

FIVE-FACE PRECISION
MACHINING SYSTEM

HF-M
Multi-Center
Series

 **SHIN NIPPON KOKI**

SNK

TECHNOLOGICAL INNOVATION

Model HF-M Series Offers The Ultimate
In Five-Face Machining Technology.

HF-M

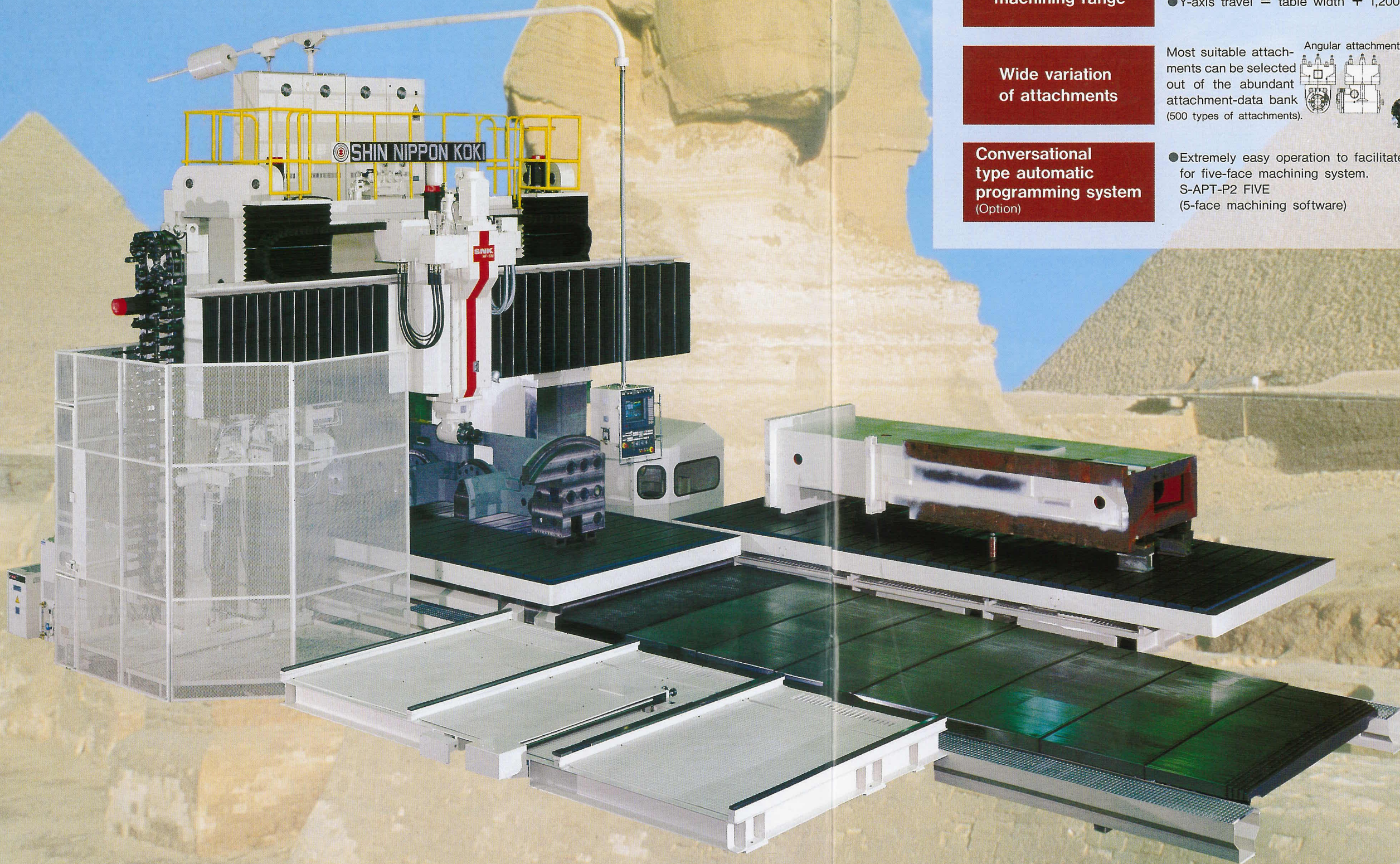
The Model HF-M Series is the ultimate in five-sided machining systems. It boasts an outstanding performance both in speed and accuracy, producing flawless products.

