Nidec
All for dreams

NIDEC OKK CORPORATION
8-10,KITA-ITAMI,ITAMI
HYOGO 664-0831 JAPAN
International Sales Department
TEL:(81)72-771-1143
www.nidec.com/en/nidec-okk/
E-mail:nokk.ovsd@nidec.com

NIDEC OKK A DIVERSIFIED MANUFACTURER OF MACHINE TOOLS
Specializes In:
Machining centers
Graphite cutting machining centers
Grinding centers
CNC Milling machines
Conventional milling machines
Total die and mold making systems
Flexible manufacturing cells and systems

NOTE :
NIDEC OKK reserves the right to change the information contained in this brochure without notice.
NIDEC OKK is not responsible to make changes to previously sold machines or accessories.
The machines in the photographs of this brochure may include optional accessories.

The export of this product is subject to an authorization from the government of the exporting country.
Check with the government agency for authorization.

NIDEC OKK USA CORPORATION
100 REGENCY DRIVE, GLENDALE HEIGHTS, IL 60139 U.S.A.
TEL:(1)630-924-9000
FAX:(1)630-924-9010

NIDEC OKK Europe GmbH
HANSEMANNSTR 33 41468 NEUSS, GERMANY
TEL:(49)2131-29868-0
FAX:(49)2131-29868-41

NIDEC OKK Machinery (THAILAND) Co.,Ltd.
KUMTHORN HOLDING BUILDING 2nd FLOOR 897-897/1 Rama 3 Road, Bangpongpang, YANNAWA, BANGKOK 10120 THAILAND
TEL:(66)2-683-2160-2
FAX:(66)2-683-2163

NIDEC OKK (SHANGHAI) CO.,LTD.
12F, TOWER B, 100 ZUNYI ROAD, CHANG NING DISTRICT, SHANGHAI, CHINA
TEL:(86)21-62700930
FAX:(86)21-62700931

Printed in Japan
22.11.1(ITP)

HM-X SERIES

Nidec
All for dreams

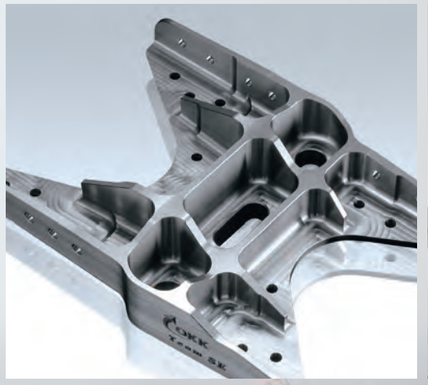
5-axis Horizontal Machining Center

HM-X SERIES

HM-X 6100
HM-X 8000

www.nidec.com/en/nidec-okk/

NIDEC OKK CORPORATION



Highly-efficient machining of extremely complex parts!

As with all OKKs we paid special attention to the rigidity of the cast body, built solid and features our massive liner roller guides and large-diameter ball screws for the feed system, allowing the HM-X Series to easily cut exotic materials.
All OKK horizontals feature Core chilled pre-tensioned and double-anchored ball screws in order to maintain the high accuracy needed throughout long hours of machining.

HM-X SERIES

5-axis Horizontal Machining Center

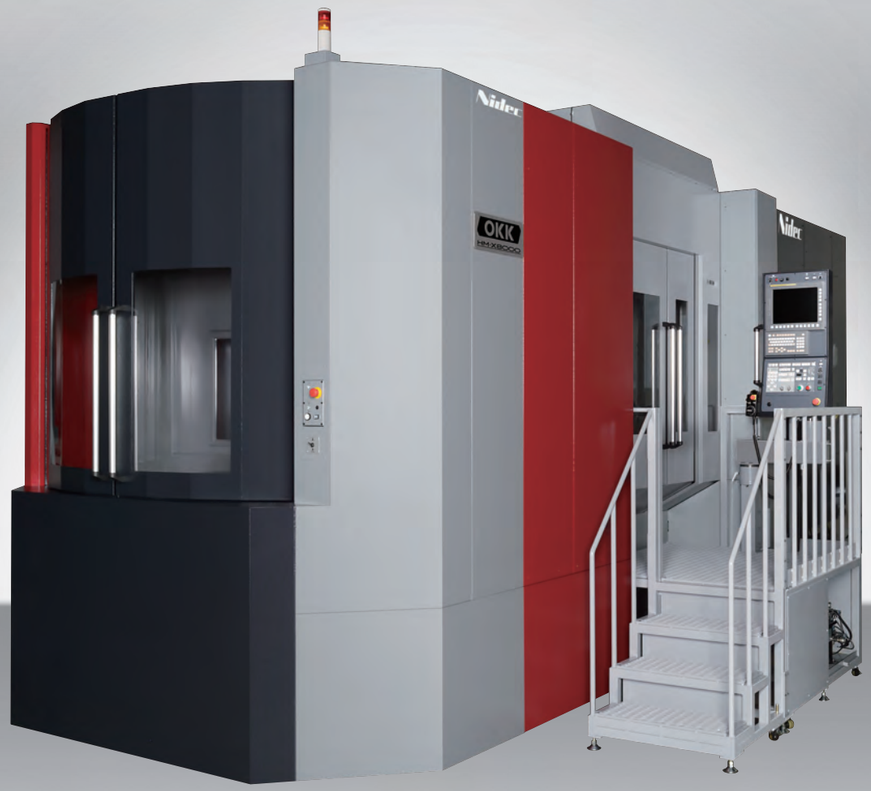
HM-X SERIES

5-axis machining center is built on the battlefield proven HM-series platform.
Excellent in both speed and rigidity.

HM-X 6100

Highly rigid trunnion table with dual-support structure and Nidec OKK's unique pallet change mechanism for excellent setup.

Rapid traverse rate	(X・Z) 75m/min (Y) 54m/min ((X・Z) 2953 ipm (Y) 2126ipm)	Maximum loading capacity	650kg (1433lbs)	Spindle torque (15% ED/Continuous rating)	623/305N・m (460/225ft・lbs)
Rapid traverse rate (A, B)	A:30 B:50min^{-1}	Spindle nose (Nominal number)	7/24 taper, No.50	Spindle output (25% ED/Continuous rating)	45/26kW (60/35HP)
Maximum workpiece size	ϕ800×H700mm (dia.31.50"×H27.56")			Spindle rotating speed	35～12000min^{-1}



HM-X 8000

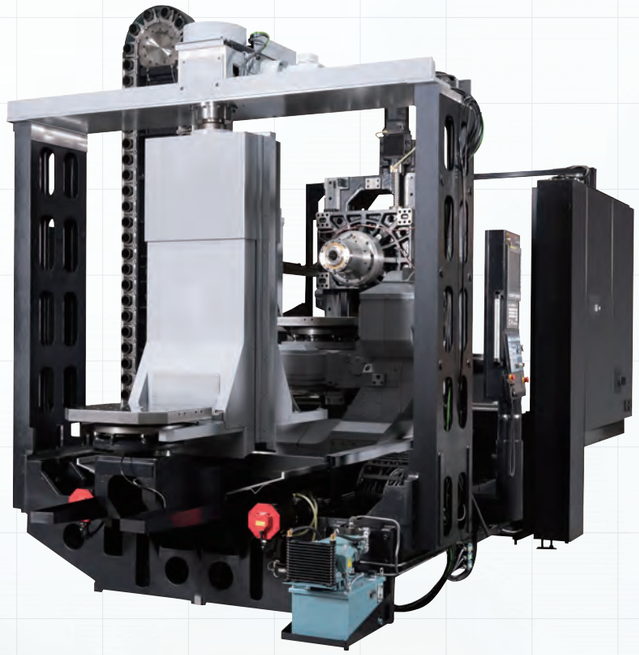
Tilting spindle head structure allows superior 5 axis machining without inclining a heavy workpiece

