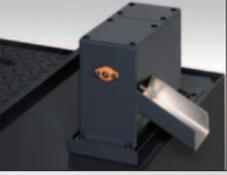
### Suitable lift up chip conveyor according to type of chips

◎ Most suitable ○ Usable △ Usable under condition × Not usable — Not applicable

Type of chips	Type of chip conveyors	Hinge type		Scraper type		Magnet Scraper type		Scraper type with drum filter		Magnet scraper type with drum filter		
		Use	Not use	Use	Not use	Use	Not use	Use	Not use	Use	Not use	
Magnetizable chips	Steel	Use or not use coolant oil										
	Short curl	◎	◎	○	○	◎	◎	○	—	◎	—	
	Spiral	◎	◎	△*2	△*2	△*2	△*2	×	—	×	—	
	Long	◎	◎	×	×	×	×	×	—	×	—	
	Needle shape	×	△*1	×	○	○*3	○	○	—	◎	—	
	Powder and small lump	×	△*1	×	○	○*3	○	○	—	◎	—	
Cast iron	Needle shape	×	△*1	×	○	○*3	○	○	—	◎	—	
	Powder and small lump	×	△*1	×	○	○*3	○	△*3	—	◎	—	
Non-magnetizable chips	Aluminum	Short curl	×	◎	△*4	○	—	—	◎	—	◎	—
		Spiral	○	◎	○	○	—	—	△*5	—	△*5	—
		Long	○	◎	○	○	—	—	△*5	—	△*5	—
		Needle shape	×	△*1	×	○	—	—	◎	—	◎	—
		Powder and small lump	×	△*1	×	○	—	—	◎	—	◎	—

\*1 Minute chips can enter the conveyor through a gap on the hinged plate. So, inside of the conveyor needs frequent cleaning.  
 \*2 Scraper can easily catch long chips. So, shortening the chips (for example by using the step feed) or removing such chips is required.  
 \*3 When flow rate of the coolant is large, filters can be clogged with chips flowed out of the conveyor case. Therefore, combined use with a magnet plate is recommendable.  
 \*4 When flow rate of the coolant is large, filters can be clogged with chips flowed out of the conveyor case. Therefore, filters require frequent cleaning.  
 \*5 Scraper can easily catch long chips. Therefore, periodical removal of chips is needed. If they remain, a drum filter may be damaged.

Optional accessories

<p><b>Air blow nozzle</b></p> <p>For dry cutting applications.</p> 	<p><b>Mist collector</b></p> <p>Mist collector suctions mist from the splash guards and is recommended when high-pressure coolant is used.</p> 	<p><b>Oil skimmer</b></p> <p>Oil skimmer collects contaminated oil from a coolant tank.</p> 	<p><b>116 tool magazine</b></p> 
<p><b>Lift-up chip conveyor</b></p> <p>To separate chips and coolant, and discharge to the outside only chips.</p> 	<p><b>T1-C</b></p> <p>Tool length measurement/ Tool break detection</p> 	<p><b>Set-up LED</b></p> <p>Set-up station incorporates LED lamps improves work efficiency.</p> 	