SNK, known as the pioneer in machining technology, is unsurpassed in reliability. The Model HF-M Series, designed in anticipation of the needs of the future, will be a "core" machine in your production shop.



The solutions to Innovate your business
and boost your profits !!!

HF-M Five-Face Precision Machining System



Features for high productivity

- Spindle drive motor: VAC 26/22kW
(Option: 37/30kW, 45/37kW)
- Spindle speed: 30 to 3,000min⁻¹
- Rapid feed (X & Y): 20m/min.
- ATC time (tool to tool): 8 seconds

Functions for high precision

- Y-axis accuracy sustained by dual servo control for W-axis
- Fully automated lubrication with temperature-controlled oil to minimize thermal displacement for:
 - Spindle oil jacket system
 - Drive gear box
 - X, Y, Z & W-axes slideways
 - Each axis feed gear box
 - Each axis feed ball screw, nuts, and brackets

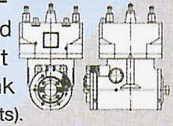
Extra-large machining range

- CNC-controlled vertical movement of crossrail (W-axis)
- X-axis travel = table length + 1,250mm (Option)
- Y-axis travel = table width + 1,200mm

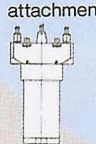
Wide variation of attachments

Most suitable attachments can be selected out of the abundant attachment-data bank (500 types of attachments).

Angular attachment

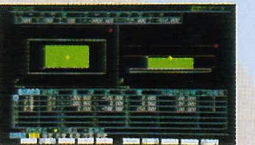


Extension attachment

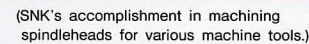


Conversational type automatic programming system (Option)

- Extremely easy operation to facilitate programming for five-face machining system.
S-APT-P2 FIVE
(5-face machining software)

