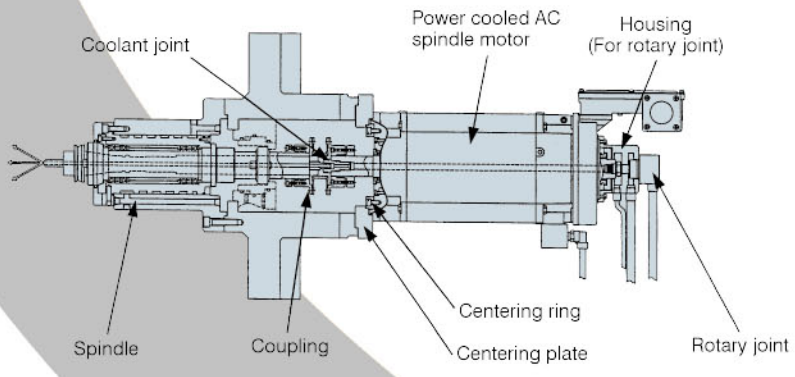
JOHNFORD®

Horizontal Machining Centers

HMC-500/500H/630/630H

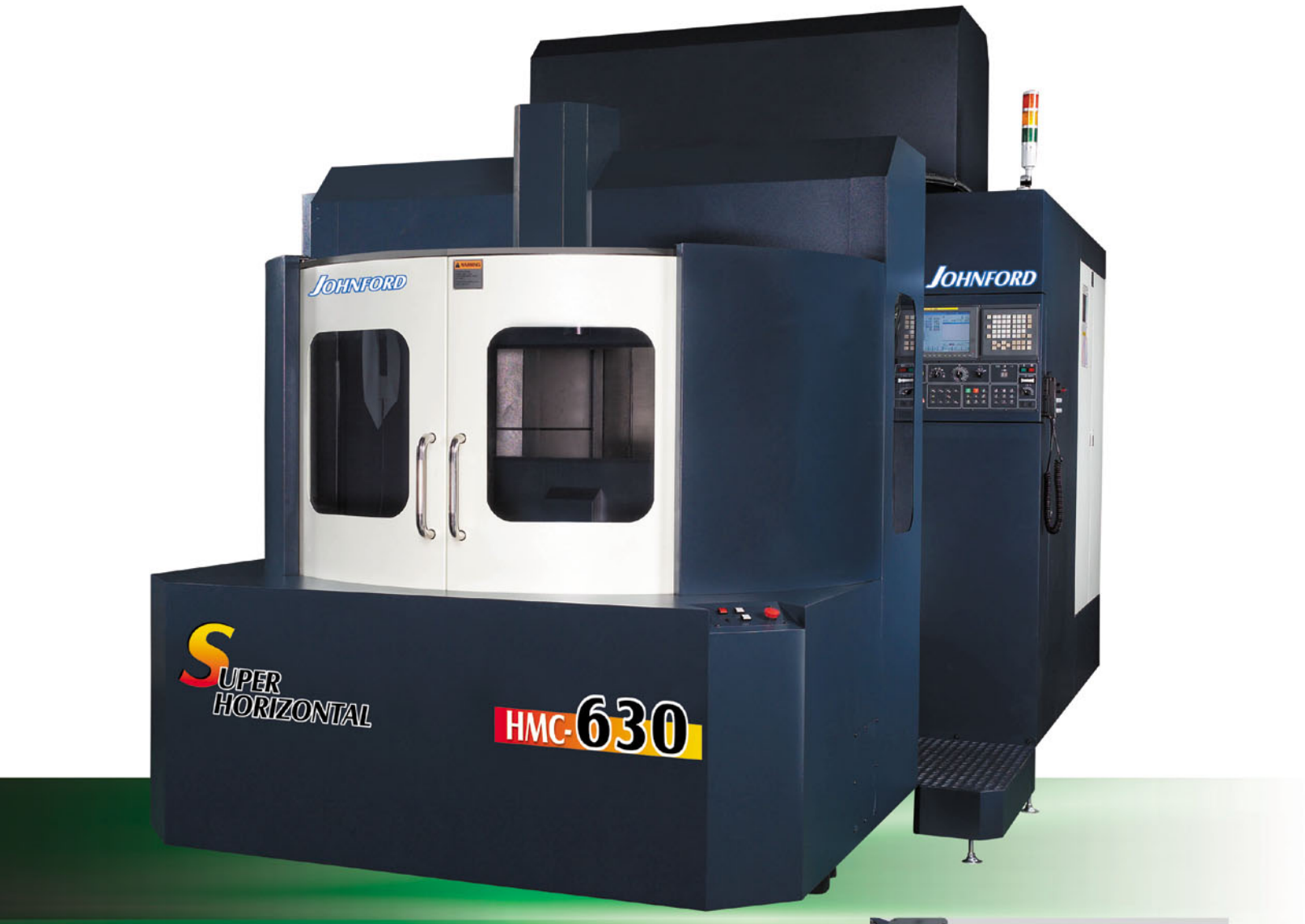
Horizontal Machining Center

HMC-500 / 500H / 630 / 630H

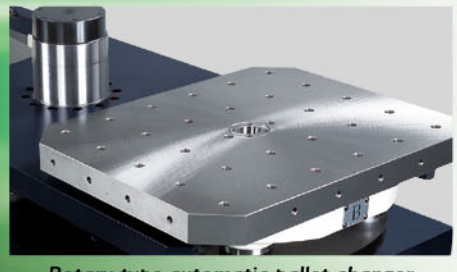


Direct Drive Spindle

Spindle through coolant function is available by directly connecting between spindle and motors, so spindle speed can be increased. And also spindle vibration and heat generation can be reduced by eliminating gear and belt in spindle head.