Up to 2000 kg can be loaded on the table supported with on large crossed roller bearings

Rapid traverse rate (X, Y, Z)	48m/min (1890ipm)	Maximum loading capacity	2000kg (4409lbs)	Spindle torque (25% ED/Continuous rating)	623/305N・m (460/225ft・lbs)
Rapid traverse rate (A, B)	A:8.3 B:16.7min^{-1}	Spindle nose (Nominal number)	7/24 taper, No.50	Spindle output (30-min/Continuous rating)	45/26kW (60/35HP)
Maximum workpiece size	ϕ1200×H1250mm (dia.47.24"×H49.21")			Spindle rotating speed	35～12000min^{-1}

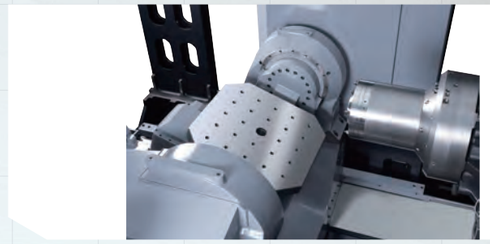
Our 5-axis No.50 taper machine with a X and Z rapid traverse of 75 m/sec (2953 ipm) that continues the HM Series high power performance

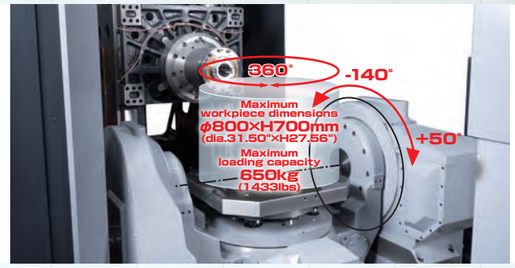
HM-X 6100



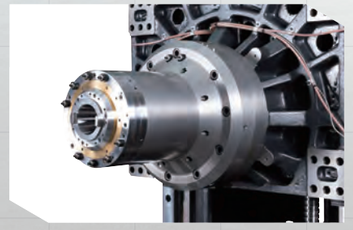
A/B axes trunnion table

The solid dual-disc clamping method of the Trunnion table ensures the brake retains force of 14430N·m(10643ft·lbs) for the A axis and 1990N·m(1468ft·lbs) for the B axis.
The double (hydraulic and mechanical) clamping method is being used for our pallet clamping which ensures the clamping force of 96000N. The pallet clamping continues to hold even in the event of power failure, keeping your employees safe and downtime to a minimal.
Trunnion table drive system has been changed to the new roller type from the conventional slide. This allows for improved indexing accuracy, rotary encoders are used for the A and B axes as a part of the standard specification.
A Direct Drive table wiithout backlash is available as an option.





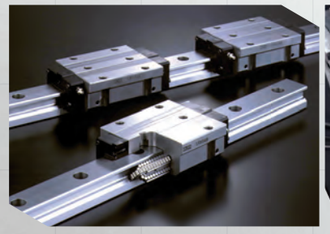
High-power, High-torque spindle head paired with our tremendously rigid main body allows you to put the power in the cut.

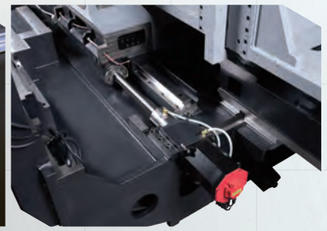


Spindle taper	No.50
Spindle motor	45/30/26kW(60/40/35HP) OP:55/37/30kW(74/50/40HP)
Maximum torque	623N·m(460ft·lbs) OP: 1202N·m(887ft·lbs)
Spindle diameter	ø100㎜(dia.3,94") OP:120㎜(dia.4.72")

Exceptional rigidity and accuracy

Nidec OKK's liner roller guides and large-diameter ball screws provide a highly rigid feed system. This combined with our high-power head allow for heavy-duty machining.
Newly adopted twin ball screw for the Z-axis. Rapid traverse rates are 75m/min (2953 ipm) in XZ-axis, 54m/min (2126ipm) in Y-axis, 30min^{-1} A-axis, 50m/min^{-1} B-axis.
As a part of the standard specification, core chilled and pre-tensioned, double-anchored ball screws matched with thermal displacement correction function (Nidec OKK's original function) result in minimal thermal displacement errors for 24-hour high-accuracy machining.





Nidec OKK' s unique pallet change mechanism

Our unique pallet exchange mechanism has achieved a pallet height of 1180 mm (46.5") on the setup side.

Side view from inside machine

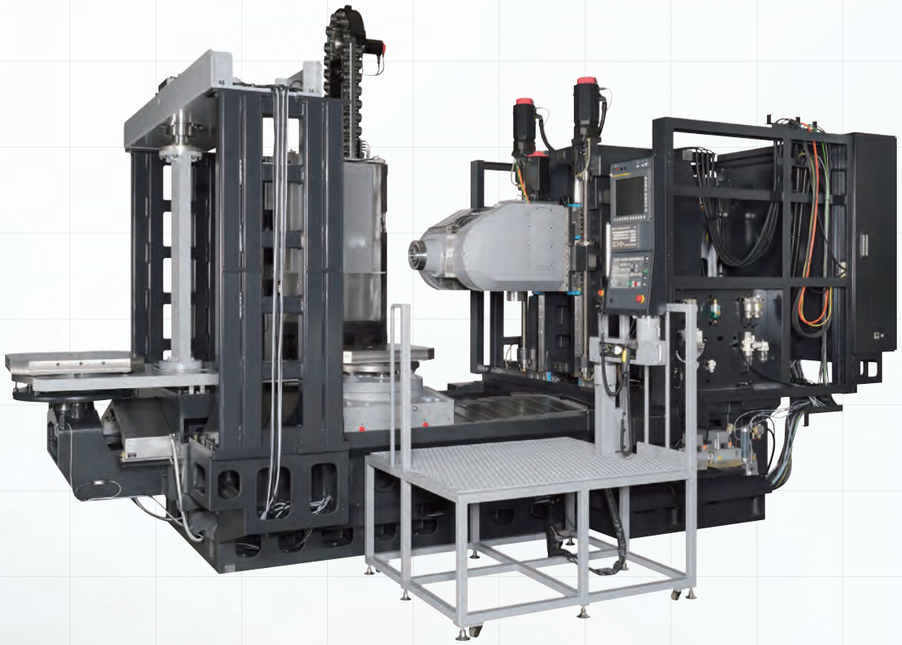
Improved chip evacuation

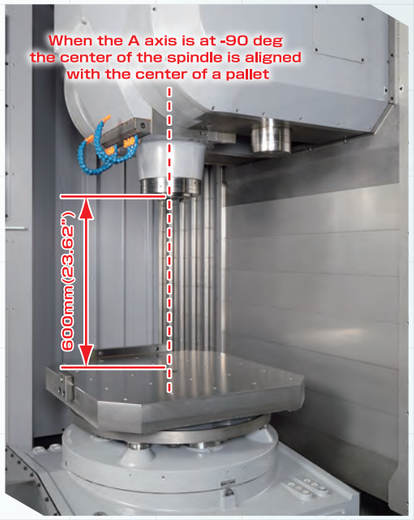
Our bed with center trough structure, large-capacity ceiling shower, coolant curtain, and spindle nose cleaning nozzle all come standard.