Option check sheet

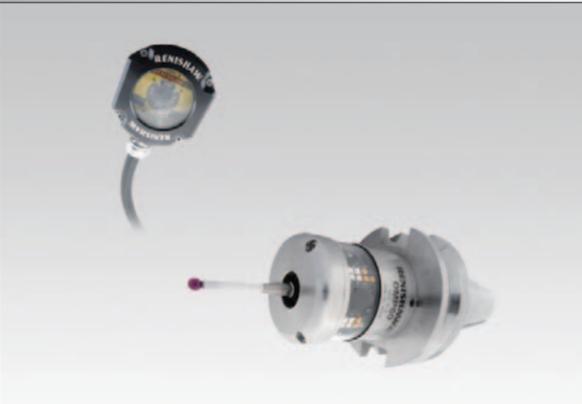
Item	Description
<input type="checkbox"/> Changing the type of pull stud	<input type="checkbox"/> MASII 60°
<input type="checkbox"/> Dual-contact tool	<input type="checkbox"/> HSK-A63
<input type="checkbox"/> Tool magazine	HMC400: <input type="checkbox"/> 60tools, <input type="checkbox"/> 116tools    HMC500: <input type="checkbox"/> 40tools, <input type="checkbox"/> 116tools
<input type="checkbox"/> Multi-pallet APC	<input type="checkbox"/> 7APC
<input type="checkbox"/> Pallet top surface	<input type="checkbox"/> T-slot
<input type="checkbox"/> Additional pallet	
<input type="checkbox"/> APC safety door automatic open / close	
<input type="checkbox"/> Oil skimmer	
<input type="checkbox"/> Addition of lighting system	<input type="checkbox"/> LED lamp in the APC setup station
<input type="checkbox"/> Signal lamp	<input type="checkbox"/> 3-lamps type without buzzer <input type="checkbox"/> 3-lamps type with buzzer
<input type="checkbox"/> Coolant-through-spindle	<input type="checkbox"/> Center through
<input type="checkbox"/> Coolant unit	<input type="checkbox"/> 2 MPa (290psi) <input type="checkbox"/> 7 MPa (1015psi) <input type="checkbox"/> With coolant cooler <input type="checkbox"/> Without coolant cooler
<input type="checkbox"/> Air blow nozzle	<input type="checkbox"/> 1 nozzle
<input type="checkbox"/> Swirl stopper block	<input type="checkbox"/> For angle attachment
<input type="checkbox"/> Workpiece flushing equipment	<input type="checkbox"/> Shower gun type
<input type="checkbox"/> Mist collector	
<input type="checkbox"/> Lift-up chip conveyor	<input type="checkbox"/> Hinged type <input type="checkbox"/> Scraper type <input type="checkbox"/> Magnet scraper type <input type="checkbox"/> Scraper type with drum filter (for aluminum + iron) <input type="checkbox"/> Magnet scraper type with drum filter (for aluminum + casting)
<input type="checkbox"/> Chip bucket	<input type="checkbox"/> Fixed type <input type="checkbox"/> Swing type
<input type="checkbox"/> Standard tool set	<input type="checkbox"/> Including a tool box
<input type="checkbox"/> Mass block	
<input type="checkbox"/> Angle plate	
<input type="checkbox"/> 2-face angle plate	
<input type="checkbox"/> Fixture interface	<input type="checkbox"/> 3ports <input type="checkbox"/> 4ports <input type="checkbox"/> 6ports <input type="checkbox"/> 8ports (HMC500 only)
<input type="checkbox"/> Touch sensor system T1	<input type="checkbox"/> Workpiece measurement <input type="checkbox"/> Tool length measurement / Tool break detection
<input type="checkbox"/> Tool break detection inside the magazine	
<input type="checkbox"/> Automatic restart at tool damage	
<input type="checkbox"/> Tool presence/absence detection	

OKK's dedicated control functions

**Setup support function**

■ **T1-A: Automatic workpiece measurement/compensation** [Option]

- The touch sensor attached to the spindle is moved to a workpiece in the automatic operation until it contacts the workpiece then based on the travel distance at that time, the required compensation amount is calculated and set as the data for the workpiece coordinate system.
- The measurement and compensation program is created according to the specified format and then executed.



■ **Hyper HQ control** [Option]

High-speed processing is enabled by improved capability of processing fine line segment toolpaths.

**<F31i-B/FAi capability of processing fine line segments>**

Type	Look-ahead processing(FAi)	Fine line segment data processing speed(m/min)(F31i)	Command method
Without Hyper HQ control	Max.20 blocks	15 (591ipm)	—
Hyper HQ control mode A	Max.20 blocks	30 (1181ipm)	ON: G05.1Q1; OFF: G05.1Q0
Hyper HQ control mode B	—	150 (5906ipm)	ON: G05.1Q1; OFF: G05.1Q0

■ **HQ tuner** [Option]

The HQ tuner provides the programmer a 10-step adjustment of parameters for hyper HQ control in accordance with processing conditions. It adjusts the hyper HQ control in accordance with the current process. For example, during roughing routines the programmer can place a higher priority on speed and in finishing routines a higher priority on dimensional accuracy at corners and circular arcs.



■ **T0 Software** [Option]

This screen enables the simple manual measurement using the touch sensor (option: T1-A or T1-B). You can move the sensor to the desired measuring point by handle mode then the machine starts the automatic measurement after the sensor contacts the workpiece. You can set the results of the measurement as the data for the desired workpiece coordinate system and tool offset number through the single key operation.

