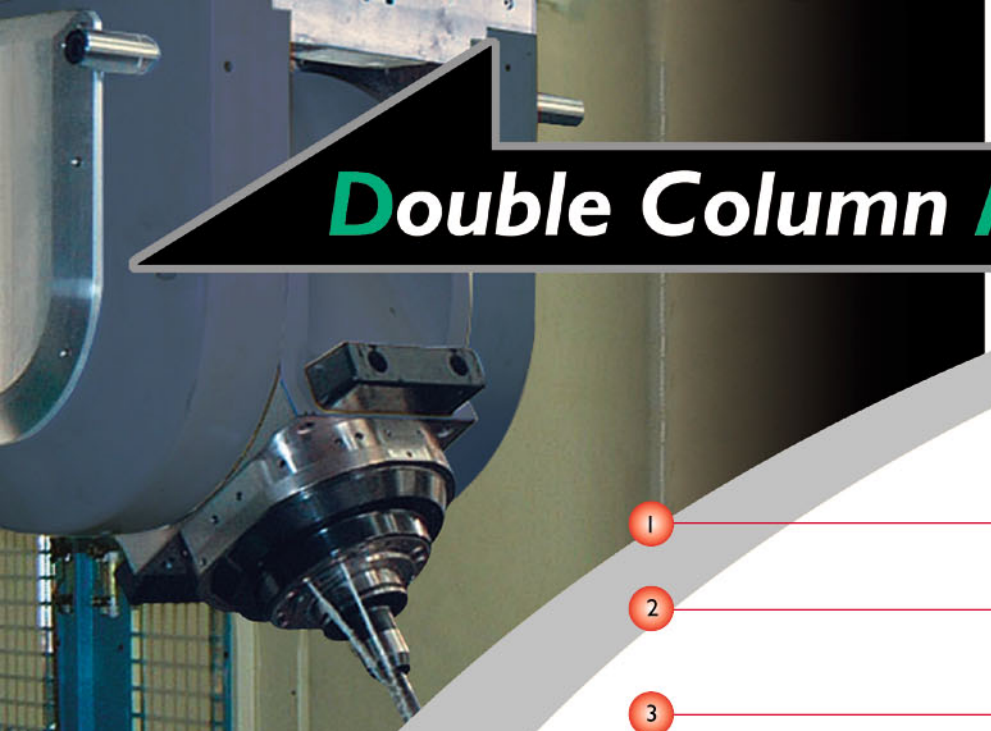
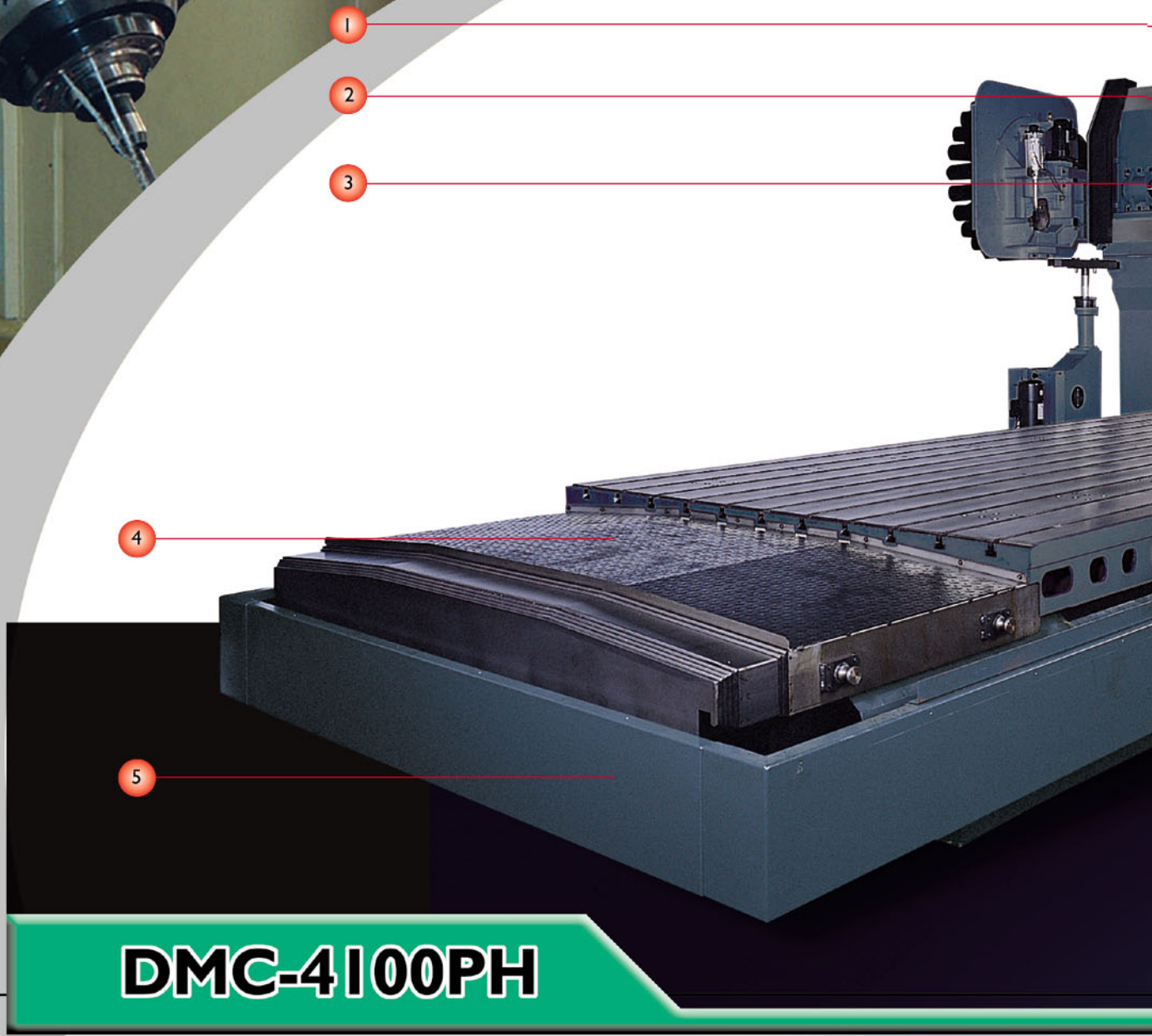
JOHNFORD®

Double Column Machining Centers

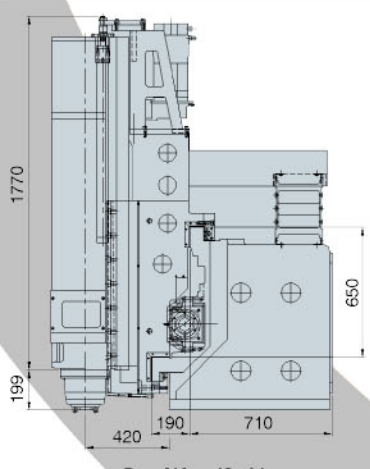
DMC-2100S/2600S/3100S/4100S/
5100S/6100S/3100P/4100P
DMC-2100SH/2600SH/3100SH/4100SH/
5100SH/6100SH/3100PH/4100PH
S Series / P Series: 3~Multi-Axis Machining Centers

Double Column Machining Cent

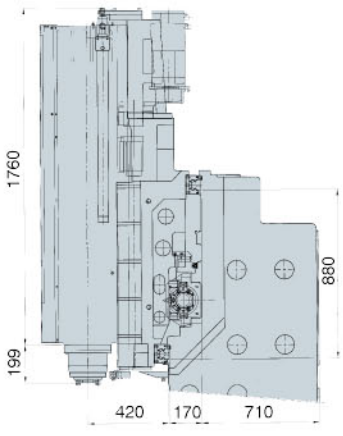




DMC-4100PH



Box Way (Std.)

