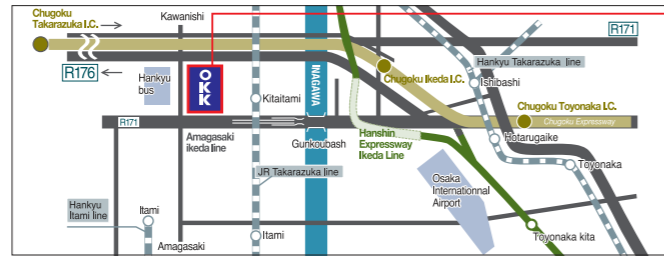


8-10, KITA-ITAMI, ITAMI
HYOGO 664-0831 JAPAN
Overseas Sales Department
TEL:(81)72-771-1112/1143
FAX:(81)72-772-7592
http://www.okk.co.jp
E-mail:ovsd@okk.co.jp

Access map



OKK Inagawa factory
8-10 Kitaitami, Itami, Hyogo Prefecture
664-0831, Japan

From Kansai International Airport :
Please take a airport bus bound for
Osaka (Itami) International Airport
and take a taxi to OKK.



Technical Center



S-Plant



W-Plant

Technical center is for test cutting, demonstration and training.
S-plant is for machining and assembly of spindles and tables.
W-plant is for final assembly of large sized machining centers.
All are located at Inagawa, Itami city, Hyogo, Japan

INAGAWA PLANT:
8-10, KITA-ITAMI, ITAMI, HYOGO 664-0831 JAPAN
TEL:(81)72-782-5121
FAX:(81)72-772-5156
E-mail:eigibu@okk.co.jp

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

Other Products Include:

- Textile Machinery
- Water Maters

NOTE :

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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.

OKK USA CORPORATION
100 REGENCY DRIVE, GLENDALE HEIGHTS, IL 60139 USA
TEL:(1)630-924-9000
FAX:(1)630-924-9010
http://www.okkcorp.com
E-mail:okkusa@okkcorp.com

OKK USA WESTERN REGIONAL OFFICE(LA)
17971 SKY PARK CIRCLE, SUITE D, IRVINE CA 92614 USA
TEL:(1)949-851-6800
FAX:(1)949-851-6888

OKK CANADA OFFICE(CANADA)
79 REGAL ROAD, UNITS 17 & 18, GUELPH, ONTARIO N1K 1B6 CANADA
TEL:(1)630-924-9000
FAX:(1)630-924-9010

OKK EUROPE GmbH
HANSEMANNSTR. 33 41468 NEUSS GERMANY
TEL:(49)2131-29868-0
FAX:(49)2131-29868-41
http://www.okkeurope.com
E-mail:info@okkeurope.com

THAI OKK MACHINERY CO., LTD.
KUMTHORN HOLDING BUILDING 2ND FLOOR 897-897/1 RAMA III ROAD BANGPONGPANG, YANNAWA, BANGKOK 10120 THAILAND
TEL:(66)2-683-2160-2
FAX:(66)2-683-2163

PT. OKK INDONESIA
WISMA NUSANTARA BUILDING 12 FLOOR,
JL.M.H.THAMRIN No.59, JAKARTA. 10350 INDONESIA
TEL:(62)21-390-2563
FAX:(62)21-390-2565

OKK(SHANGHAI) CO., LTD.
ROOM 2506, 2201 YAN AN ROAD(W.) CHANGNING DISTRICT SHANGHAI. 200336 CHINA
TEL:(86)21-62700930
FAX:(86)21-62700931
http://www.okk.com.cn
E-mail:shanghai@okk.com.cn

OKK CORPORATION SEOUL BRANCH
1203, E & C DREAM TOWER 8, 327-27, GASAN-DONG, GEUMCHEON-GU, SEOUL, 153-023 KOREA
TEL:(82)2-855-0416
FAX:(82)2-855-0426

Horizontal Machining Center

HM SERIES

- | | |
|---------|----------|
| HM 400 | HM 500S |
| HM 5000 | HM 6300S |
| HM 630 | HM 800S |
| HM 800 | HM 1000S |
| HM 1000 | HM 1250S |



HM Series Horizontal Machining Centers

HM-series horizontal machining centers are built with OKK's exceptional designs and provided with superior performance ensuring high-speed machining, rigidity, reliability, and chip evacuation. Heavy cutting capability is just one of HM-series specialties achieved by incorporating a highly developed rigid box-shaped frame. Add to that the implementation of only the best in high-speed motors, and extremely reliable ATC's (auto tool changer) and APC's (auto pallet changer) that deliver minimal chip to chip time, truly merging max performance with production proven reliability.



**HM400
HM500S**

Main specifications

HM400/40, HM400/50
Travel X x Y x Z mm (in) =630 (24.80)x620 (24.41)x710 (27.95)
Rapid traverse rate m/min (ipm)=54 (2,126)
Pallet size square mm (in) =400 (15.75)

HM500S/40, HM500S/50
Travel X x Y x Z mm (in) =630 (24.80)x620 (24.41)x710 (27.95)
Rapid traverse rate m/min (ipm)=54 (2,126)
Pallet size square mm (in) =500 (19.69)
*40:BT40 type, /50:BT40 type



**HM5000
HM6300S**

Main specifications

HM5000
Travel X x Y x Z mm (in) =800 (31.50)x750 (29.53)x880 (34.65)
Rapid traverse rate m/min (ipm) = [Std] 60 (2362)
= [Opt] XZ: 75 (2953), Y: 60 (2362)

Pallet size square mm (in) =500 (19.69)

HM6300S
Travel X x Y x Z mm (in) =800 (31.50)x750 (29.53)x880 (34.65)
Rapid traverse rate m/min (ipm) = [Std] 60 (2362)
= [Opt] XZ: 75 (2953), Y: 60 (2362)

Pallet size square mm (in) =630 (24.8)



**HM630
HM800S**

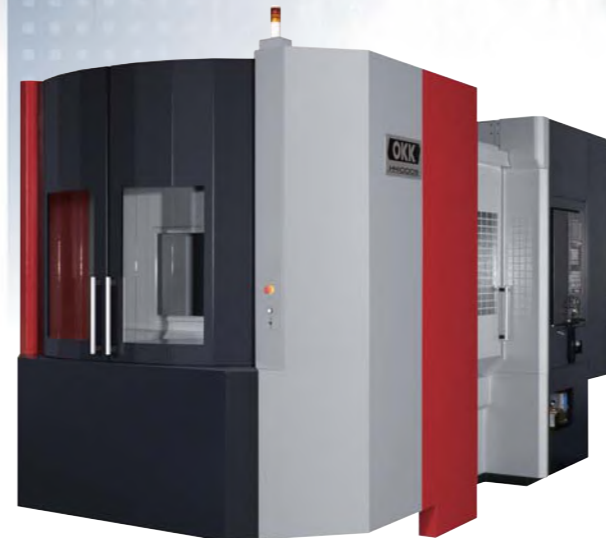
Main specifications

HM630
Travel X x Y x Z mm (in)=1050 (41.34)x900 (35.43)x900 (35.43)
Rapid traverse rate m/min (ipm) = [Std] 54 (2126)
= [Opt] 75 (2953)

Pallet size square mm (in) = 630 (24.8)

HM800S
Travel X x Y x Z mm (in)=1050 (41.34)x900 (35.43)x880 (34.65)
Rapid traverse rate m/min (ipm) = [Std] 54 (2126)
= [Opt] 75 (2953)

Pallet size square mm (in)= 800 (31.5)



**HM800
HM1000S**

Main specifications

HM800
Travel X x Y x Z mm (in) =1400(55.12)x1100(43.31)x1050(41.34)
Rapid traverse rate m/min (ipm) = 48(1889)
Pallet size square mm (in) =800(31.5)

HM1000S
Travel X x Y x Z mm (in) =1400(55.12)x1100(43.31)x1000(39.37)
Rapid traverse rate m/min (ipm) = 48(1889)
Pallet size square mm (in) =1000(39.37)



**HM1000
HM1250S**

Main specifications

HM1000
Travel X x Y x Z mm (in) =1700(66.93)x1400(55.12)x1400(55.12)
Rapid traverse rate m/min (ipm) = 48(1889)
Pallet size square mm (in) =1000(39.37)

HM1250S
Travel X x Y x Z mm (in) =1700(66.93)x1400(55.12)x1240(48.82)
Rapid traverse rate m/min (ipm) = 48(1889)
Pallet size square mm (in) =1250(49.21)

[Std] Standard equipment or function
[Opt] Optional equipment or function

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HM400/HM500S

With more rigid construction than conventional models, responding to the needs to machining a wide range of products from iron and cast iron to mold and die parts.

Not only the rigidity but also spindle speed, rapid traverse, reliability and machining performance have been upgraded.

HM400/40 and HM500S/40 models come equipped with a 10000min⁻¹ spindle, with an output of 37/26/22kW (50/35/30HP) available in BT40 spindle taper, as well as the option for a 15000min⁻¹ or 20000min⁻¹ spindle. HM400/50 and HM500S/50 models have a standard spindle reaching 12000 min⁻¹, with an output of 30/25kW (40/34HP) available in BT50 spindle taper, with an optional 8000min⁻¹. Allows customers the best option for the job.

The unique clamp construction provides excellent sealing performance by clamping while increasing the internal pressure of the table, thus preventing the infiltration of coolant enhancing the durability of the machines.



High rigid linear roller guides are used for all axes of X, Y and Z.

The ball screws are core-cooled ball screws and pre tensioned by double-anchor method. Cooling oil is forced to all ball screws, ball screw support housings and motor mounting surfaces.

The fine-feed movement and the lost motion property have been improved. The circular cutting accuracy is also improved significantly.

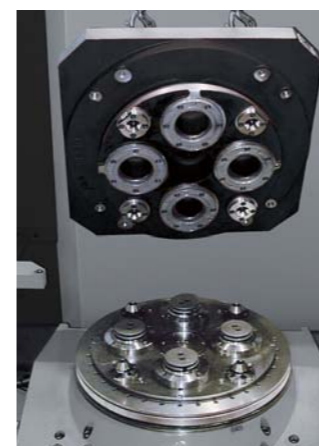
HM5000/HM6300S HM630/HM800S HM800/HM1000S

Double the speed, rigidity, reliability, durability, etc. compared with the conventional machines enable high-speed and high-accuracy machining of wide-ranging materials including hard-to-cut materials such as ferrous and casting materials.

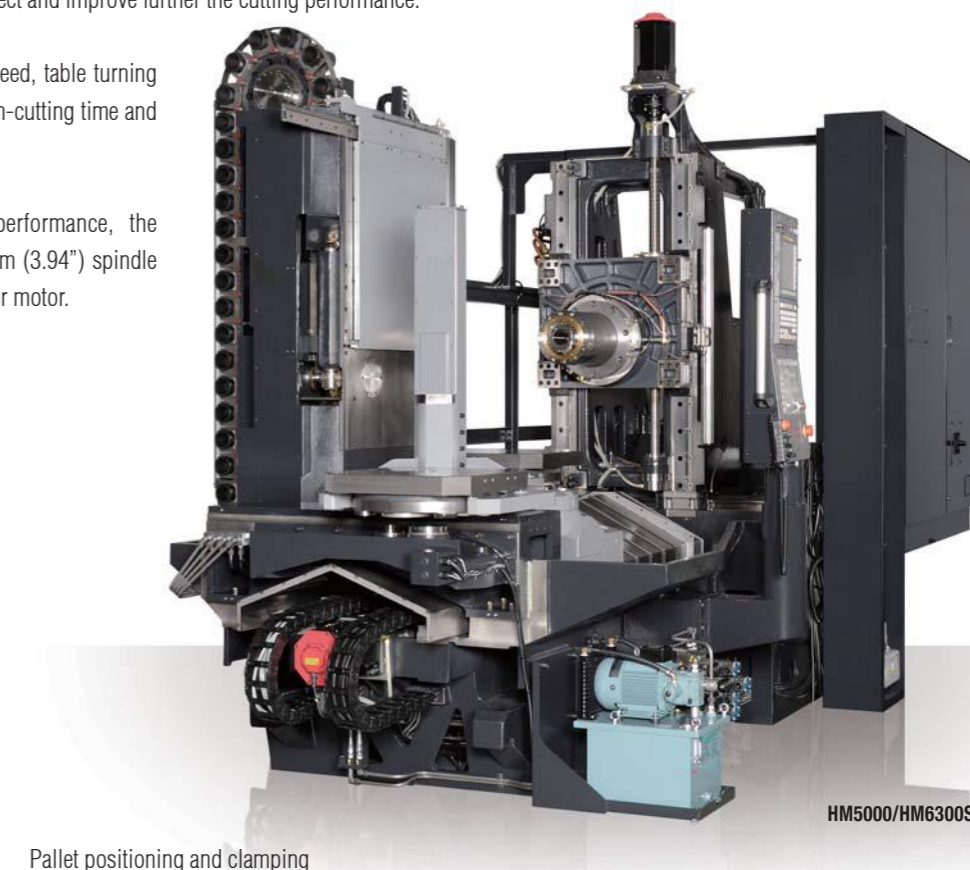
In addition to the high rigidity of the machine main unit, highly-rigid linear roller guides on the X, Y and Z axes generate a synergetic effect and improve further the cutting performance.

Increase in the rapid-traverse rates, ATC speed, table turning speed and APC speed has shortened the non-cutting time and improved production efficiency.

For the improved heavy-duty cutting performance, the machine has a BT50 large-diameter ø100mm (3.94") spindle and a 45/30/26kW (60/40/35HP) high-power motor.



Built - in - Rotary Table (BRT) use a new mechanism of precision reduction-gear roller drive. This drive system achieved high speed table indexing and toughness against overload or impact. ^{*1}



HM5000/HM6300S

Pallet positioning and clamping
Use of taper cones ensures high accurate repeatability of pallet positioning and flatness of the pallet is secured by means of OKK's original design multiple-clamp method. ^{*2}

Master pallet is available as option. ^{*3}

Characteristics

- * The machining time is significantly improved by increasing all of speeds.
- * The ball screws are core-cooled ball screws and double anchored.
- * Option of a BT40 is with 10000 min⁻¹ or BT50 with 12000 min⁻¹ is available to meet your machining needs.
- * One piece shutters are used for X and Z axes and avoids chips and coolant going to inside.

(only Z-axis shutter is one piece type for HM400/50 and HM500S/50.)

Characteristics

- * Linear roller guides are capable the six times more moment load than a conventional model.
- * BRT use the high speed and high rigid reduction-gear roller drive that is more than double the rigidity and clamping torque compared to a conventional model. ^{*1}

Specifications	Spindle speed (min ⁻¹)	Type of tool shank	Spindle bearing inner diameter (mm)	Rapid traverse rate (m/min)
HM5000/HM6300S	12000	BT50	ø100 (3.94")	60 (2362 ipm) [Opt. 75 (2953 ipm)] ^{*4}
HM630/HM800S				54 (2126 ipm) [Opt. 75 (2953 ipm)] ^{*5}
HM800/HM1000S	8000			48 (1889 ipm)

^{*1}: HM800/HM1000S and HM1000/HM1250S use worm shaft and worm wheel. ^{*2}: HM400/HM500S is using center-clamping method. ^{*3}: Master pallet is available only for HM5000/HM6300S. ^{*4}: Additional option available rapid traverse rate to 75m/min(2953ipm) for X-axis and Z-axis. ^{*5}: An air tank is necessary to attach a balance cylinder to Y axis. The air tank needs local procurement at machine export.

HM1000/HM1250S

All HM models are highly effective in machining cast-metal and iron-based work pieces, including construction machinery parts, such as cylinder blocks with massive valves requiring maximum rigidity for custom tooling and large molds.

Adopting twin-ball-screw drives and synchronously control for the Y and Z axes, suppresses vibrations and improves machining quality.

Furthermore for severe heavy-duty cutting, a larger spindle bearing diameter of 120 mm (4.72") with maximum spindle speed of 8000 min⁻¹, high-power spindle motor of 37/30 kW (50/40HP) and high-torque motorized spindle of 1009 N·m (744 ft·lbs) is available as option on HM1000/HM1250S.



Characteristics

* HM1000 and HM1250S models standard spindle delivers 12000min⁻¹, with a bearing diameter of 100mm (3.94") and 30/25kW (40/34HP), 420N·m (310 ft·lbs) of torque.

*Twin-ball-screws for both Y-and Z-axes, aiding in vibration dampening yielding extended tool life. The design focus is reduction of machining time, while increasing precision, surface finish, and contouring accuracy. HM-series are proven in high production machining environments and are ready to cut aluminum to cast metals.



Z axis twin-ball-screw

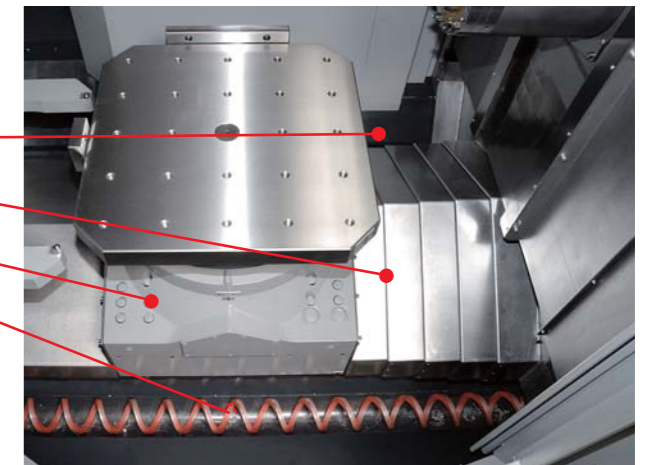
The Z-axis shutters and B-axis are angled sharply, allowing for excellent chip evacuation. Furthermore, OKK added a solid Y-axis shutter to eliminate any problems previously caused from chips clogging on un-maintained slide rails.

Thorough chip processing measures



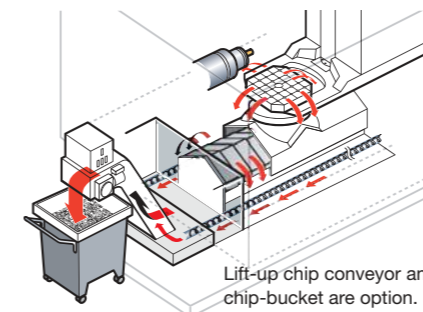
HM400/M500S

- Coil conveyor *2
- Z-axis shutter
- Table body
- Coil conveyor *2



HM5000/HM6300S

Chips are flushed so that they fall into the troughs on both sides of the table. Then, the chips are flushed out with coolant supplied through the nozzles provided in the front-end section of each trough. The coolant and chips are collected in the chip tank in the rear part of the machine (Chip flow coolant *1). In place of the standard method that flushes out chips with coolant, you may use optional coil-type chip conveyor *2 to clear the troughs and to discharge chips through the outlet in the rear part of the machine.



Lift-up chip conveyor and chip-bucket are option.



The troughs are extended and chips at the setup station can be collected.



Chip flow coolant *1

Chips are discharged from the troughs to outside of machine by big volume of coolant.

*1: Standard for HM400/500S, HM5000/HM6300S, HM800/HM1000S.
*2: Standard for HM630/HM800S, HM1000/HM1250S.

Ceiling shower [Opt]

Coolant through nozzles on the ceiling i.e. ceiling shower can be provided optionally for prevention of chips from accumulating on fixtures and workpieces.

26 nozzles for HM400/HM500S 50 nozzles for HM800/HM1000S
29 nozzles for HM5000/HM6300S 91 nozzles for HM1000/HM1250S
30 nozzles for HM630/HM800S



HM400/HM500S

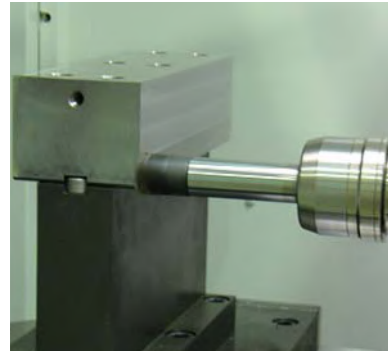


HM630/HM800S



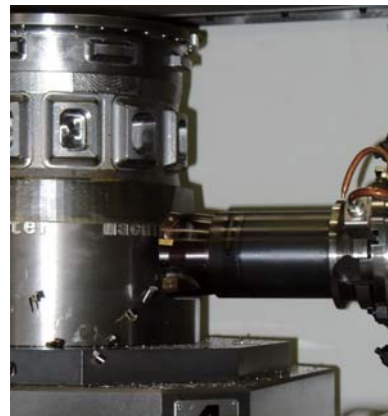
HM1000/HM1250S

High Speed and Heavy-duty Cutting



HM400/HM500Ss' standard spindle specification is motorized spindle, maximum speed 10,000min⁻¹ with grease lubrication, BT40 and 37/26/22kW (50/35/30HP). Optional spindles 15,000min⁻¹ and 20,000min⁻¹ are oil-air lubrication.

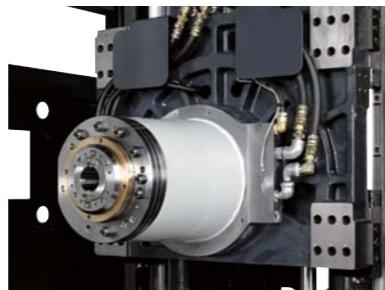
Cutting data	
Machine model	HM400/40
Material	S50C
Tool	ø32 mm (1.26") Long end milling
Length of the tool from tool holder nose	130 mm (5.12")
Spindle speed	1300 min ⁻¹
Feed rate	6500 mm/min (256 ipm)
Depth of cut	0.5 mm (0.02")
Width of cut	20 mm (0.79")



The BT50 spindle rotating at 12000 min⁻¹ secures the 45/30/26kW (60/40/35HP) output. For the bearing lubrication, the machine uses the oil-air lubrication. The spindle specification can be selected according to the details of machining.