Setup side

Wide adaptability
Machine medium and large-sized workpieces regardless of their materials

HM-X 8000

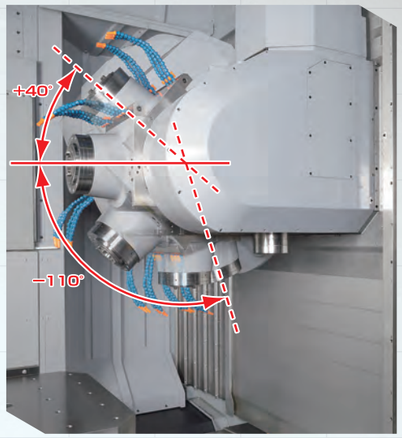




A-axis at -90 degrees

Tilting axis (A axis) is in the spindle head

The head tilting structure improves ergonomics for the operator allowing them to easily access and visually check workpieces inside the machine.
Machining is possible with the spindle positioned in the vertical and horizontal position.
When the angle of the A-axis is -90 degrees, access to the position where the center of the spindle is aligned with the center of the pallet.

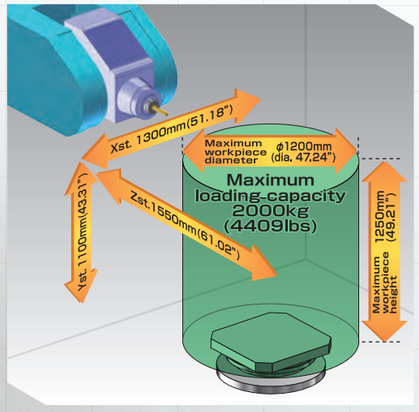


Highest-in-class spindle torque

45kW(60HP)(25%ED)/623N･m (460ft･lbs)(15%ED) high-power and high-torque built-in motor

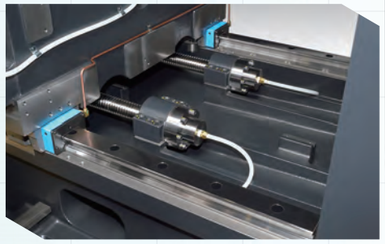
Maximum 2000kg(4409lbs) can be loaded on the table

Use of the large-diameter crossed roller bearing improves rigidity of the table and enables loading up to 2000kg(4409lbs). The brake torque has also been improved with the use of spike type brake disc. Medium and large-sized workpieces are easily loadable up to a maximum φ1200×H1250mm (dia.47.24"×H49.21")-high.



Incomparable rigidity and accuracy

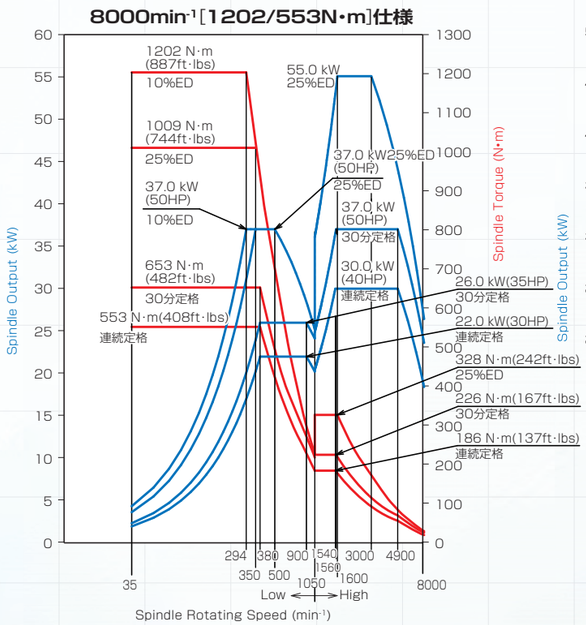
Rigid liner roller guides and large-diameter twin ball screws used for the X and Y axes improve machining quality.
As standard on all OKK horizontals the HM-X8000 is equipped with core chilled and pre-tensioned, double-anchored ball screws and our thermal displacement correction function (OKK's original function) resulting in minimal thermal displacement errors for 24-hour high-accuracy machining.

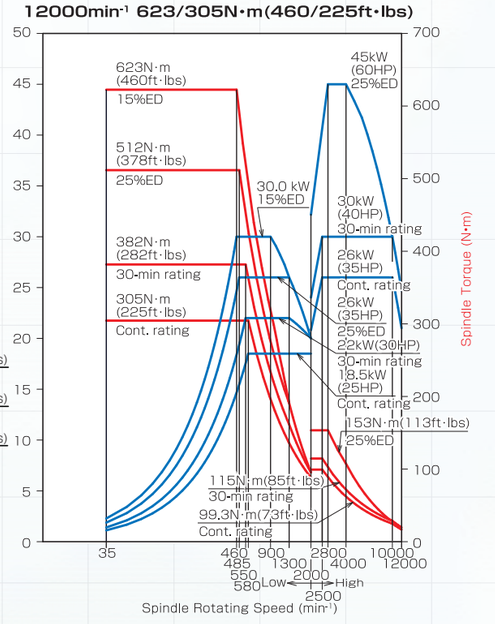


Accessibility

Improved accessibility ensures higher operability.
Easily set work offsets and inspect workpieces inside the machine.

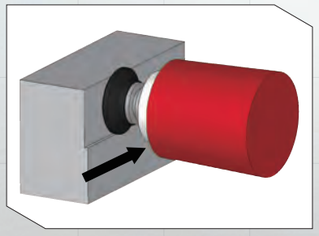
Torque Diagram



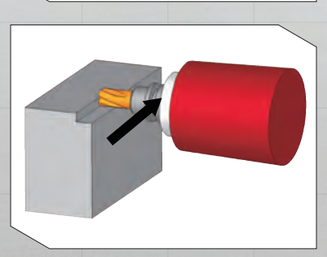


	8000min-1 1202/553N・m (887/408ft・lbs)	12000min-1 623/305N・m (460/225ft・lbs)
HM-X6100	Opt.	Std.
HM-X8000	—	Std.

Machining Capabilities

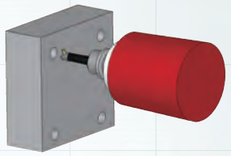


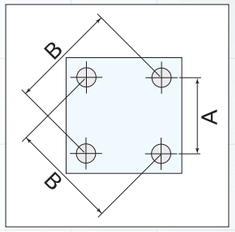
		HM-X6100	HM-X8000	
			Angle of A axis: 0°	Angle of A axis: 90°
Machining conditions	Unit	Face milling φ125(4.92")×6T		
Spindle rotating speed	min-1	300	400	400
Cut width	mm	100 (3.94")	100(3.94")	100(3.94")
Cut depth	mm	6 (0.24")	6(0.24")	6(0.24")
Feed rate	mm/min	700 (28ipm)	700(28ipm)	800(31ipm)
Cutting amount	cm3/min	420 (25.6in3/min)	420(25.6in3/min)	480(29.3in3/min)
Spindle motor load	%	104	100%	100%
Workpiece material		S45C	S45C	S45C



		HM-X6100	HM-X8000	
			Angle of A axis: 0°	Angle of A axis: 90°
Machining conditions	Unit	Side milling φ50(1.97") × 6T		
Spindle rotating speed	min-1	160	200	200
Cut width	mm	15 (0.59")	15(0.59")	15(0.59")
Cut depth	mm	40 (1.57")	50(1.97")	50(1.97")
Feed rate	mm/min	160 (6.3ipm)	200(8ipm)	240(9ipm)
Cutting amount	cm3/min	96 (5.86in3/min)	150(9.2in3/min)	180(11in3/min)
Spindle motor load	%	49	68%	78%
Workpiece material		S45C	S45C	S45C