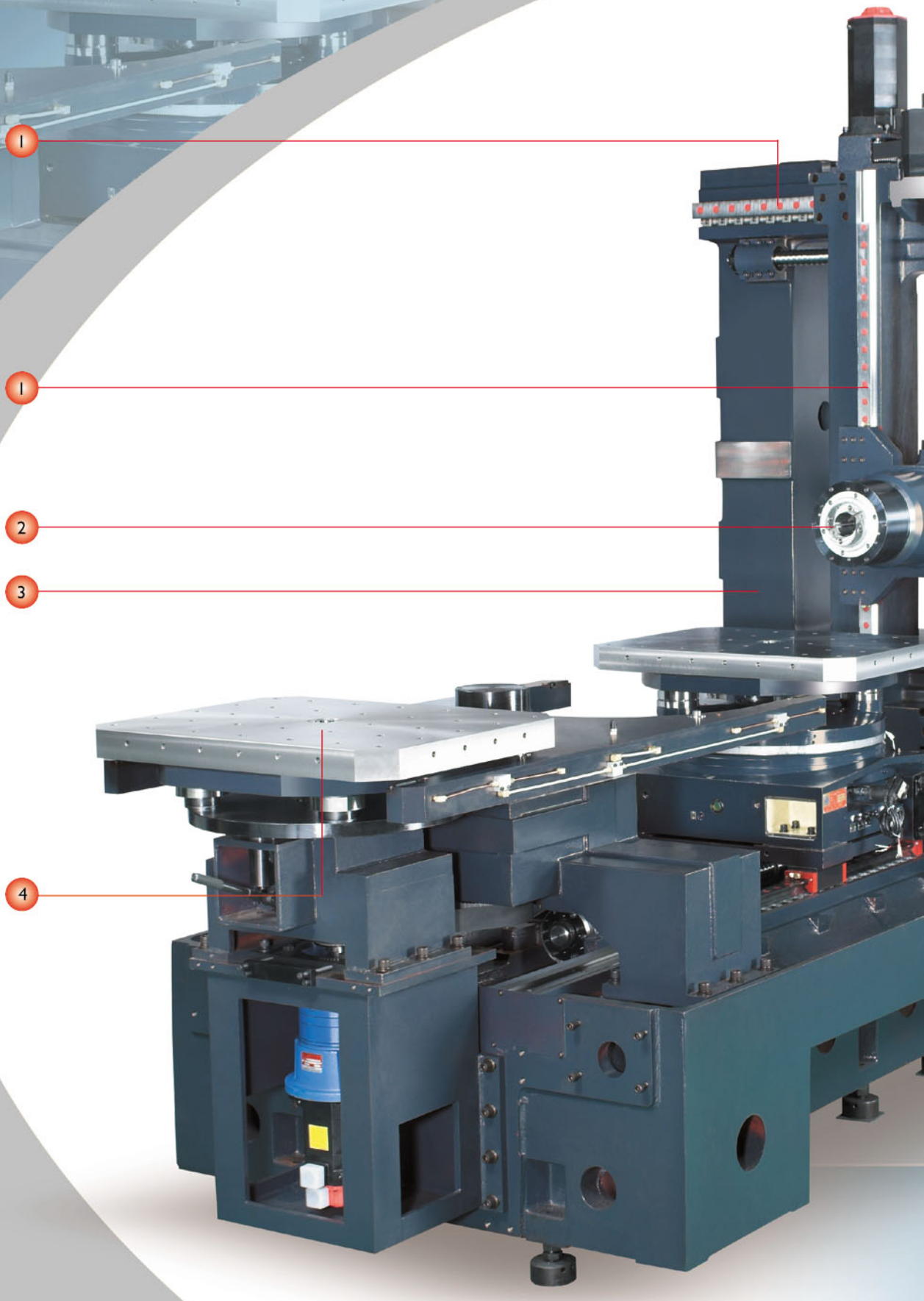
- ***High Speed Horizontal Machining Centers with New Box in Box Design.***
- ***Extremely Rigid and Reliable Structure.***
- ***Direct Drive Spindle & Motorized Spindle (Built-in) for High-Capacity Cutting Performance.***
- ***Rotary-Type Automatic Pallet Changer.***



Rotary-type automatic pallet changer

Item / Model	HMC-500	HMC-500 H	HMC-630	HMC-630 H
Table working surface (mm)	500 x 630 (19.7" x 24.8")		630 x 800 (24.8" x 31.5")	
Table load max. (kg)	550 (1210 lb)		1200 (2640 lb)	
Longitudinal travel (X) (mm)	762 (30")		1016 (40")	
Cross travel (Y) (mm)	660 (26")		813 (32")	
Vertical travel (Z) (mm)	660 (26")		890 (35")	
Spindle motor (cont. / 30min) (kW)	7.5 / 11 (BBT-40) ; 18 / 23 (HSK A63) ; 26 / 30 (No. 50 / HSK A100) ; 32 / 42 (HSK A100)			
X-Y-Z rapid traverse (m/min)	40 / 40 / 40			
Tool magaze capacity	40 (60, 80, 120 Opt.)			
Machine dimensions (LxWxH) (mm)	5725 x 3100 x 3150 (225.4" x 122" x 124")		6345 x 3490 x 3670 (249.8" x 137.4" x 144.5")	
Machine weight (kg)	11500 (25300 lb)		18000 (39600 lb)	