Technologies for reduced setup and unmanned operation

■ **Soft AC** [Option]

The soft AC function applies the feed rate override control automatically so that the value of the spindle load meter does not change significantly. This helps to prevent damages of tools caused by overload and improves cutting efficiency.

● **Adaptive control function**  
Feed override control range: 10 to 200%.  
(Changeable with parameters)  
Alarms are output at the lower limit override value.

● **Air-cut reduction function**  
Feed rates during non-cutting operation can be increased up to 200%.  
(Changeable with parameters)

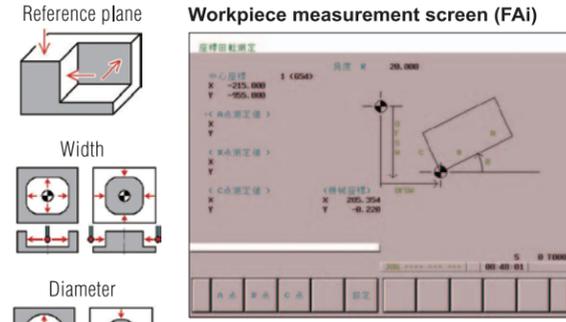
● **Tool failure monitoring function**  
Specifications similar to the soft CCM.

● **Continuous unmanned processing at the time of tool failure**  
Combined operation with the automatic restart function (Another option) is possible.

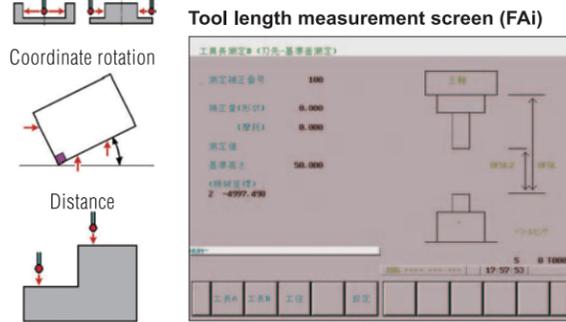
■ **Soft CCM** [Option]

The Soft CCM monitors the spindle load meter, and stops operation when the meter value exceeds the preset value (set by M signal or set for each of the T numbers through setting screen) and generation of abnormal tool load is determined which is convenient for unmanned operation at night.

**Workpiece measurement screen (FAi)**



**Tool length measurement screen (FAi)**



**Network function**

■ **Data server** [Option]

Large machining programs can be transferred to the data server through the network connected to the host computer at high speed. The transferred machining programs are executed as the main program or the sub program called up with the M198.