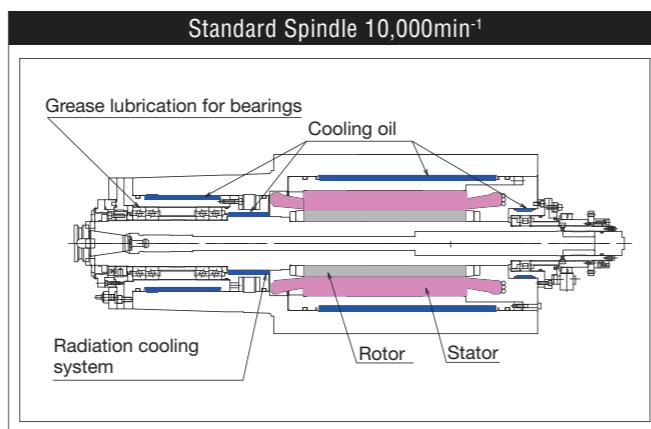
Cutting data	
Machine model	HM630
Material	S50C
Tool	ø80 mm (3.15") High feed end mill
Spindle speed	600 min ⁻¹
Feed rate	4000 mm/min (157.48 ipm)
Depth of cut	1 mm (0.04")
Width of cut	80 mm (3.15")

Spindle Cooling

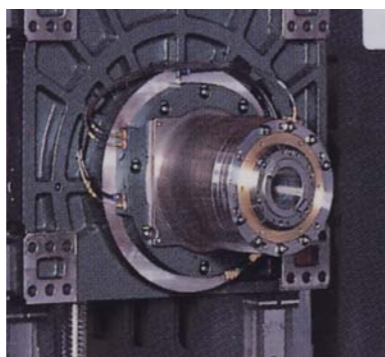


Circulating the temperature-controlled oil around the spindle housing minimize the spindle temperature fluctuation.

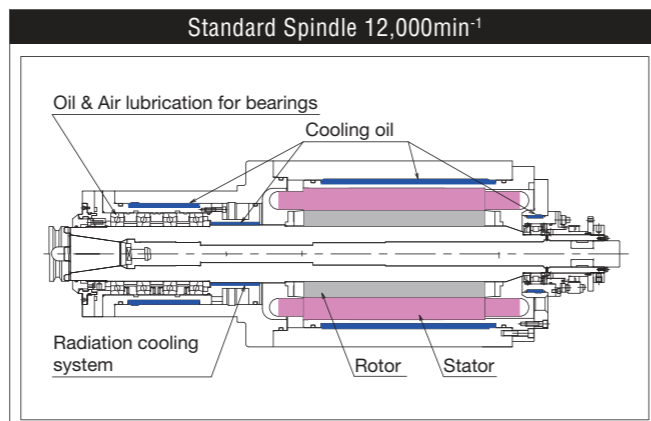
MS: Motorized spindle



Spindle Cooling

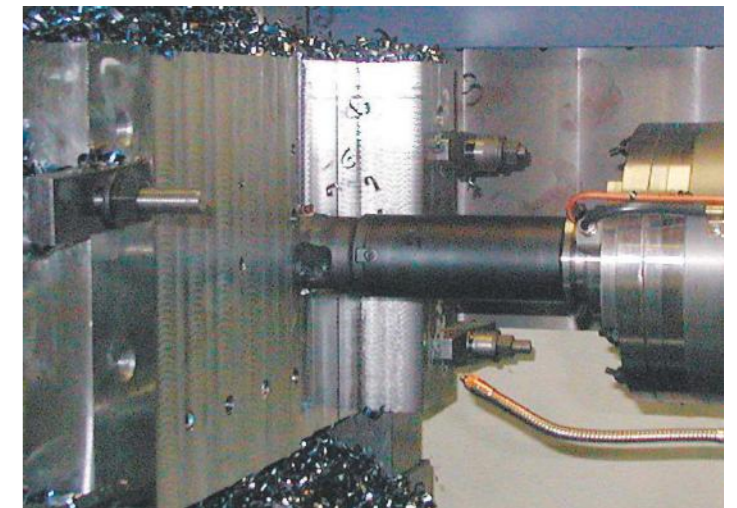


The spindle bearings are oil-air lubricated. Circulating temperature controlled oil is in the groove around the spindle housing suppressing the growth of the spindle. Furthermore, OKK's unique radiant cooling system prevents the conduction of heat generated from the motor into the spindle.



The standard spindle used for **HM800/HM1000S** is the BT50 spindle having the output of 30/25 kW (40/34 HP) and rotating at 8000 min⁻¹. The maximum torque of 420 N·m (310 ft·lbs) can provide high power in the low-speed range. Both the heavy-duty cutting and the high-speed machining are available owing to the highly-rigid spindle with ø100mm (3.94") spindle bearing inner diameter and the oil-air lubrication system.

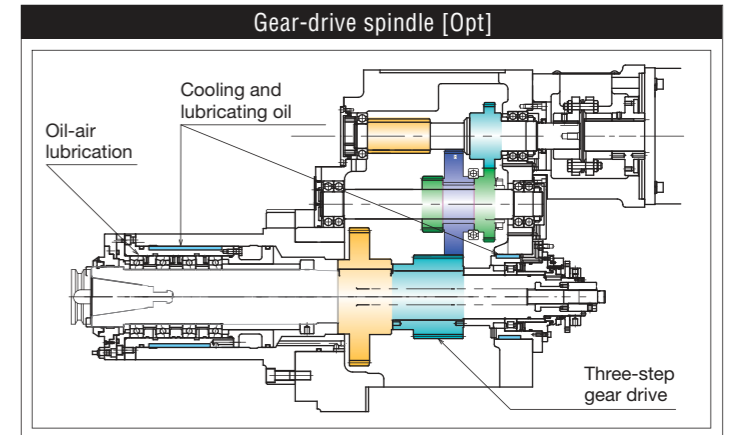
Cutting data	
Machine model	HM1000S
Material	Mold steel (SKD61)
Tool	ø80mm (3.15") End milling
Length of the tool from tool holder nose	200mm (7.87")
Spindle speed	1600mm ⁻¹
Feed rate	1920mm/min (75.6in/min)
Depth of cut	4.0mm (0.16")
Width of cut	60.0mm (2.36")



HM630 / HM800S and HM800 / HM1000S Gear-drive spindle [Opt]

Max. torque: 1251N·m (923ft·lbs)

As an option to deliver more torque for machining of hard-to-cut materials, an 8000min⁻¹ high torque gear-drive spindle produces 1251 N·m (923 ft·lbs). Available on HM630/HM800S and HM800/HM1000S.



Power of tool clamp

MS spindle			
Machine model	Spindle speed 10000min ⁻¹	Spindle speed 15000min ⁻¹	Spindle speed 20000min ⁻¹
HM400/40, HM500S/40	10000N (2200lbf)	10000N (2200lbf) [Opt]	10000N (2200lbf) [Opt]

MS spindle		
Machine model	Spindle speed 12000min ⁻¹	Spindle speed 8000min ⁻¹
HM400/50, HM500S/50	16300N (3700lbf)	16300N (3700lbf) [Opt]
HM5000/HM6300S	16300N (3700lbf)	—
HM630/HM800S	16300N (3700lbf)	16300N (3700lbf) [Opt]
HM800/HM1000S	16300N (3700lbf) [Opt]	17700N (4000lbf)
HM1000/HM1250S	16300N (3700lbf)	20600N (4600lbf) [Opt]

Gear spindle	
Machine model	Spindle speed 8000min ⁻¹
HM630/HM800S	19600N (4400lbf) [Opt]
HM800/HM1000S	19600N (4400lbf) [Opt]

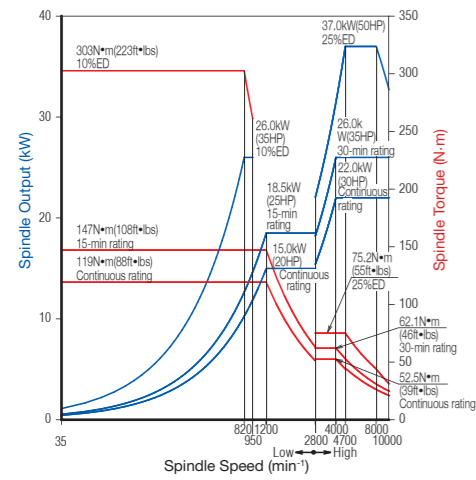


SPINDLE POWER AND TORQUE DIAGRAM

HM Series

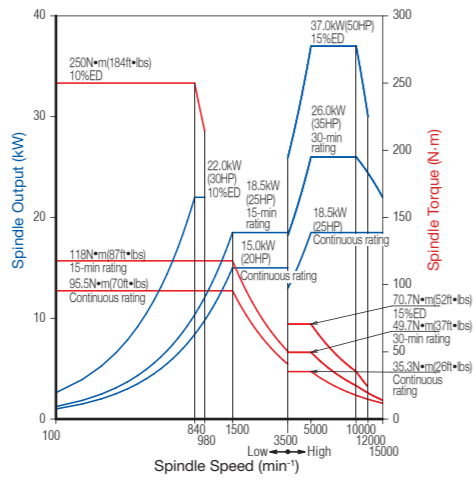
FANUC #40

10000min⁻¹ [37/26/22kW(50/35/30HP) MS]



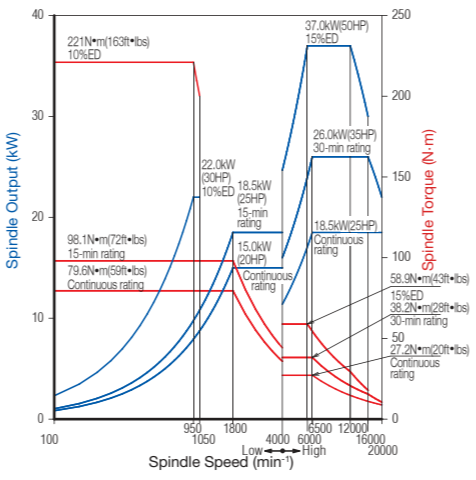
10000min ⁻¹	
Spindle motor	37/26/22kW(50/35/30HP) MS
HM400/40, HM500S/40	Standard

15000min⁻¹ [37/26/18.5kW(50/35/25HP) MS]



15000min ⁻¹	
Spindle motor	37/26/18.5kW(50/35/25HP) MS
HM400/40, HM500S/40	Option

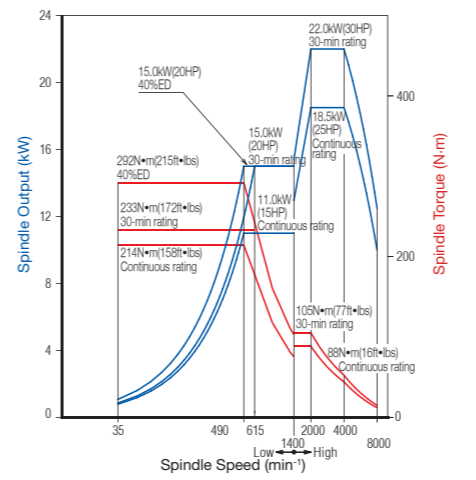
20000min⁻¹ [37/26/18.5kW(50/35/25HP) MS]



20000min ⁻¹	
Spindle motor	37/26/18.5kW(50/35/25HP) MS
HM400/40, HM 500S/40	Option

FANUC #50

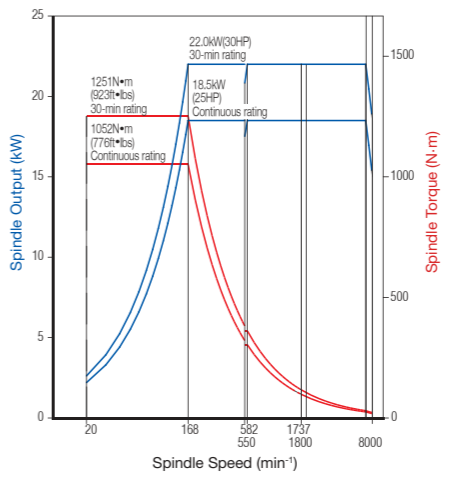
8000min⁻¹ [22 / 18.5kW(30/25HP) MS]



8000min ⁻¹	
Spindle motor	22/18.5kW(30/25HP) MS
HM400/50, HM500S/50	Option
HM5000/HM6300S	—
HM630/HM800S	—
HM800/HM1000S	—
HM1000/HM1250S	—

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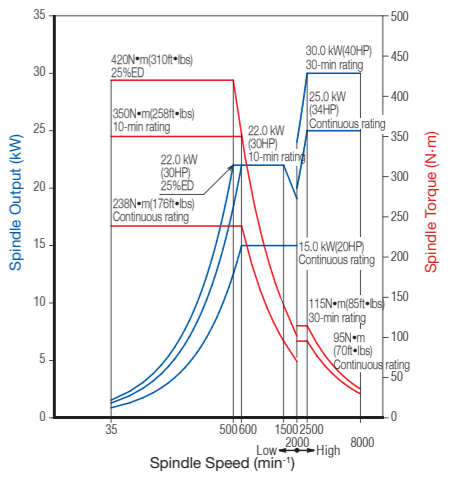
8000min⁻¹ [22 / 18.5kW(30/25HP) Gear]



8000min ⁻¹	
Spindle motor	22/18.5kW(30/25HP) Gear
HM400/50, HM500S/50	—
HM5000/HM6300S	—
HM630/HM800S	Option
HM800/HM1000S	Option
HM1000/HM1250S	—

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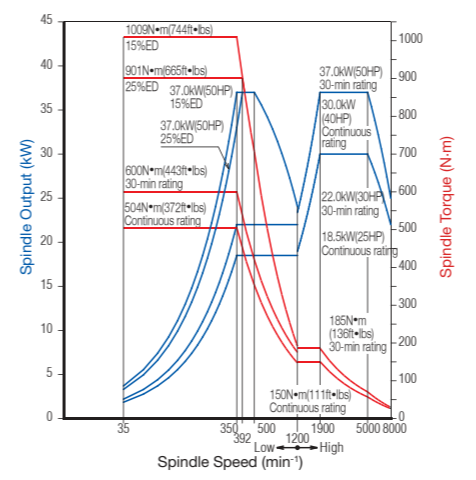
8000min⁻¹ [30 / 25kW(40/34HP) MS]



8000min ⁻¹	
Spindle motor	30/25kW(40/34HP) MS
HM400/50, HM500S/50	—
HM5000/HM6300S	—
HM630/HM800S	—
HM800/HM1000S	Standard
HM1000/HM1250S	—

--: not available

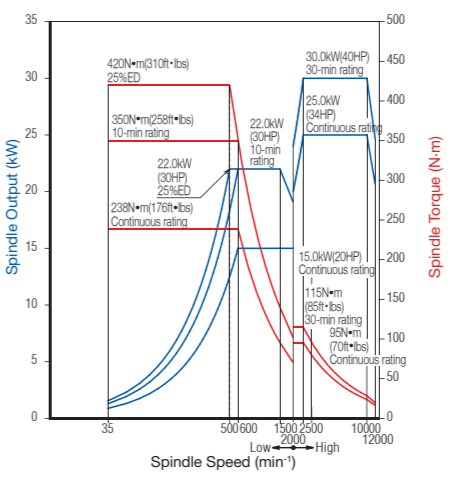
8000min⁻¹ [37 / 30kW(50/40HP) MS]



8000min ⁻¹	
Spindle motor	37/30kW(50/40HP) MS
HM400/50, HM500S/50	—
HM5000/HM6300S	—
HM630/HM800S	—
HM800/HM1000S	—
HM1000/HM1250S	Option

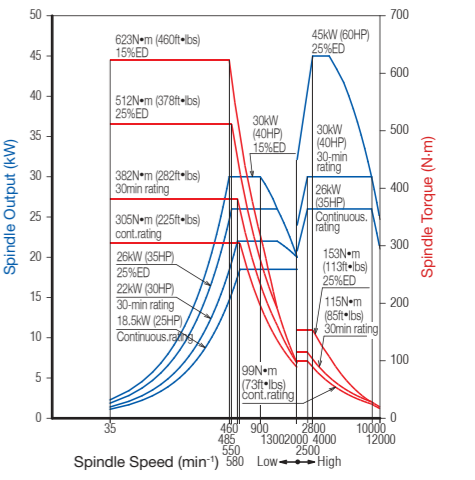
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12000min⁻¹ [30 / 25kW(40/34HP) MS]



12000min ⁻¹	
Spindle motor	30/25kW(40/34HP) MS
HM400/50, HM500S/50	Standard
HM5000/HM6300S	Standard
HM630/HM800S	—
HM800/HM1000S	Option
HM1000/HM1250S	Standard

12000min⁻¹ [45/30/26kW(60/40/35HP) MS]



12000min ⁻¹	
Spindle motor	45/30/26kW(60/40/35HP) MS
HM400/50, HM500S/50	—
HM5000/HM6300S	Option
HM630/HM800S	Standard
HM800/HM1000S	Option
HM1000/HM1250S	Option

--: not available

Table Indexing, Rotating Time and Accuracy

For the IT (Index Table) specification, the table index accuracy of 2.5 seconds is guaranteed by using the large-diameter curvic couplings.

For the BRT (Built-in Rotary Table) specification, that has a rotary encoder as standard equipment, the table index accuracy of 2.5 seconds is guaranteed.

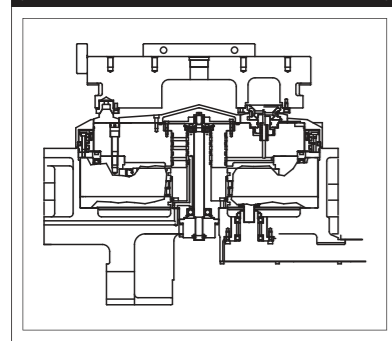
Machine model	Type of table	Index and rotation time (per 90°)
HM400/HM500S	BRT	0.5 sec
	IT[Opt]	1.9 sec
HM5000/HM6300S	BRT	0.5 sec
	IT[Opt]	1.7sec
HM630/HM800S	BRT	0.6 sec
	IT[Opt]	1.7 sec
HM800	IT	4.5 sec
HM1000S	IT	5.5 sec
HM800/HM1000S	BRT[Opt]	1.2 sec
HM1000/HM1250S	IT	5.0 sec
	BRT[Opt]	1.8 sec

IT: Index table BRT: Built-in-Rotary Table

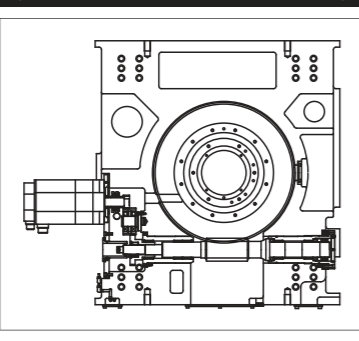


Structure of BRT

Drive with new method
(HM400/HM500S, HM5000/HM6300S, HM630/HM800S)



Worm and worm wheel drive
(HM800/HM1000S, HM1000/HM1250S)



M400/HM500S, HM5000/HM6300S, and HM630/HM800S models incorporate a newly designed table with a highly rigid reduction gear in place of a conventional worm shaft and wheel. This gear has minimal backlash, holds up to impact, and performs table indexing accurately at higher speeds. HM800/HM1000S and HM1000/HM1250S models use large-diameter bearings backing OKK's continuous improvements on rigidity.

Direct Turn APC (Automatic Pallet Changer)

The HM Series exploits the direct-turn APC unit consisting of only a pallet lift and turning mechanism. Fewer parts mean less downtime. HM1000 and HM1250S a table load of 5000kg (11000 lbs) is available as an option. All APC units have been built with expansion in mind whether it's a pallet pool or transfer system, flexibly supporting a variety of machining environments.



HM400 / HM500S



HM5000 / HM6300S

Machine model	Pallet changing time*1	Max. loadable weight on pallet kg (lb)*2
HM400	9.5 sec	450 (992)
HM500S	9.5 sec	450 (992)
HM5000	12 sec	800 (1764)
HM6300S	12 sec	700 (1543)
HM630	15 sec	1300 (2600)
HM800S	15 sec	1200 (2900)
HM800	19 sec	2000 (4400)
HM1000S	21 sec	2500 (5500)
HM1000	32 sec/43 sec[Opt]	3000 (6600)/5000 (11000) [Opt]
HM1250S	35 sec/43 sec[Opt]	3000 (6600)/5000 (11000) [Opt]

*1: JIS regulation time *2: Uniformly distributed loading

High Precision Structure

Lubrication oil cooler unit

Core cooling ball screws and Double anchor pre-tension system

The double-anchoring method limits elongation of the ball screws and improves the minute-feed characteristics and the lowers lost-motion characteristics. Accuracy in round cutting has also been improved largely.

All models of HM-series use 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.