High Rigidity Box in Box Constr



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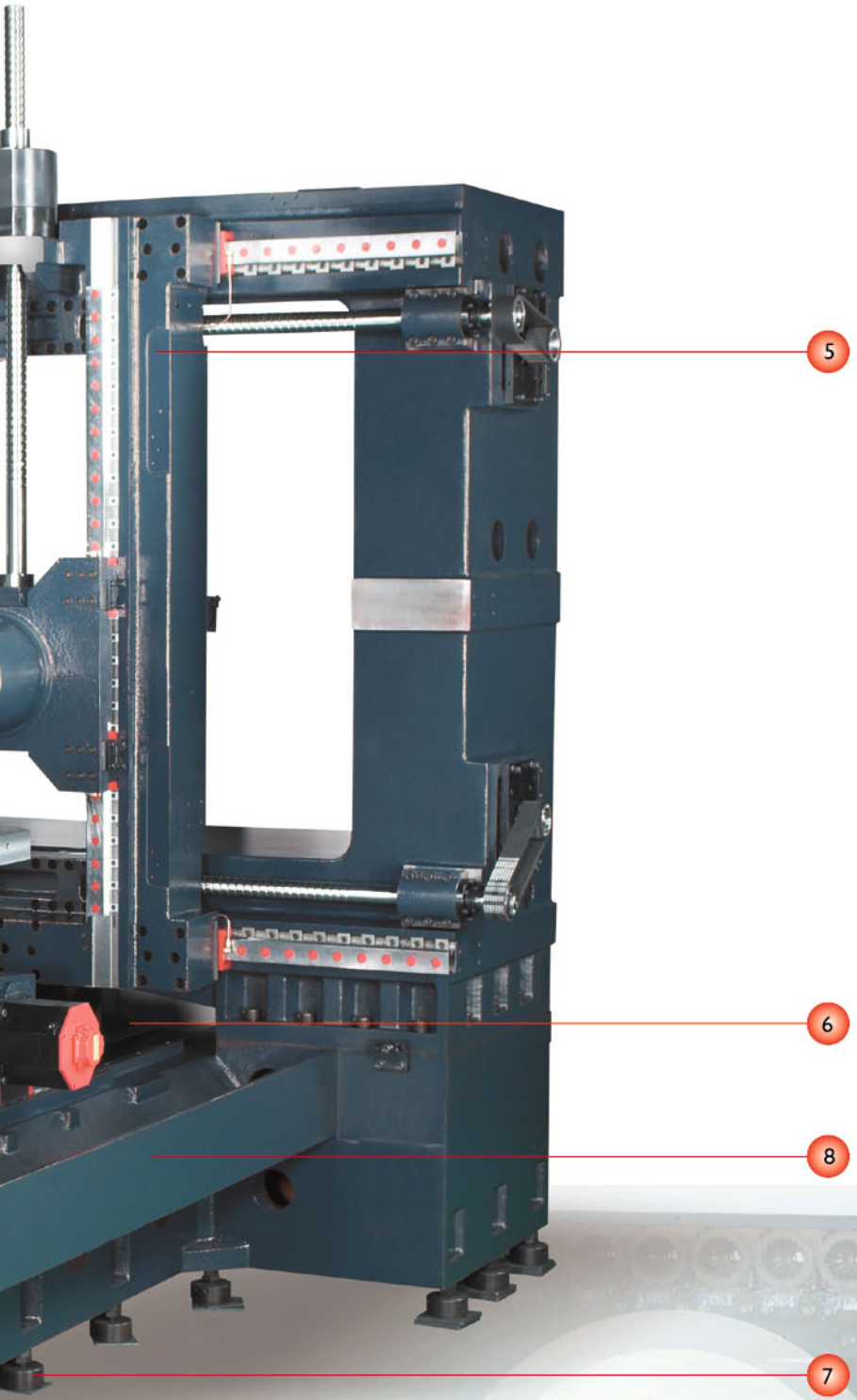


1
Three-axes are provided with heavy, superior rigidity of linear motion guide, insuring outstanding accuracy while in heavy duty machining. Low friction and high stability performance ensures longevity with accuracy. Rapid traverse rate Max. 40 m/min increases working efficiency greatly.

2
Lower mounted spindle headstock construction for lowering the vibration center, yet increasing stability greatly.

3
The super width column provides maximum support and strength to headstock.

4
1 degree index table emplo-yees high precision curve clutch for accurate positioning. 0.001° graduated index table (opt.) employees high precision worm gear mechanism for positioning.

5
Moving saddle design with thermal symme-try construction eliminates thermal strain.

6
The design of slide-ways covers provides efficient chips removing, and easy to clean.

7
One piece construction of support base for ball screws insures high accuracy in axes traverse.

8
High rigidity constucted base is heavy V-ribs reinforced on slide way. Creating the excellent stability and accuracy in machining large workpieces.

Automatic Tool Changer

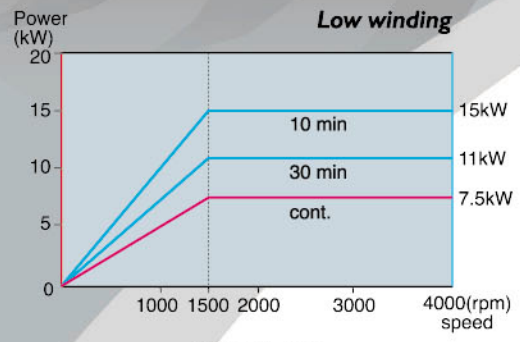
- Reliable automatic tool changer provides 1.98 tool-to-tool change time for No.40 tools and 3.5 tool-to-tool change time for No.50 tools.
- Bi-directional tool changer without interference. 40 tools ATC is standard. 60 tools or more are optional.

40 tools (Std.)

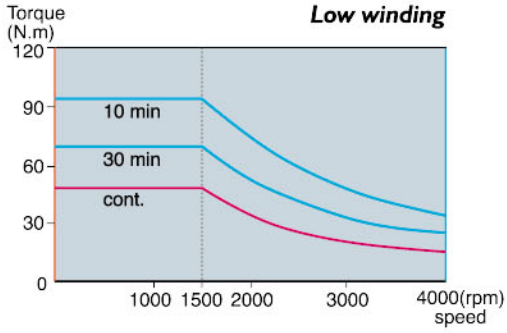
60/80/120 tools (Opt.)

Spindle Power & Torque Chart

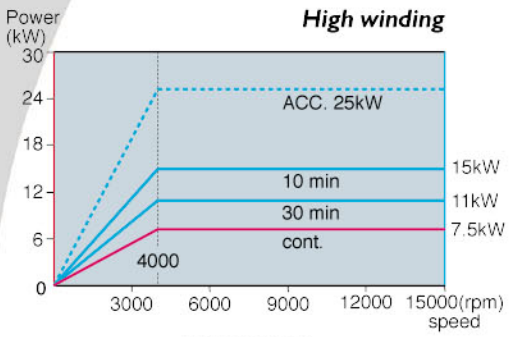
FANUC αT8/20000 (Plan) Output (ACC. Power is not Guaranteed Value) (No.40) (Std.)