Accuracy



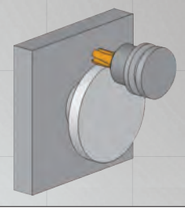


A	200.000(7.87")
B	282.843(11.13555")

Cutting Accuracy

(mm)

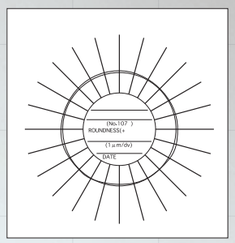
	HM-X6100		HM-X8000	
	Nidec OKK tolerance	Result	Nidec OKK tolerance	Result
Axial direction	0.015 (0.00059")	0.005 (0.00020")	0.015 (0.00059")	0.004 (0.00016")
Diagonal direction	0.015 (0.00059")	0.006 (0.00024")	0.015 (0.00059")	0.002 (0.00008")
Deviation of hole dia	0.010 (0.00039")	0.005 (0.00020")	0.015 (0.00059")	0.004 (0.00016")



Circular Cutting Accuracy

(mm)

	HM-X6100		HM-X8000	
	Nidec OKK tolerance	Result	Nidec OKK tolerance	Result
Circularity	0.015 (0.00059")	0.004 (0.00016")	0.015 (0.00059")	0.004 (0.00016")

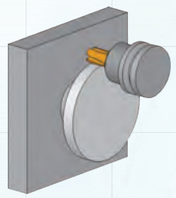


Positioning Accuracy

(mm)

		HM-X8000
Positioning accuracy (X, Y, Z)	Without linear scale	X:±0.0025(0.00010")/full length Y:±0.0025(0.00010")/full length Z:±0.0030(0.00012")/full length
	With linear scale	X:±0.0020(0.00008")/full length Y:±0.0020(0.00008")/full length Z:±0.0025(0.00010")/full length
Positioning repeatability (X, Y, Z)	Without linear scale	±0.0015(0.00006")/full length
	With linear scale	±0.0010(0.00004")/full length
Positioning accuracy	With encoder	A axis: ±5 sec; B axis: ±2.5 sec

(Nidec OKK tolerance)

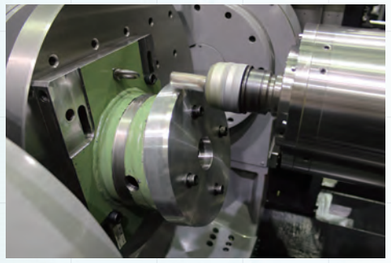


Simultaneous 5-axis taper cone machining

(mm)

	HM-X6100		HM-X8000	
	Nidec OKK tolerance	Result	Nidec OKK tolerance	Result
Circularity	0.050 (0.00197")	0.013 (0.00051")	0.050 (0.00197")	0.015 (0.00059")

Remarks
*1: The above sample data shows short-time machining examples and the results of continuous machining may differ.
*2: The above sample data show the accuracy under the Nidec OKK's in-house cutting test conditions. The results may vary with the conditions of the cutting tools and fixtures.
*3: The accuracies shown above are the values obtained based on the Nidec OKK's inspection standards under the conditions that the machine is installed according to the Nidec OKK's foundation drawing while keeping the ambient temperature constant.



Unmanned Operation

Matrix Magazine and Multi Pallet are available as an option.
These systems can be expanded easily in the field after its delivery.

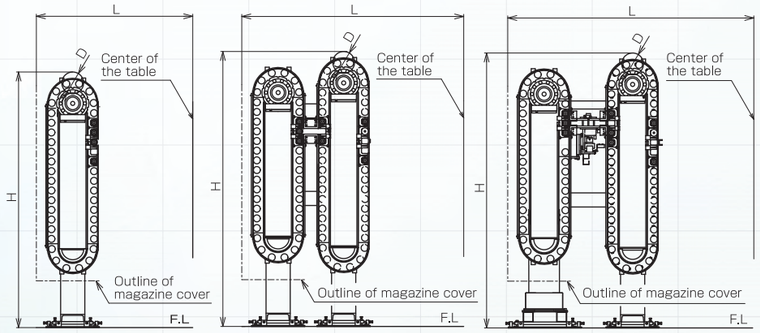
Matrix Magazine

Multi Pallet

Tool Magazine

Chain-type 60-tool magazine are included in the standard specification. there is also a Matrix Magazine option, which will increase the capacity up to 161 / 233 / 311 or 389 tools (Capacity of Matrix Magazine).

40/60-tool magazine | **80/116-tool magazine** | **120/160/176/236-tool magazine**

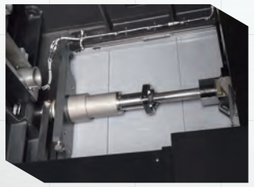


Number of storable tools*1	HM-X6100 L mm	HM-X6100 H mm	HM-X6100 D*2 mm	HM-X8000 L mm	HM-X8000 H mm	HM-X8000 D*2 mm
40 tools (Opt)	2105 (82.87")	2915 (114.76")	ø300 (dia.11.81")	2130 (83.86")	3305 (130.12")	ø270 (dia.10.63")
60 tools (Std)		4115 (162.01")			4265 (167.91")	
80 tools (Opt)	2960 (116.54")	3155 (124.21")		2945 (115.94")	3545 (139.57")	
116 tools (Opt)		4115 (162.01")			4265 (167.91")	
120 tools (Opt)	3275 (128.94")	3155 (124.21")		3245 (127.76")	3545 (139.57")	
160 tools (Opt)					3545 (139.57")	
176 tools (Opt)		4235 (166.73")			4265 (167.91")	
236 tools (Opt)					4265 (167.91")	

*1: Number of storable tools of the 40/60-tool magazine refers to a total number of tools including the tool in the spindle i.e. subtract one from the above for the actual number of tools storable in the magazine.
*2: The dimension D means the maximum tool diamer applied to the tool with no tools placed in the pots in the tool magazine that adjoin the pot designated to the tool. It is ø115 mm in any of the above cases unless both pots have no tools.

ATC [Automatic Tool Changer]

The ATC unit offers stable tool changes and amazing durability. The speed variable ATC function included in the standard specification enables smooth tool change in the use of heavy or large-diameter tool as the ATC turning speed is reduced automatically according to the setting made at the time of registration of the relevant tool.



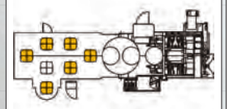
HM-X6100	HM-X8000
Maximum tool diameter ø300mm (dia.11.8")	Maximum tool diameter ø270mm (dia.10.63")
*ø115mm(dia.4.53") unless adjoining pots have no tools	*ø115mm(dia.4.53") unless adjoining pots have no tools
Maximum tool length 600mm (23.6")	Maximum tool length 400mm (15.75")
Maximum tool mass 30kg (66lbs) (in the case of slow turning)	Maximum tool mass 25kg (55lbs) (in the case of slow turning)
*When rotating at normal speed : 10kg(22lbs) When rotating at medium speed : 20kg(44lbs)	*15kg(33lbs) when turning at normal speed

APC [Automatic Pallet Changer]

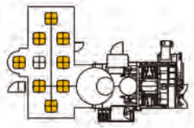
The direct-turn 2APC unit is included in the standard specification. The automatic multi pallet changer and the FMS are available optionally. The units are compatible with the through-pallet jig interface and the rotary joint type jig interface.