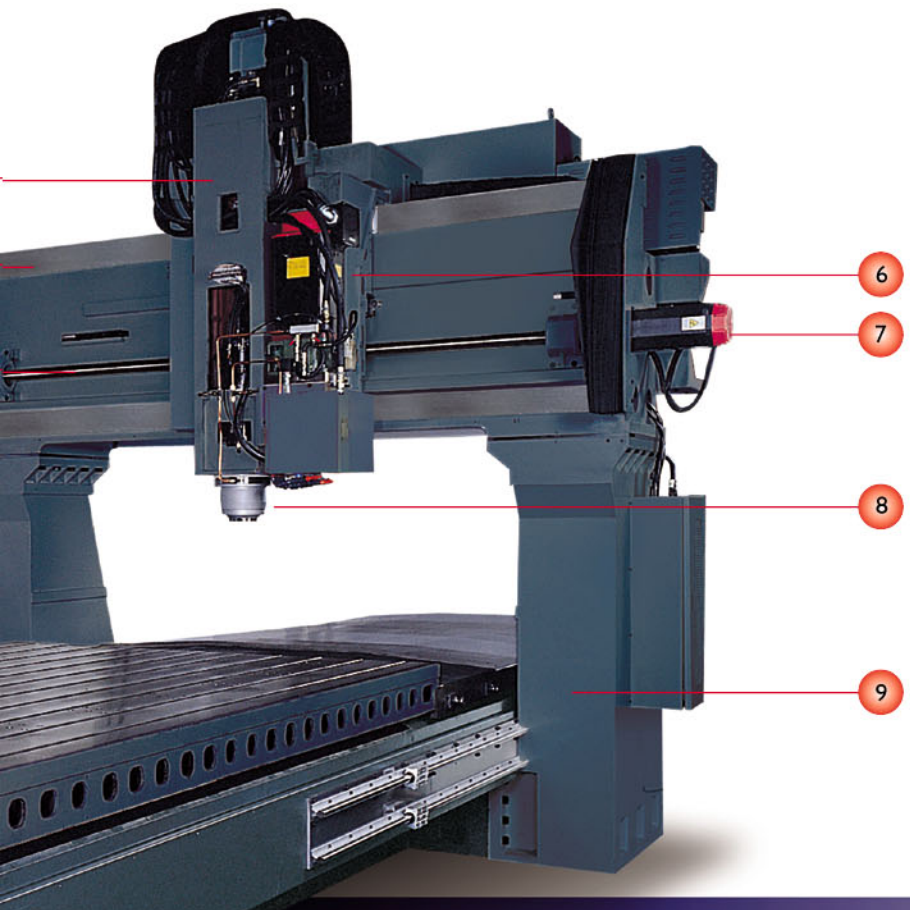


Linear Way (Opt.)

Structure of Y Axis

- The standard box ways with Turcite-B are used on the Y-axis. But there is an optional great roller-type linear way used on the Y-axis for your choice.
  The optional linear way with the features of high rigidity, great dynamic and static load carrying capacity, outstanding running smoothness and the total enclosure of the carriage.
- The Z axis uses hardened and ground box ways with turcite-B.
- Hydraulic counter balance provides high stability and smooth operation.

ers (P Series)



1
Extra large milling head with rigid box ways. The head is held by 825 mm(32.5") of the saddle.

2
The distance between the standard box ways used on the Y-axis is 650 mm (25.6"), and the distance between the optional roller-type linear ways is 880 mm (34.6").

3
Large diameter ballscrews ϕ63 mm (2.5") in the Y axis and ϕ50 mm (2") in the Z axis. In the X axis, ϕ63 mm (2.5") for DMC-3100P and ϕ70 mm (2.8") for DMC-4100P.

4
Heavy duty rigid roller-type linear ways are used on the X axis for speed and precision.

5
Massive one piece base castings. All major machine components are made from high quality meehanite cast iron.

6
Huge saddle is 800x962 mm (31.5"x37.9")

7
7 kW servo motor is used on Y axis and 6 kW servo motor is used on X axis with 2:1 gear reduction drives for the most axis thrust available.

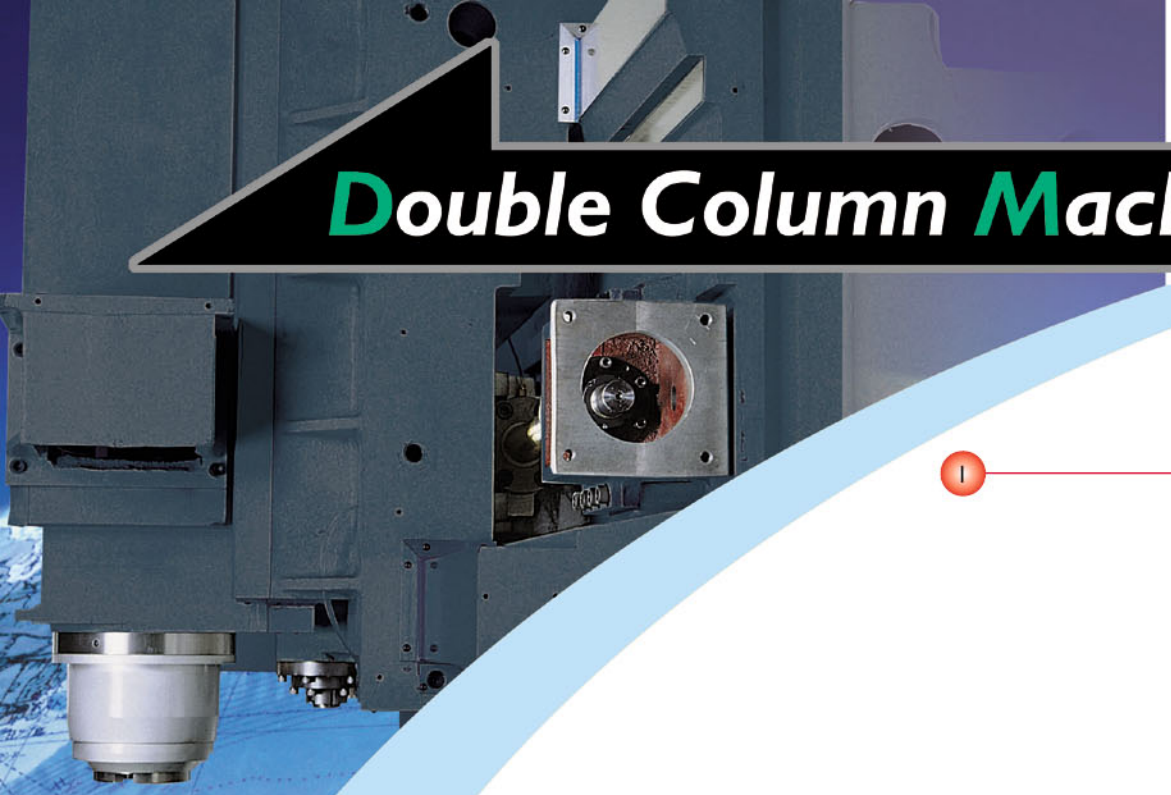
8
26 kW spindle motor with 2 speed ZF gearbox and 6000 rpm standard on the No.50 machines.
It comes with a spindle oil cooler too!

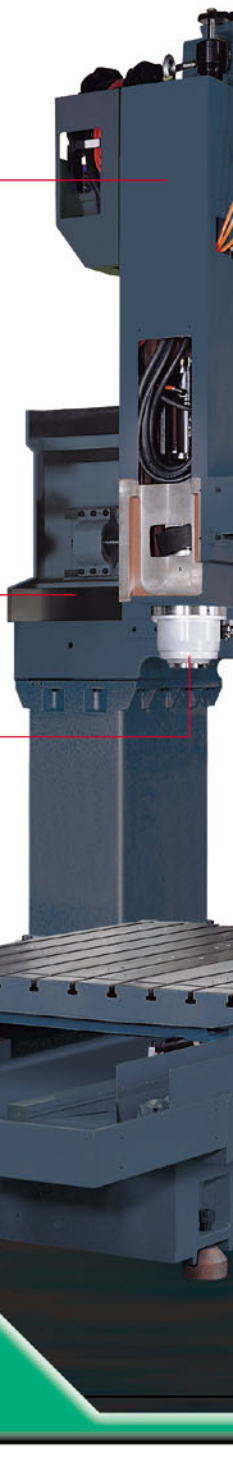
9
High rigidity columns casting for maximum reliability.

Optimal Design for Structure (P Series)

There are two types of operation box for your choice.