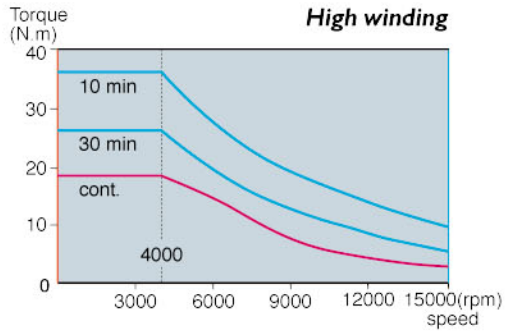
HMC-500 / 630
■ 15000 rpm direct drive spindle



HMC-500 / 630
■ 15000 rpm direct drive spindle

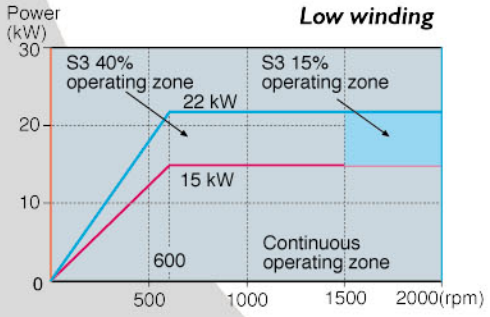


HMC-500 / 630
■ 15000 rpm direct drive spindle

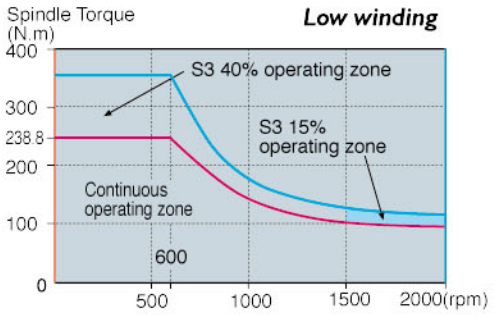


HMC-500 / 630
■ 15000 rpm direct drive spindle

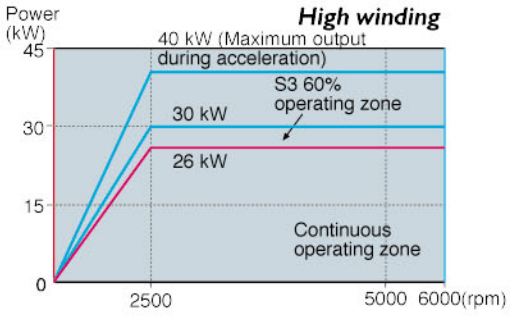
FANUC αL26 / 10000, 6000 rpm (No.50) (Std.)



HMC-500 / 630
■ 6000 rpm direct drive spindle

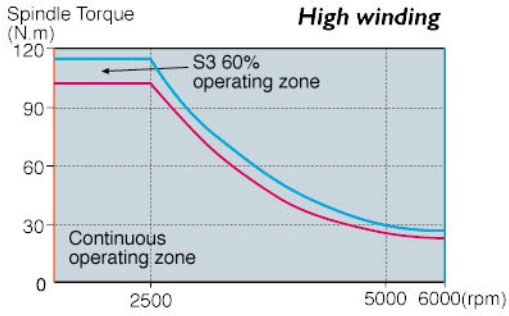


HMC-500 / 630
■ 6000 rpm direct drive spindle



HMC-500 / 630

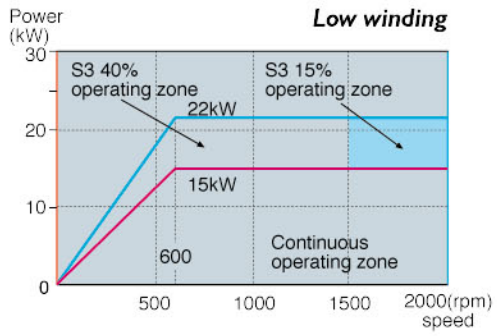
■ 6000 rpm direct drive spindle



HMC-500 / 630

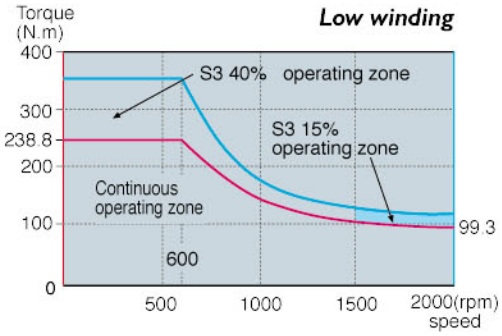
■ 6000 rpm direct drive spindle

FANUC αL26 / 10000 Output (ACC. Power is not Guaranteed Value) (No.50/HSK A100) (Opt.)