Transferring machining programs at high speed

### HMC400 Specifications

#### Specifications

Item		HMC400
Travel on X axis (Column: right/left)	mm	560 (22.05")
Travel on Y axis (Spindle head: up/down)	mm	560 (22.05")
Travel on Z axis (Pallet: back/forth)	mm	690 (27.17")
Distance from table top surface to spindle center	mm	80~640 (3.15"~25.20")
Distance from table center to spindle nose	mm	50~740 (1.97"~29.13")
Table (Pallet) work surface area	mm	□400 (15.75")
Max. workpiece weight loadable on table (pallet)	kg	400(882lbs)[Uniformly distributed load]
Max. workpiece size loadable on table (pallet)	mm	ø630×920 (ø24.80"×36.22")
Table (Pallet) top surface configuration		24×M16 tap
Min. indexable angle of table (pallet)	deg	0.001°
Spindle speeds	min <sup>-1</sup>	100~15000
Number of spindle speed		2-step (Winding change system)
Spindle nose(nominal number)		7/24 taper No.40 Dual-contact type
Spindle bearing bore diameter		ø70(2.76")
Rapid traverse rate	X × Y × Z	m/min 63 (2480opm)
	B	min <sup>-1</sup> 33.3
Cutting feed rate *1	X × Y × Z	mm/min 1~40000 (0.04~1575ipm) *1
	B	min <sup>-1</sup> 1~27.7 *1
Tool shank(nominal number)		JIS B 6339 BT40
Pull stud(nominal number)		MAS I (45°)
Number of storable tools	tool	40 *2
Max. tool diameter	mm	ø95 (3.74") [ø170 (6.69") with no tools in adjacent pots]
Max. tool length (from the gauge line)	mm	450 (17.72") *3
Max. tool weight	kg	5 (11lbs) [12 (26lbs) with slow ATC cycle] / Total 200 (440lbs)
Max. tool moment	N·m	9.8 (7.2ft·lbs)
Tool selection method		Address fixed random method
Tool exchange time (cut-to-cut)	sec	2.8
Pallet exchange method		Direct turn method
Pallet exchange time (JIS evaluation time)	sec	9.0
Spindle motor (15%ED/30min/Continuous rating)	kW	37/26/18.5 (50HP/35HP/25HP)
Feed motors	kW	X, Y, Z: 5.5 (7.4HP) B: 2.7 (3.6HP)
Coolant pump motor	kW	60Hz: 1.2 (1.6HP) 50Hz: 0.7 (0.9HP)
Hydraulic pump motor	kW	1.5 (2HP)
Spindle and feed system cooling oil pump motor(oil cooler)	kW	1.1/0.4 (1.5HP/0.5HP) [compression/discharge]
Spindle lubrication oil pump motor (oil air lubrication)	kW	0.017 (0.02HP)
ATC motor	kW	1.2 (1.6HP)
Tool Magazine motor	kW	1.4 (1.9HP)
APC motor	kW	1.8 (2.4HP)
Power supply AC200V±10% 50/60Hz±1Hz AC220V±10% 60Hz±1Hz	kVA	51
Compressed air supply	Mpa, l/min[ANR]	0.4~0.6 (58~87psi) *4, Min. 500 (132gpm) *4 *5
Coolant tank capacity	L	530 (140gal)
Spindle and feed system cooling oil tank capacity(oil cooler)	L	20 (5gal)
Spindle lubrication oil tank capacity (oil air lubrication)	L	2 (0.5gal)
Lubrication oil tank capacity	L	20(5gal)
Machine height(from floor surface)	mm	2640 (103.94")
Required floor space	mm	2605×4480 (102.56"×176.38")
Machine weight	kg	8500 (19000lbs)
Operating environment temperature	°C	5~40

#### Standard accessories

Item	Q'ty	Remarks
LED lamp	1set	
Coolant tank (installed separately)	1set	Tank capacity 530L (140gal)
Splash Guard/APC safety guard	1set	
Slide way protection sliding covers for X, Y and Z axes	1set	
Earth leakage breaker	1set	
Automatic power off	1set	
Edge locator	1set	
Signal lamp	1set	2-lamps type without buzzer
Direct-turn APC unit	1set	
Coil-type chip conveyor	1set	1 set for each of right and left
Hydraulic unit (installed separately)	1set	

Item	Q'ty	Remarks
Ceiling shower	1set	
Spindle head and ball screw cooling oil temperature controller (installed separately)	1set	
Ball screw and tool magazine automatic grease lubrication unit	1set	
Oil air lubrication unit	1set	
Foundation parts for machine anchoring (Bond anchoring method)	1set	with bond
Magazine tool holder remove device	1set	
Instruction manual	1set	
Electrical instruction manual (including electrical diagrams)	1set	

\*1: Under the HQ or Hyper HQ control

\*2: The number of storable tools refers the total number of tools including the one attached to the spindle i.e. subtract one from the above for the number of tools storable in the tool magazine.

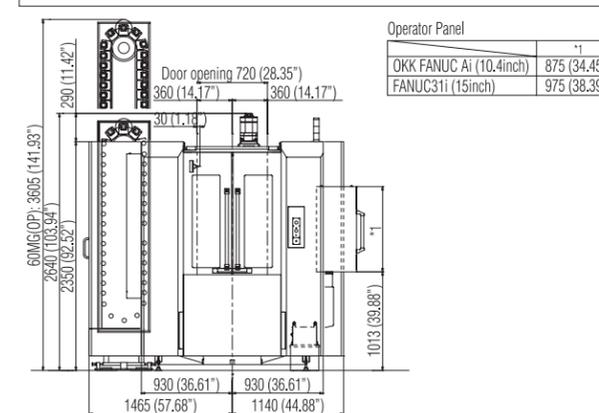
\*3: Conditional. For details, refer to tool limits drawing.

\*4: Purity of the supplied air should be equivalent to or higher than Class 3.5.4 specified in ISO 8573-1/JIS B8392-1.