Double Column Machining Cent





1

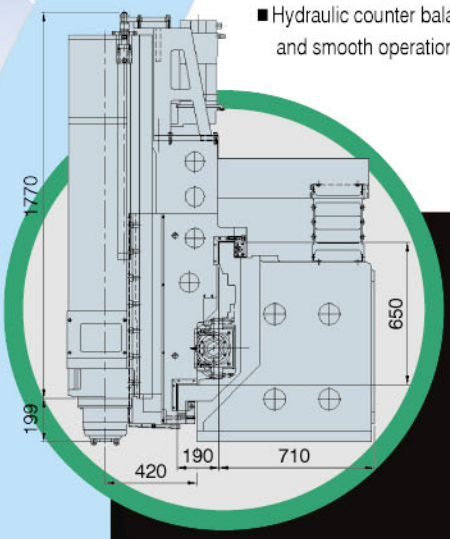
2

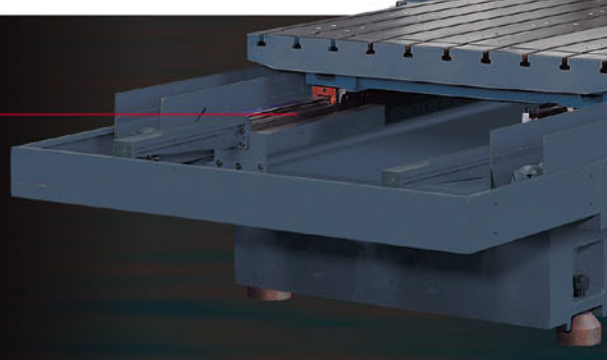
3

4

Structure of Y Axis

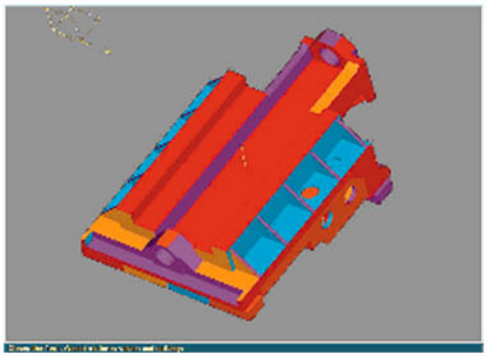
- The Y axis and Z axis uses hardened and ground box ways with turcite-B.
- Box structure ram to ensure working stability and accuracy.
- Zero overhang on X, Y, Z travel.
- Hydraulic counter balance provides high stability and smooth operation.



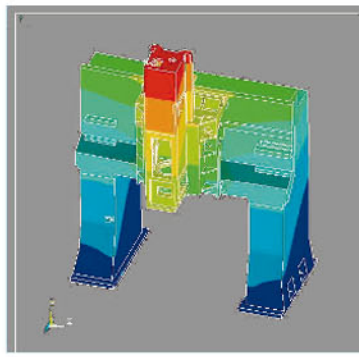


Built Right... Built to Last!

The structures of major components of DMC'S machining centers have been designed with the finite element analysis (FEA). By this way, we refine our design and improve product quality.
They can offer high rigidity and good precision that are for beyond ordinary.

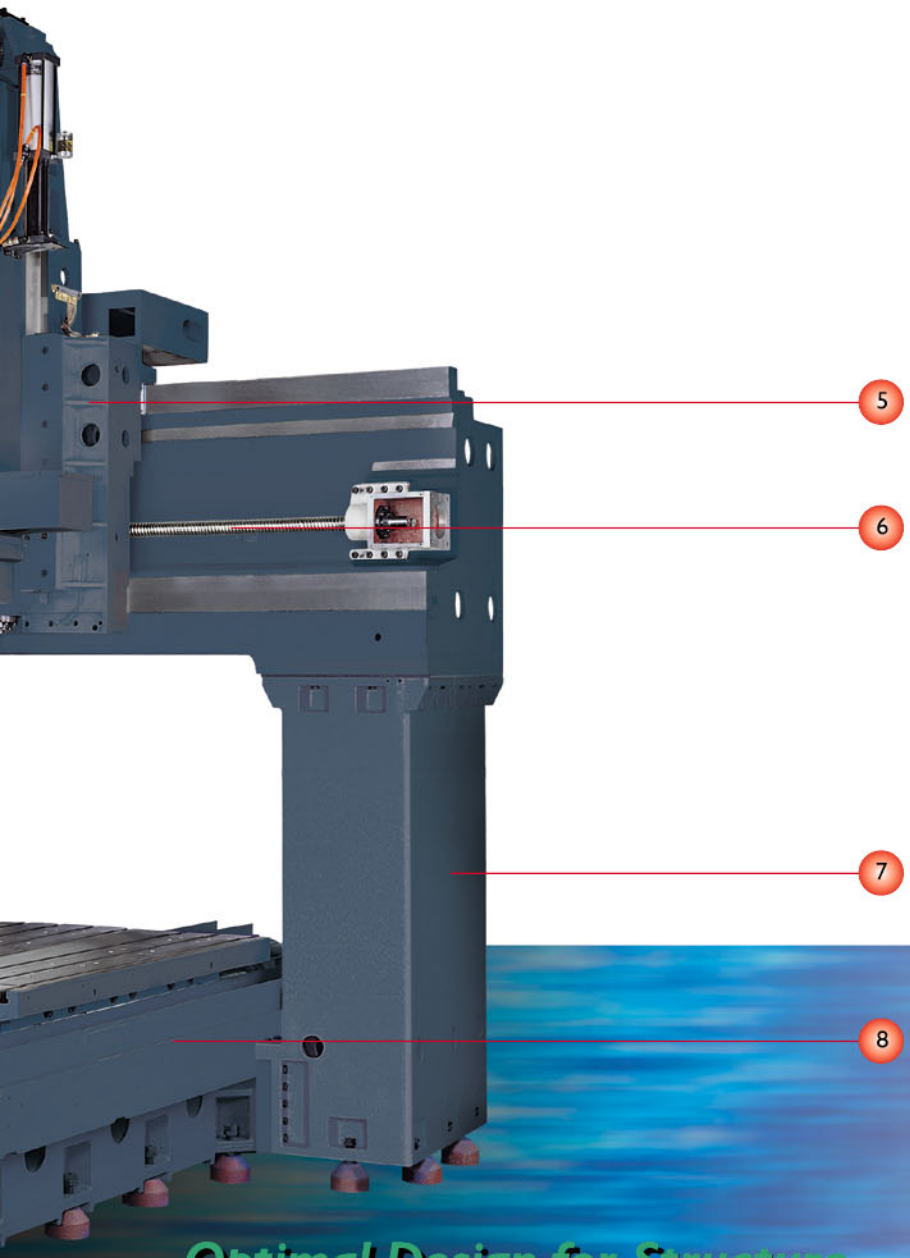


3D Optimal Design



Main Structure FEA

ers (S Series)



1
Extra large milling head with rigid box ways. The head is held by 962 mm (37.9") of the saddle.

2
Distance between the Y-axis rigid box way is 650 mm (25.6"). Linear ways are optional on Y-axis.

3
26 kW spindle motor with 2 speed ZF gearbox and 6000 rpm standard on the No.50 machines.
If comes with a spindle oil cooler too!
662 N.m (488 1b. ft) of Torque at only 375 rpm!

4
Heavy duty rigid roller-type linear ways are used on the X axis for speed and precision.

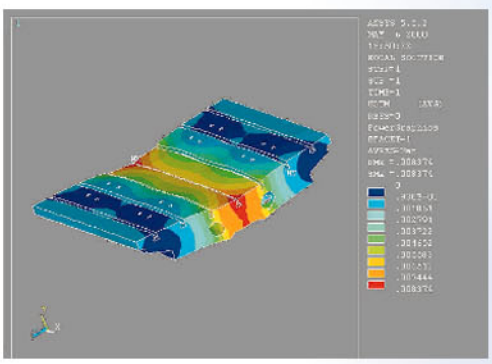
5
Huge saddle that is 820x1001 mm (32.3" x 39.4")

6
Large diameter all ϕ63 mm (2.5") X, Y ballscrews and ϕ50 mm (2") Z axis ballscrew. They are pretensioned to eliminate thermal growth.

7
High rigidity columns and bridge casting for maximum reliability.

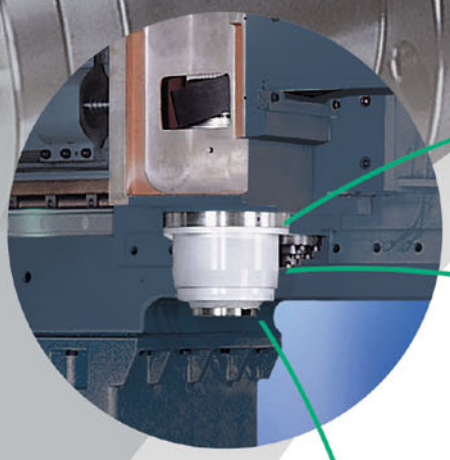
8
One piece meehanite cast iron base

Optimal Design for Structure (S Series)

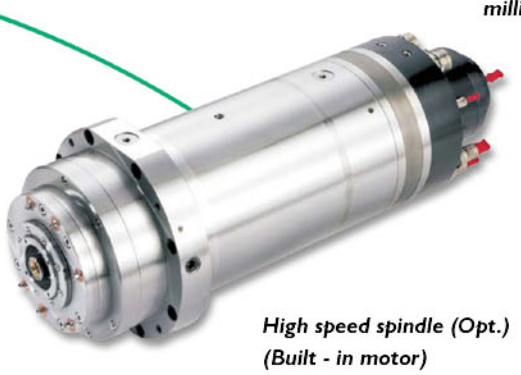


Total Solution of Spindles

Multiple Configurations to Match any Need



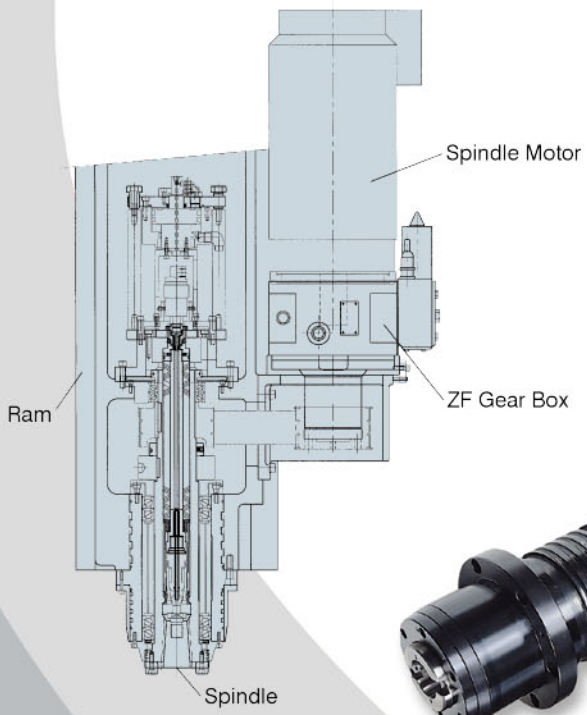
Direct drive 2-axis NC milling head (Opt.)