Double Anchored Core Cooling Ball Screw, and Linear Roller Guides

HM400/HM500S



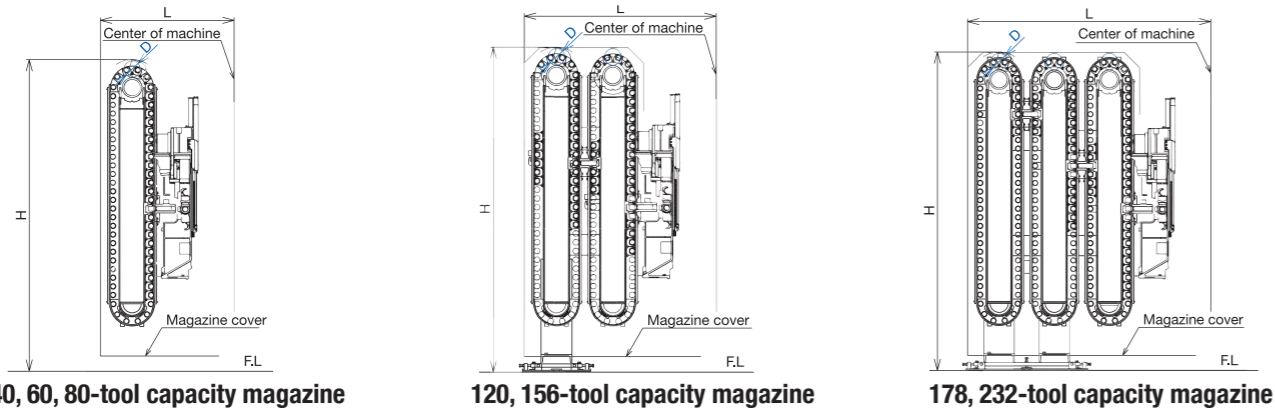
HM5000/HM6300S



HM1000/HM1250S

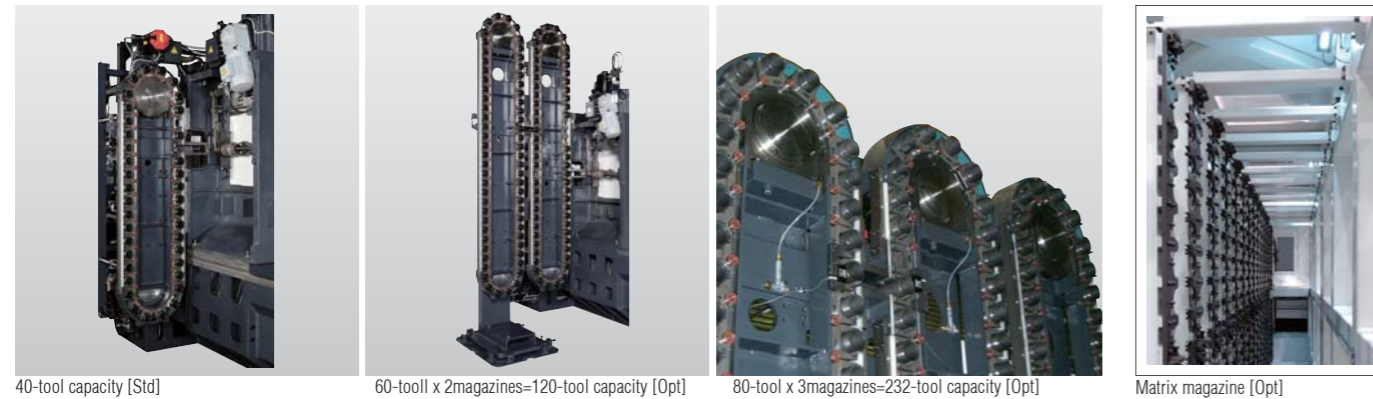


Tool Magazine for BT40



Machine Model	HM400/40, HM500S/40		
Tool storage capacity ^{*1}	L mm (in)	H mm (in)	D mm (in) ^{*2}
40tools [Std]	1315 (51.77)	2480 (97.64)	ø160 (6.30)
60tools [Opt]		3065 (120.67)	
80tools [Opt]		3915 (154.13)	
120tools [Opt]	1860 (73.23)	3150 (124.02)	
156tools [Opt]		3875 (152.56)	
178tools [Opt]	2405 (94.69)	3150 (124.02)	
232tools [Opt]		3875 (152.56)	

*1: The number of tool storage capacity refers a total number including the tool installed in the spindle i.e. subtract one from the above for the actual number of storage capacity.
 *2: D shows the max. diameter of tool without tool in adjacent pot. It is ø82mm (3.23") when tool is in adjacent pot.

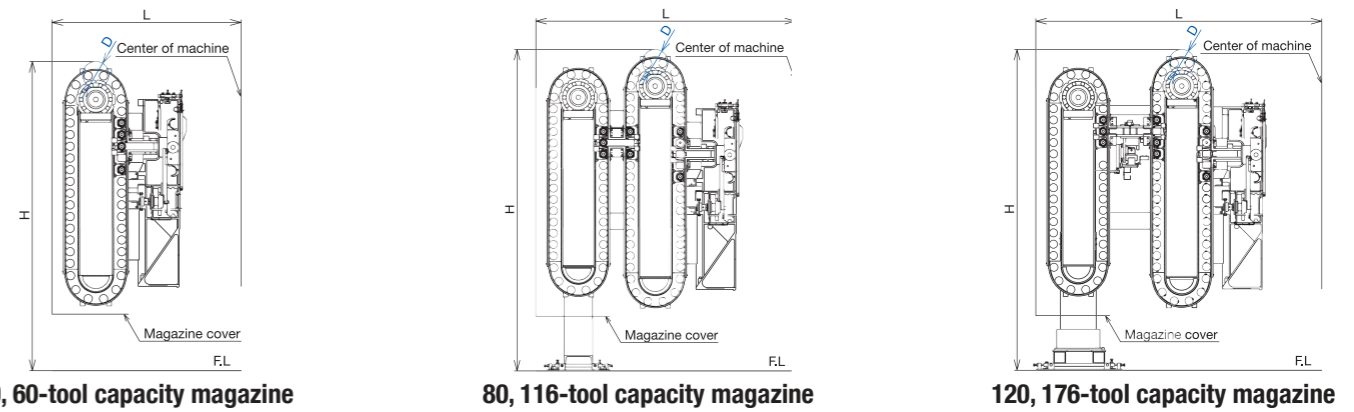


Restriction of tools

Machine model	Max. tool length	Max. diameter with tool in adjacent pot	Max. diameter without in adjacent pot	Max.weight of tool	Moment load
	mm (in)	mm (in)	mm (in)	kg (lb)	N-m (ft-lbs)
HM400/40, HM500S/40	400 (15.75) ^{*1}	ø82 (3.23) ^{*1}	ø160 (6.30) ^{*1}	12 (26.5) ^{*2}	9.8 (7.2)

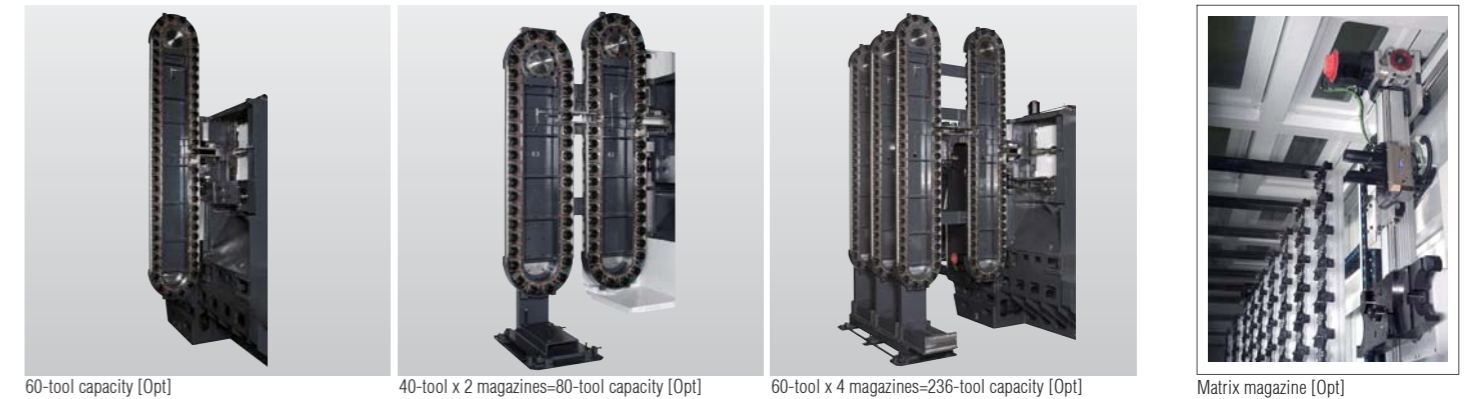
*1: It is loadable under the restriction. (Refer to P34)
 *2: required slow ATC speed.

Tool Magazine for BT50



Machine Model	HM400/50, HM500S/50			HM5000/HM6300S			HM630/HM800S			HM800/HM1000S			HM1000/HM1250S		
	L mm(in)	H mm(in)	D mm(in) ^{*2}	L mm(in)	H mm(in)	D mm(in) ^{*2}	L mm(in)	H mm(in)	D mm(in) ^{*2}	L mm(in)	H mm(in)	D mm(in) ^{*2}	L mm(in)	H mm(in)	D mm(in) ^{*2}
40 tools [Std] ^{*1}	1715 (67.52)	2970 (116.93)	ø250 (9.84)	1880(74.02)	2965 (116.73)	ø270 (10.63)	2005 (79)	3170 (124.8)	ø270 (10.63)	2180 (85.8)	3375(132.9)	ø270 (10.63)	2330 (91.7)	3650 (143.7)	ø270 (10.63)
60 tools [Opt]		4170 (164.17)			4165 (163.98)			4370 (172.1)			4335(170.7)			4610 (181.5)	
80 tools [Opt]	2530 (99.61)	3210 (126.38)		2695(106.10)	3205 (126.18)		2820 (111.1)	3410 (134.3)		2995 (117.9)	3615(142.3)		3160 (124.4)	3890 (153.2)	
116 tools [Opt]		4170 (164.17)		4165 (163.98)	4370 (172.1)		4335(170.7)	4610 (181.5)							
120 tools [Opt]	2850 (112.20)	3210 (126.38)		2995(117.91)	3205 (126.18)		3120 (122.8)	3410 (134.3)		3295 (129.7)	3615(142.3)		3445 (135.6)	3890 (153.2)	
176 tools [Opt]		4170 (164.17)			4165 (163.98)			4370 (172.1)			4335(170.7)			4610 (181.5)	

*1: The number of tool storage capacity refers a total number including the tool installed in the spindle i.e. subtract one from the above for the actual number of storage capacity. (40, 60-tool magazine)
 *2: D shows the maximum diameter of tool when without tool in adjacent pot. It is ø115mm (4.53") when tool is in adjacent pot.



Restriction of tools

Machine model	Max. tool length ^{*1}		Max. diameter with tool in adjacent pot ^{*1}	Max. diameter without in adjacent pots ^{*1}	Max. weight of tool	Moment load
	Standard mm (in)	Option mm (in)	Standard mm (in)	mm (in)	kg (lb)	N-m (ft-lbs)
HM400/50, HM500S/50	400 (15.75)	—	ø115 (4.53)	ø250 (9.84)	25 (55) ^{*2}	29.4 (21.7)
HM5000/HM6300S	500 (19.69)	—	ø115 (4.53)	ø270 (10.63)	25 (55) ^{*2}	29.4 (21.7)
HM630/HM800S	500 (19.69)	600 (23.62)	ø115 (4.53)	ø270 (10.63)	25 (55) ^{*3}	29.4 (21.7)
HM800/HM1000S	500 (19.69)	600 (23.62)	ø115 (4.53)	ø270 (10.63)	25 (55) ^{*3}	29.4 (21.7)
HM1000/HM1250S	600 (23.62)	—	ø115 (4.53)	ø270 (10.63)	25 (55)	29.4 (21.7)

* The maximum work diameter is to be smaller when 600mm (23.62") tool length is used. (HM630/800S) --: not available
 * When three or more multiple magazines, 600mm (23.62") length tools are usable in the first and second magazines. In the 3rd or the following magazines, the maximum tool length shall be limited to 500mm (19.69").
 *1: It is loadable under the restriction. (Refer to P34, P36, P38, P40, P42)
 *2: Required slow ATC speed.
 *3: 30kg (66lbs) for the gear head spindle



Use of the OKK's proven and original high-speed synchronous tool changer (OKK patented) provides the steady tool change and excellent durability. In order to realize the smooth tool change operation, the standard specification includes the variable ATC function and, when the ATC handles the tool such as the heavy tool and the large-diameter tool, the ATC turning speed slows down automatically if the slow turning is selected at the time of tool registration.

BT40

Max.time the farthest position to waiting position of magazine			
60-tool magazine base		80-tool magazine base	
60-tool	13 sec	80-tool	16.5 sec
120-tool	26.7 sec	156-tool	31.3 sec
178-tool	36.2 sec	232-tool	47.1 sec

Tool change time (cut to cut)	
Machine model	Standard
HM400/40, HM500S/40	3.3 sec



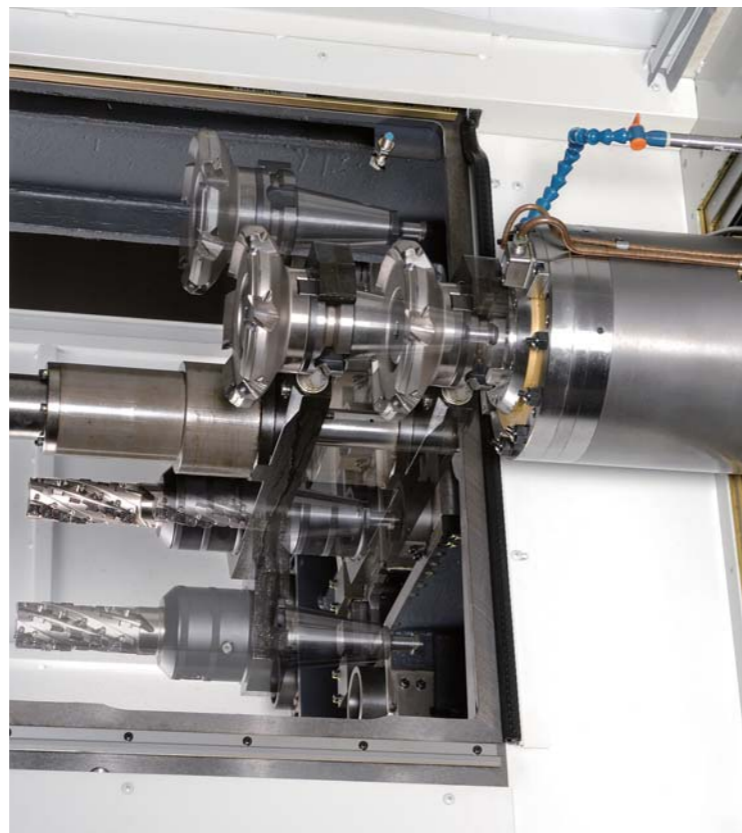
HM400/HM500S

BT50

Max.time the farthest position to waiting position of magazine			
40-tool magazine base		60-tool magazine base	
40-tool	10.0 sec	60-tool	13.5 sec
80-tool	30.3 sec	116-tool	37.3 sec
120-tool	33.2 sec	176-tool	40.2 sec
160-tool	34.2 sec	236-tool	41.2 sec

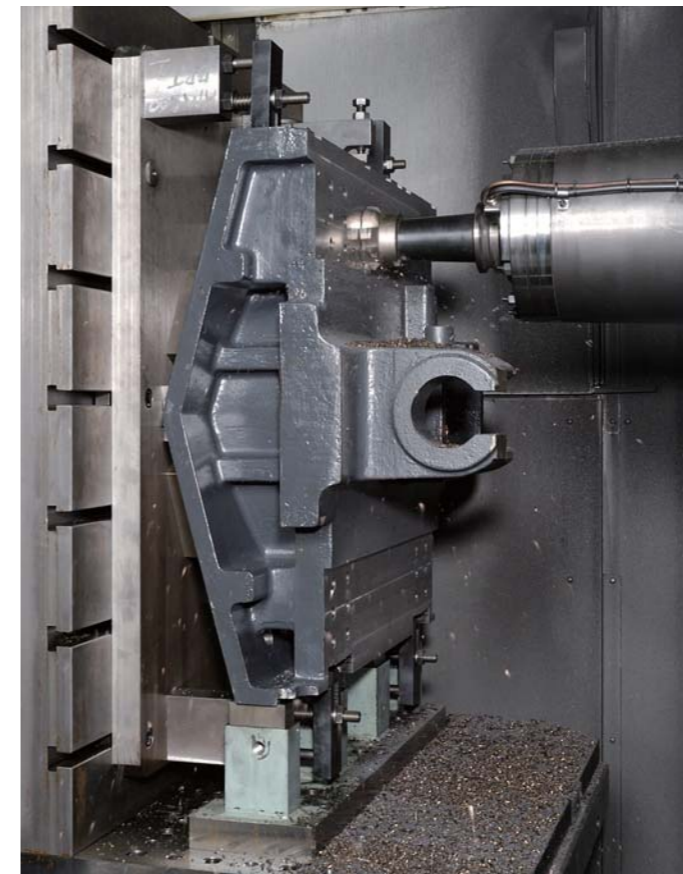
Tool change time (cut to cut)		
Machine model	Standard	Gear-drive spindle
HM400/50, HM500S/50	4.2 sec	—
HM5000/HM6300S	4.3 sec	—
HM630/HM800S	4.4 sec	5.0 sec
HM800/HM1000S	5.8 sec	6.0 sec
HM1000/HM1250S	6.2 sec	—

—: not available

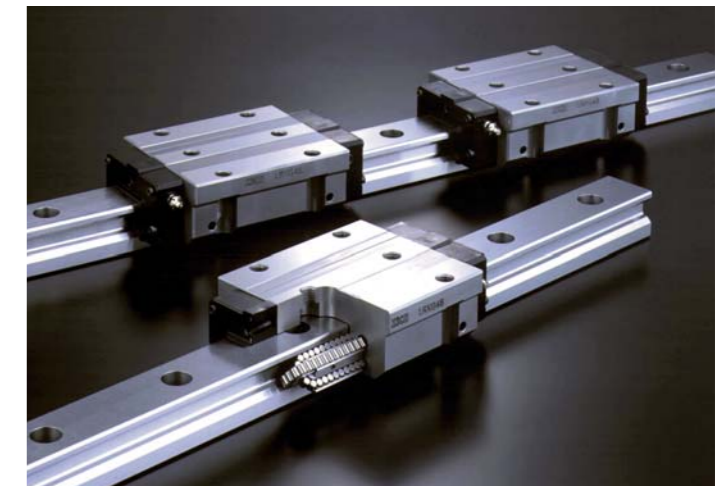


HM630/HM800S

* 600mm (23.62") tool length specification is standard only for HM1000/HM1250S. The other models are option.



Cutting data	
Machine model	HM800
Tool	ø100mm (3.94") Face milling
Material	FC300 (Cast iron)
Spindle speed	800 min ⁻¹
Feed rate	800mm/min (31.50 in/min)
Depth of cut	3.0mm (0.12")
Width of cut	90.0mm (3.54")



Linear roller guide

The machines use an intense linear roller guide system that is simply built to last, through all high feed rates, rapid accelerations and performs superbly in high-load machining.

Ball screw with pre-lubricated seals

In order to reduce the environmental burdens, the grease lubrication method is used for lubricating the ball screws / feed guides.



Ball screw with pre-lubricated seals

Pallet positioning and clamping

Use of taper cones ensures high accuracy in repeated positioning of the pallets. Flatness of the pallet is secured accurately by means of the multi-clamp method. (HM400/HM500S use center clamp method.)



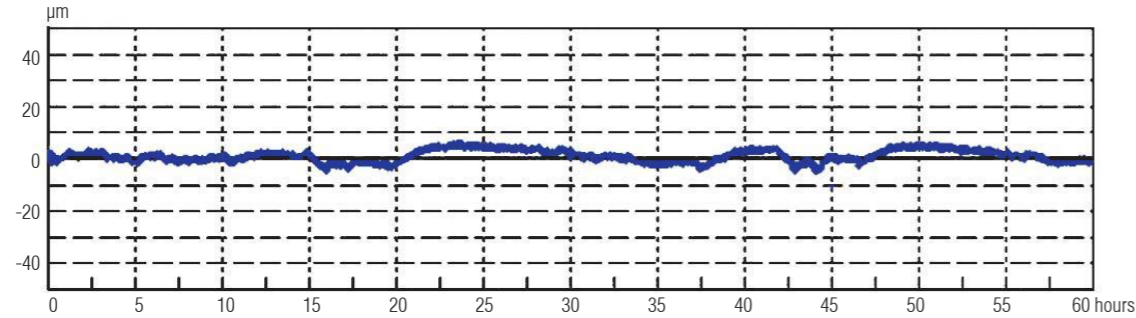
Multi-clamp method

Soft scale II m [Spindle thermal displacement compensation function]

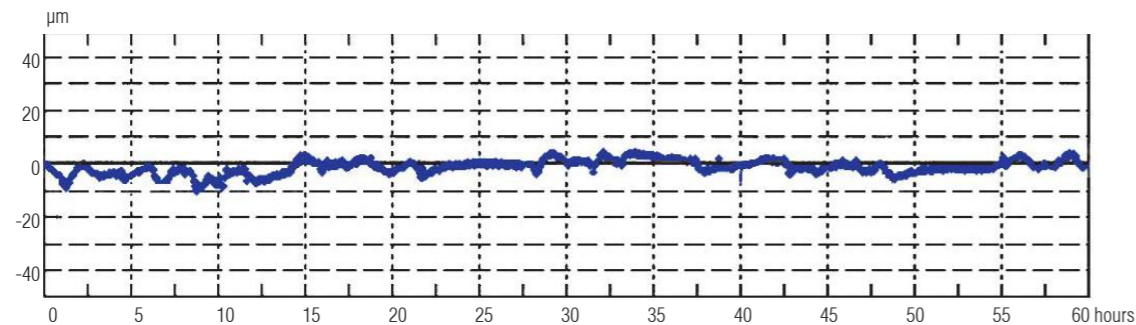
Thermal displacement of the spindle can be a cause for fluctuating machining accuracy. The soft scale II m reduces thermal displacement of the spindle and provides stable machining accuracy. The soft scale II m constantly monitors a rotating status of the spindle and temperature of the spindle and the machine body in order to compensate automatically the thermal displacement according to changes in machine movement and based on the accumulated OKK's original data.