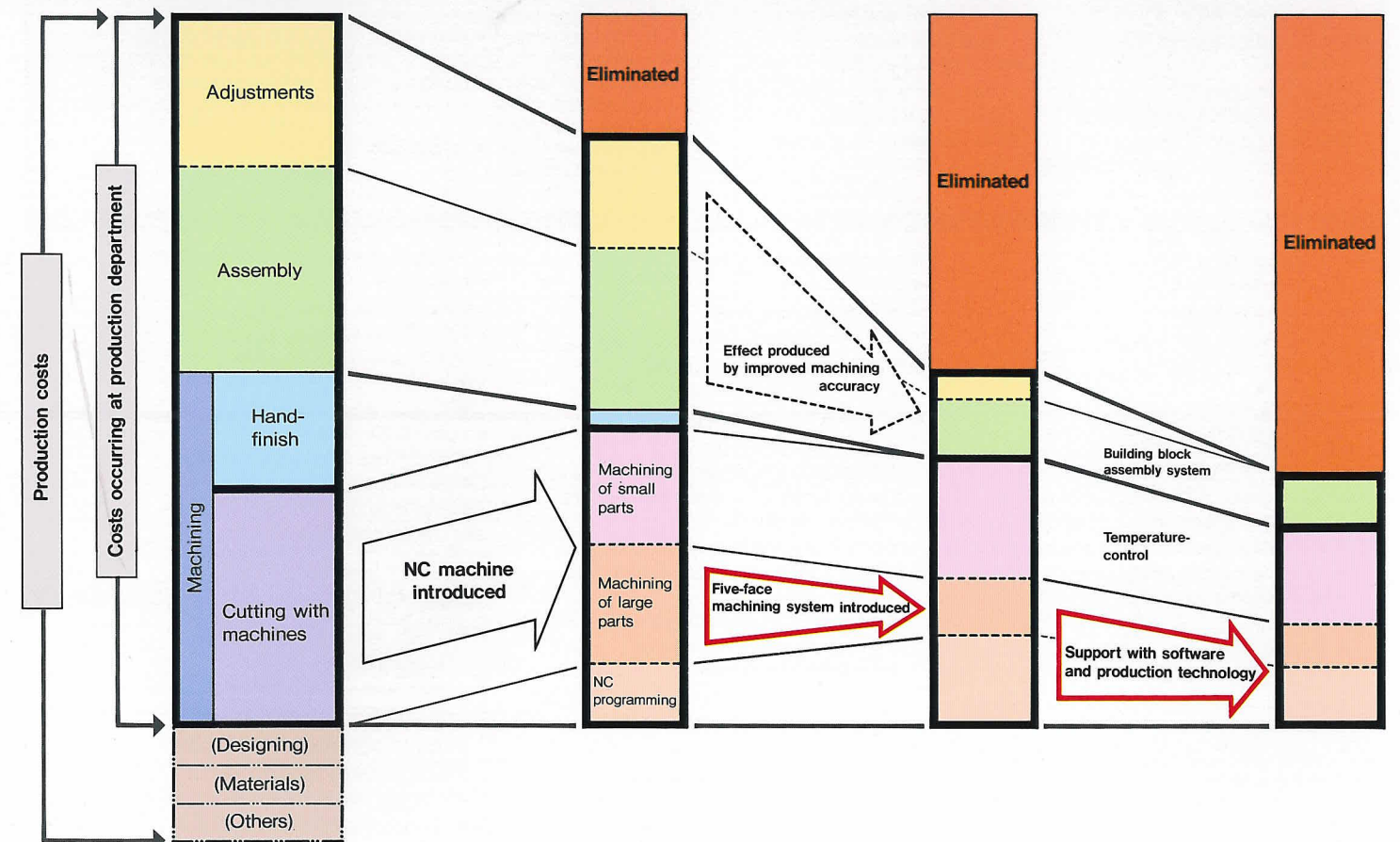


HF-M Multi-Centers
Most reliable machine series best suited for
FMS applications



Machining time decreased to 1/2 to 1/4
Machining lead time reduced to 1/10 to 1/20

Machining time	Lead time	Setup changes
58 hrs.	45 days	9 times
33 hrs.	3 days	3 times
Approx. $\frac{1}{2}$	$\frac{1}{15}$	$\frac{1}{3}$



Machine Specifications

Model			Unit	HF-3M				HF-4M			
Effective distance between columns			mm [in]	2,000 [78.7]				2,500 [98.4]			
Max. distance from table (pallet) top to spindle end			mm [in]	1,750 [68.8] (1,500 [59.0])		2,250 [88.5] (2,000 [78.7])		2,000 [78.7] (1,750 [68.8])	2,250 [78.7] (2,000 [78.7])	2.5 (2.2)	
Table (pallet) working surface		Length	mm [in]	3,000 [118.1]	4,000 [157.4]	5,000 [196.8]	6,000 [236.2]	4,000 [157.4]	5,000 [196.8]	6.0	
		Width		1,500 [59.0]				2,000 [78.7]			
Loading capacity on table (pallet)			kg [lb]	15,000 [33,000] (15,000 [33,000])		20,000 [44,000] (20,000 [44,000])		15,000 [33,000] (15,000 [33,000])			
Travels (Effective)	Table longitudinal (X)		mm [in]	3,250 [127.9]	4,250 [167.3]	5,250 [206.6]	6,250 [246.0]	4,250 [167.3]	5,250 [206.6]	6.2	
	Spindlehead transverse (Y)			2,700 [106.2]				3,200 [125.9]			
	Ram vertical (Z)										
	Crossrail vertical (W)			700 [27.5]	1,200 [47.2]		950 [37.4]	1,200 [47.2]	1.4		
Spindlehead	Cross section of ram		—								
	Spindle diameter and nose taper										
	Spindle speed										
	Spindle drive motor and maximum torque										
	Other option for spindlehead										
Feedrates	Rapid feed	Standard: Simultaneous 3 axes feed ※2	(X・Y)	m/min [in/min]							
			(Z)								
			(W)								
	Cutting feed	Option: Simultaneous 4 axes feed	(X・Y・Z)	mm/min [in/min]							
			(W)								
Control system			—								