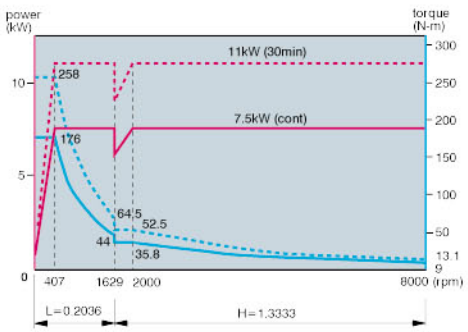


High speed spindle (Opt.)
(Built - in motor)

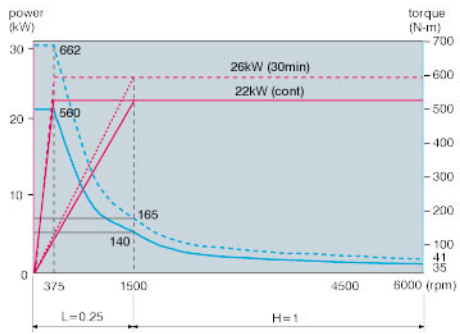
High performance cartridge spindle (Std.)

High Performance Cartridge Spindle (Std.)





No. 40 Spindle
(Auto Hi-Lo 2 Step ZF Gearbox)



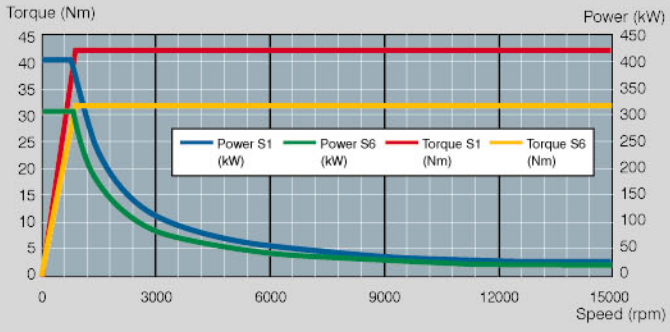
No. 50 Spindle
(Auto Hi-Lo 2 Step ZF Gearbox)

Spindle Power & Torque Chart

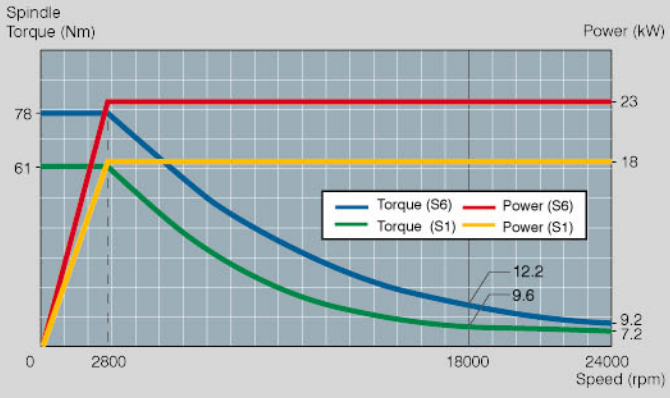
Technical Data

Drive Layout		
Tool system	HSK A63	HSK A100
Power	18 kW	32 kW
Nominal speed	2,800 rpm	1,000 rpm
Max. Torque	78 Nm	400 Nm
Max. Speed	24,000 rpm	15,000 rpm
Control	Fanuc / Siemens / Heidenhain	
Voltage	230V / 380V	380V
Max. Current	90 A / 54A	125 A
Driver	-	SPM-75 HVI
Clamping system	Spring-mechanical+ Power-mechanical	Hydraulic
Clamping Force	18 kN	45 kN
Tool cleaning	Central + Surrounding	Central + Surrounding
Spindle bearings	2 x ϕ 70 Hybrid	3 x ϕ 110 Hybrid
Bearing rigidity	Sr 310.2 N/μm	680 N/μm
Bearing lubrication	Oil-air mist	Oil-air mist
Spindle cooling	Water glycol	Water glycol
Cooling performance	2.5 kW	6 kW
Cooling temperature	The same as machine	The same as machine
Cooling volume approx	12 ℓ/min	15 ℓ/min
Tool Cooling		
Internal coolant flow	Optional	Standard
Max. Pressure	80 bar	80 bar
Suitable for dry operation	Yes	Yes
Air	Possible	Possible
Min. quantities of cooling lubricant	Optional	-

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



HSK A100 15,000 rpm



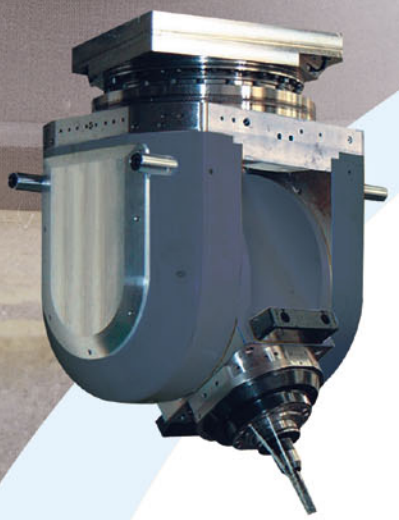
HSK A63 24,000 rpm (Oil-air)
15,000/18,000 rpm (Grease)

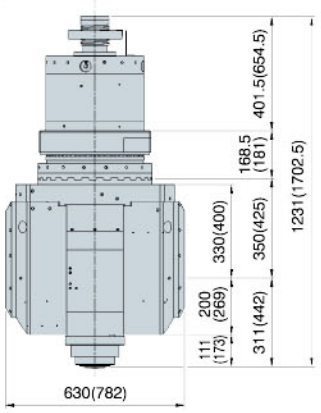
Metal Removal Rate		Milling		Milling		Drilling		Threading	
Tool system		HSK A63	HSK A100	HSK A63	HSK A100	HSK A63	HSK A100	HSK A63	HSK A100
Power		18 kW	32 kW	18 kW	32 kW	18 kW	32 kW	18 kW	32 kW
Material		Steel 60-70 kg/mm^2		Aluminum 7075		Steel 60-70 kg/mm^2		Steel 60-70 kg/mm^2	
Machining volume	(cm^3/min)	300	704	1382	2878	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	5140	2440	1435	500	330
Cutting speed	(m/min)	360	360	1615	1615	230	230	37	37
Cutting B x T	(mm)	40 x 4	80 x 5.5	60 x 3	80 x 5	-	-	-	-
Feed	(mm/min)	1840	1600	7680	7196	366	287	500	1300