Spindle thermal displacement (HM630 actual data example)

Y axis



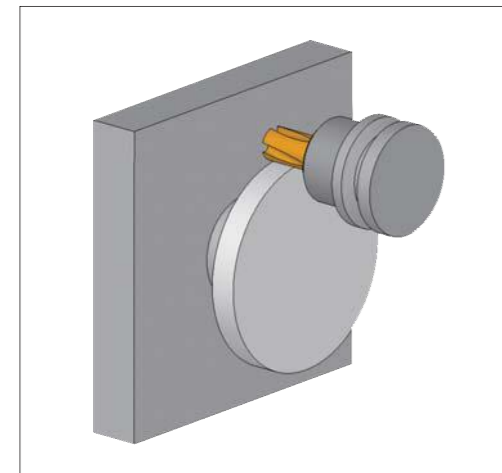
Z axis



Cutting data	
Spindle speed	0~12000 min ⁻¹
Room temperature	21C° (±1C°)
Total running hours	60 hours included warming up time

* Due consideration should be taken for the machine installation status, environmental temperature and operating condition. The data here may not be obtained due to these conditions.

Accuracy of roundness

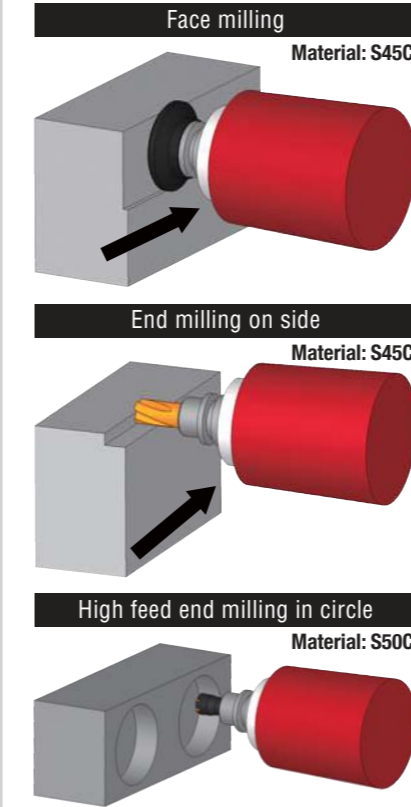


Roundness	Tolerance	Actual data example
HM400/HM500S	15μm(0.00059")	3.6μm(0.00014")
HM5000/HM6300S	15μm(0.00059")	3.1μm(0.00012")
HM630/HM800S	15μm(0.00059")	3.3μm(0.00013")
HM800/HM1000S	15μm(0.00059")	4.5μm(0.00018")
HM1000/HM1250S	15μm(0.00059")	5.0μm(0.00020")

Data condition	
Material	Aluminum
Cutting dia	250mm (9.85")
Feed rate	F500mm/min (19.7in/min)

- Notes:
1. The data show example which obtained in short run. It may differ from data obtained in continuous run.
 2. The data were obtained under OKK's test cutting conditions. The data may differ due to conditions of cutting tools, fixtures, cutting speed and room temperature.
 3. The above accuracy are subject to machine installed according to OKK specifications and constant temperature environment. Accuracy are based on OKK inspection standard.

Cutting data



Face milling	Material: S45C			
	HM400/40, HM500S/40 ø100mm(4.9")x6 - tooth	HM5000/HM6300S ø125mm(4.9")x6 - tooth	HM630/HM800S HM800/HM1000S ø125mm(4.9")x6 - tooth	HM1000/HM1250S ø125mm(4.9")x6 - tooth
Spindle speed	1000min ⁻¹	600min ⁻¹	300 min ⁻¹	300 min ⁻¹
Cutting width	80mm (3.15")	100mm (3.94")	100 mm (3.94")	100 mm (3.94")
Cutting depth	5mm (0.20")	6mm (0.24")	6 mm (0.24")	6 mm (0.24")
Feed rate	800mm/min (31ipm)	1000mm/min (39.4 in/min)	600 mm/min (23.6 in/min)	1000 mm/min (39.4 in/min)
Cutting amount	320cm ³ /min (19.5in ³ /min)	600cm ³ /min (36.6 in ³ /min)	360 cm ³ /min (22 in ³ /min)	600 cm ³ /min (36.6 in ³ /min)

End milling on side	Material: S45C			
	HM400/40, HM500S/40 ø32mm(1.26")x6 - tooth	HM5000/HM6300S ø50mm(1.97")x6 - tooth	HM630/HM800S HM800/HM1000S ø50mm(1.97") x6-tooth Roughing end mill	HM1000/HM1250S ø50mm(1.97") x6-tooth Roughing end mill
Spindle speed	250 min ⁻¹	160 min ⁻¹	160 min ⁻¹	160 min ⁻¹
Cutting width	32 mm (1.26")	20 mm (0.79")	25 mm (0.98")	15 mm (0.59")
Cutting depth	16 mm (0.63")	40 mm (1.57")	40 mm (1.57")	50 mm (1.97")
Feed rate	200 mm/min (7.87 in/min)	180 mm/min (7.09 in/min)	160 mm/min (6.3 in/min)	300 mm (11.8 in/min)
Cutting amount	102 cm ³ /min (6.2 in ³ /min)	144 cm ³ /min (8.8 in ³ /min)	160 cm ³ /min (9.8 in ³ /min)	225 cm ³ /min (13.7 in ³ /min)

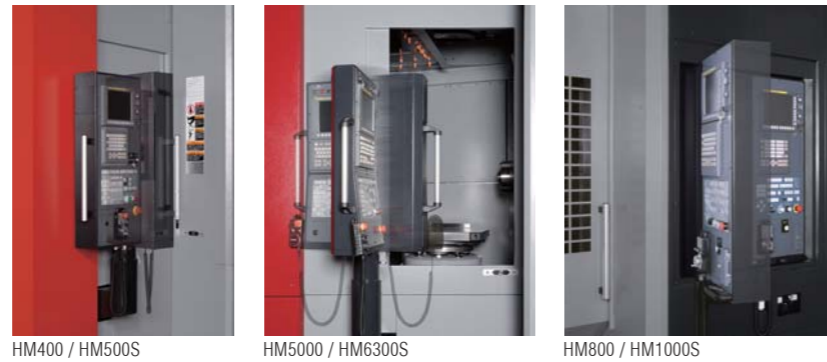
High feed end milling in circle	Material: S50C	
	HM630/HM800S, HM800/HM1000S ø50 mm (1.97") High feed rate end mill	
Spindle speed	1400 min ⁻¹	
Cutting width	40 mm (1.57")	
Cutting depth/round	0.5 mm (0.02")	
Feed rate	7000 mm/min (276 in/min)	

Sample work pieces



Easy Operation

By the design of swivel operation panel and considerate splashguard of accessibility, the accessibility to spindle and pallet is significantly improved.



HM400 / HM500S

HM5000 / HM6300S

HM800 / HM1000S

Easy loading and unloading

Front door of the APC opens wide so that the work loading/unloading and setup operations can be carried out easily.



HM1000 / HM1250S

HM5000 / HM6300S

Easy Tool Loading and Unloading in Tool Magazine

1 Magazine interruption function [Std]

During automatic operation, the tool loading and unloading operation in the tool magazine can be executed.

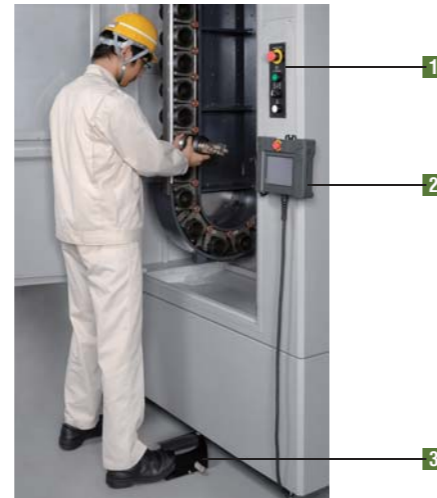
2 Operation panel [Opt]

Through a simple operation, a tool corresponding to a designated tool number is called up to the setup position inside the magazine.

3 Foot-operated switch for removing a tool [Opt*]

The foot-operated switch eases removal of a tool from a magazine pot.

*: Standard for Dual-contact holder



Operation Stand [Opt]



The operation stand is supplied optionally as needed.

*: Standard for HM1000/HM1250S

Photo is an example of operation stand.

Maintenance

Daily maintenance equipment is easily performed at the back and one side of machine.

HM400/50, HM500S/50



1 2 3 4

HM5000 / HM6300S



3 1 6 2 4

HM800/HM1000S



5 6 1 2 3 4 7 8

Daily maintenance equipment

No.	Name of equipment	No.	Name of equipment
1	Air regulator	5	Manual oil supply for magazine
2	Air lubricator	6	Spindle oil-air unit
3	Air dryer	7	Hydraulic unit
4	Oil -in-air removing unit	8	Oil temperature control unit for Spindle and screws



Automatic lubrication unit for magazine and ATC part [Opt]



Automatic grease lubrication unit for linear guides and ball screws [Opt]

Eco friendly

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.

Hydraulic free ATC unit *1

OKK has an added advantage of eco-friendly reliability with our use of a hydraulic free, mechanical cam driven ATC unit.

LED lamps [Opt] *2

The machine incorporates LED lamps due to their low heat generation and power consumption savings. Furthermore, the LED lamps have a long life to save replacement money and maintenance.

Turning off lights inside the machine [Opt]

When the machine is not operated for a certain period of time, lights inside the machine are turned off automatically.

*1: Except for HM400/40, HM500S/40 and HM5000/HM6300S *2: HM5000/HM6300S is standard.



LED lamp work light

Easy return of ATC and APC

Tools and pallets can be returned easily to origin position in accordance with monitor, even if stopped at half way of ATC and APC.



Stopped at half way of ATC



Guidance display for ATC



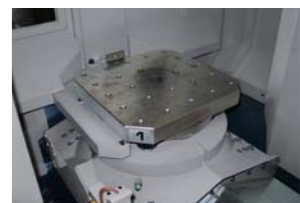
ATC arm returned to origin position



Stopped at the half way of APC



Guidance display for APC

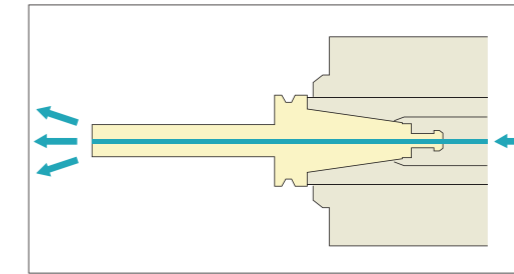
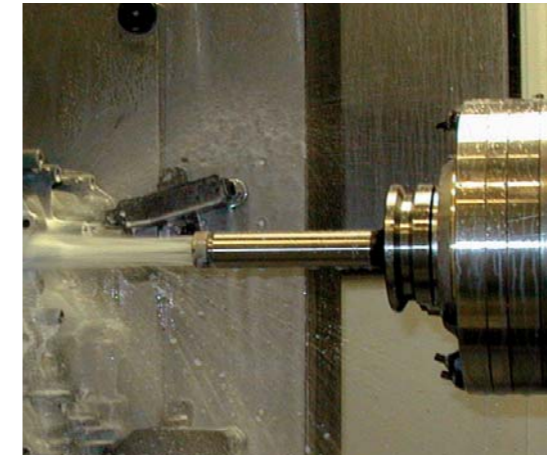


Pallet returned to origin position

Item			Standard and optional Accessories					
			HM400/40	HM400/50	HM5000	HM630	HM800	HM1000
			HM500S/40	HM500S/50	HM6300S	HM800S	HM1000S	HM1250S
Controller	FANUC	FAI						
		F31i						
		F31i-B5	Essential for the 5-axis simultaneous control					
Spindle taper and pull stud	Taper	BT40						
		BT50						
	Two faces contact holder	HSK-A63						
		HSK-A100						
Pull stud	BT type							
	OKK90°							
	MASI							
Maximum spindle speed	BT40	MS						
		10000min ⁻¹	37/26/22kW (50/35/30HP)					
		15000min ⁻¹	37/26/18.5kW (50/35/25HP)					
	BT50	MS						
		8000min ⁻¹	37/26/18.5kW (50/35/25HP)					
		20000min ⁻¹	22/18.5kW (30/25HP)					
Gear	MS							
	12000min ⁻¹	30/25kW (40/34HP)						
Table/Axis	Table	IT (Index Table)	Least Index 1°					
		BRT (Built-in rotary table)	Least Index 0.001°					Least Index 0.0001°
Rapid feed rate 75m/min (2953ipm)					X-axis*Z-axis only			
Addition of controlled axis			*1	*1	*1	*1	*1	*1
Magazine	BT40	40MG	40MG×1					
		60MG	60MG×1					
		80MG	80MG×1					
		120MG	62MG×2					
		156MG	80MG×2					
		178MG	62MG×3					
		232MG	80MG×3					
	BT50	200MG/300MG/400MG	Matrix magazine					
		40MG	40MG×1					
		60MG	60MG×1	*2	*2	*2	*2	*2
		80MG	44MG+40MG					
		116MG	60MG×2	*2	*2	*2	*2	*2
		120MG	44MG+40MG×2					
		160MG	44MG+40MG×3					
Magazine Interruption function	Magazine operation panel							
	Tool holder remove by foot pedal	Standard for BT50/HSK Dual-contact holder						
	For Automatic Pallet Handler and Pallet	2-pallet APC						
APC	Multiple APC	6-pallet APC						
	Separate setup station for the multiple APC ^{Note 1}	8-pallet APC						
	Tapped type Pallet		25-M16 screw	25-M16 screw	24-M16 screw	24-M16 screw	24-M16 screw(*3)	
Pallet	T-Slot type Pallet							
	Additional Pallet							
	Coolant tank	Standard Coolant tank						
Chip ejection	Lift up chip conveyor	Hinged type/Scraper type/with Draum filter						
	Coil conveyor	Bed left and right						
	Chip flow coolant	Bed left and right						
Collant	Spindrecoolant nozzle							
	Ceiling Shower							
	Coolant shower gun							
	Air blow and oil mist							
	Coolant through spindle	2Mpa (290psi)/7Mpa (1015psi)						
	Air through spindle							
	Oil hole							
	Oil skimmer							
For accuracy	Mist collector							
	Dubble anchor pretension ball screw	With core cooling ball screw						
	Lubrication oil cooler unit							
Other accessories	Linear scale feed back	XY-axis or XYZ-axis						
	Coolant cooler unit							
	Signal tower lamp	Tow lamp without buzzer						
Working light	Fluorescent light							
	LED light							
	Workpiece automatic measurement	Manual measurement						
	Tool length measurement	Workpiece automatic measurement						
	Tool length measurement and break detection	Workpiece automatic measurement/ Tool length automatic measurement/ Tool break detection						
	Tool break detection	Tool length automatic measurement/Tool break detection						
Automatic grease lubrication unit	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						
Automatic oil lubrication unit for MG and ATC part	Tool break detection in magazine*4	Contact type or laser type						
	XYZ -axis/ball screw							
	Foundation parts for machine anchoring	Bond anchoring method						
Rotary window	at operation door							

MG: Tool magazine unit Note 1: The separate setup station for the multiple APC is regarded as the standard specification when the multiple pallet specification is selected.(Except for HM400/500S and HM5000/HM6300S)
 *1: The controller needs to be changed when the 5-axis simultaneous control is selected.
 *2: It is not available for the HSK-A100.
 *3: Twenty-four M20s are used for HM1250S.
 *4: It is available only for the FANUC controller.

High pressure coolant through spindle [Opt]



High pressure coolant unit

High pressure coolant is supplied to the tip of a cutting tool through the center hole of spindle and the cutting tool. It is very efficient for chip removal, cooling the cutting point and extending the life of cutting tools. Air supply through the spindle is also available by switching a valve. [Another Opt]

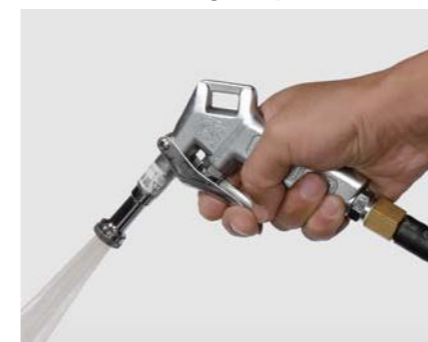


Thickener bag filter

Discharge pressure Mpa (psi)		2.0 (290)	7.0 (1,015)
Discharge volume L/min (gpm)	50Hz	36 (9.5)	21 (5.5)
	60Hz	35 (9.2)	30 (7.9)

Notes :
 *Discharge values indicated are at the outlet of pump.
 *Actual discharge volumes from the tool are different due to the hole-diameter of cutter tools.

Coolant shower gun [Opt]



Air blow nozzle [Opt]



Automatic grease lubrication unit for linear guides and ball screws [Opt] *1



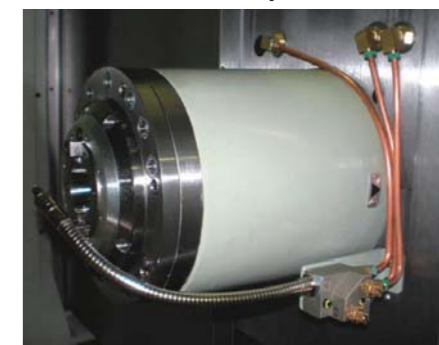
Automatic lubrication unit for magazine and ATC part [Opt]



Mist collector [Opt]*2



Oil mist & Air blow [Opt]



Mist collector suctions mist from the splash guards and is recommended when high-pressure coolant is used.

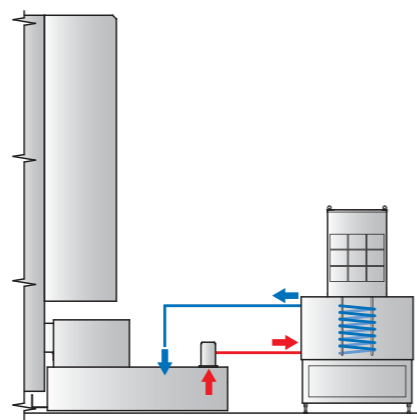
*1: Only for HM630/HM800S, it is regarded as the optional specification.

*2: We can provide the mounting holes in the splash guard and a terminal block for wiring in the control panel for the customer to install the equipment that the customer prepares for themselves.

For more stable machining accuracy

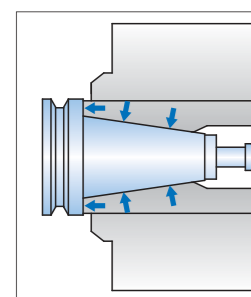
Coolant cooler [Opt]

Oil temperature has a major factor in thermal displacement of machine. Coolant cooler suppresses rise of temperature generated during machining and achieves a stable machining accuracy. This option is recommendable for accurate machining. This option is also strongly recommended, when the oil-based coolant is used.

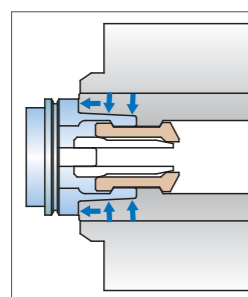


Spindle

Dual-contact [Opt]



BT specification



HSK specification



Spindle for Dual-contact holder of BT50

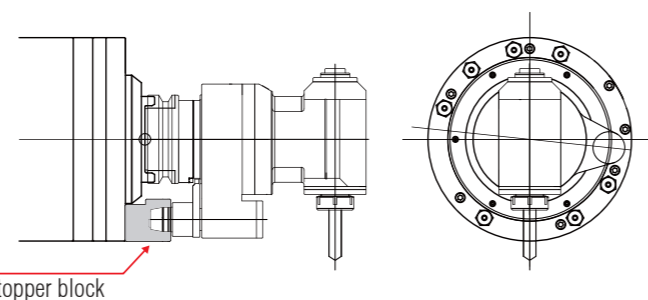


Dual-contact holder is loaded, no space between holder and spindle nose.



HSK-A63

Improvements in rigidity of tools have been achieved by 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.)



Stopper block

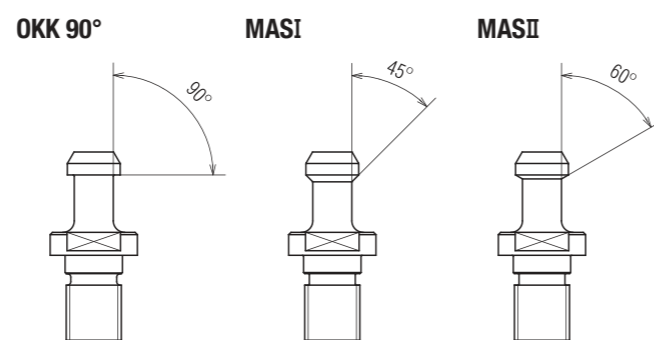
Stopper block [Opt]

- 1) For high speed spindle holder
- 2) For high speed spindle holder with coolant jacket
- 3) For angle head

Notes: Please inform OKK the brand name and model when you order this stopper block.