HM-X8000	6APC laid in line	6000×13400mm(236.22"×527.56")
	6APC laid crosswise	6130×12100mm(241.34"×476.38")
	8APC laid in line	6000×15000mm(236.22"×590.55")
	8APC laid crosswise	7730×12100mm(304.33"×476.38")

HM-X8000
6APC with setup station laid in line



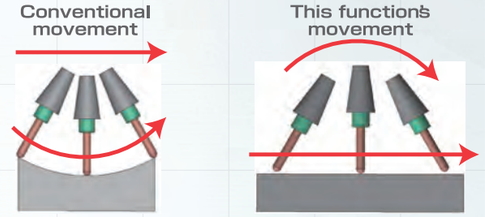
HM-X8000
8APC with setup station laid crosswise



5-axis Support Technologies

5-axis Control Function

Tool Center Point Control



Produces errors due to movement of rotation axis

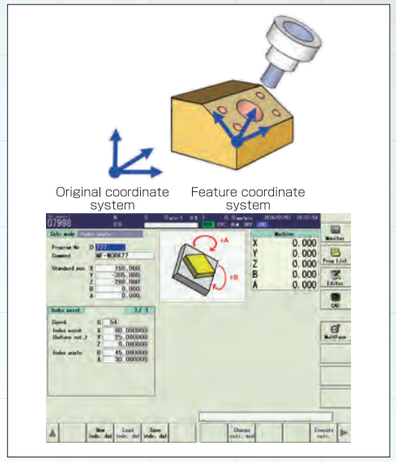
Loci of the tool tip as instructed

Linear interpolation while changing the angle of the tool normally requires complicated machining data using minute segments as shifts in the direction of the axis of the tool need to be instructed according to the change in the tool's angle.
By using the Tool Center Point Control, location of the tool tip are as instructed regardless of the instructions for the rotation axis. As speed of the tool tip is constant (designated speed), further high-quality surfacing can be achieved.

5-axis Indexing Function

Inclined Surface Indexing (Machining) Command
HM-X6100 Opt. HM-X8000 Std.

The inclined surface indexing (machining) commands allow setting as desired the surface to be machined by using the newly defined coordinate system (feature coordinate system).
It enables efficient creation of the machining programs similar to the programming for the normal 3-axis machining centers.



MULTI-FACER II

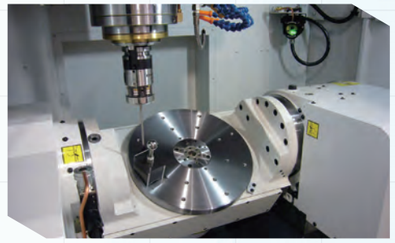
When indexing the planes to be machined on the 5-axis machining centers, it may take time for setting the workpiece origins. Those workpiece origins can be set easily by using the MULTI-FACER II that enables creating the programs for indexing easily without requiring calculations.

5-axis Measurement Function

A5 system Opt.

When 5-axis machining, One key component to high accuracy 5 axis machining is ensuring that the center position of the rotation axis has been set correctly.
If wrong this significant effects the machining accuracy.
OKK has reduced the error that can be generated by the operator with our A5 System, (OKK's Original software) that allows the operator to easily measure and set the center of rotation axes automatically with use of this software.
A5 System improves upon the already high-accuracy 5-axis indexing capability and simultaneous 5-axis machining.

Note: This function does not adjust the accuracy of linear 3 axies.



Specifications

Item		Unit	HM-X6100	HM-X8000
Travel on X axis (Column: right / left)		mm	1050(41.34")	1300(51.18")
Travel on Y axis (Spindle head: up / down)		mm	900(35.43")	1100(43.31")
Travel on Z axis (Pallet: back / forth)		mm	1000 (APC st +190)(39.37"(APC st+7.48"))	1550(61.02")
Travel on A axis (Pallet tilting / head tilting)		deg	−140 to 50	−110 to 40
Travel on B axis (Pallet turning)		deg	360	
Distance from table top surface to spindle center		mm	−270 to 630(-10.63" to 24.80")	60 to 1160(2.36" to 45.67")
Distance from table center to spindle nose		mm	50 to 1050(1.97" to 41.34")	−500 to 1050(−19.69" to 41.34")
table (pallet) work surface area		mm	□600(□23.62")	□800(□31.50")
Max. workpiece weight loadable on table (Pallet)		kg	650(1433lbs) (Uniformly distributed load)	2000(4409lbs) (Uniformly distributed load)
Pallet top surface configuration			24×M16 tap	
Minimum index angle of table (pallet)		deg	0.001	
Minimum index angle of A axis		deg	0.001	
Table (Pallet) index time for 90 degrees		sec	0.55	1.2
A axis index time for 90 degrees		sec	1.0	2
Spindle speed		min⁻¹	35 to 12000	
Number of spindle speed change steps			Electrical two-speed control (MS)	
Spindle nose (Nominal number)			7/24 taper, No. 50	
Spindle bearing bore diameter		mm	φ100(φ3.94")	
Rapid traverse rate	XYZ:	mm/min	XZ:75000(2953ipm) Y:54000(2126ipm)	48000 (1890ipm)
	AB:	min⁻¹	A:30 B:50	A:8.3 B:16.7
Cutting feed rate	XYZ:	mm/min	1 to 40000 (0.04 to 1575ipm)*1	1 to 20000 (0.04 to 787ipm)*1
	AB:	min⁻¹	A:0.1～5 B:0.1～5	A:0.1～8.3 B:0.1～5.6
Type of tool shank (Nominal number)			JIS B 6339 BT50	
Type of pull stud (Nominal number)			Nidec OKK only 90°	
Tool storage capacity		tools	60*2	
Maximum tool diameter (Adjacent tools available)		mm	φ115(4.53")	
Maximum tool diameter (no adjacent tools)		mm	φ300(11.81")	φ270(10.63")
Maximum tool length (from the gauge line)		mm	600(23.62")	400(15.75")
Maximum tool weight		kg	Normal speed: 10(22lbs)/midium speed:20(44lbs)/ Slow speed:30(66lbs)	Normal turning: 15(33lbs)/ Slow turning:25(55lbs)
Maximum tool moment		N·m	29.4(21.7ft.lbs)	
Tool selection method			Address fixed random method	
Tool exchange time (cut-to-cut)		sec	4.2	5.7
Pallet change method			Direct-turn method	
Pallet exchange time (New JIS evaluation time)		sec	18.0	22.0
Spindle motor		kW	45(60HP)(25%ED)/30(40HP)(30 min rating)/26(35HP)(continuous rating)	
Motor for spindle oil-air lubricationpump		kW	0.017 (0.023HP)	
Motor for tool clamp/unclamp unit		kW	1.5(2HP)	0.75(1HP)
For APC fork swivel		kW	0.75(1HP)	—
For APC ascent/descent		kW	5.5 (7.38HP)	—
Feed motor	XYZ:	kW	XY:5.5(7.4HP) Z:5.5(7.4HP)×2	X:5.0(6.7HP)×2 Y:14.0(18.8HP)×2 Z:6.0(8HP)
	AB:	kW	A:5.5(7.4HP) B:4.5(6.0HP)	A:7.0(9.4HP) B:4.5(6.0HP)
Hydraulic pump motor		kW	1.5(2.0HP)	
Motor of oil cooler for spindle and feed system (compression/discharge)		kW	1.1(1.5HP)/0.4(0.54HP)	1.1(1.5HP)/0.4×2(0.54HP)
Coolant pump motor		kW	60Hz. 1.1 50Hz. 0.75	60Hz. 1.2 50Hz. 0.7
Power supply AC200V±10% 50/60±1Hz AC220V±10% 60±1Hz *4 *3		kVA	62	82
Compressed air supply		Mpa,ℓ/min[ANR]	0.4 to 0.6(58 to 87psi)*4, 500(132gpm)*5	
Hydraulic unit tank capacity		ℓ	20(5gal)	
Spindle oil-air lubrication oil		ℓ	2.0(0.53gal)	
Spindle and feed system cooling oil tank capacity		ℓ	20(5.3gal)	20(5.3gal)×2
Magazine lubricating oil tank capacity		ℓ	4.2(1.1gal)	
Coolant tank capacity		ℓ	530(140gal)	800(211.3gal)
Machine height		mm	4115(162")	4290 (168.90")
Required floor space		mm	4995(196.65")×6065(238.78") (Opt. Lift-up chip conveyor specifications)	5433(213.9")×7755(305.3) (Opt. Lift-up chip conveyor specifications)
Machine weight		kg	21000(46297lbs)	30000(66138lbs)
Operating environment temperature		℃	5 to 40	