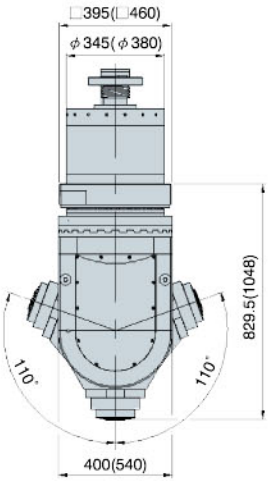
2-Axis NC Milling Head

NC Milling Head with Motorized Spindle

( ) For AC5 Tool System





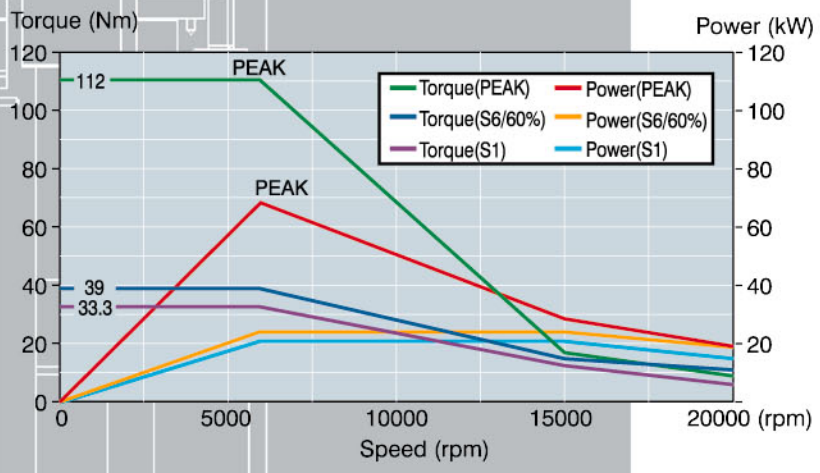


Technical Data

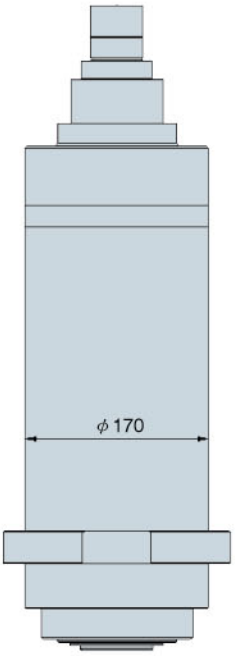
Main Spindle				
Item \ Model	AC4		AC5	
Power	21 kW (S1) / 24 kW (S6-60%)		31 kW (S1) / 40 kW (S6-40%)	
Nominal speed	6,000 rpm		1,000 rpm	
Max. torque	34 Nm (cont.) / 100 Nm (max.)		296 Nm (S1) / 401 Nm (S6)	
Max. speed	20,000 rpm		10,000 rpm	
A-Axis swiveling angle	±110°		±110°	
C-Axis swiveling angle	±220°		±220°	
Tool system	HSK A63		BT-50 / CAT-50 / HSK A100	
Clamping system	Hydraulic		Hydraulic	
Clamping force	18 kN		20 kN	
Tool cleaning	Automatic		Automatic	
Spindle bearings front	2 x ϕ70 Hybrid		3 x ϕ100 Hybrid	
Bearing rigidity	Axis / radial 512 N/μm		Axis / radial 660 N/μm	
Bearing lubrication	Grease		Grease	
Spindle cooling	Automatic		Automatic	
Cooling performance	3 kW		5 kW	
Cooling temperature	20-25°		20-25°	
Cooling volume flow approx	12 ℓ/min		14 ℓ/min	
Metal removal rate	Milling	Milling	Milling	Drilling
Material	Steel 600-700 N/mm²	Aluminium AlMgSi 1	Steel 600-700 N/mm²	Steel 600-700 N/mm²
Machining volume (cm³/min)	268	1,026	568	-
Tool/edges(ϕ mm)	32 / 3	63 / 5	63 / 5	40
Rotational speed (r.p.m.)	3,580	4,460	1820	360
Cutting speed (m/min)	360	883	360	45
Cut W x D (mm)	25 x 4	50 x 4	50 x 5	-
Feed (mm/min)	2,685	5,129	2,275	250

Cooling System		
External coolant supply	6 Spray nozzles	6 Spray nozzles
Internal coolant supply	optional	optional
Max. pressure	70 bar	70 bar
Air	optional	-
Minimal cooling lubrication	optional	-

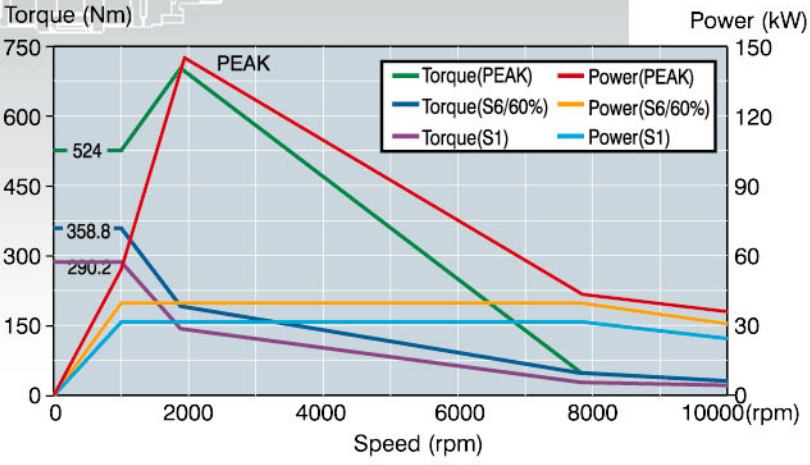
Power Chart



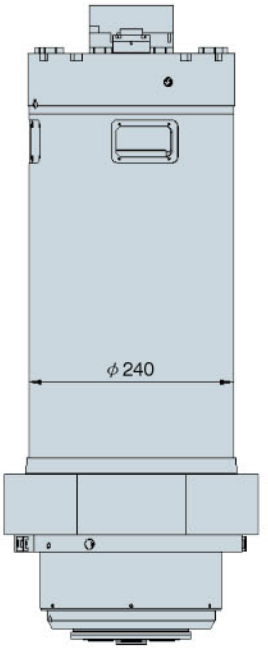
HSK A63 20,000 rpm



HSK A63
(for AC42)



HSK A100 10,000 rpm

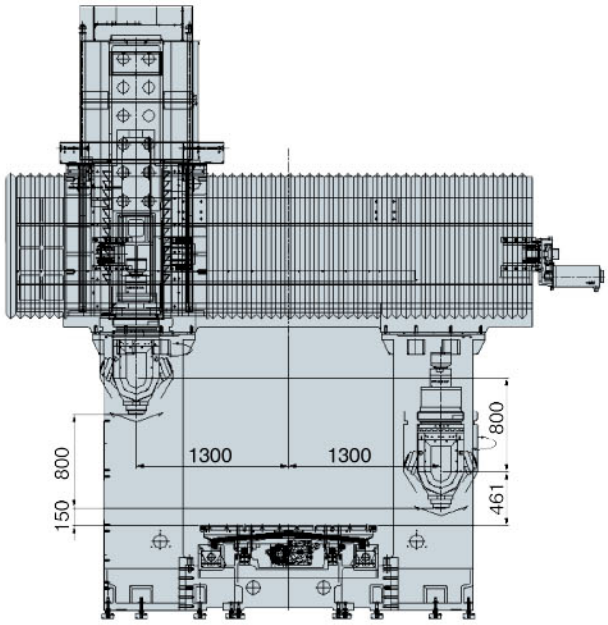


HSK A100
(for AC52)

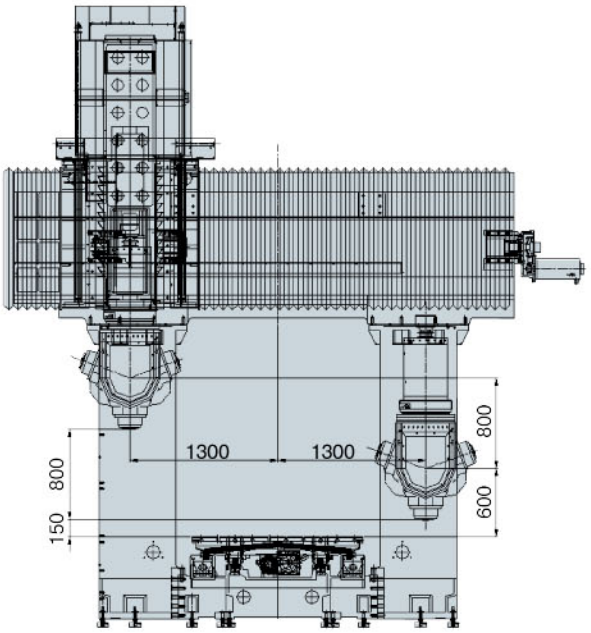
Working Range for 2-Axis NC Milling Head