Type of pull stud

	7/24 taper No.40	7/24 taper No.50
OKK90°	Option	Standard
MASI	Standard	Option
MASII	Option	Option



Lift up chip conveyor [Opt]

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

Height of chip drop

Type of chip conveyor	Hinged type, Scraper type and Magnet scraper type	Scraper type with drum filter	Magnet scraper type with drum filter
HM400/HM500S	1020 mm (40.16")	1100 mm (43.31")	1100 mm (43.31")
HM5000/HM6300S	1020 mm (40.16")	1220 mm (48.03")	1220 mm (48.03")
HM630/HM800S	1020 mm (40.16")	1220 mm (48.03")	1220 mm (48.03")
HM800/HM1000S	1070mm (42.13")	1200mm (47.24")	1200mm (47.24")
HM1000/HM1250S	1070mm (42.13")	1200mm (47.24")	1200mm (47.24")



Photo is Scraper type. Chip bucket is another option. There are fixed type and swivel type. Photo is fixed type chip bucket.

Magnet separator [Opt]



As an option for the lift-up chip conveyor, adding a magnet separator is possible for collecting powder and particle casting chips and preventing accumulation of chips inside tanks and clogging of devices such as pumps and filters.

Oil skimmer [Opt]



Oil skimmer collects contaminated oil from a coolant tank.

Rotary wiper [Opt]



Install on operators window

Automatic measurement and Tool breakage detection with OKK Touch sensor system [Opt]

Model of touch sensor system

Function	Description	System name
Workpiece measurement and compensation	<ul style="list-style-type: none"> Load the touch sensor into the spindle. Automatic operations will bring the sensor into contact with the workpiece. The workpiece coordinate system will be measured and the necessary compensation amount will be updated. Program instructions are issued according to the specified format. 	T1-A
Tool length measurement	<ul style="list-style-type: none"> When a tool is commanded for tool length check, automatic operations will bring the tool in contact with the table mounted touch sensor. This operation will update the tool length offset for that tool. Measurement and compensation programs in accordance with the specified format are produced and executed. Applicable tools: Drills and taps 	T1-B
Tool break detection	<ul style="list-style-type: none"> When a tool is commanded for broken tool check, automatic operations will bring the tool in contact with the table mounted touch sensor. If the tool tip does not make contact with the sensor at the designated offset length the tool is determined to be broken. This checking command can be put into the machining program at any point. Applicable tools: Drills and taps Details of the movement when tool break is detected depend on the specifications of the machine main unit. 	T1-C

*Adding the T0 software enables also the manual measurement. Please refer to "T0 software [Opt]" on the page 29.

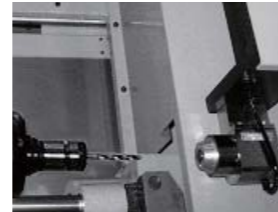
Tool length measurement and Tool breakage detection

A tool in the tool magazine is called up to the spindle, and length of the tool is measured automatically and registered automatically as data of the tool length in respective offset number. After the tool is used in machining, the tool can be checked for breakage automatically. If the tool is detected as damaged, the machine issues an alarm and stops operating.



Tool breakage detection in tool magazine [Another Opt]

This function enables detecting tool breakage in the tool magazine while the machine is in the automatic operation.



* Non contact type sensor of laser system is also available.

Type of sensor



[OMP60] Renishaw

Use the optical signal transfer method. The signal receiver block is not needed since signals are sent and received by using infrared rays. The signal receiver module can be fitted on inside wall of splash guard.



[RMP60] Renishaw

Use the radio signal transfer method. It is suitable for the machines having long distance for signal transfer from the sensor to the receiver such as the large models and 5-axis machining centers.



[MP700] Renishaw

With a low and consistent trigger force in all sensing directions, the MP700 is ideal for complex and contoured part inspection.

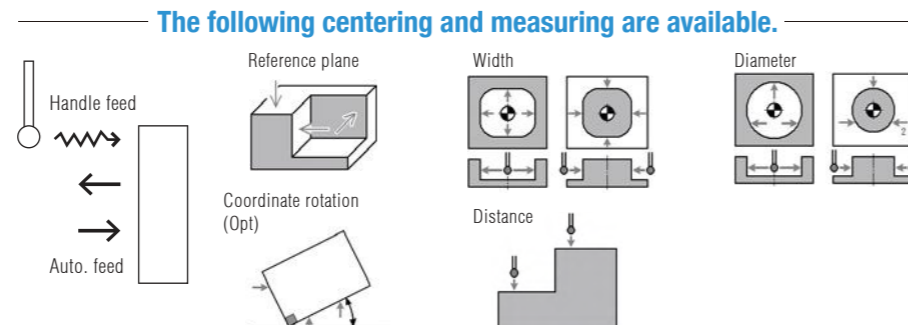


[TC50] Blum

The multidirectional touch probe TC50 allows fast, precise and automatic determination of workpiece position and workpiece dimensions in machining centers.

Manual measurement with software of touch sensor system T0

A sensor is moved to the desired measuring position by operating a manual handle. The machine starts measuring automatically when the sensor comes into contact with a workpiece, and results of the measurement are reflected in the settings of desired work coordinate system and tool offset number through a simple operation.



Hydraulic and compressed air supply ports for fixture [Opt]

Rotary joint on pallet system (Example 1)



Example of the use of 6-port rotary joint (HM400/500S, HM5000/HM6300S)

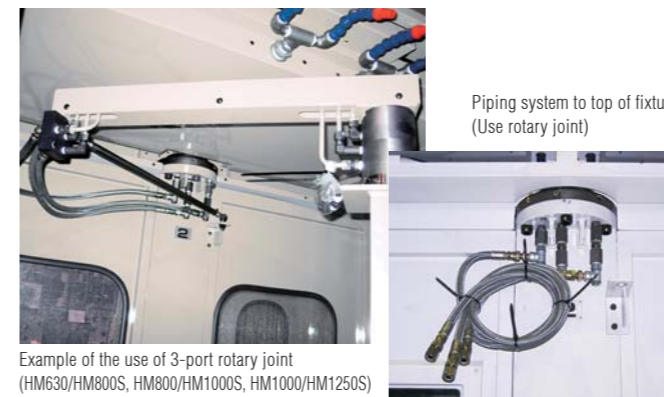
Supply from above the fixture: Hydraulic or air pressure can be applied to the clamping device constantly so that the workpiece clamping device is prevented from getting loose during machining. However, height of the fixture is limited due to a rotary joint and its piping installed above the fixture.

The pallet-through method is simple and does not require a rotary joint and its piping above the fixture. However, the clamp/unclamp function is available only in the setup station. (Hydraulic pressure and air pressure are not supplied after moving to the machining position.)

	Rotary joint on pallet system	pallet through
HM400/HM500S	○	○
HM5000/HM6300S	○	○
HM630/HM800S	○	×
HM800/HM1000S	○	○
HM1000/HM1250S	○	○

Note1: The pallet-through system allows the clamping operations of the fixtures only in the work setup station.
Note2: Availability is depends on the supply source (hydraulic or air), pressure, number of ports and other specification.

Rotary joint on pallet system (Example 2)



Example of the use of 3-port rotary joint (HM630/HM800S, HM800/HM1000S, HM1000/HM1250S)

Pallet through system (Use auto-coupler)

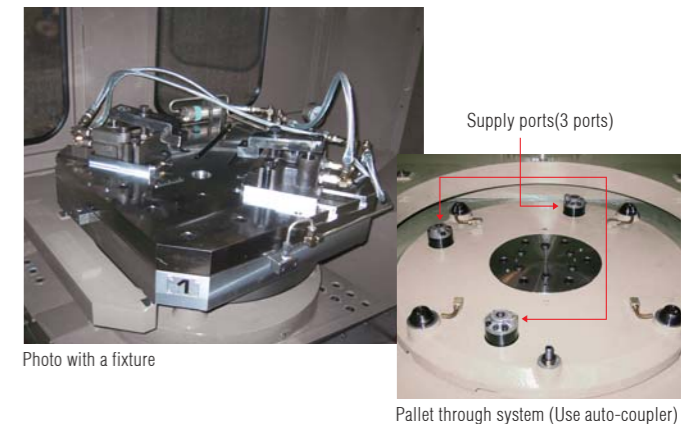
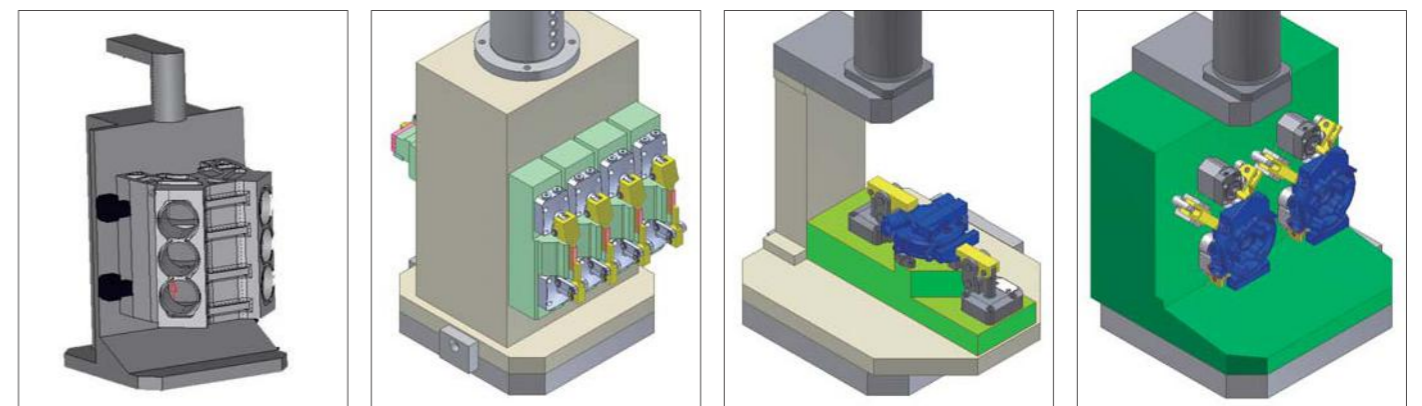


Photo with a fixture

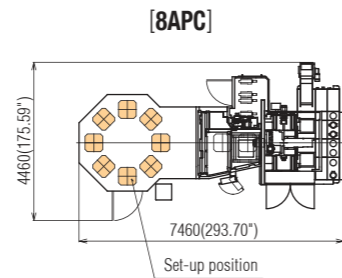
Pallet through system (Use auto-coupler)

Fixture example



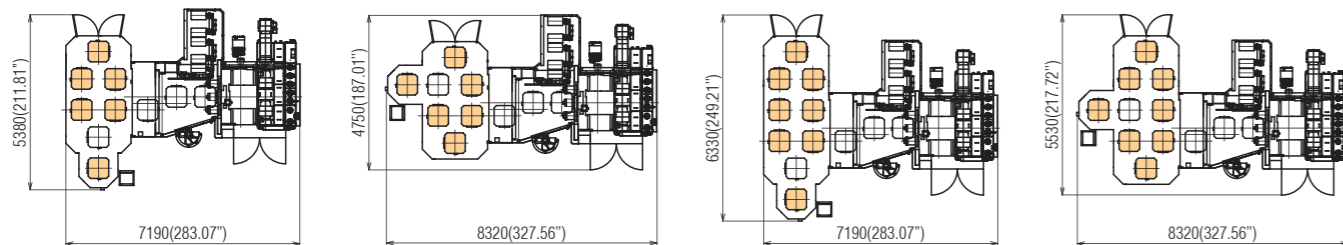
Multiple-pallet APC [Opt]

HM400/HM500S



HM5000/HM6300S

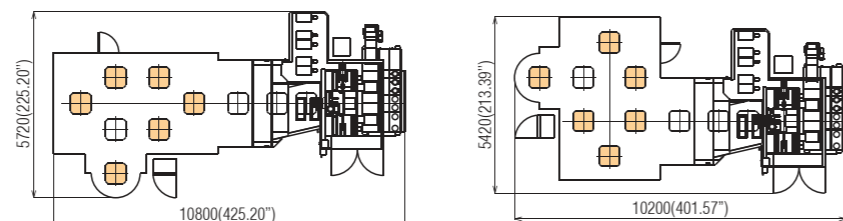
- [6-pallet with set-up station (pattern 1)]
- [6-pallet with set-up station (pattern 2)]
- [8-pallet with set-up station (pattern 1)]
- [8-pallet with set-up station (pattern 2)]



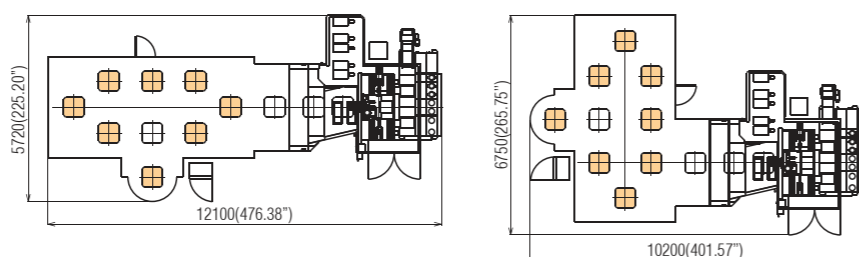
HM630/HM800S



- [6-pallet vertical type with set-up station]
- [6-pallet horizontal type with set-up station]

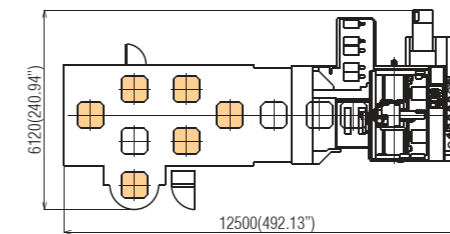


- [8-pallet vertical type with set-up station]
- [8-pallet horizontal type with set-up station]

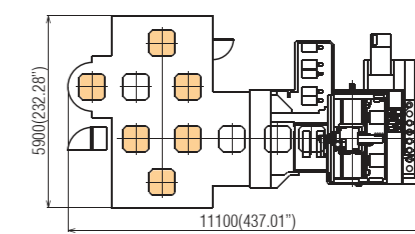


HM800/HM1000S

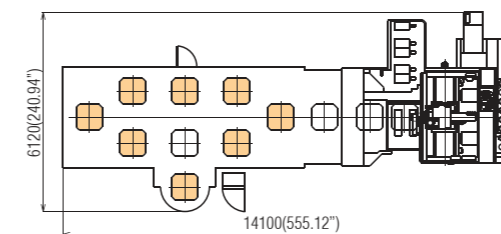
- [6-pallet vertical type with set-up station]



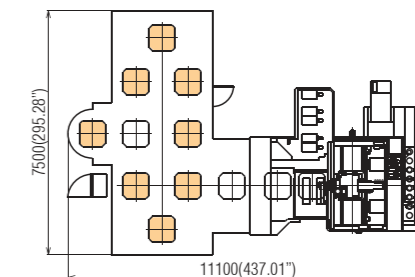
- [6-pallet horizontal type with set-up station]



- [8-pallet vertical type with set-up station]

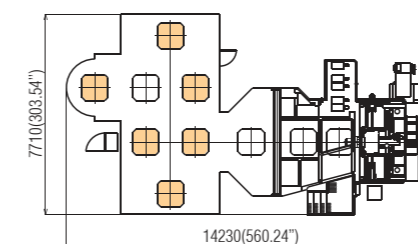


- [8-pallet horizontal type with set-up station]

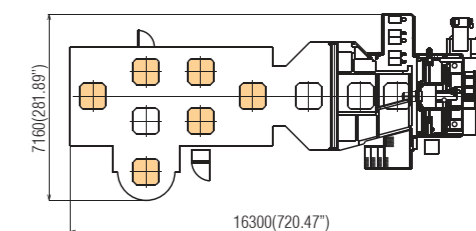


HM1000/HM1250S

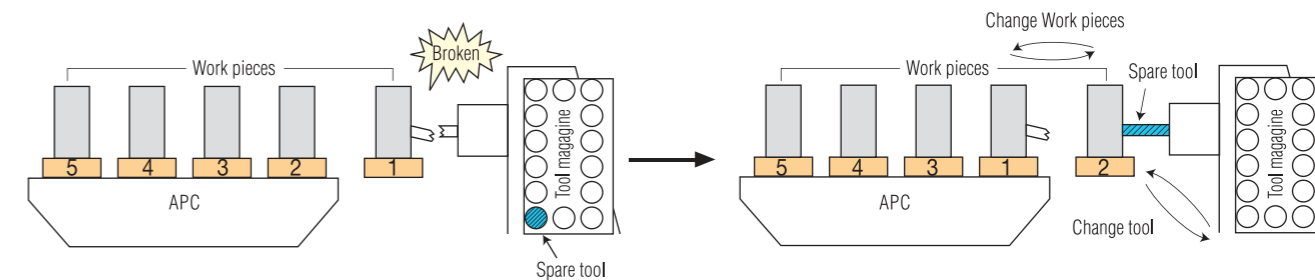
- [6-pallet horizontal type with set-up station]



- [6-pallet vertical type with set-up station]



Auto restart function [Another Opt]



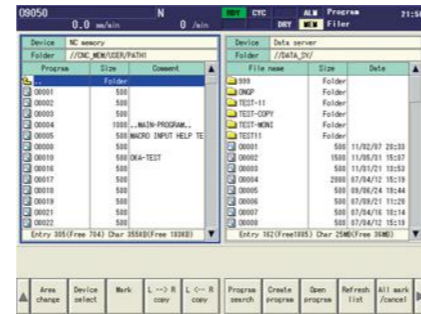
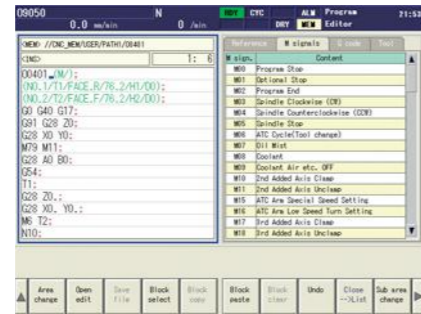
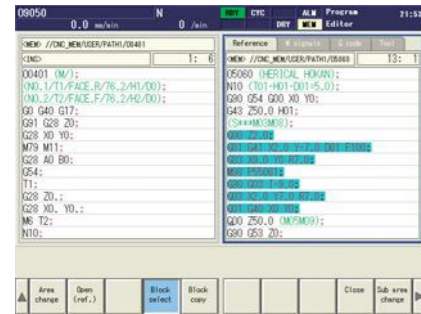
When a tool failure detected by a tool breakage detection system such as soft CCM, touch sensor system T1-C or others, automatic restart stops the machine and interrupts processing. The system will exchange the broken tool with an available spare tool then will either execute an APC or program end command.

OKK's exclusive control functions

Programming support functions

Program Editor [F31i-B]

Program editor allows you to edit programs stored in NC memory, from a data server (or hard disc) or memory card.



- Two programs can be displayed side by side.
- Characters in the program can be converted all at once. (Example: Changes F1000 to F1200.)
- Multiple-line data can be copied from other programs with ease.

- By switching the right-side screen for reference use, a list of M signals/G codes and information on tools in the magazine can be displayed.

- Programs can be copied or deleted and program names can be changed easily with the Program Editor.
- The Program Editor's multiple-file batch copy function enables to make a backup of the programs in the NC memory or hard disc easily with a memory card.

Setup support functions

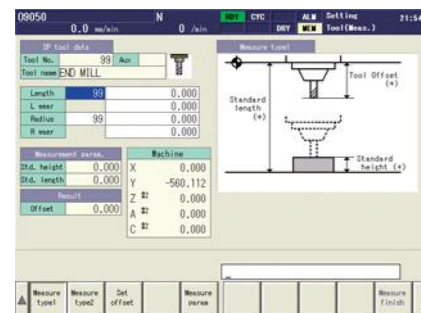
Tool Support [F31i-B]

Now through a single set-up screen the tools number, description, schematic, and geometry are displayed. You can also perform the tool change commands and measurement cycle at the same set-up screen.

Tool setup screen

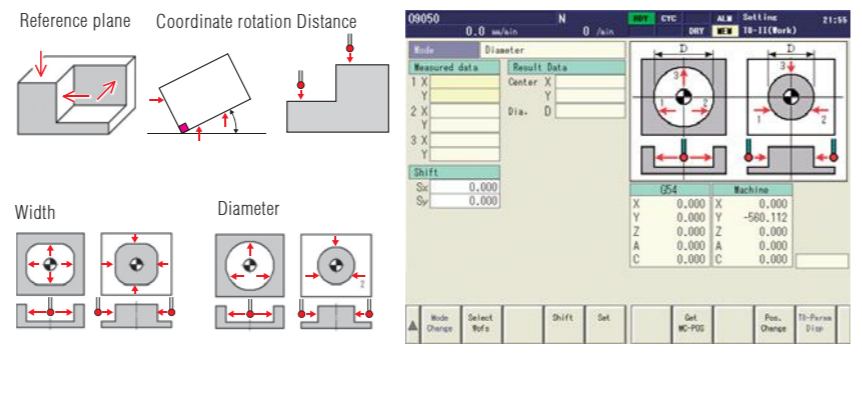


Tool length compensation amount measurement screen



T0 software [Opt]

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.



Maintenance functions

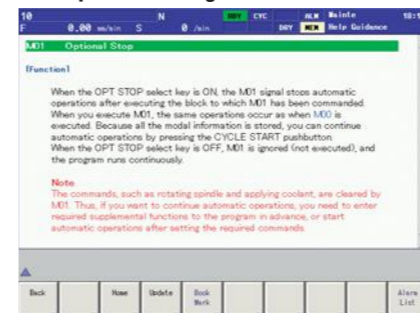
Help Guidance [F31i-B]

The screen will display detailed information regarding the machine alarm and will explain how to recover the machine from the problem. This screen will also display a list of G-codes and a description of M signals.

Display of details of alarms



Description of M signals



Technologies for Reduced Setup and Unmanned Operation

Soft AC [Opt]

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 improve 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 machining at the time of tool failure (option)
 - Combined operation with the automatic restart function is possible.

Soft CCM [Opt]

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.