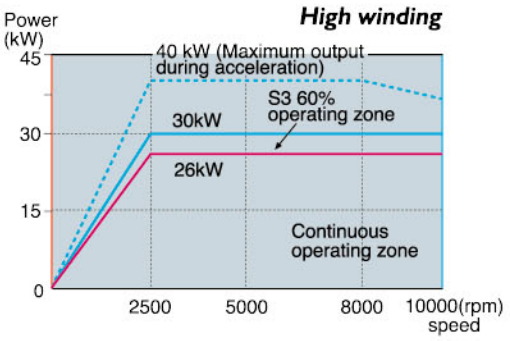
HMC-500H / 630H

■ 10000 rpm direct drive spindle



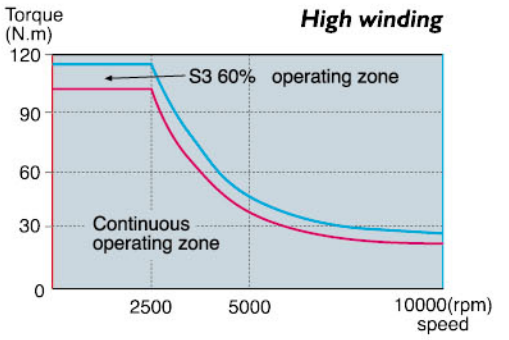
HMC-500H / 630H

■ 10000 rpm direct drive spindle



HMC-500H / 630H

■ 10000 rpm direct drive spindle



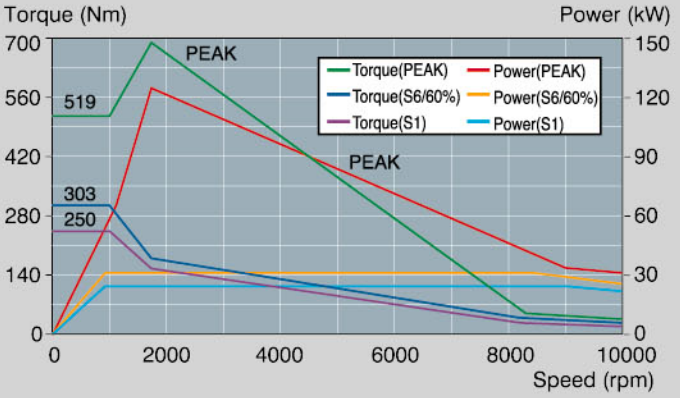
HMC-500H / 630H

■ 10000 rpm direct drive spindle

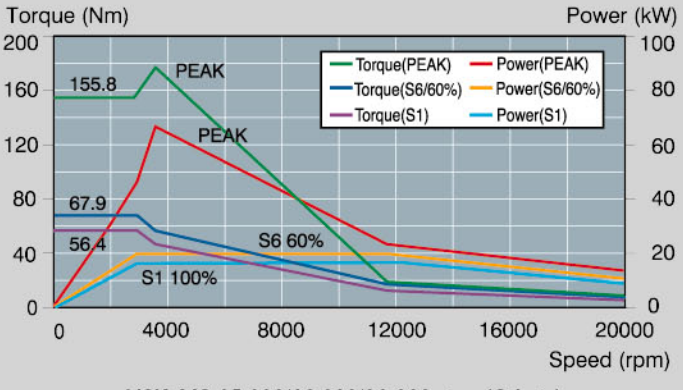
Technical Data

Drive Layout		
Tool system	HSK A63	HSK A100
Power	17 kW	26 kW
Nominal speed	2,880 rpm	992 rpm
Max. Torque	56.4 Nm	303 Nm
Max. Speed	20,000 rpm	10,000 rpm
Control	Fanuc / Siemens / Heidenhain	
Voltage	220V / 380V	400V
Max. Current	90 A / 54 A	125 A
Driver	-	SPM-75 HVI
Clamping system	Spring-mechanical+ Power-mechanical	Hydraulic
Clamping Force	18 kN	45 kN
Tool cleaning	Central + Surrounding	
Spindle bearings	2 x ϕ 70 Hybrid	2 x ϕ 100 Hybrid
Bearing rigidity	Sr 310.2 N/μm	680 N/μm
Bearing lubrication	Grease	
Spindle cooling	Water glycol	
Cooling performance	> 5 kW	> 7 kW
Cooling temperature	The same as machine	
Cooling volume approx	12 ℓ/min	15 ℓ/min
Tool Cooling		
Internal coolant flow	Optional	Standard
Max. Pressure	70 bar	
Suitable for dry operation	Yes	
Air	Possible	
Min. quantities of cooling lubricant	Optional	-

High Speed Spindle (Built-in Motor)(Opt.)



HSK A100 10,000 rpm



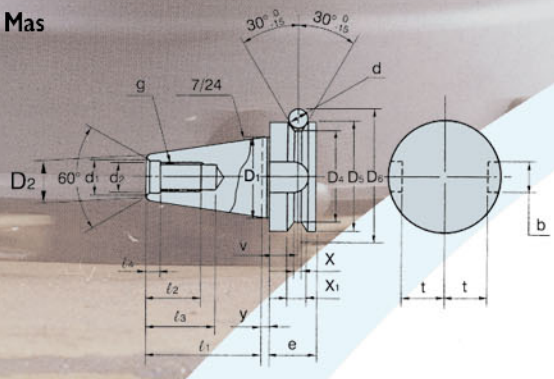
HSK A63 15,000/18,000/20,000 rpm (Oil-air)

Metal Removal Rate		Milling		Milling		Drilling		Threading	
Tool system		HSK A63	HSK A100	HSK A63	HSK A100	HSK A63	HSK A100	HSK A63	HSK A100
Power		17 kW	26 kW	17 kW	26 kW	17 kW	26 kW	17 kW	26 kW
Material		Steel 60-70 kg/mm^2		Aluminum 7075		Steel 60-70 kg/mm^2		Steel 60-70 kg/mm^2	
Machining volume	(cm^3/min)	300	577	1382	1770	259	-	-	-
Tool/edges	(ϕ mm)	ϕ 50 / 4	ϕ 100 / 7	ϕ 80 / 7	ϕ 100 / 7	ϕ 30	ϕ 51	M24	M36
Rotational speed	(min^{-1})	2300	1146	6400	2107	2440	1435	500	330
Cutting speed	(m/min)	360	360	1615	662	230	230	37	37
Cutting B x T	(mm)	40 x 4	80 x 4.5	60 x 3	80 x 5	-	-	-	-
Feed	(mm/min)	1840	1604	7680	4425	366	287	500	1300

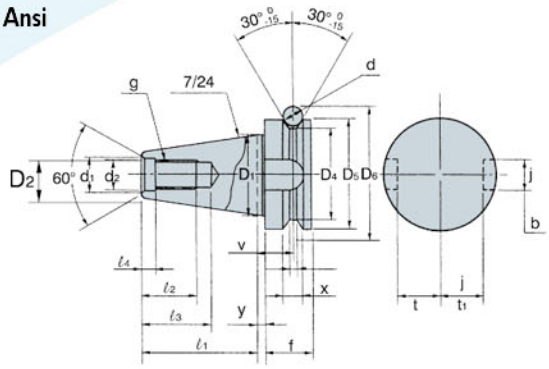
Tool System

BT/CAT Tool Dimension

Mas



Ansi



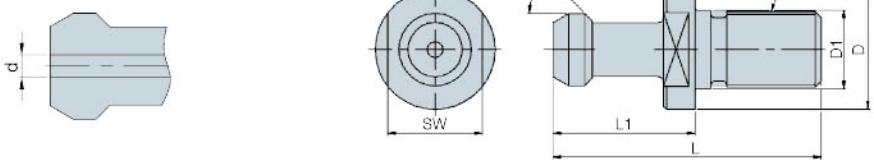
Unit: mm

Shank size \ Item		D1	ℓ1	d1	d2	g	ℓ2	ℓ3	ℓ4	b	ℓ5	t	t1	j
No.40	MAS(BT)	44.45	65.4 -0.2	19	17 H8	M16	30min	43min	9 +0.5 0	16.1 H12	21min	22.6 0 -0.2	-	-
	ANSI(CAT)	44.45	68.4 0 -0.3	18.5	16.4 +0.4 0	M16x2	30min	42.5min	4.75 +0.5 0	16.1 H12	-	22.8 0 -0.4	26 0 -0.4	-
No.50	MAS(BT)	69.85	101.8 -0.2	27	25 H8	M24	45min	62min	13.0 +0.5 0	25.7 H12	-31min	35.4 0 -0.2	-	-
	ANSI(CAT)	69.85	101.75 0 -0.3	26.5	24.8 +0.4 0	M24x3	45min	-	5.75 +0.5 0	25.7 +0.2 0	-	35.5 0 -0.4	40.4 0 -0.4	-