DMC-2100SH / 2600SH / 3100SH / 4100SH / 5100SH / 6100SH-R2

Y travels: 2600 mm, Z travels: 800 mm



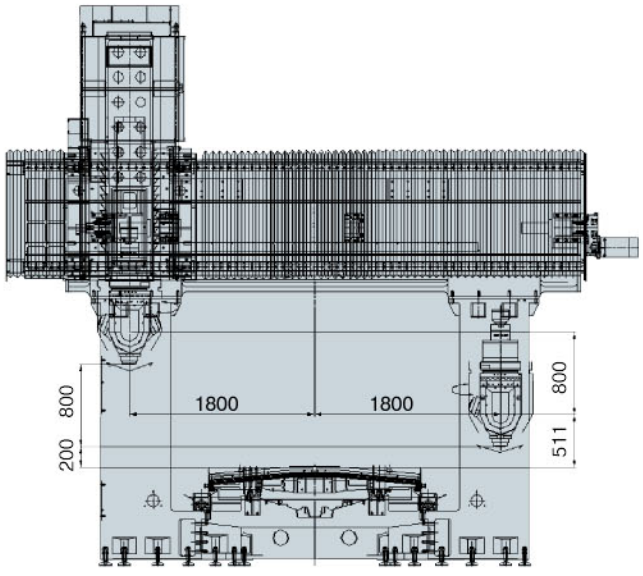
Head AC4



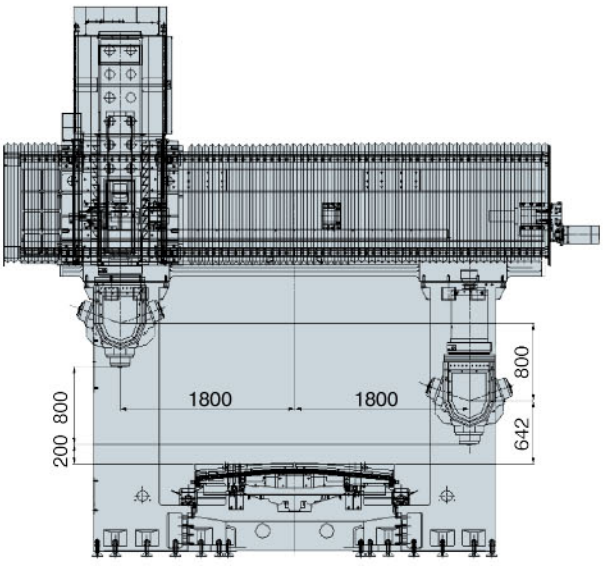
Head AC5

DMC-3100PH / 4100PH-R2

Y travels: 3600 mm, Z travels: 800 mm

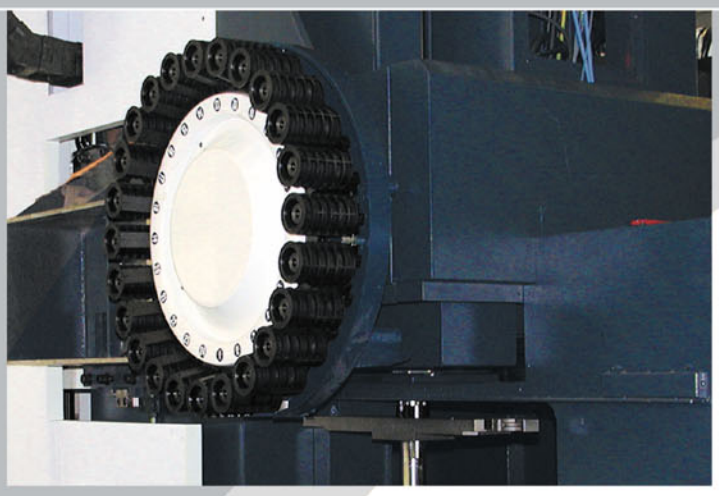


Head AC4



Head AC5

Automatic Tool Changer



No. 40 24 tools (Std.)
No. 50 24 tools (Std.)

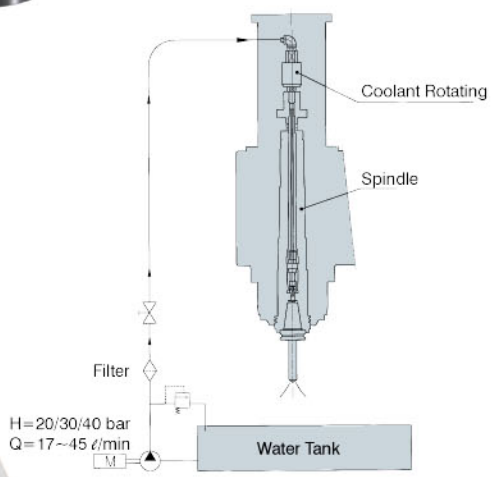
Tool change time: (Std.)
No. 40: 2.5 sec
No. 50: 4 sec

32/40/60 tools (Opt.)

- 24 tools (Std.) or 32/40/60 tools (Opt.) are used on the cam-type automatic tool changer. The tool change time is 2.5 seconds for No.40 and 4 seconds for No.50.
- 80/120 tools (Opt.) are used on the hydraulic automatic tool changer. It provides 7 seconds for tool change time. Automatic tool change arm is supported by linear ways to ensure rapid and smooth traverse.
- Bi-directional tool changer without interference.

Accessories

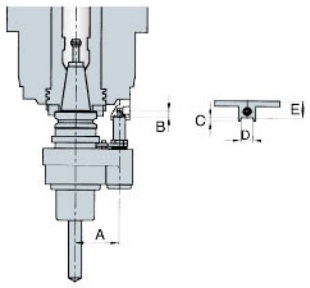
Coolant Thru Spindle



Automatic Chip Removal (Screw Type Chip Conveyor)

Remote Handwheel

Coolant Thru Tool Tip

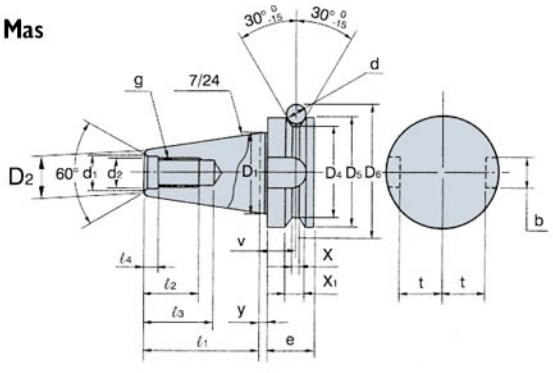


Model \ Item	Taper No.	A	B	C	D	E
DMC-2100S / 2600S 3100S / 4100S 5100S / 6100S 3100P / 4100P	No.40	65	9	5	18	25.5
DMC-2100SH/2600SH 3100SH/4100SH 5100SH/6100SH 3100PH/4100PH	No.50	80	23.5	5	18	36.5

Tool System

BT/CAT Tool Dimension

Mas



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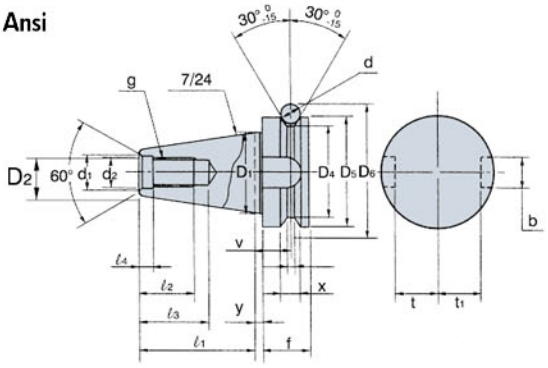


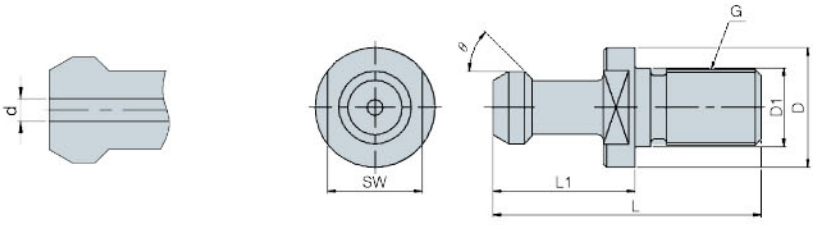
Unit: mm

Shank size \ Item		D1	ℓ1	d1	d2	g	ℓ2	ℓ3	ℓ4	b	t	t1
No.40	MAS(BT)	44.45	65.4 -0.2	19	17 H8	M16	30min	43min	9 +0.5 0	16.1 H12	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	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		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)	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)	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

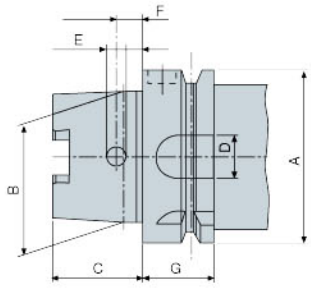
Pull Stud



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	15	29

CNC System-Fanuc 18*i*-MB

We use the FANUC CNC system for reliability, performance, and FANUC's excellent worldwide service. It is up to the machine tool builder that options are resident in the control and we load it up. Others call them options, but we call them standard. Features such as 10.4" color LCD display, Custom Macro B, Helical, 640 m of memory, Canned Cycles, Full MDI keyboard, and AI NANO Contour Control (high speed machining with 180 blocks look ahead) are all standard. Not to mentioned Fanuc's state-of-the-art AC digital servo and spindle systems.