High-efficiency Control Technologies

Hyper HQ Control [Opt]

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

F31i-B/FAi capability of processing fine line segments

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

The above values show (theoretical) maximum speeds for processing 1-mm-segment blocks constructing a straight line. Actual processing speeds depend on the type of the machine and NC data.

HQ Tuner [Opt]

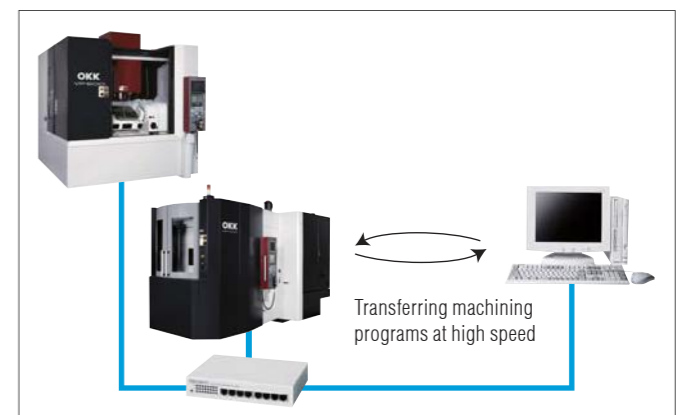
The HQ tuner provides the programmer a 10-step adjustment of parameters for hyper HQ control in accordance with processing conditions. It adjusts the hyper HQ control in accordance with the current process. For example, during roughing routines the programmer can place a higher priority on speed and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



High-efficiency Control Technologies

Data Server [Opt]

A large amount of 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 programs or sub-programs (called up by using the M198 signal.)



FANUC Controller F31i-B

(Windows CE-installed Open CNC)

Standard Specification	Standard Specification	Optional Specification
No. of controlled axes: 4 axes (X, Y, Z, B)	Sequence number search	3-dimensional cutter compensation
No. of simultaneously controlled axes: 3 axes (4 axes for BRT specification)	Program restart	Tool offset sets: 200 sets in total PK1
Least input increment: 0.001mm / 0.0001"	Cycle start	Tool offset sets: 400 sets in total
Max. programmable dimension: ±999999.999mm / ±39370.0787"	Auto restart	Tool offset sets: 499 sets in total
Absolute / Incremental command: G90 / G91	Single block	Tool offset sets: 999 sets in total
Decimal point input / Pocket calculator type decimal point input	Feed hold	Addition of workpiece coordinate system (48 sets in total): G54.1 P1 to P48 PK1
Inch / Metric conversion: G20 / G21	Manual absolute on/off: parameter	Addition of workpiece coordinate system (300 sets in total): G54.1 P1 to P300
Program code: ISO / EIA automatic discriminaton	Sub program control	Machining time stamp
Program format: FANUC standard format	Canned cycle: G73, G74, G76, G80 to G89	Addition of optional block skip: 9 in total
Nano interpolation (internal)	Mirror image function: parameter	Tool retract and return
Positioning: G00	Automatic corner override	Sequence number comparison and stop
Linear interpolation: G01	Exact stop check/mode	Manual handle interruption
Circular interpolation: G02 / G03 (CW / CCW), including radius designation	Programmable data input: G10	Programmable mirror image PK1
Cutting feed rate: 6.3-digit F-code, direct command	Backlash compensation for each rapid traverse and cutting feed	Optional chamfering / corner R
Dwell: G04	Smooth backlash compensation	Custom macro PK1
Manual handle feed: manual pulse generator 1 set(0.001, 0.01, 0.1mm)	Memory pitch error compensation (interpolation type)	Interruption type custom macro
Rapid traverse override: 0 / 1 / 10 / 25 / 50 / 100%	Skip function	Addition of custom macro common variables: 600
Cutting feed rate override: 0 to 200% (every 10%)	Tool length manual measurement	Figure copy
Feed rate override cancel: M49 / M48	Emergency stop	Coordinate system rotation: G68, G69
Rigid tapping: G84, G74 (Mode designation: M29)	Data protection key	Scaling: G50, G51
Part program storage capacity: 160m [64KB]	NC alarm display / alarm history display	Chopping (Axis control by PMC)
No. of registered programs: 120	Machine alarm display	Playback
Part program editing	Stored stroke check 1	Automatic tool length measurement: G37 / G37.1
Background editing	Stored stroke check 2, 3	Tool life management: 256 sets in total PK1
Extended part program editing	Load monitor	Addition of tool life management sets: 1024 sets in total
10.4" color LCD	Self-diagnosis	High-speed skip
Clock function	Absolute position detection	Run hour and parts count display PK1
MDI (Manual Data Input) operation	Manual guide i (Basic)	Manual guide i (Milling cycle)
Memory card interface		
Spindle function: 5-digit S-code direct command		
Spindle speed override: 50 to 150% (every 5%)		
Tool function: 4-digit T-code direct command		
ATC tool registration		
Auxiliary function: 3-digit M-code programming		
Multiple M-codes in 1 block: 2 codes (HM400/HM500S/HM5000/HM6300S: 3 codes (Max. 20 settings))		
Tool length offset: G43, G44/G49		
Tool diameter and cutting edge R compensation: G41, G42/G40		
Tool offset sets: 99 sets in total		
Tool offset memory C		
Manual reference position return		
Automatic reference position return: G28/G29		
2nd reference position return: G30		
Reference position return check: G27		
Automatic coordinate system setting		
Coordinate system setting: G92		
Machine coordinate system: G53		
Workpiece coordinate system: G54 to G59		
Local coordinate system: G52		
Program stop: M00		
Optional stop: M01		
Optional block skip: /		
Dry run		
Machine lock		
Z-axis feed cancel		
Auxiliary function lock		
Graphic display		
Program number search		
	Optional Specification	Original OKK Software
	15" color LCD	Machining support integrated software (including Help guidance, etc.) STD
	Additional one axis control: name of axis(A, B, C, U, V, W) *	Tool support STD
	Additional two axes control: name of axis(A, B, C, U, V, W) *	Program editor STD
	No. of simultaneously controlled axes: 5 axes *	EasyPRO STD
	Least input increment: 0.0001mm / 0.00001"	Work manager OP
	FS15 tape format	HQ control STD
	Unidirectional positioning: G60	Hyper HQ control mode A OP
	Helical interpolation PK1	Hyper HQ control mode B PK2 OP
	Cylindrical interpolation	Hyper HQ value kit (including the items with "PK2") OP
	Hypothetical axis interpolation	NC option package (including the items with "PK1") OP
	Spiral/Conical interpolation	Special canned cycle (including circular cutting) OP
	Smooth interpolation (Hyper HQ control B mode is required)	Cycle mate F OP
	NURBS interpolation (Hyper HQ control B mode is required)	Soft scale IIm STD
	Involute interpolation	Touch sensor T0 software OP
	One-digit F code feed	Tool failure detection system (Soft CCM) OP
	Handle feed 3 axes(Standard pulse handle is removed)	Adaptive control (Soft AC) OP
	Part program storage capacity: 320m [128KB] (250 in total)	Automatic restart at tool damage OP
	Part program storage capacity: 640m [256KB] (500 in total)	
	Part program storage capacity: 1280m [512KB] (1000 in total) PK1	
	Part program storage capacity: 2560m [1MB] (1000 in total)	
	Part program storage capacity: 5120m [2MB] (1000 in total)	
	Part program storage capacity: 10240m [4MB] (1000 in total)	
	Part program storage capacity: 20480m [8MB] (1000 in total)	
	RS232C interface: RS232C-1CH	
	Data server: ATA card (1GB) PK2	
	Data server: ATA card (4GB)	
	Spindle contour control (Cs contour control)	
	Tool position offset	

*F31i-B5 (Windows CE-installed Open CNC) controller is required
STD: Standard OP: Option

FANUC Controller FAI

Standard Specification	Standard Specification	Original OKK Software
No. of controlled axes: 4 axes (X, Y, Z, B)	Optional block skip: /	HQ control STD
No. of simultaneously controlled axes: 3 axes (4 axes for BRT specification)	Addition of optional block skip: 9 in total	Hyper HQ control mode A OP
Least input increment: 0.001mm / 0.0001"	Dry run	Soft scale IIm STD
Max. programmable dimension: ±999999.999mm / ±39370.0787"	Machine lock	Special canned cycle (including circular cutting) OP
Absolute / Incremental command: G90 / G91	Z-axis feed cancel	Touch sensor T0 software OP
Decimal point input / Pocket calculator type decimal point input	Auxiliary function lock	Tool failure detection system (Soft CCM) OP
Inch / Metric conversion: G20 / G21	Graphic display	Adaptive control (Soft AC) OP
Program code: ISO / EIA automatic discriminaton	Program number search	Automatic restart at tool damage OP
Program format: FANUC standard format	Sequence number search	
Nano interpolation(internal)	Program restart	
Positioning: G00	Cycle start	
Linear interpolation: G01	Auto restart	
Circular interpolation: G02 / G03 (CW / CCW), including radius designation	Single block	
Unidirectional positioning: G60	Feed hold	
Helical interpolation	Manual absolute on/off: parameter	
Cylindrical interpolation	Sequence number comparison and stop	
Cutting feed rate: 6.3-digit F-code, direct command	Manual handle interruption	
Dwell: G04	Sub program control	
Manual handle feed: manual pulse generator 1 set (0.001, 0.01, 0.1mm)	Canned cycle: G73, G74, G76, G80 to G89	
Rapid traverse override: 0 / 1 / 10 / 25 / 50 / 100%	Mirror image function: parameter	
Cutting feed rate override: 0 to 200% (every 10%)	Automatic corner override	
Feed rate override cancel: M49 / M48	Exact stop check/mode	
Rigid tapping: G84, G74 (Mode designation: M29)	Programmable data input: G10	
One-digit F code feed	Scaling: G50, G51	
Inverse time feed	Custom macro	
Part program storage capacity: 1280m [512KB]	Interruption type custom macro	
No. of registered programs: 400	Addition of custom macro common variables: 600	
Part program editing	Programmable mirror image	
Background editing	Coordinate system rotation: G68, G69	
Extended part program editing	Optional chamfering / corner R	
10.4" color LCD	Manual guide i (Basic)	
Clock function	Backlash compensation for each rapid traverse and cutting feed	
MDI(Manual Data Input) operation	Memory pitch error compensation	
Run hour and parts count display	Skip function	
Memory card interface	Tool length manual measurement	
Spindle function: 5-digit S-code direct command	Tool life management: 128 sets in total	
Spindle speed override: 50 to 150% (every 5%)	Emergency stop	
Tool function: 4-digit T-code direct command	Data protection key	
ATC tool registration	NC alarm display / alarm history display	
Auxiliary function: 3-digit M-code programming	Machine alarm display	
Multiple M-codes in 1 block: 3 codes (Max. 20 settings)	Stored stroke check 1	
Tool length offset: G43, G44/G49	Stored stroke check 2, 3	
Tool diameter and cutting edge R compensation: G41, G42/G40	Load monitor	
Tool offset sets: 400 sets in total	Self-diagnosis	
Tool offset memory C	Absolute position detection	
Tool position offset		
Manual reference position return		
Automatic reference position return: G28/G29		
2nd reference position return: G30		
Reference position return check: G27		
Automatic coordinate system setting		
Coordinate system setting: G92		
Machine coordinate system: G53		
Workpiece coordinate system: G54 to G59		
Local coordinate system: G52		
Addition of workpiece coordinate system (48 sets in total): G54.1 P1 to P48		
Program stop: M00		
Optional stop: M01		
	Optional Specification	
	Additional one axis control: name of axis (A, C, U, V, W) (No. of simultaneously controlled axes: 4 axes)	
	Additional two axes control: name of axis (A, C, U, V, W) (No. of simultaneously controlled axes: 4 axes)	
	FS11 tape format	
	Part program storage capacity: 5120m [2MB] (400 in total)	
	Data server: ATA card (1GB)	
	Spindle contour control (Cs contour control)	
	Manual guide i (Milling cycle)	
	High-speed skip	
	RS232C interface: RS232C-1CH	

STD: Standard OP: Option

Standard Specifications

Item		HM400/40	HM500S/40	HM400/50	HM500S/50
Travel on X axis (Column: right/left)	mm	630 (24.80")			
Travel on Y axis (Spindle head: up/down)	mm	620 (24.41")			
Travel on Z axis (Table: back/forth)	mm	710 (27.95")			
Distance from table top surface to spindle center	mm				
Distance from table center to spindle nose	mm	80-700 (3.15"-27.55")	50-670 (1.97"-26.38")	80-700 (3.15"-27.55")	50-670 (1.97"-26.38")
Pallet work surface area	mm				
Max. weight loadable on pallet	kg	□ 400 (15.75")	□ 500 (19.69")	□ 450 (17.72")	□ 500 (19.69")
Pallet top surface configuration		25xM16tap			
Minimum indexable angle of table	deg	BRT 0.001 / IT[Opt] 1**			
Table index time (for indexing 90 degrees)	sec	BRT 0.5 / IT[Opt] 1.9			
Spindle speed	min ⁻¹	35-10,000		35-12,000	
Number of spindle speed change steps		Electric 2-step speed change (MS)			
Spindle inner taper		7/24 taper, No.40		7/24 taper, No.50	
Spindle bearing inner diameter	mm	ø80 (3.15")		ø100 (3.94")	
Rapid traverse rate	m/min	54 (2,126 ipm)			
Cutting feed rate	mm/min	1-40,000 (0.04-1574 ipm)*2			
Type of tool shank		JIS B 6339 BT40		JIS B 6339 BT50	
Type of pull stud		MAS403 P40T-1 (MASI)		OKK only 90°	
Tool storage capacity	tool	40*3			
Maximum tool diameter	mm	ø82 (3.23") / ø160 (6.30") without tool in adjacent pot		ø115 (4.53") / ø250 (9.84") without tool in adjacent pot	
Maximum tool length (from the gauge line)	mm	400 (15.75")			
Maximum tool weight	kg	12 (26 lbs) with slow ATC cycle		25 (55 lbs) with slow ATC cycle	
Maximum tool moment	N·m	9.8 (7.2 ft·lbs)		29.4 (21.7 ft·lbs)	
Tool selection method		Address fixed random system			
Tool change time (cut-to-cut)	sec	3.3		4.2	
Pallet change method		Direct turn			
Pallet change time (JIS evaluation time)	sec	9.5			
Spindle motor	AC, kW	FANUC 37 (50HP)/26 (35HP) / 22 (30HP) (25%ED/30min/cont. rating)		FANUC 30 (40HP) / 25 (34HP) (30min/cont. rating)	
Feed motor (X,Y,Z,B)	kW	FANUC 5.5 (7.4HP) / 5.5 (7.4HP) / 4.5 (6.0HP) /BRT: 4.5 (6.0HP) (IT[Opt]: 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 (0.5HP)			
Coolant pump motor	kW	50Hz: 0.7 (0.9HP) 60Hz: 1.2 (1.6HP)			
Power supply AC200V±10% 50/60±1Hz AC220V±10% 60±1Hz [†]	kVA	FANUC 56		FANUC 62	
Compressed air supply	MPa, ℓ/min [ANR]	0.4-0.6*3, 500*5(58-87 psi, 132 gal/min)			
Hydraulic unit tank capacity	ℓ	20 (5.3 gal)			
Spindle and feed system cooling oil tank capacity	ℓ	20 (5.3gal)			
Coolant tank capacity	ℓ	480 (127 gal)			
Machine height	mm	2844 (111.97")		2970 (116.93")	
Required floor space	mm	Refer to the floor space drawing.			
Machine weight	kg	12,000 (26,455 lbs)	12,200 (26,896 lbs)	12,500 (27,557 lbs)	12,700 (27,998 lbs)
Operating environment temperature	°C	5-40			

*1 BRT: Built-in rotary table minimum indexing 0.001° IT: Index table minimum indexing 1°

*2 Available under the HQ or hyper HQ control.

*3 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.

*4 When the supply voltage is 220VAC, the supply frequency of 60Hz only is applicable.

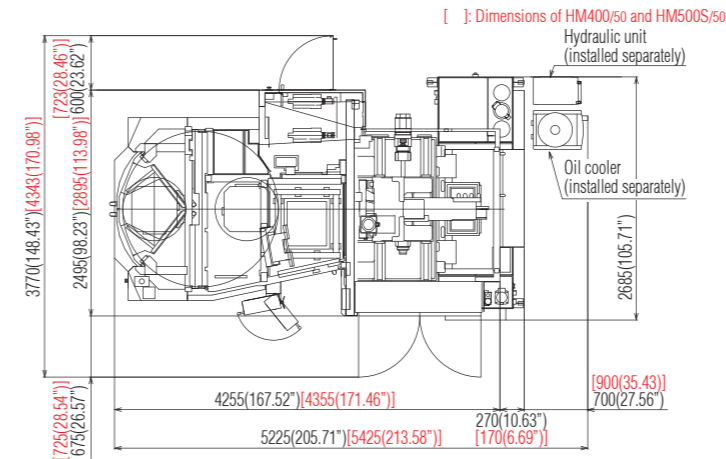
*5 Purity of compressed air should be class 3.5.4 or higher class of ISO 8573-1/JIS B8392-1 standard.

*6 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 supply requirement.

Machine Dimensions

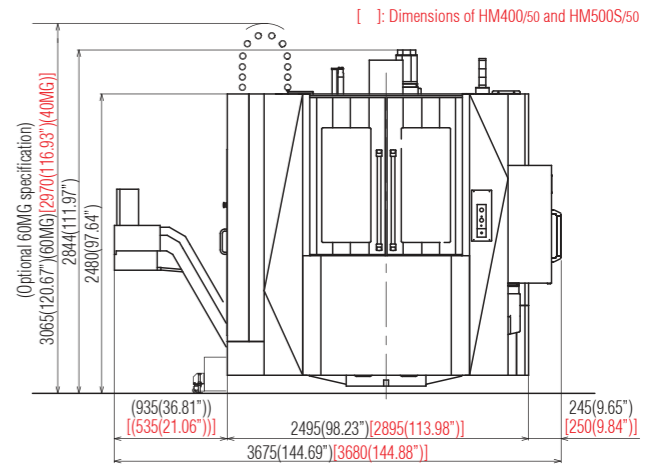
mm(in)

Floor Space

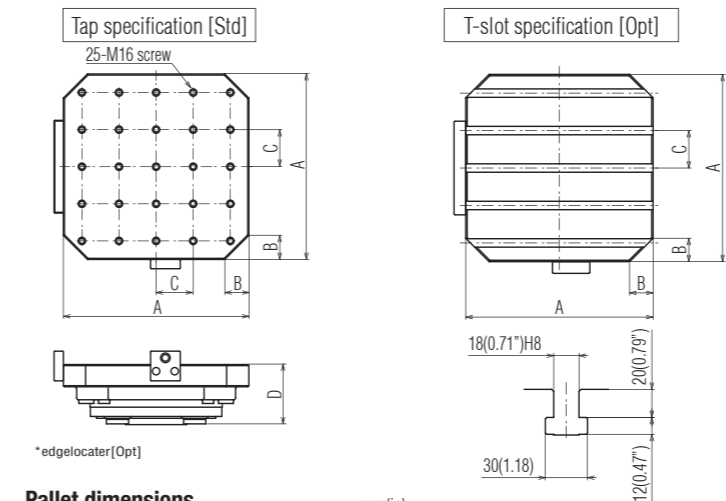


Front View

Lift up chip conveyor [Opt]

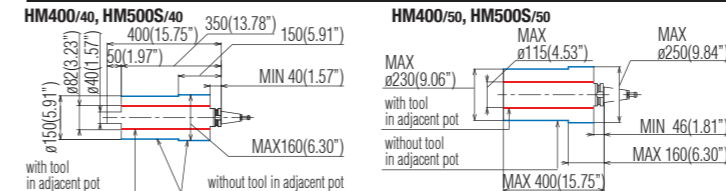


Pallet Dimensions



Pallet dimensions	mm(in)			
	A	B	C	D
HM400	400(15.8")	50(1.97")	80(3.15")	130(5.12")
HM500S	500(19.7")	65(2.56")	100(3.94")	160(6.30")
HM400(T-slot)	400(15.8")	50(1.97")	80(3.15")	160(6.30")
HM500S(T-slot)	500(19.7")	65(2.56")	100(3.94")	190(7.48")

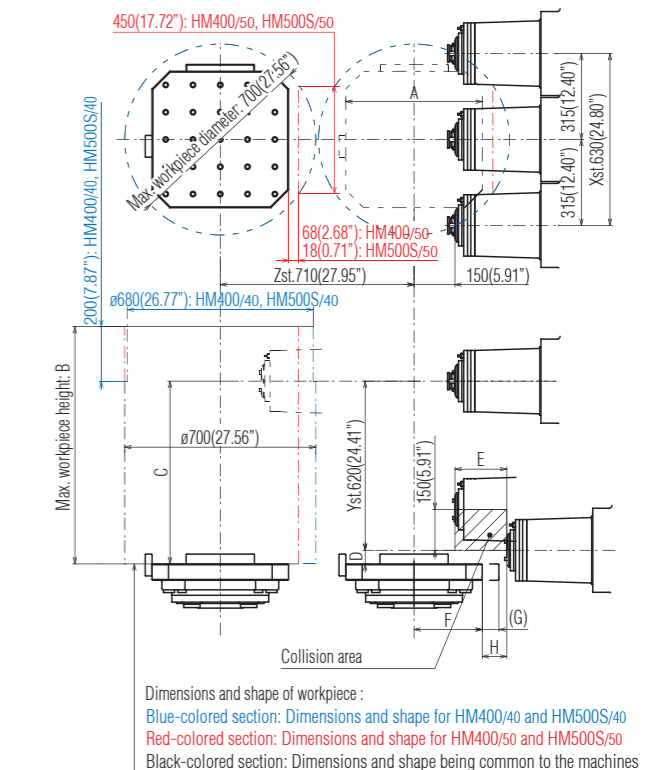
Restriction on Tool



XYZ axis travel diagrams

	mm(in)							
	A	B	C	D	E	F	G	H
HM400	400(15.75")	900(35.43")	700(27.56")	80(3.15")	160(6.30")	200(7.87")	50(1.97")	110(4.33")
HM500S	500(19.69")	870(34.25")	670(26.38")	50(1.97")	190(7.48")	250(9.84")	61(2.40")	90(3.54")
HM400(T-slot)	400(15.75")	870(34.25")	670(26.38")	50(1.97")	160(6.30")	200(7.87")	50(1.97")	110(4.33")
HM500S(T-slot)	500(19.69")	840(33.07")	640(25.20")	20(0.79")	190(7.48")	250(9.84")	61(2.40")	90(3.54")