Unit: mm

Shank size \ Item		D3	D4	D5	e	f	v	x	x1	y	D2	d	D6
No.40	MAS(BT)	-	53	63 H8	25	-	16.6 -0.1	5	10 +0.1 0	2 -0.4	25.375	10	75.679
	ANSI(CAT)	44.7 0 -0.5	56.25 0 -0.5	63.55 0 -0.1	-	15.82 +0.1 0	11.1	3.75 +0.15 0	-	3.18	24.5	7	72.3 -0.05
No.50	MAS(BT)	-	85	100 H8	35	-	23.2 -0.1	7-	15 +0.1 0	3 -0.4	40.158	15	119.020
	ANSI(CAT)	70.1 0 -0.5	91.25 0 -0.5	98.45 0 -0.1	-	15.82 +0.1 0	11.1	3.75 +0.15 0	-	3.18	40.173	7	107.25 -0.05

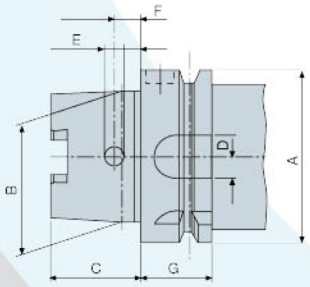
Pull Stud



Unit: mm

Shank size	Pull stud type	L	L1	D	D1	θ	G	SW	d
BT-40	P40T-1	60	35	23	17	45°	M16	19	3
CAT-40	ANSI B5.50 CAT	53.8	32	23	17	45°	M16	19	3
BT / CAT-50	P50T-1	85	45	38	25	45°	M24	30	5

HSK Tool Dimension

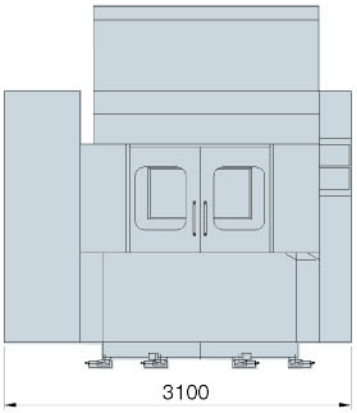


Unit: mm

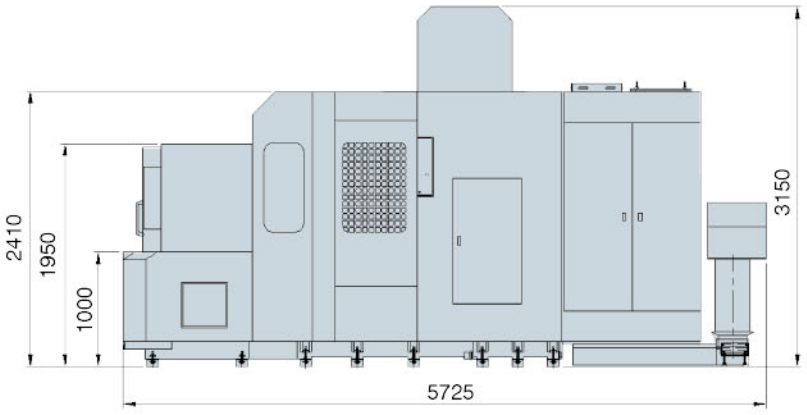
Shank size \ Item	A	B	C	D	E	F	G
HSK A63	63	48	32	16.12	7.5	9	26
HSK A100	100	75	50	20.02	12	26	29