Standard accessories

<ul style="list-style-type: none">● ATC device 60 tools (for both vertical and horizontal spindles) Max.tool dia.290mm (with all pots filled:110mm) Max.tool length 500mm Max.tool weight 25kg Max.tool moment39.2N・m Pull stud MAS P50T- II● Angular attachment for 1set L=300mm Indexing at every 90° Max.permissible speed 1500min⁻¹ Max.output power 22kW● AAC(Automatic attachment changer)	(for one attachment and a protective cover) <ul style="list-style-type: none">● Automated lubrication with temperature control for: Spindle ram oil jacket Spindle drive gear box Each axis slideway Ball screws and nuts Feed gear boxes● Operation pendant (Swinging type in vertical and crosswise directions)● Spindlehead-following type hydraulic balancing for crossrail	<ul style="list-style-type: none">● Twin-balancing system for ram● Monitoring functions: Ladder display Self-diagnostic function Spindle load meter● Foundation parts● Coolant system Standard coolant tank 550lit. (Effective:300lit.) 0.4MPa 25lit./min.● Coolant collection troughs● Built-in five-face machining software with CNC● Lighting equipment (A fluorescent light to be provided under the crossrail.)	<ul style="list-style-type: none">● Slideway covers (X-axis:) Telescopic steel covers (Y-axis:) Bellows cover (W-axis:) Upper part: Bellows cover Lower part: Telescopic steel covers● Low-oil-level alarm for lubrication unit● Portable type manual handle operation panel● Spindle speed display● Earth leakage break function● Ladder and handrail● Arrow indication for feed axis directions● Tool box● Spare parts (Fuse 100%)
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Selectable Options