XYZ axes travel diagrams



Standard Specifications

Item		HM5000	HM6300S
Travel on X axis (Column: right/left)	mm	800 (31.50")	
Travel on Y axis (Spindle head: up/down)	mm	750 (29.53")	
Travel on Z axis (Table: back/forth)	mm	880 (34.65")	
Distance from table top surface to spindle center	mm	80-830 (3.15"-32.68")	50-800 (1.96"-31.50")
Distance from table center to spindle nose	mm	70-950 (2.76"-37.40")	
Pallet work surface area	mm	□500 (19.69")	□630 (24.80")
Max. weight loadable on pallet	kg	(Uniform load) 800 (1763 lbs)	(Uniform load) 700 (1543 lbs)
Pallet top surface configuration		24×M16tap	
Minimum indexable angle of table	°	BRT 0.001 / IT [Opt] 1° ¹	
Table index time (for indexing 90 degrees)	sec	BRT 0.5 / IT [Opt] 1.7	
Spindle speed	min ⁻¹	35-12,000	
Number of spindle speed change steps		Electric 2-step speed change (MS)	
Spindle inner taper		7/24 taper, No.50	
Spindle bearing inner diameter	mm	ø100 (3.94")	
Rapid traverse rate	m/min	60 (2,362 ipm)	
Cutting feed rate	mm/min	1-40,000 (0.04-1574 ipm) ²	
Type of tool shank		JIS B 6339 BT50	
Type of pull stud		OKK only 90°	
Tool storage capacity	tool	40 ³	
Maximum tool diameter	mm	ø115 (4.53") / ø270 (10.63") without tool in adjacent pots	
Maximum tool length (from the gauge line)	mm	500 (19.69")	
Maximum tool weight	kg	25 (55 lbs)	
Maximum tool moment	N·m	29.4 (21.68 ft·lbs)	
Tool selection method		Address fixed random system	
Tool change time (cut-to-cut)	sec	4.3	
Pallet change method		Direct turn	
Pallet change time (JIS evaluation time)	sec	12	
Spindle motor (30min/cont. rating)	AC, kW	FANUC 30 (40HP) / 25 (34HP)	
Motor for ATC (Automatic Tool Changer)	kW	0.75 (1HP)	
Feed motor (X,Y,Z,B)	kW	FANUC 5.5 (7.4HP) / 5.5 (7.4HP) / 5.5 (7.4HP) / BRT: 4.5 (6.0HP) (IT[Opt]: 1.6 (2.1HP))	
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 (0.5HP)	
Coolant pump motor	kW	50Hz: 0.7 (0.9HP) 60Hz: 1.2 (1.6HP)	
Power supply AC200V±10% 50/60±1Hz AC220V±10% 60±1Hz ⁴	kVA	FANUC 59	
Compressed air supply	MPa, ℓ/min [ANR]	0.4-0.6 ⁵ , 500 ⁶ (58-87 psi, 132 gal/min)	
Hydraulic unit tank capacity	ℓ	20 (5.3 gal)	
Spindle and feed system cooling oil tank capacity	ℓ	20 (5.3gal)	
Magazine lubricating oil tank capacity	ℓ	1 (0.3 gal)	
Coolant tank capacity	ℓ	720 (190 gal) (Option for the lift up type chip conveyor specification)	
Machine height	mm	3,125 (123.03")	
Required floor space	mm	3,945×5,230 (155.31"×205.91") (Option for the lift up type chip conveyor specification)	
Machine weight	kg	14,000 (30,864 lbs)	14,300 (31,525 lbs)
Operating environment temperature	°C	5-40	

¹ BRT: Built-in rotary table minimum indexing 0.001° IT: Index table minimum indexing 1°

² Available under the HQ or hyper HQ control.

³ 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.

⁴ When the supply voltage is 220VAC, the supply frequency of 60Hz only is applicable.

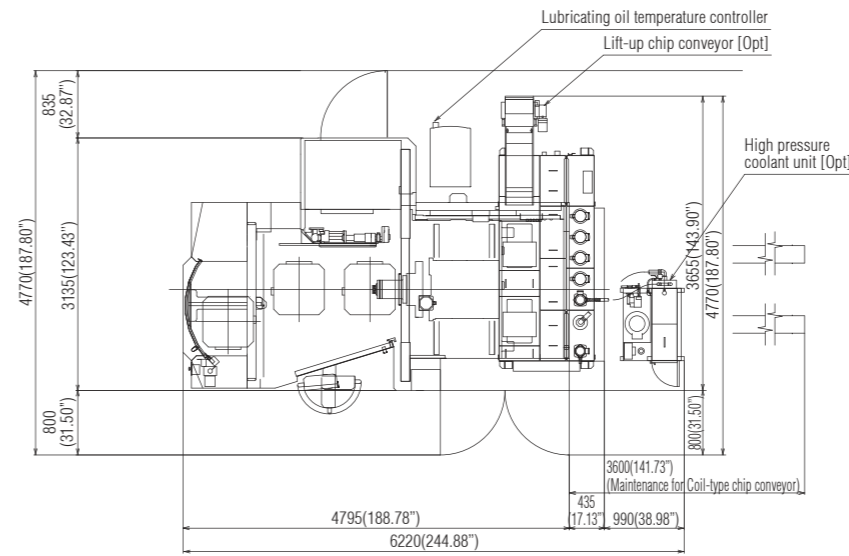
⁵ Purity of compressed air should be class 3.5.4 or higher class of ISO 8573-1/JIS B8392-1 standard.

⁶ 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 supply requirement.

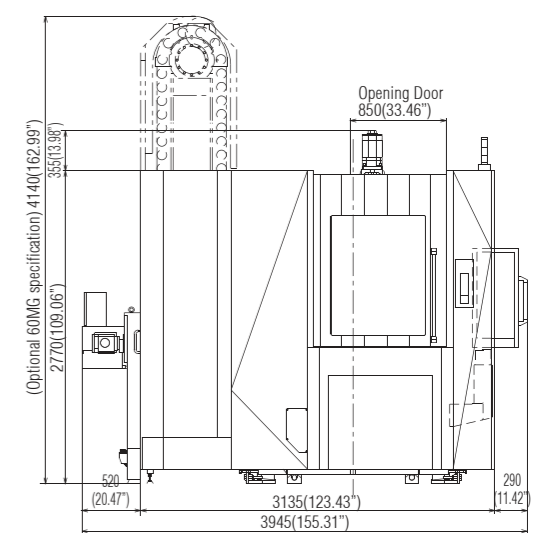
Machine Dimensions

mm(in)

Floor Space

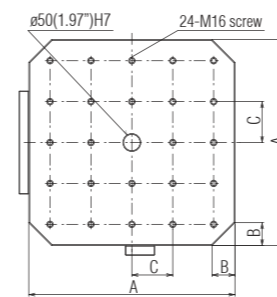


Front View

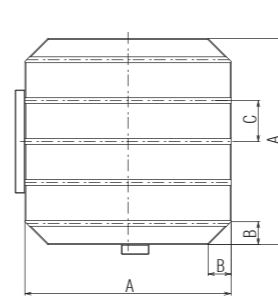


Pallet Dimensions

Tap specification [Std]



T-slot specification [Opt]



Pallet dimensions

	A	B	C	D
HM5000	500(19.69")	60(2.36")	100(3.94")	130(5.12")
HM6300S	630(24.80")	70(2.76")	125(4.92")	160(6.30")

Notes: Tap and T-slot are same dimensions.

XYZ axis travel diagrams

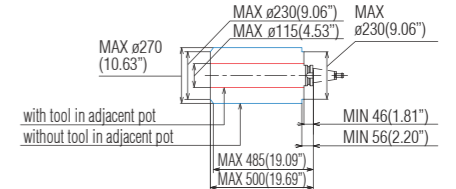
	A	B	C	D	E
HM5000	500(19.69")	1090(42.91")	830(32.68")	80(3.15")	271(10.67") ¹
HM6300S	630(24.8")	1060(41.73")	800(31.5")	50(1.97")	336(13.23") ²

¹ At B-axis rotated 0°/90°/180°/270°: 250mm (9.84").

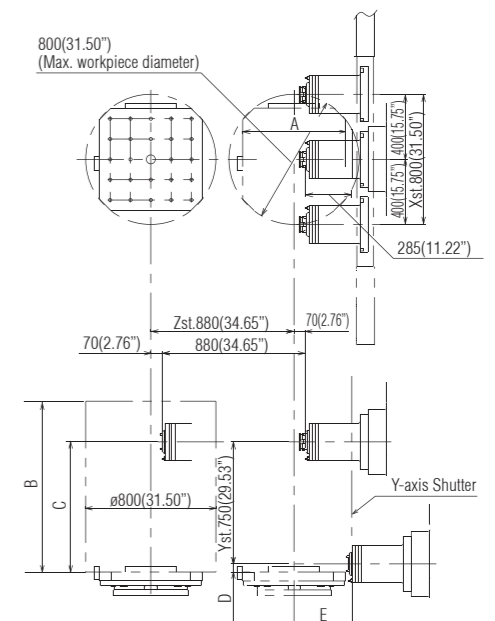
² At B-axis rotated 0°/90°/180°/270°: 315mm (12.40").

Notes: Tap and T-slot are same dimensions.

Restriction on Tool



XYZ axes travel diagrams



Standard Specifications

Item		HM630	HM800S
Travel on X axis (Column: right/left)	mm	1050 (41.34")	
Travel on Y axis (Spindle head: up/down)	mm	900 (35.43")	
Travel on Z axis (Table: back/forth)	mm	900 (35.43")	880 (34.65")
Distance from pallet top surface to spindle center	mm	80-980 (3.15"-38.58")	60-960 (2.36"-37.80")
Distance from pallet center to spindle nose	mm	200-1100 (7.87"-43.31")	220-1100 (8.66"-43.31")
Pallet work surface area	mm	□ 630 (24.80")	□ 800 (31.50")
Max. weight loadable on pallet	kg	(Uniform load) 1300 (2866 lbs)	(Uniform load) 1200 (2645 lbs)
Pallet top surface configuration		24xM16 tap	
Minimum indexable angle of table	°	BRT 0.001 / IT [Opt] 1°*	
Table index time (for indexing 90 degrees)	sec	BRT 0.6 / IT [Opt] 1.7	
Spindle speed	min ⁻¹	35-12,000	
Number of spindle speed change steps		Electric 2-step speed change (MS)	
Spindle inner taper		7/24 taper, No.50	
Spindle bearing inner diameter	mm	ø100 (3.94")	
Rapid traverse rate	m/min	54 (2,126 ipm)	
Cutting feed rate	mm/min	1-40,000 (0.04-1574 ipm)*2	
Type of tool shank		JIS B 6339 BT50	
Type of pull stud		OKK only 90°	
Tool storage capacity	tool	40*3	
Maximum tool diameter	mm	ø115 (4.53") / ø270 (10.63") without tool in adjacent pots	
Maximum tool length (from the gauge line)	mm	500 (19.69")	
Maximum tool weight	kg	25 (55 lbs)	
Maximum tool moment		29.4 (21.7 ft · lbs)	
Tool selection method		Address fixed random system	
Tool change time (cut-to-cut)	sec	4.4	
Pallet change method		Direct turn	
Pallet change time (JIS evaluation time)	sec	15.0	
spindle motor (25%ED/30min/cont. rating)	AC, kW	FANUC 45 (60HP) / 30 (40HP) / 26 (35HP)	
Motor for tool clamp/unclamp unit	kW	0.75 (1.0HP)	
Feed motor (X, Y, Z, B)	kW	FANUC 5.5 (7.4HP) / 5.5 (7.4HP) / 5.5 (7.4HP) / BRT: 4.5 (6.0HP) (IT[Opt]: 2.7 (3.6HP))	
Hydraulic pump motor	kW	1.5 (2.0HP)	
Motor of oil cooler for spindle and feed system (compression/discharge)	kW	1.7(2.3 HP) / 0.75 (1.0 HP)	
Coolant pump motor	kW	50Hz: 0.7 (0.9HP) 60Hz: 1.2 (1.6HP)	
Motor for APC unit	kW	0.75 (1.0 HP)	
Power supply 200VAC ±10% 50/60 ±1Hz 220VAC ±10% 60 ±1Hz*	kVA	FANUC 65	
Compressed air supply	MPa, ℓ/min [ANR]	0.4~0.6*5, 500*6 (58~87 psi, 132 gal/min)	
Hydraulic unit tank capacity	ℓ	20 (5.3 gal)	
Spindle and feed system cooling oil tank capacity	ℓ	70 (18.5 gal)	
Magazine lubricating oil tank capacity	ℓ	1 (0.3 gal)	
Coolant tank capacity	ℓ	400 (106 gal)	
Machine height	mm	3,430 (135.04")	
Required floor space	mm	3,420x5,450 (134.65"x214.57")	
Machine weight	kg	18,000 (39700 lbs)	18,500 (40800 lbs)
Operating environment temperature	°C	5-40	

*1 BRT: Built-in rotary table minimum indexing 0.001° IT: Index table minimum indexing 1°

*2 Available under the HQ or hyper HQ control.

*3 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.

*4 When the supply voltage is 220VAC, the supply frequency of 60Hz only is applicable.

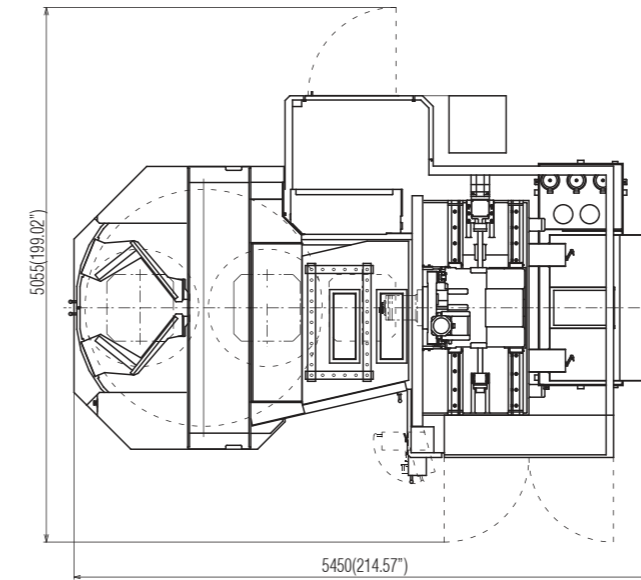
*5 Purity of compressed air should be class 3.5.4 or higher class of ISO 8573-1/JIS B8392-1 standard.

*6 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 supply requirement.

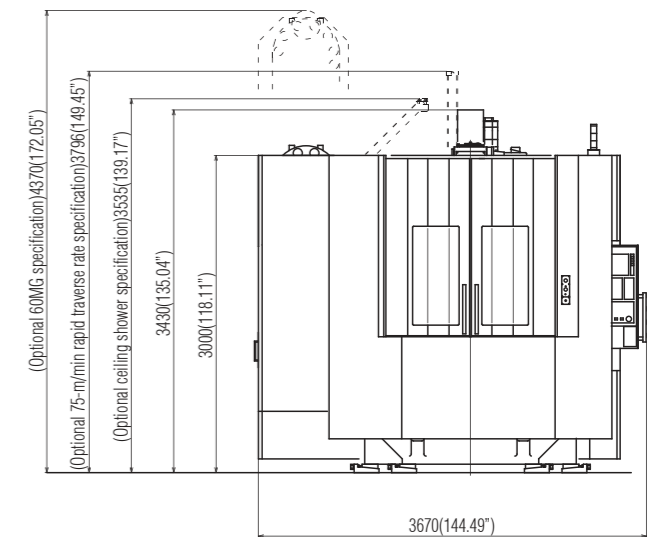
Dimensions

mm(in)

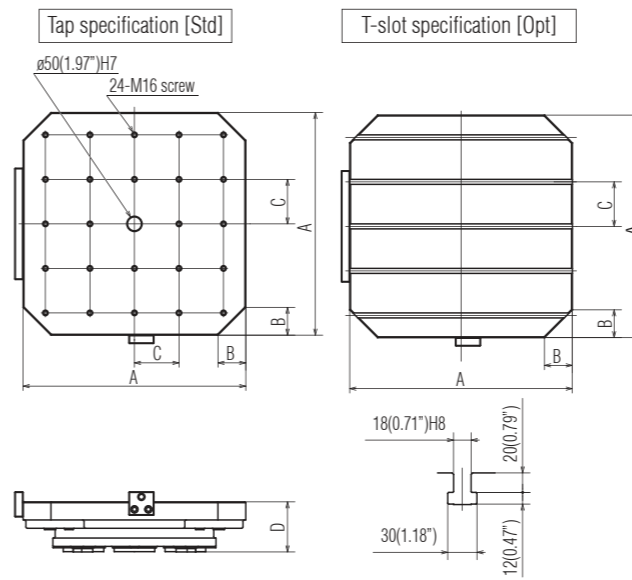
Floor Space



Front View



Pallet Dimensions

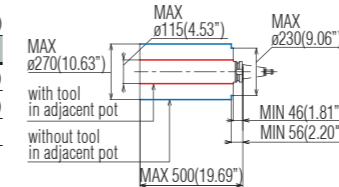


Restriction on Tool

Pallet dimensions

	A	B	C	D
HM630	630(24.8")	70(2.76")	125(4.92)	160(6.30")
HM800S	800(31.5")	100(3.94")	160(6.30")	180(7.09")
HM800S(T-slot)	800(31.50")	100(3.94")	160(6.30")	200(7.87")

HM630: Tap and T-slot are same dimensions.



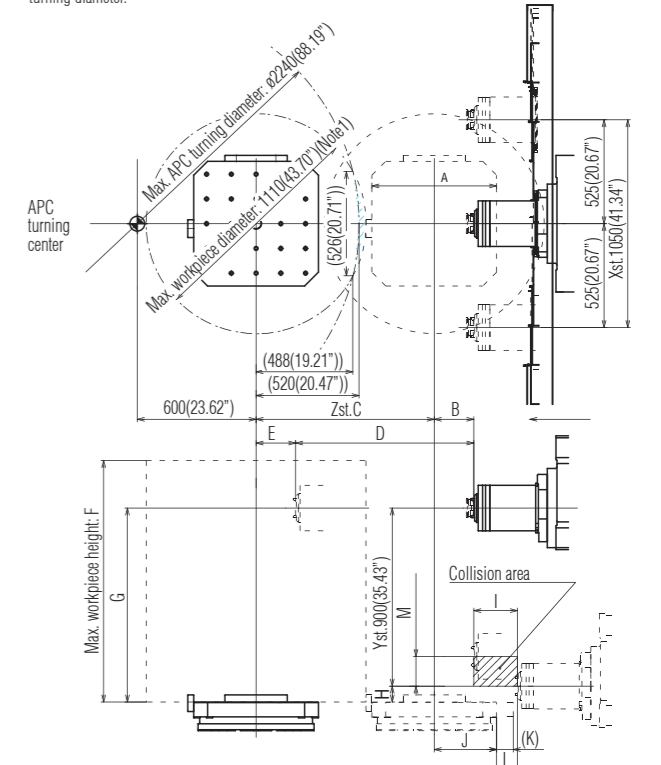
XYZ axis travel diagrams

	A	B	C	D	E	F	G	H	I	J	K	L	M
HM630	630(24.8")	200(7.87")	900(35.43")	900(35.43")	200(7.87")	1220(48.03")	980(38.58")	80(3.15")	220(8.66")	315(12.4")	84(3.31")	105(4.13")	150(5.91")
HM800S	800(31.5")	220(8.66")	880(34.65")	880(34.65")	220(8.66")	1200(47.24")	960(37.80")	60(2.36")	300(11.81")	400(15.75")	100(3.94")	120(4.72")	150(5.91")
HM800S(T-slot)	800(31.50")	220(8.66")	880(34.65")	880(34.65")	220(8.66")	1180(46.46")	940(37.01")	40(1.57")	300(11.81")	400(15.75")	100(3.94")	120(4.72")	170(6.69")

HM630: Tap and T-slot are same dimensions.

XYZ axes travel diagrams

(Note 1) For executing the APC operation, the loaded workpiece must not exceed the specified maximum APC turning diameter.