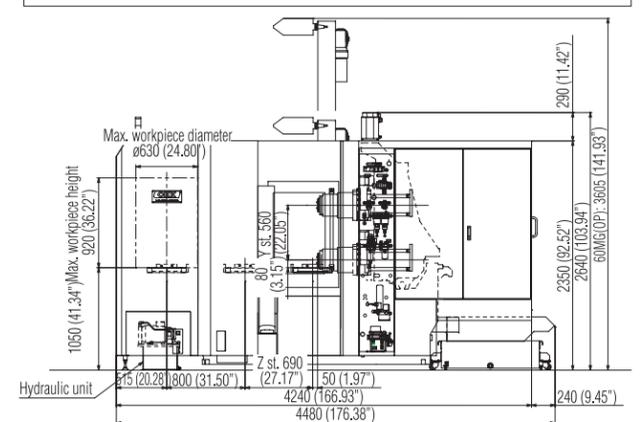
\*5: The flow rate for the standard specification machine is specified in the above. When optional specifications such as an air blower is added, add the corresponding air supply according to the operating frequency.

### Dimensions [mm]

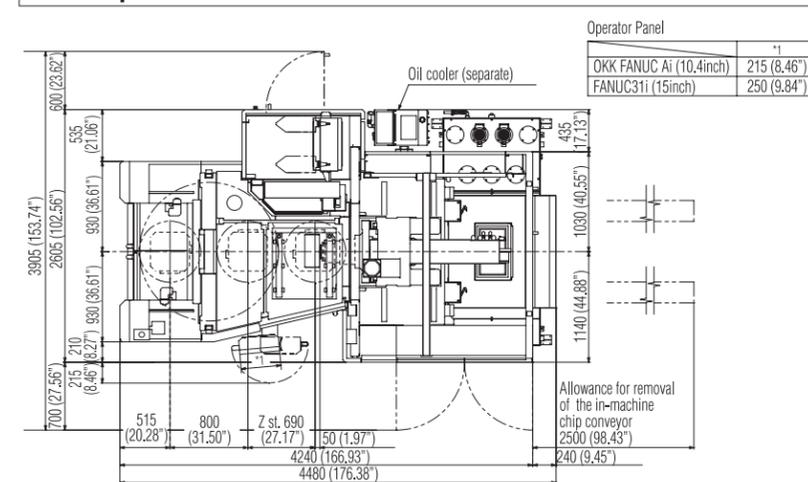
#### Front view



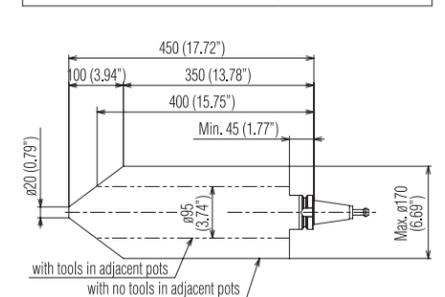
#### Side view



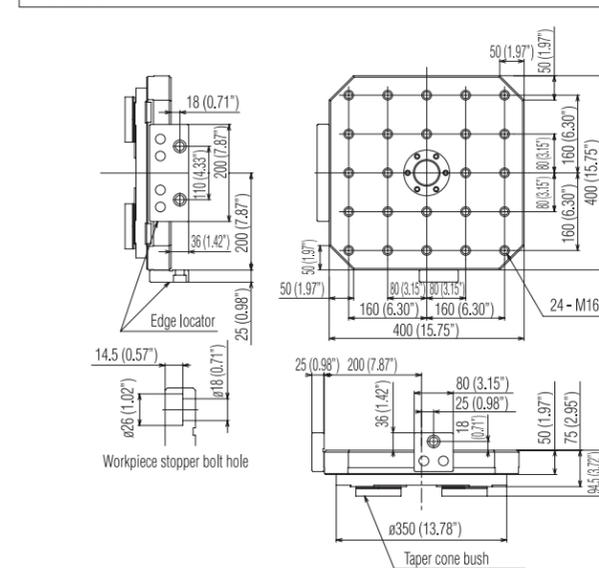
#### Floor space



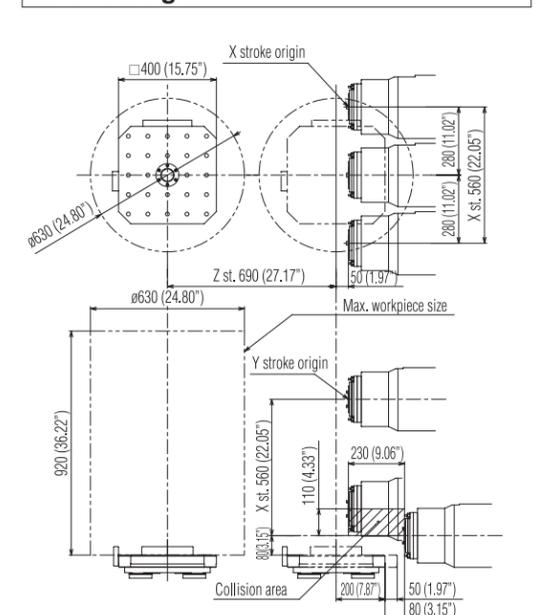
#### Restrictions on tool



#### Pallet



#### Stroke diagram



# HMC500 Specifications

## Specifications

Item		HMC500
Travel on X axis (Column: right/left)	mm	760 (29.92")
Travel on Y axis (Spindle head: up/down)	mm	760 (29.92")
Travel on Z axis (Pallet: back/forth)	mm	800 (31.50")
Distance from table top surface to spindle center	mm	80~840 (3.15"~33.07")
Distance from table center to spindle nose	mm	70~870 (2.76"~34.25")
Table (Pallet) work surface area	mm	□500 (19.69")
Max. workpiece weight loadable on table (pallet)	kg	700 (1543lbs) [Uniformly distributed load]
Max. workpiece weight loadable on table (pallet)	mm	ø800×1150 (ø31.50"×45.28")
Table (Pallet) top surface configuration		24×M16 tap
Min. indexable angle of table (pallet)	deg	0.001°
Spindle speed	min <sup>-1</sup>	100~15000
Number of spindle speed		2-step (Winding change system)
Spindle nose (nominal number)		7/24 taper No.40 Dual-contact type
Spindle bearing bore diameter	mm	ø70 (2.76")
Rapid traverse rate	X × Y × Z	m/min 63 (2480opm)
	B	min <sup>-1</sup> 40
Cutting feed rate *1	X × Y × Z	mm/min 1~40000 (0.04~1575ipm) *1