*1: Available under the HQ or hyper HQ control.
*2: The number of stored tools refers a total number of tools including the one installed on the spindle i.e. subtract one from the above for actual number of tools stored in the tool magazine.
*3: When the supply voltage is 220VAC, the supply frequency of 60Hz only is applicable.
*4: Purity of compressed air should be class 3.5.4 or higher class of ISO 8573-1/JIS B8392-1 standard.
*5: Specified is the compressed air supply flow rate for standard specification machines. When optional specifications such as an air blow nozzle are added, add the corresponding air supplyrequirement.
Note: Machining accuracy can be affected by the environment where the machine is installed. Please make sure to install the machine in an appropriate environment.

Standard and optional Accessories

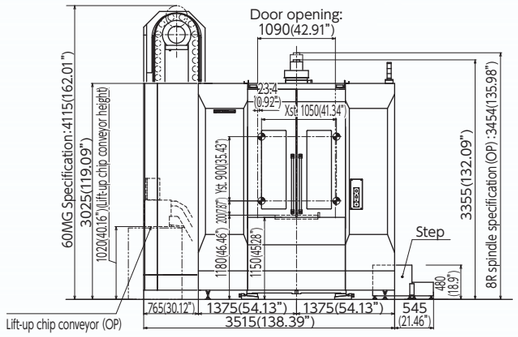
Standard: Option: Not available:

Item				HM-X6100	HM-X8000
Spindle taper and pull stud	Taper		BT50		
	Tow faces contact holder		HSK-A100		
			BT type		
	Pull stud		OKK90°		
			MAS I		
			MAS II		
	Spindle-noze swirl stopper block			For oil hole holder/ For angle attachments	
		Oil hole block piping		Normal pressure (equivalent to 1.1kw(1.48HP) pump)	
Maximum spindle speed	BT50	MS	8000min⁻¹	55/37/30kW(74/50/40HP)	
			12000min⁻¹	45/30/26kW(60/40/35HP)	
Table/ Axis	Table		BRT(Built-in rotary table)	Least Index 0.001°	
			Direct drive motor table specification		
Magazine	BT50 HSK-A100		40MG	40MG×1	
			60MG	60MG×1	*1
			80MG	44MG+40MG	*1
			116MG	60MG×2	*1
			120MG	44MG+40MG×2	*1
			160MG	44MG+40MG×3	*1
			176MG	60MG×3	*1
			236MG	60MG×4	*1
			161MG/233MG/311MG/389MG	Matrix magazine	
	Magazine Interruption function				
	Magazine operation panel				
	Tool breakage detection system				
	Tool holder remove by foot pedal				
For Automatic pallet hanger and pallet	APC		2APC		
			APC safety door automatic operation		
			Multiple APC	6-pallet APC	
				8-pallet APC	
	Pallet		Tapped type Pallet	24-M16 screw	
			T-Slot type Pallet		
			Additional Pallet		
For Coolant and Chip conveyor	Coolant tank		Standard Coolant tank		
			Lift up chip conveyor	Hinge/Scraper/Scraper with magnet/Drum	
	Chip ejection		Coil conveyor	Bed left and right	
			Chip flow coolant	Bed left and right	
	Coolant		Spindrecoolant nozle		
			Ceiling Shower		
			Coolant shower gun		
			Air blow		
			Oil mist air blow		
			Coolant through spindle	2MPa/7MPa	
			Air through spindle		
			Oil hole		
			Oil skimmer		
			Mist collector		
	Minimal Quantity lubrication system				
For accuracy	Dubble anchor pretension ball screw			With core cooling ball screw	
	Oil cooler for spindle and feed system				
	Linear scale feed back			XY-axis or XYZ-axis	
	Rotary encoder			AB-axis	
	Coolant cooler unit				
Other accessories	Signal tower lamp			3-lamp type with buzzer	
	Working light			LED light	
	Workpiece automatic measurement Tool length measurement and break detection Tool break detection		Touch sensor T0	Manual measurement	
			Touch sensor T1-A	Workpiece automatic measurement	
			Touch sensor T1-B	Workpiece automatic measurement/Tool length automatic measurement/Tool break detection	
			Touch sensor T1-C	Tool length automatic measurement/Tool break detection	
			Tool break detection in magazine	Contact type or laser type	
	Automatic grease lubrication unit			XYZ-axis/ball screw	
	Automatic oil lubrication unit for MG and ATC part				
	Foundation parts for machine anchoring			Bond anchoring method	
	Rotary window			At operation door	

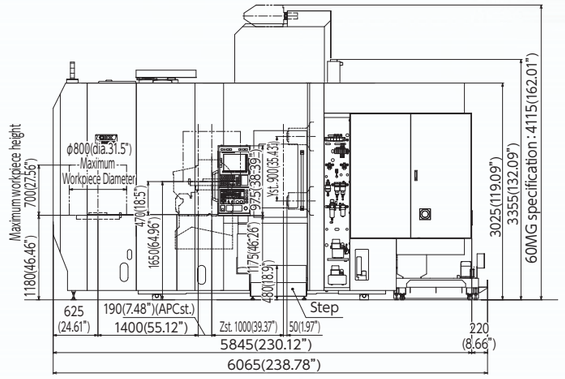
MG: Tool magazine unit *1: It is not available for the HSK-A100.