Standard Specifications

Item		HM800	HM1000S
Travel on X axis (Column: right/left)	mm	1400 (55.12")	
Travel on Y axis (Spindle head: up/down)	mm	1100 (43.31")	
Travel on Z axis (Table: back/forth)	mm	1050 (41.34")	1000 (39.37")
Distance from pallet top surface to spindle center	mm	60-1160 (2.36"-45.67")	30-1130 (1.18"-44.49")
Distance from pallet center to spindle nose	mm	200-1250 (7.87"-49.21")	250-1250 (9.84"-49.21")
Pallet work surface area	mm	□ 800 (31.50")	□ 1000 (39.37")
Max. weight loadable on pallet	kg	(Uniform load) 2000 (4400 lbs)	(Uniform load) 2500 (5500 lbs)
Pallet top surface configuration		24xM16 tap	
Minimum indexable angle of table	°	IT 1/ BRT [Opt] 0.001**1	
Table index time (for indexing 90 degrees)	sec	IT 4.5 / BRT [Opt] 1.2	IT 5.5 / BRT [Opt] 1.2
Spindle speed	min ⁻¹	35-8,000	
Number of spindle speed change steps		Electric 2-step speed change (MS)	
Spindle inner taper		7/24 taper, No.50	
Spindle bearing inner diameter	mm	ø100 (3.94")	
Rapid traverse rate	m/min	48 (1,889 ipm)	
Cutting feed rate	mm/min	1-40,000 (0.04-1574 ipm)*2	
Type of tool shank		JIS B 6339 BT50	
Type of pull stud		OKK only 90°	
Tool storage capacity	tool	40*3	
Maximum tool diameter	mm	ø115 (4.53") / ø270 (10.63") without tool in adjacent pots	
Maximum tool length (from the gauge line)	mm	500 (19.69")	
Maximum tool weight	kg	25 (55 lbs)	
Maximum tool moment		29.4 (21.7 ft · lbs)	
Tool selection method		Address fixed random system	
Tool change time (cut-to-cut)	sec	5.8	
Pallet change method		Direct turn	
Pallet change time (JIS evaluation time)	sec	19.0	21.0
spindle motor (30min/cont. rating)	AC, kW	FANUC 30 (40HP) / 25 (34HP)	
Motor for tool clamp/unclamp unit	kW	0.75 (1.0HP)	
Feed motor (X, Y, Z, B)	kW	FANUC 5.5 (7.4HP) / 9.0 (12.1HP) / 6.0 (8.0HP) / IT: 2.7 (3.6HP) (BRT[Opt]: 4.5 (6.0HP))	
Hydraulic pump motor	kW	1.5 (2.0HP)	
Motor of oil cooler for spindle and feed system (compression/discharge)	kW	1.7 (2.3HP) / 0.75 (1.0HP)	
Coolant pump motor	kW	50Hz: 0.7 (0.9HP) 60Hz: 1.2 (1.6HP)	
Motor for APC unit	kW	0.75 (1.0HP)	
Power supply 200VAC ±10% 50/60 ±1Hz 220VAC ±10% 60 ±1Hz*	kVA	FANUC 61	
Compressed air supply	Pa, ℓ/min [ANR]	0.4-0.6*5, 500*6 (58-87 psi, 132 gal/min)	
Hydraulic unit tank capacity	ℓ	20 (5.3 gal)	
Spindle and feed system cooling oil tank capacity	ℓ	72 (19 gal)	
Magazine lubricating oil tank capacity	ℓ	1 (0.3 gal)	
Coolant tank capacity	ℓ	800 (211 gal)	
Machine height	mm	4,000 (157.48")	
Required floor space	mm	3,682x6,395 (144.96"x251.77")	
Machine weight	kg	24,500 (54,000 lbs)	25,000 (55,000 lbs)
Operating environment temperature		5~40	

*1 BRT: Built-in rotary table minimum indexing 0.001° IT: Index table minimum indexing 1°

*2 Available under the HQ or hyper HQ control.

*3 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.

*4 When the supply voltage is 220VAC, the supply frequency of 60Hz only is applicable.

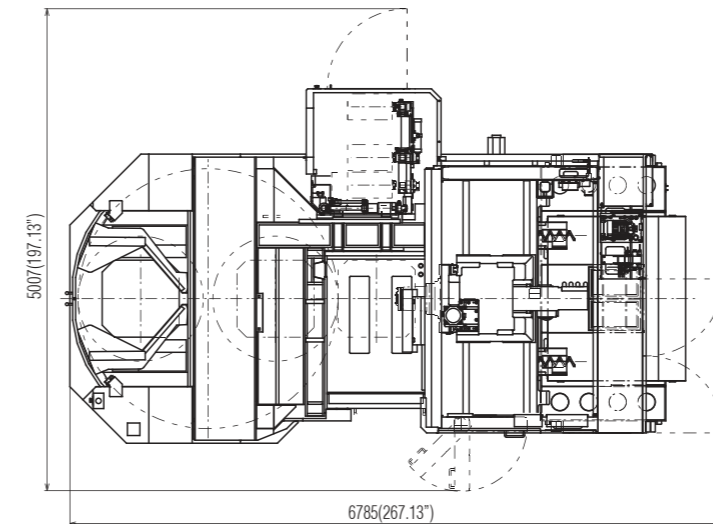
*5 Purity of compressed air should be class 3.5.4 or higher class of ISO 8573-1/JIS B8392-1 standard.

*6 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 supply requirement.

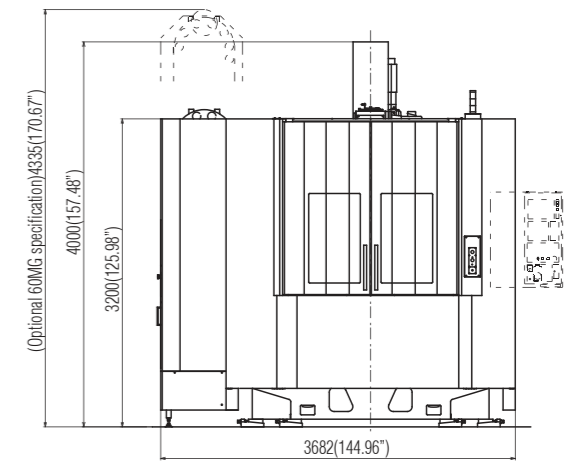
Dimensions

mm(in)

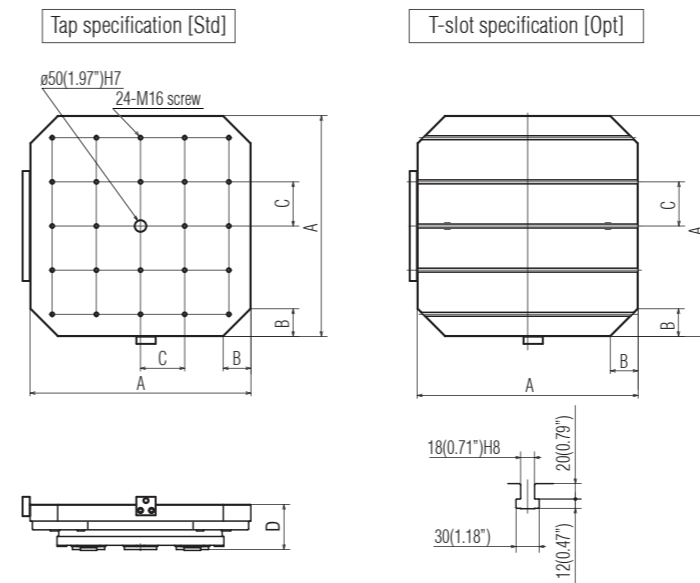
Floor Space



Front View

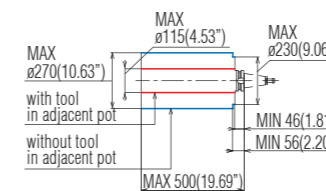


Pallet Dimensions



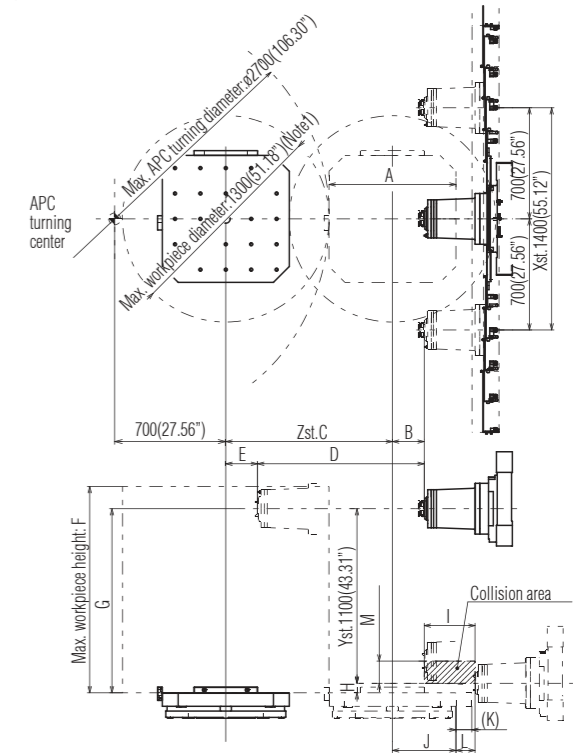
	A	B	C	D
HM800	800(31.5")	100(3.94")	160(6.30")	174(6.85")
HM1000S	1000(39.37")	125(4.92")	200(7.87")	204(8.03")
HM800(T-slot)	800(31.5")	100(3.94")	160(6.30")	204(8.03")
HM1000S(T-slot)	1000(39.37")	125(4.92")	200(7.87")	214(8.43")

Restriction on Tool



XYZ axes travel diagrams

(Note1)
For executing the APC operation, the loaded workpiece must not exceed the specified maximum APC turning diameter.



XYZ axis travel diagrams

	A	B	C	D	E	F	G	H	I	J	K	L	M
HM800	800(31.5")	200(7.87")	1050(41.34")	1050(41.34")	200(7.87")	1300(51.18")	1160(45.67")	60(2.36")	320(12.6")	400(15.75")	100(3.94")	120(4.72")	140(5.51")
HM1000S	1000(39.37")	250(9.84")	1000(39.37")	1000(39.37")	250(9.84")	1270(50.00")	1130(44.49")	30(1.18")	400(15.75")	500(19.69")	125(4.92")	150(5.91")	140(5.51")
HM800(T-slot)	800(31.5")	200(7.87")	1050(41.34")	1050(41.34")	200(7.87")	1270(50.00")	1130(44.49")	30(1.18")	320(12.6")	400(15.75")	100(3.94")	120(4.72")	140(5.51")
HM1000S(T-slot)	1000(39.37")	250(9.84")	1000(39.37")	1000(39.37")	250(9.84")	1260(49.61")	1120(44.09")	20(0.79")	400(15.75")	500(19.69")	125(4.92")	150(5.91")	150(5.91")

Standard Specifications

Item		HM1000	HM1250S
Travel on X axis (Column: right/left)	mm	1700 (66.93")	
Travel on Y axis (Spindle head: up/down)	mm	1400 (55.12")	
Travel on Z axis (Table: back/forth)	mm	1400 (55.12")	1240 (48.82")
Distance from pallet top surface to spindle center	mm	100-1500 (3.94"-59.06")	70-1470 (2.76"-57.87")
Distance from pallet center to spindle nose	mm	200-1600 (7.87"-62.99")	360-1600 (14.17"-62.99")
Pallet work surface area	mm	□1000 (39.37")	□1250 (49.21")
Max. weight loadable on pallet	kg	(Uniform load) 3000 (6600 lbs)	
Pallet top surface configuration		24xM16 tap	24xM20 tap
Minimum indexable angle of table	°	IT 1/ BRT [Opt] 0.0001*1	
Table index time (for indexing 90 degrees)	sec	IT 5.0 / BRT [Opt] 1.8	
Spindle speed	min ⁻¹	35-12,000	
Number of spindle speed change steps		Electric 2-step speed change (MS)	
Spindle inner taper		7/24 taper, No.50	
Spindle bearing inner diameter	mm	ø100 (3.94")	
Rapid traverse rate	m/min	48 (1,889 ipm)	
Cutting feed rate	mm/min	1-20,000 (0.04-787 ipm)*2	
Type of tool shank		JIS B 6339 BT50	
Type of pull stud		OKK only 90°	
Tool storage capacity	tool	40*3	
Maximum tool diameter	mm	ø115 (4.53") / ø270 (10.63") without tool in adjacent pots	
Maximum tool length (from the gauge line)	mm	600 (23.62")	
Maximum tool weight	kg	25 (55 lbs)	
Maximum tool moment	N·m	29.4 (21.7 ft·lbs)	
Tool selection method		Address fixed random system	
Tool change time (cut-to-cut)	sec	6.2	
Pallet change method		Direct turn	
Pallet change time (JIS evaluation time)	sec	32.0	35.0
spindle motor (30min/cont. rating)	AC, kW	FANUC 30 (40HP) / 25 (34HP)	
Motor for tool clamp/unclamp unit	kW	0.75 (1.0HP)	
Feed motor (X, Y, Z, B)	kW	FANUC 5.0 (6.7HP) / 5.5x2 (7.4x2HP) / 5.0x2 (6.7x2HP) / IT: 3.0 (4.0HP) (BRT[Opt]: 5.5 (7.4HP))	
Hydraulic pump motor	kW	2.2 (3.0HP)	
Motor of oil cooler for spindle and feed system (compression/discharge)	kW	1.7 (2.3HP) / 0.75x2 (1.0x2HP)	
Coolant pump motor	kW	50Hz: 0.7 (0.9HP) 60Hz: 1.2 (1.6HP)	
Motor for APC unit	kW	FANUC: 1.2 (1.6HP)	
Power supply 200VAC ±10% 50/60 ±1Hz 220VAC ±10% 60 ±1Hz*4	kVA	FANUC 72	
Compressed air supply	MPa, ℓ/min [ANR]	0.4-0.6*5, 500*6 (58-87 psi, 132 gal/min)	
Hydraulic unit tank capacity	ℓ	20 (5.3 gal)	
Spindle and feed system cooling oil tank capacity	ℓ	70x2 (18.5x2 gal)	
Magazine lubricating oil tank capacity	ℓ	4 (1.1 gal)	
Coolant tank capacity	ℓ	800 (211 gal)	
Machine height	mm	3,717 (146.34")	
Required floor space	mm	5,530x8,195 (217.72"x322.64")	
Machine weight	kg	31,000 (68,400 lbs)	32,500 (72,000 lbs)
Operating environment temperature	°C	5-40	

*1 BRT: Built-in rotary table minimum indexing 0.001° IT: Index table minimum indexing 1°

*2 Available under the HQ or hyper HQ control.

*3 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.

*4 When the supply voltage is 220VAC, the supply frequency of 60Hz only is applicable.

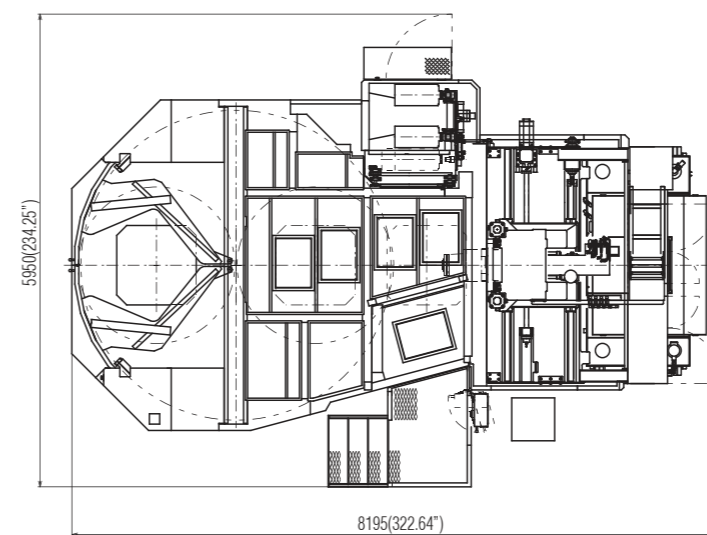
*5 Purity of compressed air should be class 3.5.4 or higher class of ISO 8573-1/JIS B8392-1 standard.

*6 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 supply requirement.

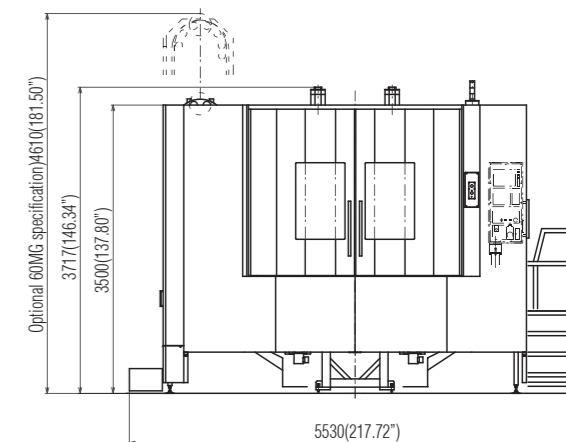
Dimensions

mm(in)

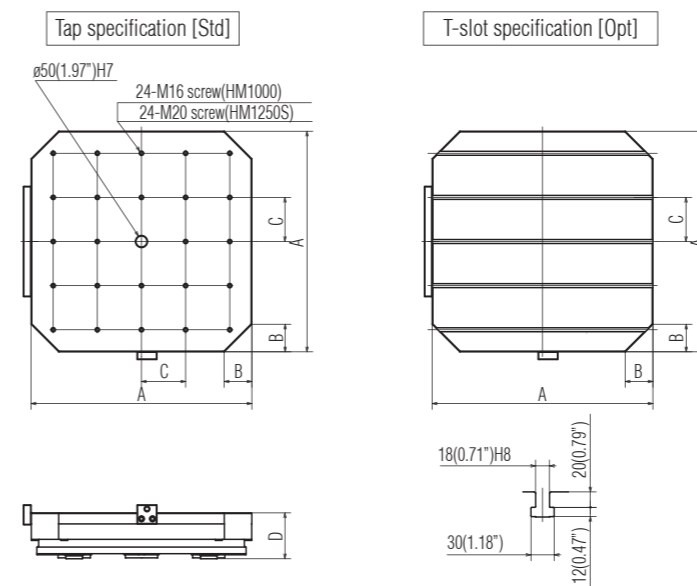
Floor Space



Front View



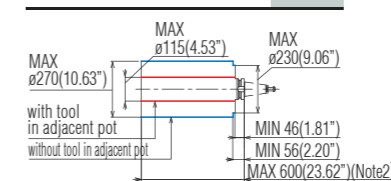
Pallet Dimensions



Pallet dimensions

	A	B	C	D
HM1000	1000 (39.37")	125 (4.92")	200 (7.87")	208 (8.19")
HM1000(T-slot)	1000 (39.37")	125 (4.92")	200 (7.87")	238 (9.37")
HM1250S	1250 (49.21")	125 (4.92")	250 (9.84")	238 (9.37")
HM1250S(T-slot)	1250 (49.21")	125 (4.92")	250 (9.84")	258 (10.16")

Restriction on Tool



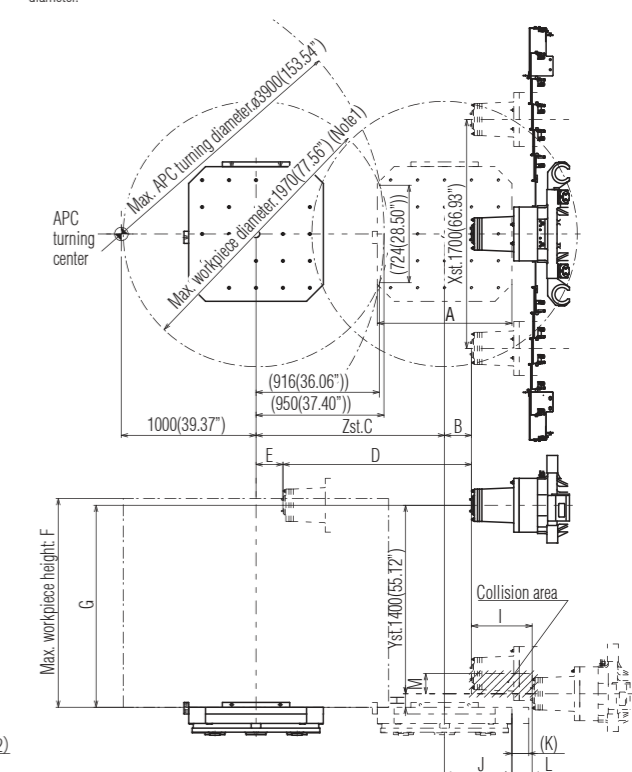
(Note2) When three or more multiple magazines, 600mm (23.62") length tools are usable in the first and second magazines only. In the 3rd or the following magazines, the maximum tool length shall be limited to 500mm (19.69")

XYZ axis travel diagrams

	A	B	C	D	E	F	G	H	I	J	K	L	M
HM1000	1000 (39.37")	200 (7.87")	1400 (55.12")	1400 (55.12")	200 (7.87")	1550 (61.02")	1500 (59.06")	100 (3.94")	450 (17.72")	500 (19.69")	125 (4.92")	150 (5.91")	150 (5.91")
HM1000(T-slot)	1000 (39.37")	200 (7.87")	1400 (55.12")	1400 (55.12")	200 (7.87")	1520 (59.84")	1470 (57.87")	70 (2.76")	450 (17.72")	500 (19.69")	125 (4.92")	150 (5.91")	180 (7.09")
HM1250S	1250 (49.21")	360 (14.17")	1240 (48.82")	1240 (48.82")	360 (14.17")	1520 (59.84")	1470 (57.87")	70 (2.76")	470 (18.50")	625 (24.61")	175.4 (6.91")	205 (8.07")	180 (7.09")
HM1250S(T-slot)	1250 (49.21")	360 (14.17")	1240 (48.82")	1240 (48.82")	360 (14.17")	1500 (59.06")	1450 (57.09")	50 (1.97")	470 (18.50")	625 (24.61")	175.4 (6.91")	205 (8.07")	180 (7.09")

XYZ axes travel diagrams

(Note1) For executing the APC operation, the loaded workpiece must not exceed the specified maximum APC turning diameter.



mm(in)