Dimensions

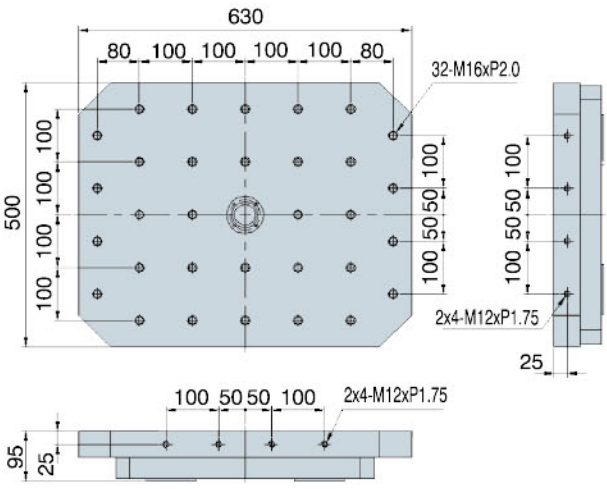
HMC-500 / 500H

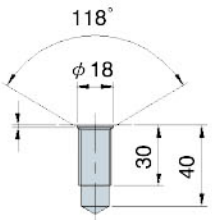


Front View

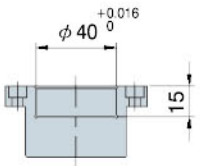


Side View



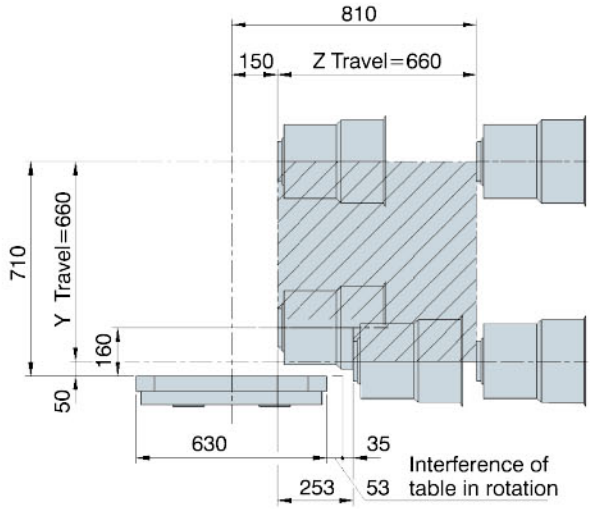


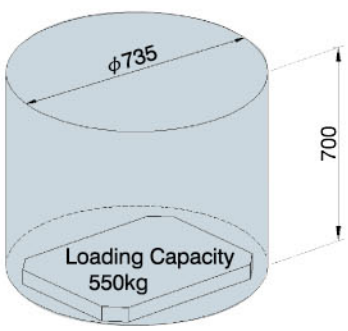
X-X Section



Center Hole

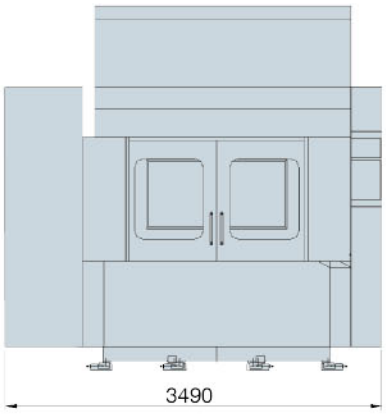
Table Dimensions



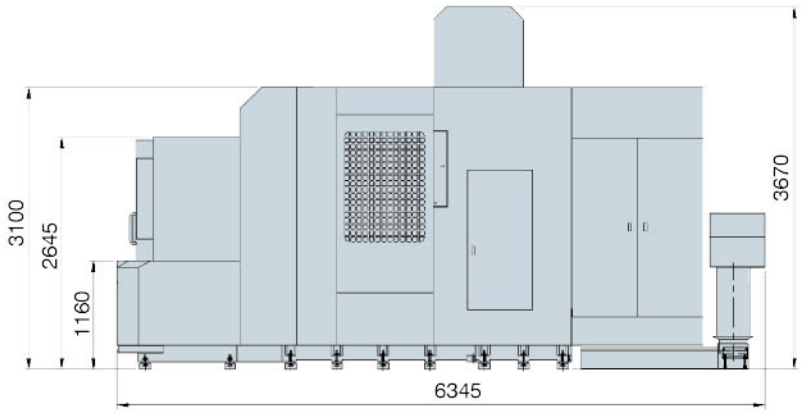


Machining Area

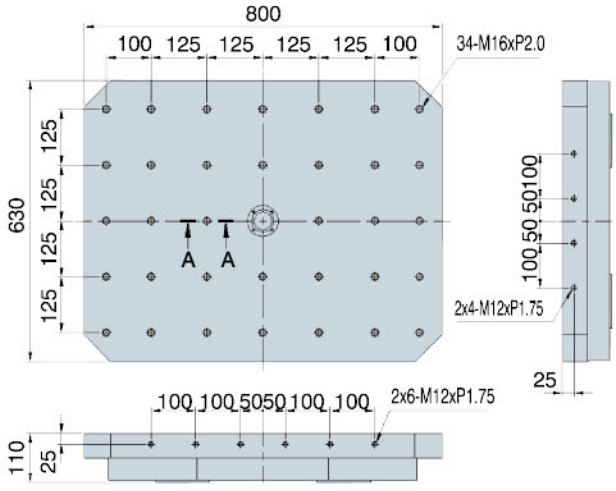
HMC-630 / 630H

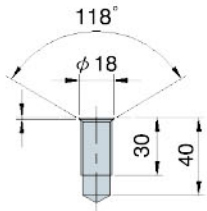


Front View

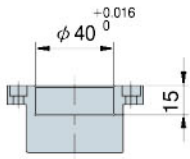


Side View



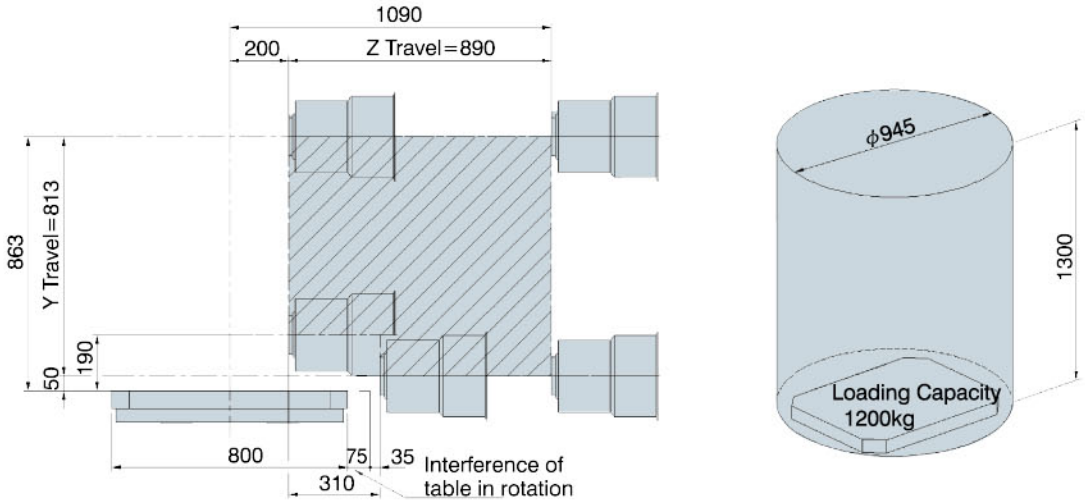


X-X Section



Center Hole

Table Dimensions



Machining Area

Specifications

Item \ Model		HMC-500	HMC-500H	HMC-630	HMC-630H
Table working surface (mm)		500 x 630 (19.7" x 24.8")		630 x 800 (24.8" x 31.5")	
Table load max. (kg)		550 (1210 lb)		1200 (2640 lb)	
Screw hole		M16 x P2.0		M16 x P2.0	
Longitudinal travel (X) (mm)		762 (30")		1016 (40")	
Cross travel (Y) (mm)		660 (26")		813 (32")	
Vertical travel (Z) (mm)		660 (26")		890 (35")	
Spindle nose to table center (mm)		150~810 (5.9"~31.9")		200~1090 (7.8"~42.9")	
Spindle center to table top (mm)		50~710 (2"~28")		50~863 (2"~33.9")	
Spindle speed & taper (rpm)	Std.	Direct drive 15000	Direct drive 6000 (BT / CAT)	Direct drive 15000	Direct drive 6000 (BT / CAT)
	Opt.	Built-in 15000 / 18000 / 24000 (BBT-40 / HSK A63)	①Direct drive10000 (BT / CAT / BBT-50 / HSK A100) ②Built-in 10000 (HSK A100)	Built-in 15000 / 18000 / 24000 (BBT-40 / HSK A63)	①Direct drive10000 (BT / CAT / BBT-50 / HSK A100) ②Built-in 10000 (HSK A100)
Spindle motor (cont. / 30 min) (kW)	Std.	7.5 / 11	26 / 30	7.5 / 11	26 / 30
	Opt.	17 / 21	① 26 / 30 ② 31 / 40	17 / 21	①26 / 30 ②31 / 40
X-Y-Z Cutting feed (mm/min)		1~15000		1~12000	
X-Y-Z Rapid traverse (m/min)		40 / 40 / 40		40 / 40 / 40	
Tool magazine capacity		Arm type 40 (60, 80, 120 Opt.)			
Adjacent pockets max. tool dia.(mm)		ϕ75	ϕ125	ϕ75	ϕ125
Max. tool diameter x length		ϕ100 x 320	ϕ200 x 385	ϕ100 x 320	ϕ200 x 400
Max. tool weight (kg)		10 (22 lb)	15 (33 lb)	10 (22 lb)	15 (33 lb)
Tool selection		Bi-direction random type shortest path			
Tool to tool change time (sec)		1.98	3.5	1.98	3.5
Hydraulic pump motor (kW)		3.8			
X, Y, Z, axis drive motor (kW)		4 / 7 / 4		4 / 7 / 7	
Table index		1° (0.001° Opt.)			
Number of pallets		2 (6, 12 Opt.)			
Change time (APC) (sec)		8		15	
Machine dimension (LxWxH) (mm)		5725 x 3100 x 3150 (225.4" x 122" x 124")		6345 x 3490 x 3670 (249.8" x 137.4" x 144.5")	
Machine weight (kg)		11500 (25300 lb)		18000 (39600 lb)	

■ All data subject to change without notice.

■ All the specifications are listed with the FANUC CNC system.

Standard Accessories:

1. Cycle finish light (M30)
2. Coolant unit
3. Levelling bolts & pads
4. Hydraulic unit
5. Spindle oil cooling cooler
6. Chip conveyor & chip bucket