HM-X 6100 Machine Dimensions

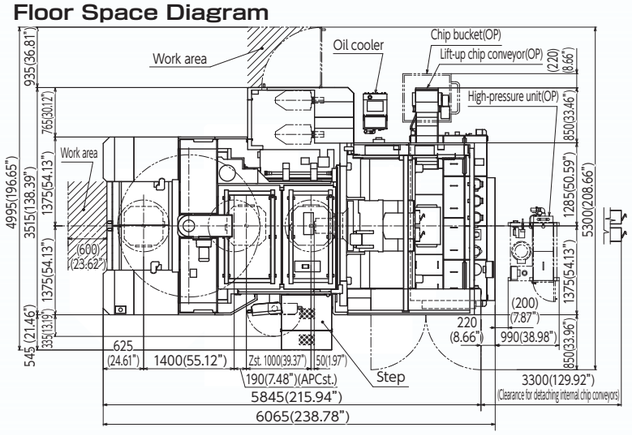
Front View



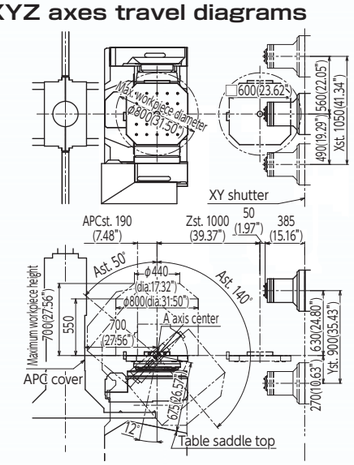
Side View



Floor Space Diagram



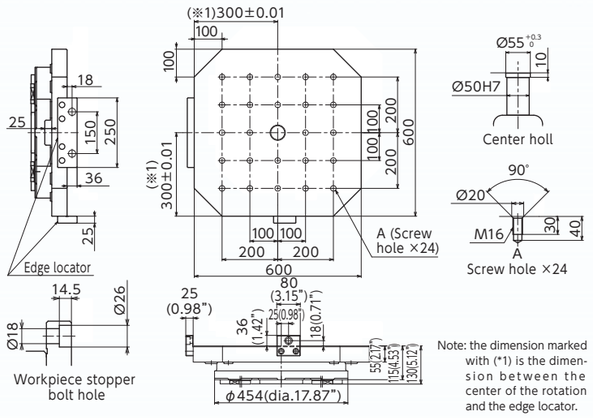
XYZ axes travel diagrams



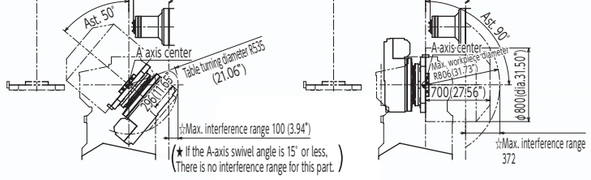
Nore 1: The A-axis cannot be swiveled to the maximum at the Z-axis stroke end or its vicinity.(☆)
Note 2: The head, XY-axis shutter and table are NC-controlled to prevent collision by the 3D collision check function.

Note 3: There is an interference range with the XY-axis shutter depending on the workpiece shape. (★)

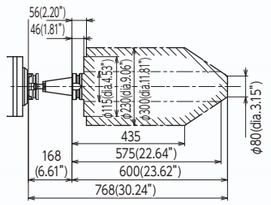
Pallet Dimensions



Note: the dimension marked with (*1) is the dimension between the center of the rotation and the edge locator.

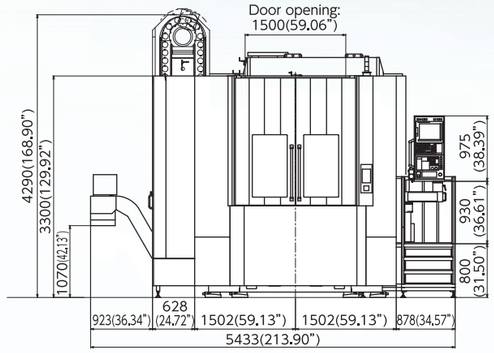


Restrictions on tool

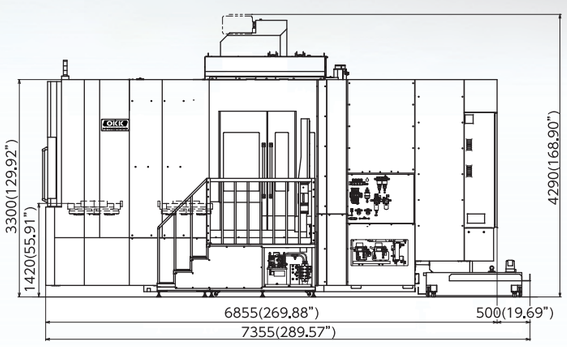


HM-X 8000 Machine Dimensions

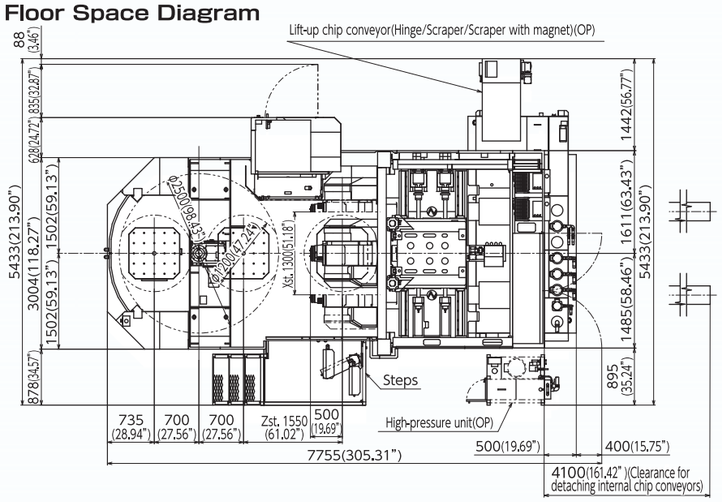
Front View



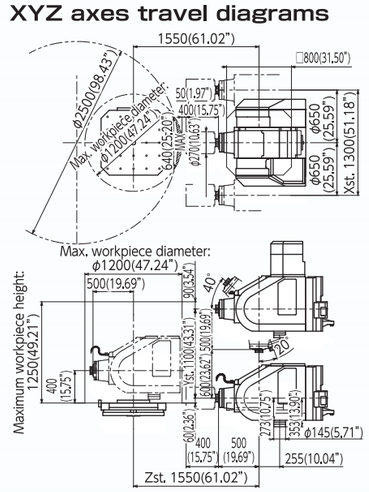
Side View



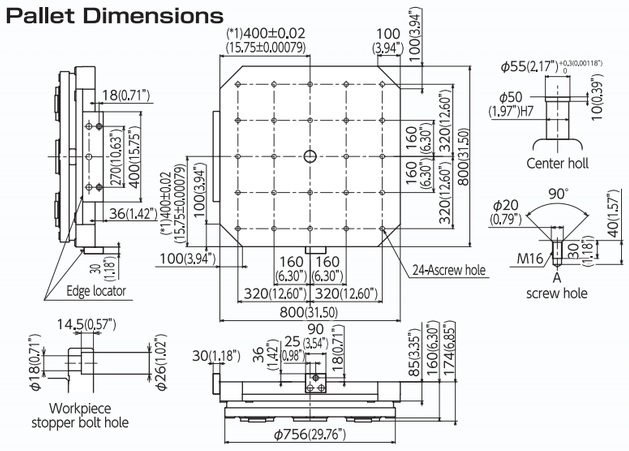
Floor Space Diagram



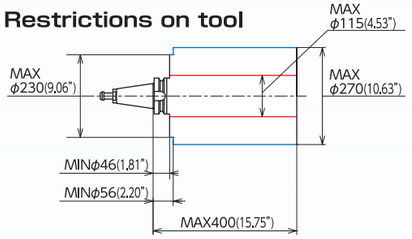
XYZ axes travel diagrams



Pallet Dimensions



Restrictions on tool



Note: The dimension marked with (*1) is the dimension between the center of rotation and the edge locator.