	B	min <sup>-1</sup> 1~27.7 *1
Tool shank (nominal number)		JIS B 6339 BT40
Pull stud (nominal number)		MAS I (45°)
Number of storable tools	tool	60 *2
Max. tool diameter	mm	ø95 (3.74") [ø170 (6.69") with no tools in adjacent pots]
Max. tool length (from the gauge line)	mm	550 (21.65") *3
Max. tool weight	kg	5 (11lbs) [12 (26lbs) with slow ATC cycle] / Total 300 (661lbs)
Max. tool moment	N·m	9.8 (7.2ft·lbs)
Tool selection method		Address fixed random method
Tool exchange time (cut-to-cut)	sec	2.9
Pallet exchange method		Direct turn method
Pallet exchange time (JIS evaluation time)	sec	13
Spindle motor (15%ED/30min/Continuous rating)	kW	37/26/18.5 (50HP/35HP/25HP)
Feed motors	kW	X,Y,Z: 5.5 (7.4HP) B: 4.5 (6.0HP)
Coolant pump motor	kW	60Hz: 1.2 (1.6HP) 50Hz: 0.7 (0.9HP)
Hydraulic pump motor	kW	1.5 (2HP)
Spindle and feed system cooling oil pump motor (oil cooler)	kW	1.1/0.4 (1.5HP/0.5HP) [compression/discharge]
Tool Magazine motor	kW	0.017 (0.02HP)
ATC motor	kW	1.2 (1.6HP)
Tool Magazine motor	kW	1.4 (1.9HP)
APC motor	kW	2.5 (3.4HP)
Power supply AC200V±10% 50/60Hz±1Hz AC220V±10% 60Hz±1Hz	kVA	48
Compressed air supply	Mpa,ℓ/min[ANR]	0.4~0.6 (58~87psi) *4, Min.500 (132gpm) *4 *5
Coolant tank capacity	L	530 (140gal)
Spindle and feed system cooling oil tank capacity (oil cooler)	L	20 (5gal)
Spindle lubrication oil tank capacity (oil air lubrication)	L	2 (0.5gal)
Lubrication oil tank capacity	L	20 (5gal)
Machine height (from floor surface)	mm	3605 (141.93")
Required floor space	mm	2750×4845 (108.27"×190.75")
Machine weight	kg	10500 (23148lbs)
Operating environment temperature	°C	5~40