Conversational

If ease of programming at the machine is your need, the optional Manual Guide i software is what you have been looking for. 10.4" color LCD, tool and material libraries, solid modeling animation, automatic graphical prompt driven programming and simple question and answer format make programming at the machine in a breeze.

Do You Want to Fly ?

With the optional Data Server (up to the maximum capacity of 1 GB for your choice) and AI NANO HPCC (High Precision Contour Control) with 64-bit RISC processor, you can fly through 3-axis simultaneous movements at 60,000 blocks per minute. Or take it one step further by adding the NURBS option for even faster contouring with better finishes. Call us for the fastest CNC system on the planet.

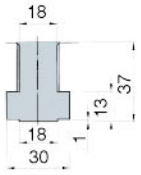
Dimensions

S Series Dimensions

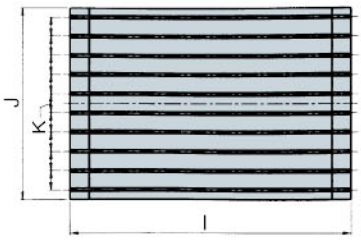
Unit: mm

Model \ Size	A	B	C	D	E	F
DMC-2100S/2100SH	950 (37.4")	725 (28.5")	890 (35")	2030 (79.9")	3760 (148")	6633 (261.1")
DMC-2600S/2600SH	950 (37.4")	725 (28.5")	890 (35")	2030 (79.9")	3760 (148")	7633 (300.5")
DMC-3100S/3100SH	950 (37.4")	725 (28.5")	890 (35")	2030 (79.9")	3760 (148")	8633 (340")
DMC-4100S/4100SH	950 (37.4")	855 (33.7")	890 (35")	2165 (85.2")	3890 (153")	11153 (439.1")
DMC-5100S/5100SH	1216 (47.9")	928 (36.5")	890 (35")	2240 (88.2")	3890 (153")	13666 (538")
DMC-6100S/6100SH	1350 (53.1")	928 (36.5")	890 (35")	2031 (80")	3890 (153")	15590 (613.8")

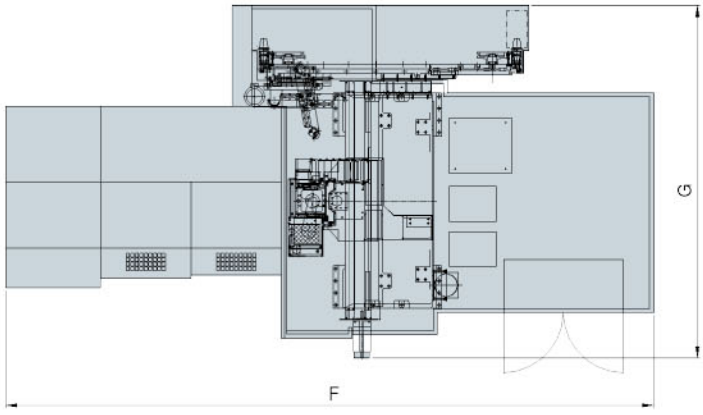
Model \ Size	G	H	I	J	K
DMC-2100S/2100SH	4065 (160")	1796 (70.7")	2200 (86.6")	1500 (59.1")	150 (5.9")
DMC-2600S/2600SH	4065 (160")	1796 (70.7")	2700 (106.3")	1500 (59.1")	150 (5.9")
DMC-3100S/3100SH	4065 (160")	1796 (70.7")	3200 (126")	1500 (59.1")	150 (5.9")
DMC-4100S/4100SH	4070 (160.2")	1796 (70.7")	4200 (165.4")	1500 (59.1")	150 (5.9")
DMC-5100S/5100SH	4070 (160.2")	1796 (70.7")	5200 (204.7")	1500 (59.1")	150 (5.9")
DMC-6100S/6100SH	4070 (160.2")	1796 (70.7")	6200 (244.1")	1500 (59.1")	150 (5.9")



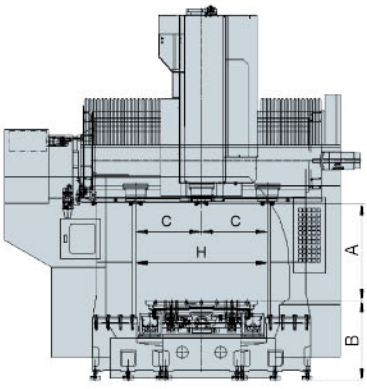
T-Slot



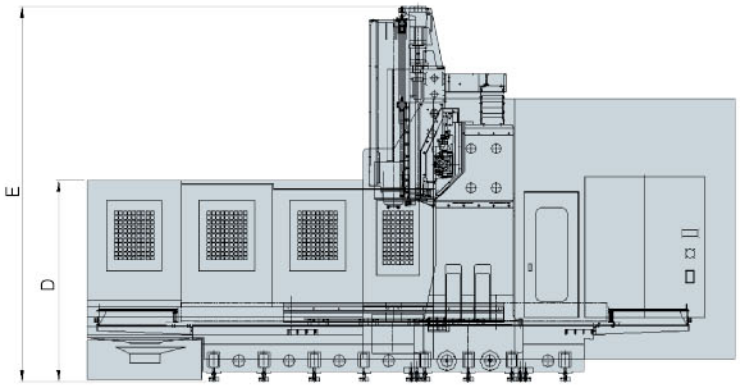
Table



Top View (floor space required)



Front View



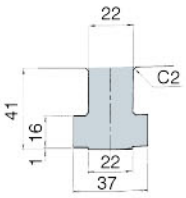
Side View

P Series Dimensions

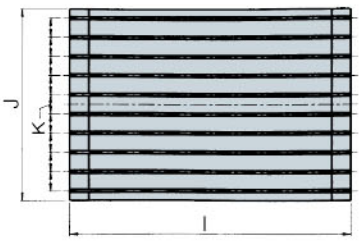
Unit: mm

Model \ Size	A	B	C	D	E	F
DMC-3100P/3100PH	950 (37.4")	900 (35.4")	1150 (45.3")	1800 (70.8")	3940 (155.1")	8482 (334")
DMC-4100P/4100PH	950 (37.4")	900 (35.4")	1150 (45.3")	1800 (70.8")	3940 (155.1")	10980 (432.3")

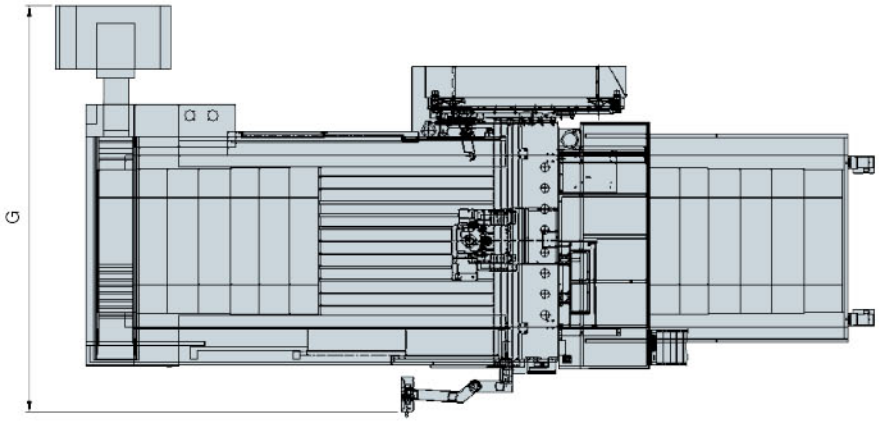
Model \ Size	G	H	I	J	K
DMC-3100P/3100PH	5655 (222.6")	2420 (95.3")	3200 (126")	2050 (81")	180 (7.1")
DMC-4100P/4100PH	5655 (222.6")	2420 (95.3")	4200 (165.4")	2050 (81")	180 (7.1")



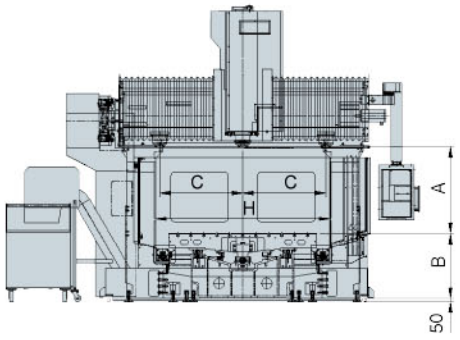
T-Slot



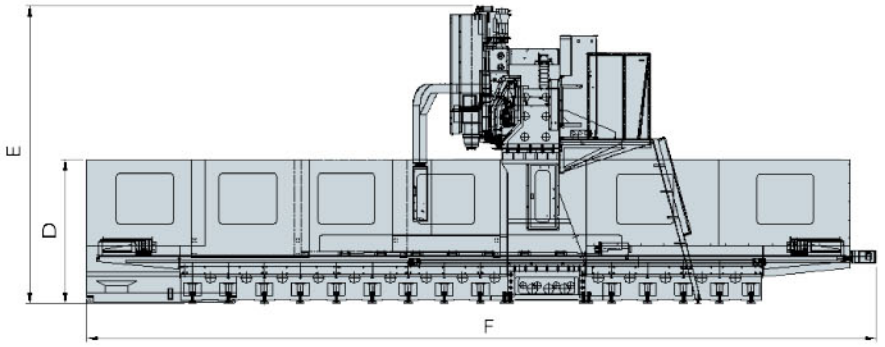
Table



Top View (floor space required)