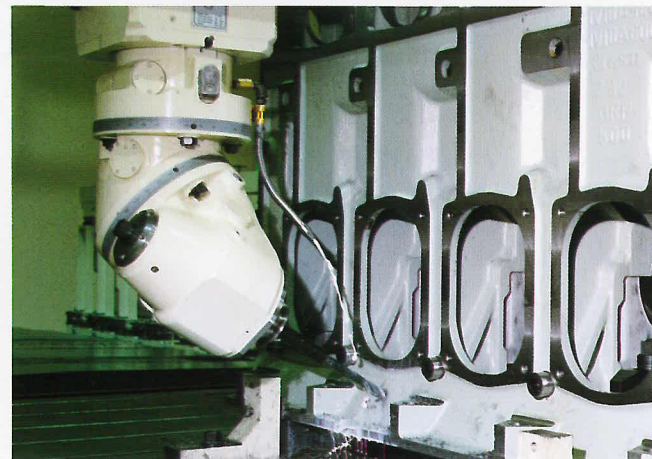
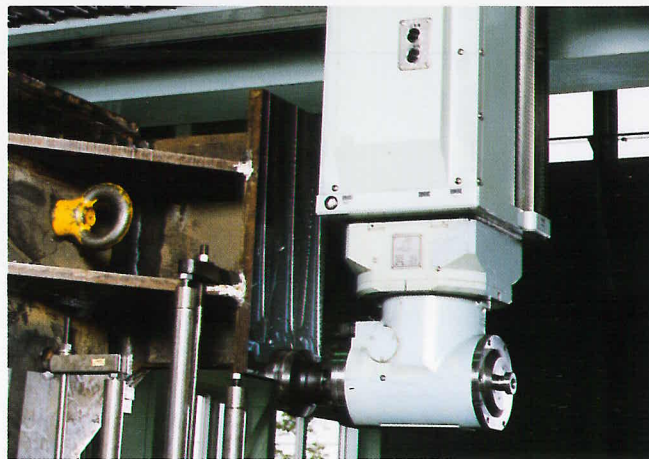
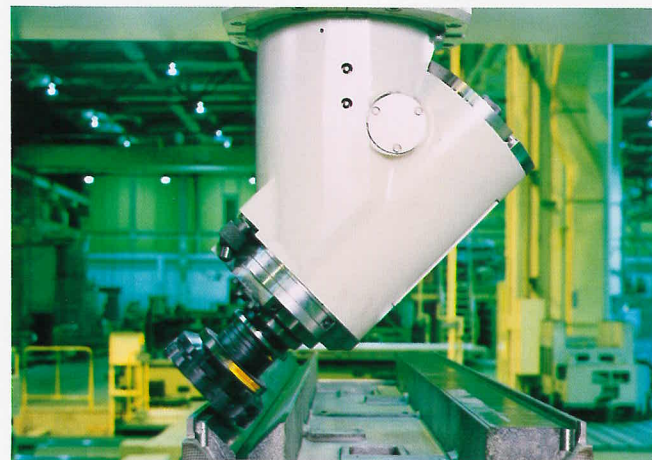
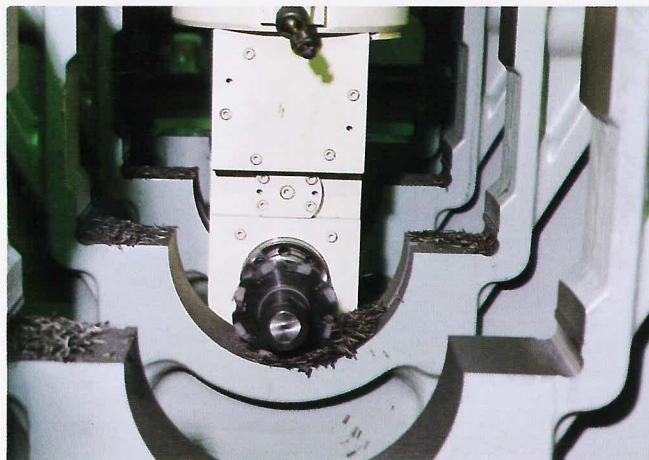
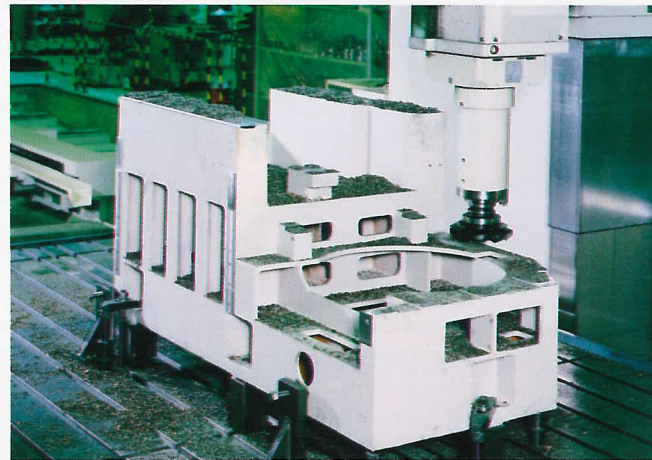
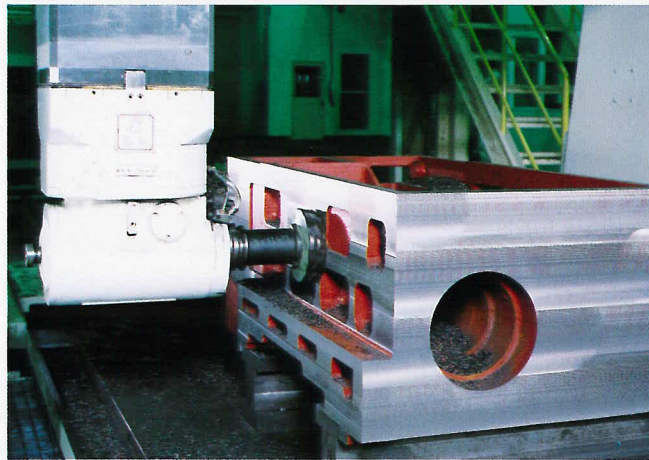
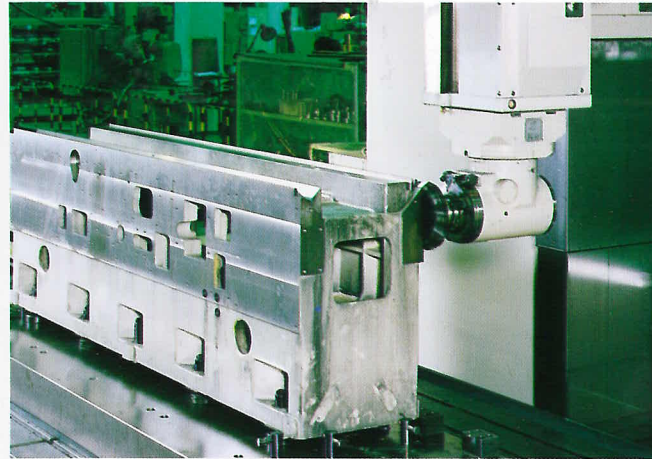
<ul style="list-style-type: none">● APC (Automatic pallet changer)<ul style="list-style-type: none">● Side-delivery type● Back-delivery type● ATC (Automatic tool changer)<ul style="list-style-type: none">● 90tools● 120tools● 180tools● 220 tools● Max.tool weight 35kg● AAC (Automatic attachment changer)<ul style="list-style-type: none">● for 2 attachments plus a protective cover● for 3 attachments plus a protective cover● for 4 attachments plus a protective cover● for 5 attachments plus a protective cover● Attachments (AAC possible)<ul style="list-style-type: none">● Angular attachment(L=500)(ATC possible)● Extension attachment(L=500)(ATC possible)● Special small angular attachment(L=500)● 45°inclined universal attachment● Center swing universal attachment(automatic indexing type)● High speed attachment 6,000min⁻¹ (ATC possible)● Coolant system<ul style="list-style-type: none">● Level switch● Increased discharge rate/discharge pressure	<ul style="list-style-type: none">● Increased capacity tank● Chip conveyor<ul style="list-style-type: none">● Two-conveyor type● Three-conveyor type● Functions for higher accuracy<ul style="list-style-type: none">● Scale feedback (for X,Y,Z & W axes)● Functions for automation<ul style="list-style-type: none">● Automatic power on● Automatic tool length measuring function (Laser system *1, Touch sensor type)● Vertical, Horizontal● Tool breakage detecting function (Laser system *1, Touch sensor type)● Vertical, Horizontal● Tool breakage detecting function and spare tool changing function● Monitoring functions<ul style="list-style-type: none">● Machining end indication light● Machining end stop(Automatic power shutoff)● Three-lamp indication light● Maintenance support display	<ul style="list-style-type: none">● Output terminal for indication light● Spot light● Machine top warning light● AC100V power socket (to be provided on saddle)● Low-oil-level alarm for hydraulic unit● Portable type manual handle operation panel with coordinate display● Attachment indexing at every 5°● Attachment indexing at every 1°● Special software for attachment● Lifter for operator <p>Special options</p> <ul style="list-style-type: none">● Energy saving options<ul style="list-style-type: none">・Electric energy monitor・Hydraulic unit with inverter control・Oil temperature control unit with inverter control● AAC for six attachments or more● Special attachments● FMS applications● Special coating● Others(Please contact SNK for any detail.) <p>*1:The laser system can measure the tool diameter.</p>