## Standard accessories

Item	Q'ty	Remarks
LED lamp	1set	
Coolant tank (installed separately)	1set	Tank capacity 530L (140gal)
Splash Guard/APC safety guard	1set	
Slide way protection sliding covers for X,Y and Z axes	1set	
Earth leakage breaker	1set	
Automatic power off	1set	
Edge locator	1set	
Signal lamp	1set	2-lamps type without buzzer
Direct-turn APC unit	1set	
Coil-type chip conveyor	1set	1 set for each of right and left
Hydraulic unit (installed separately)	1set	

Item	Q'ty	Remarks
Ceiling shower	1set	
Spindle head and ball screw cooling oil temperature controller (installed separately)	1set	
Ball screw and tool magazine automatic grease lubrication unit	1set	
Oil air lubrication unit	1set	
Foundation parts for machine anchoring (Bond anchoring method)	1set	with bond
Magazine tool holder remove device	1set	
Instruction manual	1set	
Electrical instruction manual (including electrical diagrams)	1set	

\*1: Under the HQ or Hyper HQ control

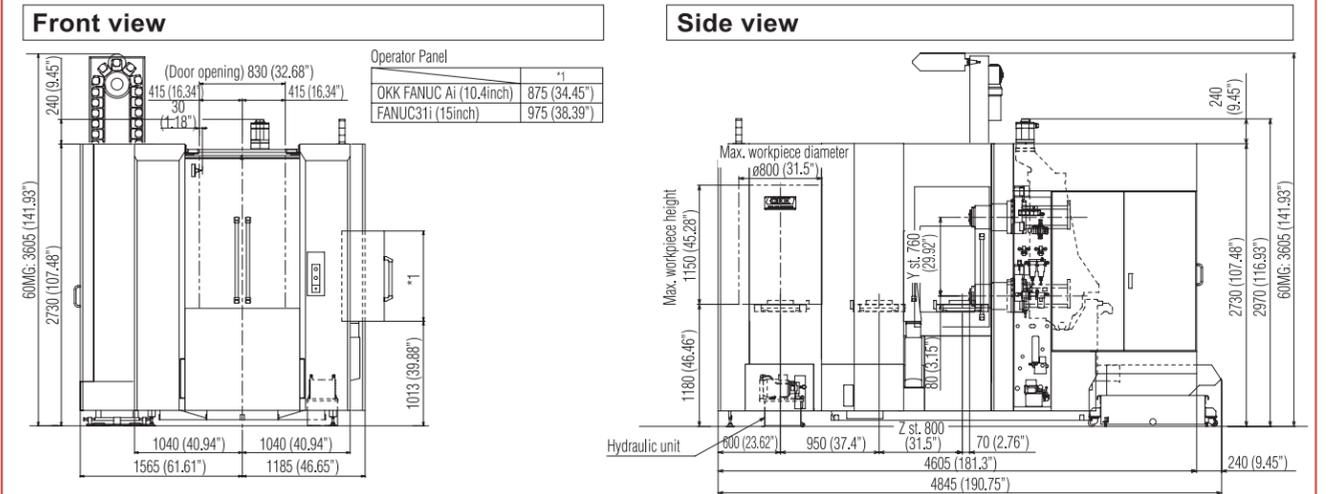
\*2: The number of storable tools refers the total number of tools including the one attached to the spindle i.e. subtract one from the above for the number of tools storable in the tool magazine.

\*3: Conditional. For details, refer to tool limits drawing.

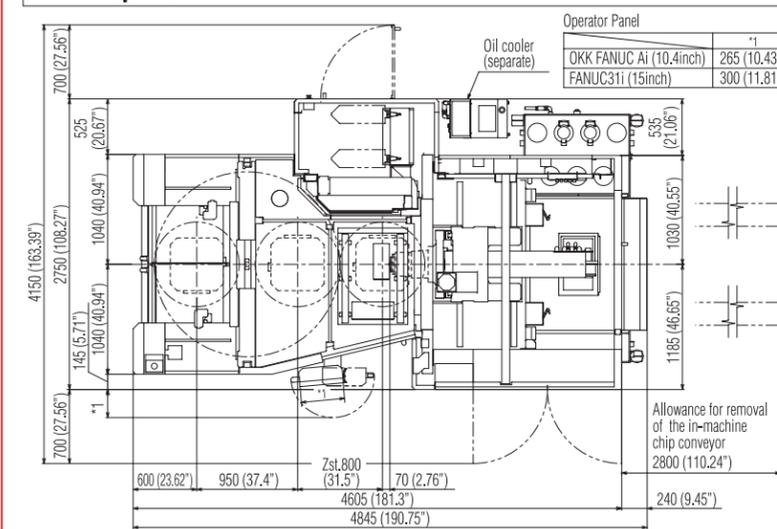
\*4: Purity of the supplied air should be equivalent to or higher than Class 3.5.4 specified in ISO 8573-1/JIS B8392-1.