F31i-B5 Plus(WindowsCE Open CNC)

Standard Specification	HM-X6100	HM-X8000
No. of controlled axes: 5 axes (X, Y, Z, A, B)	○	○
No. of simultaneously controlled axes: 5 axes	○	○
Least input increment: 0.001mm / 0.0001°	○	○
Max. programmable dimension: ±999999.999mm / ±39370.0787"	○	○
Inch / Metric conversion :G20 / G21	○	○
Program format: FANUC standard format	○	○
Decimal point input / Pocket calculator type decimal point input	○	○
Absolute / Incremental programming: G90 / G91	○	○
Program code: ISO / EIA automatic discrimination	○	○
FS15 tape format	○	○
Nano interpolation (internal)	○	○
Positioning: G00	○	○
Linear interpolation: G01	○	○
Circular interpolation: G02 / G03 (CW/CCW)(Including radius designation)	○	○
Helical interpolation	○	○
Unidirectional positioning: G60	○	○
Cutting feed rate: 6.3-digit F-code, direct designation	○	○
Rapid traverse override: 0 / 1 / 10 / 25 / 50 / 100%	○	○
Cutting feed rate override: 0 to 200% (every 10%)	○	○
Feed rate override cancel: M49 / M48	○	○
Rigid tapping: G84, G74 (Mode designation: M29)	○	○
Manual handle feed: Least input increment ×1, ×10, ×100 / graduation	○	○
Dwell: G04	○	○
One-digit F code feed	○	○
inverse time feed	○	○
Part program storage capacity: total 10240m [4MB] (total 1000 programs)	○	○
Part program editing	○	○
Background editingPossible to program or edit the machining program while NC machining is executed.	○	○
Extended part program editing	○	○
15-inch color LCD / QWERTY key MDI	○	○
Clock function	○	○
MDI (manual data input) operation	○	○
Run hour and parts count display	○	○
Memory card / USB interface	○	○
Spindle function: Direct designation of spindle speed with 5-digit S-code	○	○
Spindle speed override: 50 to 150% (every 5%)	○	○
Tool function: Direct designation of called tool number with 4-digit T-code	○	○
ATC tool registration	○	○
Auxiliary function: Designation with 3-digit M-code	○	○
Multiple M-codes in 1 block: Maximum 3 codes in 1 block (Maximum 20 settings)	○	○
Tool length offset: G43, G44 / G49	○	○
Tool diameter and cutting edge R compensation: G41, G42 / G40	○	○
Tool offset sets: total 400 sets	○	○
Tool offset memory C	○	○
Tool position offset	○	○
Automatic reference position return: G28 / G29	○	○
2nd reference position return: G30	○	○
Machine coordinate system: G53	○	○
Coordinate system setting: G92	○	○
Automatic coordinate system setting	○	○
Workpiece coordinate system: G54 to G59 G54.1 P1~P48	○	○
Local coordinate system: G52	○	○
Polar coordinate command: G15, G16	○	○
Manual reference position return	○	○
Reference position return check: G27	○	○
Optional block skip: /	○	○
Single block	○	○
Dry run	○	○
Machine lock	○	○
Z-axis feed cancel	○	○
Auxiliary function lock	○	○
Graphic function	○	○
Program number search	○	○
Sequence number search	○	○
Program restart	○	○
Cycle start	○	○
Feed hold	○	○
Manual absolute (ON / OFF with PMC parameter)	○	○
Auto restart	○	○
Program stop: M00	○	○
Optional stop: M01	○	○
Sequence number collation and stop	○	○
Sub program control	○	○
Canned cycle: G73, G74, G76, G80 to G89	○	○
Mirror image function parameter	○	○
Custom macro	○	○
Programmable mirror image	○	○
Programmable data input: G10	○	○
Automatic corner override	○	○
Manual Guide i (Basic)	○	○
Exact stop check / mode	○	○
Scaling: G50, G51	○	○
Additional custom macro common variables: 1000	○	○
Coordinate system rotation: G68, G69	○	○
Optional chamfering / corner R	○	○
Playback	○	○
Memory pitch error compensation (interpolation type)	○	○

Standard Specification	HM-X6100	HM-X8000
Backlash compensation for each rapid traverse and cutting feed	○	○
Smooth backlash	○	○
Skip function	○	○
Tool life management: total 256 sets	○	○
Tool length manual measurement	○	○
Emergency stop	○	○
Data protection key	○	○
NC alarm display / alarm history display	○	○
Machine alarm display	○	○
Stored stroke check 1	○	○
Stored stroke check 2	○	○
Load monitor	○	○
Self-diagnosis	○	○
Absolute position detection	○	○
Return from 3rd, 4th reference position	○	–
Tool center point control	○	○
Data server: ATA card (1GB)	○	○
Manual feed for 5 axis machining	–	○
Tool direction Tool length offset	–	○
Straightness compensation	–	○

Optional Specification		
Least input increment: 0.0001mm / 0.00001°		
Spiral / Conical interpolation		
Cylindrical interpolation		
Hypothetical axis interpolation		
Involute interpolation		
NURBS interpolation		
Smooth interpolation (Hyper HQ control B mode is required)		
Handle feed 3 axes: Standard pulse handle is removed		
Part program storage capacity:total 20480m [8MB] (1000 in total)		
Machining time stamp		
Data server: ATA card (4GB)		
RS232C interface: RS232C-1CH		
Spindle contour control (Cs contour control)		
Tool position offset		
Tool offset sets: total 499 sets		
Tool offset sets: total 999 sets		
Addition of workpiece coordinate system (total 300 sets): G54.1 P1 to P300		
Optional block skip: Total 9		
Manual handle interruption		
Tool retract and return		
Figure copy		
Interruption type custom macro		
Instruction of inclined plane indexing		STD
Chopping		
Manual Guide i (Milling cycle)		
Addition of tool life management sets: total 1024 sets		
High-speed skip		
3D Coordinate transformation		

Original Nidec OKK Software		
Integrated machining support software (incl. help guidance, etc.)	STD	STD
Tool support	STD	STD
Program Editor	STD	STD
EasyPRO	STD	STD
A5-system (A) Measurement of turning center	Opt	Opt
Work Manager	Opt	Opt
HQ control	STD	STD
Hyper HQ control mode B	STD	STD
Multi-Facer Ⅱ (5-Axis processing soft ware)	STD	STD
Special canned cycle (including circular cutting)	Opt	Opt
Cycle Mate F	Opt	Opt
Soft Scale Ⅱ m	STD	STD
Touch sensor T0 software	Opt	–
Soft CCM (Tool failure detection system)	Opt	Opt
Soft AC (Adaptive control unit)	Opt	Opt
Automatic restart at tool damage	Opt	Opt

STD: Standard Opt: Option

Functions for Operability and Environmental Measures

ECO Measures

ECO Sleep Function

In order to reduce wasted power, air, etc., the power saving mode is activated when the machine has been in the standby state for a specified period of time. During the power saving mode, servos, chip convers, etc. are turned off. The mode is cancelled automatically when the setup operation is finished (door is closed).

LED Lamp HM-X6100 Std. HM-X8000 Std.

LED lamps are used for reduction in heat generated by the lighting system and for saving power.

Inverter Oil Cooler HM-X8000 Std.

Inverter oil cooler provides limited temperature variation and realizes energy consumption.

Improved Operability

15-inch Operation Panel

- 15-inch color liquid crystal display improves visibility of the information displayed on the screen as well as operability.
- Not only operability but simplicity has been taken into account for the operation panel. The operation panel has a QWERTY keyboard similar to the PCs'keyboards.
- The OKK's original screens for the setup operations and operational support are contained.

F31i-B

lift-up type chip conveyors Opt.

Compatibility of lift-up type chip conveyors with chip types

◎: Most suitable ○: Usable △: Conditionally usable ×: Not usable –: Not applicable

Type of chip conveyor			Hinged		Scraper		Magnet scraper		Scraper with drum filter		Magnet scraper with drum filter	
Use of coolant oil			Used	Not used	Used	Not used	Used	Not used	Used	Not used	Used	Not used
Type of chips: Magnetizable chips	Steel	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	–	◎	–
Type of chips: 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. Therefore, inside the conveyor needs to be cleaned frequently.
*2: Scraper can easily catch long chips. Therefore, shortening the chips (for example by using the step feed) or removing the chips is required if left un maintained the drum filter may get damaged.
*3: When flow rate of the coolant is large, filters can be clogged with chips out of the conveyor case. Therefore, combined use of a magnet plate and frequent cleaning of filters is recommended.

This photo shows the hinged pan type chip conveyor (fixed type and tilting type chip buckets are available optionally).