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		Standard spec.				Option.				()Spec. for machines with APC			
		HF-5M				HF-6M				HF-7M			
		3,000〔118.1〕				3,500〔137.7〕				4,000〔157.4〕			
98.4〕 (88.1)〕	2,750〔108.2〕 (2,500〔98.4〕)	2,250〔88.5〕 (2,000〔78.7〕)	2,500〔98.4〕 (2,250〔88.5〕)	2,750〔108.2〕 (2,500〔98.4〕)	3,000〔118.1〕 (2,750〔108.2〕)	2,500〔98.4〕 (2,250〔88.5〕)	2,750〔108.2〕 (2,500〔98.4〕)	3,000〔118.1〕 (2,750〔108.2〕)	3,250〔127.9〕 (3,000〔118.1〕)	3,000〔118.1〕 (2,750〔108.2〕)	3,500〔137.7〕 (3,250〔127.9〕)	4,150〔163.3〕	
236.2〕	7,000〔275.5〕	4,000〔157.4〕	5,000〔196.8〕	6,000〔236.2〕	7,000〔275.5〕	5,000〔196.8〕	6,000〔236.2〕	7,000〔275.5〕	8,000〔314.9〕	7,000〔275.5〕	8,000〔314.9〕	10,000〔393.7〕	
		2,500〔98.4〕				3,000〔118.1〕				3,500〔137.7〕			
20,000〔44,000〕 (20,000〔44,000〕)	20,000〔44,000〕 (15,000〔33,000〕)	20,000〔44,000〕 (20,000〔44,000〕)	30,000〔66,000〕 (30,000〔66,000〕)		25,000〔55,000〕 (25,000〔55,000〕)	30,000〔66,000〕 (30,000〔66,000〕)	40,000〔88,000〕 (40,000〔88,000〕)		60,000〔132,000〕 (30,000〔66,000〕)	60,000〔132,000〕 (40,000〔88,000〕)	100,000〔220,000〕		
246.0〕	7,250〔285.4〕	4,250〔167.3〕	5,250〔206.6〕	6,250〔246.0〕	7,250〔285.4〕	5,250〔206.6〕	6,250〔246.0〕	7,250〔285.4〕	8,250〔324.8〕	7,250〔285.4〕	8,250〔324.8〕	11,000〔433.0〕	
		3,700〔145.6〕				4,200〔165.3〕				4,700〔185.0〕			
Standard:800〔31.4〕／Option:1,000〔39.3〕													
57.0〕	1,700〔66.9〕	1,200〔47.2〕	1,450〔57.0〕	1,700〔66.9〕	1,950〔76.7〕	1,450〔57.0〕	1,700〔66.9〕	1,950〔76.7〕	2,200〔86.6〕	1,950〔76.7〕	2,450〔96.4〕	3,200〔125.9〕	
400×500mm〔15.7"×19.7"〕※1													
φ120mm〔4.724"〕●ISO No.50													
30～3,000min ⁻¹													
Standard:26kW (30min.rating) / 22kW (continuous) ●1,130N・m Option: 37kW (30min.rating) / 30kW (continuous) ●2,100N・m : 45kW (30min.rating) / 37kW (continuous) ●1,950N・m													
Standard:Two coolant nozzles (flexible and flow-adjustable) Option:Switching for coolant and air blow Option:Special block for through-tool coolant holder Option:Through spindle coolant													
20〔787〕(End of stroke)10〔393〕										20※3〔787※3〕		X=12※3〔472※3〕 Y=20※3〔787※3〕	
9〔354〕													
3〔118〕(Area 60Hz)●2.5〔98〕(Area 50Hz)													
1～6,000〔0.1～236〕													
1～3,000〔0.1～118〕(Area 60Hz)●1～2,500 (Area 50Hz)													
FANUC Series 31i													
※1 Ram interference area is 536mm in X direction and 512mm in Y direction.													
※2 Standard is three-axis feed (X,Y & Z) at time. Simultaneous four-axis feed is optionally available and needs a much larger hydraulic unit.													
※3 Decelerates in the stroke end.													
* If your requirements exceed the specifications listed in this table, please contact us.													