7. Tools, tool box and various manuals
8. Full enclosure splash guard
9. 1 degree index table
10. Auto lubrication with alarm
11. Rigid tapping
12. Air system with alarm
13. Spindle speed / load meter
14. 2 pallet APC
15. Heat exchanger
16. FANUC 0*i*-MD

Optional Accessories:

1. Contact tool setting system (Renishaw TS-27R or BULM NT-A2/NT-A3)
2. High pressure coolant thru tool tip
3. High pressure coolant thru spindle
4. Arm type 60, 80, 120 tools ATC
5. 6 or 12 pallets APC
6. Linear scale
7. Rotary table (0.001°)
8. Built-in spindle (15000 / 18000 / 20000 rpm for HSK A63)
9. Direct drive spindle (10000 rpm for BT / CAT / BBT-50 / HSK A100)
10. Built-in spindle (10000 rpm for HSK A100)
11. FANUC 31*i*-MB controller
12. Workpiece measuring system (Renishaw 0MP-60 or BULM TC-50)
13. Manual guide *i* / 0*i* (0*i*MD) ; Manual guide *i* (31*i*MB)

CNC Control Specs

■ CNC system type

O: Std. △: Opt. -: Nil

Type / Model	HMC-500	HMC-500H	HMC-630	HMC-630H
FANUC 0*i*MD			○	
FANUC 31*i*MB			△	
Heidenhain *i*TNC530 HSCI			△	
Siemens 840D			△	
Siemens 828D			△	

■ Fanuc specifications

O: Std. △: Opt. -: Nil

	Item	Specifications		0iMD	31iMB
Display unit	8.4" color LCD			○	-
	10.4" color LCD			△	○
Function	Data Server with 2GB CF card			△	△
	AICC II			△	○
	High speed processing			-	△
	Conversational programming with graphic function	Manual guide 0*i*	0*i*MD	○	-
		Manual guide *i*	31*i*MB / 0*i*MD (10.4" LCD)	△	○
	NC program memory	1280 meter (about 512 KB)		○	○

■ Siemens specifications

O: Std. △: Opt. -: Nil

	Item	Specifications	828D	840D
Operation Panel	10.4" color LCD		○	○
	15.1" color LCD		-	△
	Machine panel MCP483C		○	○
	TCU without hard disk	CF card	○	○
	PCU 50 with hard disk		-	△
	Ethernet		○	○
Function	ShopMill programming		△	△
	Automatic residual material detection		△	△
	Universal interpolator NURBS		○	○
	Spline interpolation for 3 - axes		△	△

■ Heidenhain specifications

O: Std. △: Opt. -: Nil

	Item	Specifications	iTNC530 HSCI MC6222
Display unit	Visual display unit 15" TFT display		○
Function	Main computer (MC6222)	0.5 ms block processing time	○
	NC programming memory	21GB on SSDR	○
Software option 1	• Cylindrical surface interpolation • Feed rate in mm/min • Tilting the working plane • Circular interpolation in 3 axes with tilted working plane • HSC path control with special nominal-position value filters		△
Software option 2	**3-D machining** • Motion control with minimum jerk • 3-D tool compensation through surface normal vectors • TCPM: Tool center point management • Keeping the tool normal to the contour • Tool radius compensation normal to the tool direction • Manual traverse in the active tool-axis system **Interpolation** • Linear in 5 axes (Subject to export permit) • Spline: execution of splines (3rd degree polynomial)		△

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