\*5: The flow rate for the standard specification machine is specified in the above. When optional specifications such as an air blower is added, add the corresponding air supply according to the operating frequency.

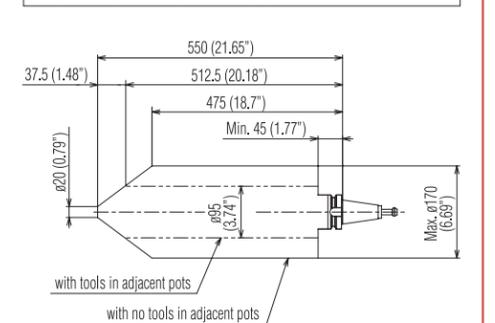
## Dimensions [mm]



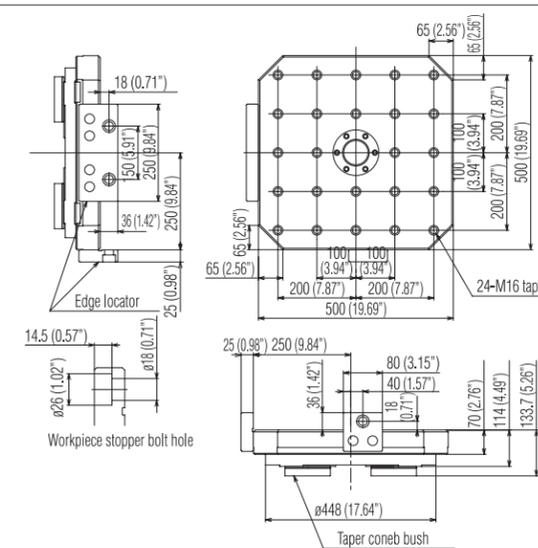
## Floor space



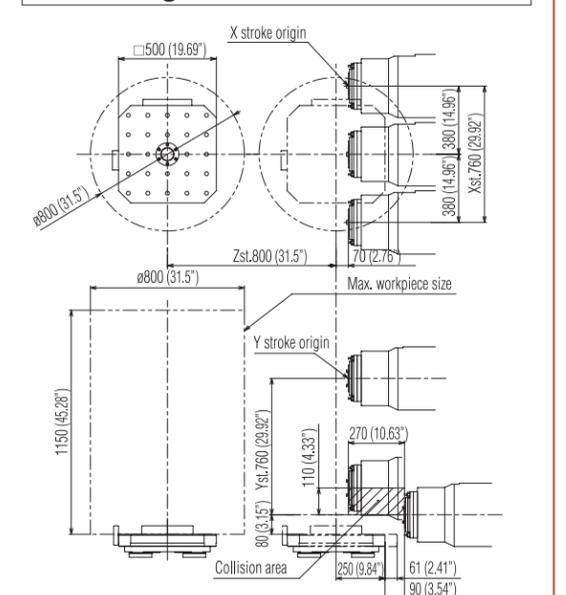
## Restrictions on tool



## Pallet



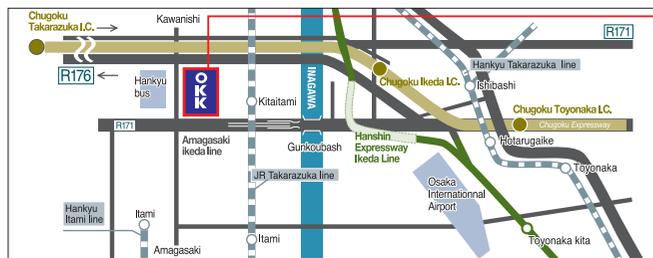
## Stroke diagram





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**Access map**



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