Front View



Side View

Specifications

Item \ Model	DMC-2100S DMC-2100SH	DMC-2600S DMC-2600SH	DMC-3100S DMC-3100SH	DMC-4100S DMC-4100SH	DMC-5100S DMC-5100SH	DMC-6100S DMC-6100SH	DMC-3100P DMC-3100PH	DMC-4100P DMC-4100PH
Distance between columns (mm)	1796 (70.7")						2400 (94.4")	
Table size (mm)	2200 x 1500 (86.6" x 59")	2700 x 1500 (106.2" x 59")	3200 x 1500 (126" x 59")	4200 x 1500 (165.4" x 59")	5200 x 1500 (204.7" x 59")	6200 x 1500 (244.1" x 59")	3200 x 2050 (126" x 80.7")	4200 x 2050 (165.3"x80.7")
X axis travel (mm)	2100 (82.7")	2600 (102.4")	3100 (122")	4100 (161.4")	5100 (200.7")	6100 (240.2")	3100 (122")	4100 (161.4")
Y axis travel (mm)	1778 (70")						2300 (90.5")	
Z axis travel (mm)	800 (31.5")							
Spindle nose to table (mm)	150~950 (5.9"~37.4")							
Spindle taper	BT-40 / CAT-40		HSK A63 (Opt.)	For DMC-2100S DMC-2600S DMC-3100S DMC-4100S DMC-5100S DMC-6100S DMC-3100P DMC-4100P	BT-50 / CAT-50		HSK-A100 (Opt.)	For DMC-2100SH DMC-2600SH DMC-3100SH DMC-4100SH DMC-5100SH DMC-6100SH DMC-3100PH DMC-4100PH
Spindle diameter (Bearing) (mm)	ϕ70 (ϕ2.8")		-		-		-	
Spindle speed (rpm)	8000, 10000,12000 (Opt.)		15000, 18000, 24000		6000		15000	
Spindle motor (kW)	7.5 / 11 Hi Lo Gear		17 / 20 built-in (for 15000,18000rpm) 18 / 23 built-in (for 24000rpm)		22 / 26 Hi Lo Gear		32 / 42 built-in	
X-Y-Z rapid traverse (m/min)	12 / 12 / 12 , 472" / 472" / 472"							
X-Y-Z cutting feed (mm/min)	1-10000							
ATC: Adjacent pockets max. tool dia. (mm)	ϕ75 (ϕ3")		For DMC-2100S DMC-2600S DMC-3100S DMC-4100S DMC-5100S DMC-6100S DMC-3100P DMC-4100P		ϕ125 (ϕ5")		For DMC-2100SH DMC-2600SH DMC-3100SH DMC-4100SH DMC-5100SH DMC-6100SH DMC-3100PH DMC-4100PH	
ATC: No.of tools	Arm type 24 Arm type 32 / 40 (Opt.)				Arm type 24 Arm type 32 / 40 (Opt.)			
ATC: Max. tool diameter (mm)	ϕ100 (ϕ4")				ϕ200 (ϕ7.8")			
ATC: Max. tool length (mm)	320 (12.6")				400 (15.7")			
ATC: Max. tool weight (kg)	10 (22 lb)				15 (33 lb)			
ATC: Tool selection	Bi-direction random type, Shortest path							
Table load capacity (kg)	10000 (22000 lb)				12000 (26400 lb)		10000 (22000 lb)	
Dimensions: Length (mm)	6633 (261.1")	7633 (300.5")	8633 (340")	11153 (439.1")	13666 (538")	15590 (613.8")	8482 (334")	10980(432.2")
Dimensions: Width (mm)	4065 (160")			4070 (160.2")			5655 (222.6")	
Dimensions: Height (mm)	3800 (150")			3890 (153")			3890 (153.1")	
Machine weight (kg)	29600 (65120 lb)	31200 (68640 lb)	32800 (72160 lb)	37500 (82500 lb)	42100 (92620 lb)	47000 (103525 lb)	35000 (77000 lb)	41000 (90200 lb)

- All data subject to change without notice.
- All the specifications are listed with the FANUC CNC system.

Standard Accessories:

1. Coolant system
2. Spindle air blast
3. Heat exchanger
4. Full enclosure (S series)
5. Two screw type chip conveyors
6. One chain type chip conveyor
7. Operation box
8. Tools, tool box and various manuals
9. Rigid tapping
10. Spindle oil cooler
11. Working lamp (One spotlight & two daylight lamps)
12. FANUC 0*i*-MD controller

Optional Accessories:

1. Contact tool setting system (Renishaw TS-27R)
2. High pressure coolant thru tool tip
3. High pressure coolant thru spindle
4. Full enclosure (P series)
5. Workpiece measuring system
6. Linear scale
7. 32/40 tools (for BT / CAT spindle)
8. 15000, 18000, 24000 rpm for HSK A63 built-in spindle
9. 15000 rpm for HSK A100 built-in spindle
10. 2-axis NC milling head
11. External coolant flow of spindle (tool edge)
12. Manual guide *i* / 0*i* (0*i*MD) ; Manual guide *i* (18*i*MB / 21*i*MB)

CNC Control Specs

■ CNC system type

O: Std. △: Opt. -: Nil

Type / Model	DMC Series	DMC Series-R2	DMC Series-5F
FANUC 0*i*MD	○	-	-
FANUC 21*i*MB	△	-	-
FANUC 18*i*MB	△	-	○
FANUC 18*i*MB5	△	△	△
Heidenhain *i*TNC530 with MC420	△	-	△
Heidenhain *i*TNC530 with MC422	△	△	△
Siemens 810D	△	-	-
Siemens 840D (572.5)	△	○	△
Siemens 840D (573.5)	△	△	△

■ Fanuc specifications

O: Std. △: Opt. -: Nil

	Item	Specifications		0iMD	18iMB	21iMB
Display unit	8.4" color LCD			○	-	-
	10.4" color LCD			△	○	○
Function	Data Server with 1GB CF card			△	△	△
	HPCC by 64 bits Risc card			-	△	-
	Conversational programming with graphic function	Manual guide 0*i*	0*i*MD	○	-	-
		Manual guide *i*	18*i*MB / 21*i*MB / 0*i*MD (10.4" LCD)	△	○	○
	NC program memory	640 meter (about 256 KB)		○	○	○
	4th interface			○	○	○

■ Siemens specifications

O: Std. △: Opt. -: Nil

	Item	Specifications	810D	840D
Operation Panel	10.4" color LCD		○	○
	12.1" color LCD		△	△
	15.1" color LCD		△	△
	KB 483C full CNC keyboard		△	△
	PCU 20 without hard disk		○	○
	Network / disk drive management	CF card	△	△
	PCU 50 with hard disk	Include HD & Ethernet	△	△
Function	ShopMill programming copy licence		△	△
	Automatic residual material detection		△	△
	Universal interpolator NURBS		○	○
	4th axis interface		○	○
	Spline interpolation for 3 - axis		△	△
	Spline interpolation for multi - axis	Only for DMC - R2	-	△
	Machining package milling: Contains the option: Machining package multi - axis, multi-axis interpolation, spline interpolation for multi - axis machining, 3D tool radius compensation	Only for DMC - R2	-	△

■ Heidenhain specifications

O: Std. △: Opt. -: Nil

	Item	Specifications	iTNC530 MC420	iTNC530 MC422
Display unit	Visual display unit 15" TFT display		○	○
Function	Main computer	MC420 3.6 ms block processing time	○	-
		MC422 0.5 ms block processing time	-	○
	NC programming memory	26GB on hard disk	○	○
	4th interface		△	△
Software option 1	• Cylindrical surface interpolation • Feed rate in mm/min • Tilting the working plane • Circular interpolation in 3 - axis with tilted working plane		△	○
Software option 2	• HSC path control with special nominal-position value filters • 3-D tool compensation through surface normal vectors • Tool Center Point Management (TCPM) • Keeping the tool normal to the contour • Tool radius compensation normal to the direction of the tool • Linear interpolation in multi - axis (export license required) • Spline interpolation: execution of splines (3rd degree polynomial) • 0.5 ms block processing time		△	○

Whatever You Need for Milling and Turning We Offer the Best.

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