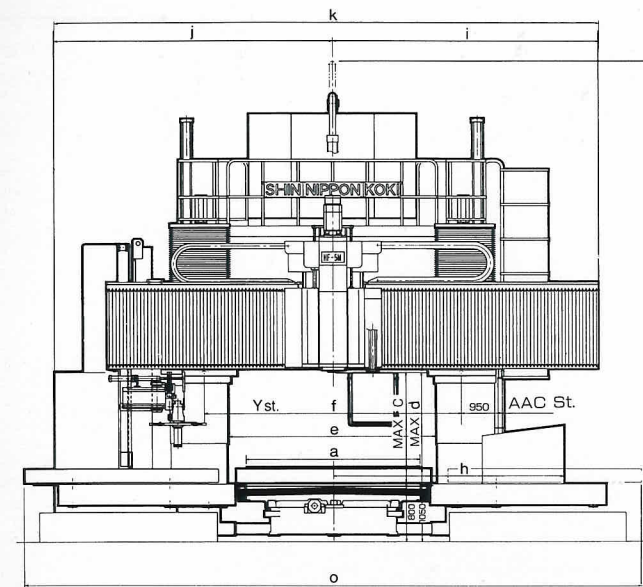
CNC System Specification (FANUC Series 31i)

Basic specifications				4 axes (X,Y,Z & W)		3 axes ※2		3 axes ※2		2 axes		0.001mm(0.0001")		±99999.999mm(±3937.0078")		●Plane selection (G17 to G19)		●Rotary axis roll-over		●Coordinate system setting (G92)		●Manual absolute on and off		●Programmable data input (G10)		●Programmable parameter input		●Sub program call (10 folds nested)		●Circular interpolation by R programming		●Auxiliary function (M code)		●Auxiliary function lock		●Tool function (T code)		●Tool offset memory A		●Tool length offset (G43,G44,G49)		●Tool length measurement		●Backlash compensation for each rapid traverse and cutting feed		●Smooth backlash compensation		●Program protect		●Extended part program editing		●Clock function		●Current position display		●Program comment display (program name 31 characters)		●Parameter setting and display		●Alarm display		●Alarm history display		●Operator message history display		●Operation history display		●Actual cutting feedrate display		●Operating monitor screen		●Servo setting screen		●Spindle setting screen		●Servo waveform display		●Data protection key (1 type)		●Erase LED screen display		●Parameter set supporting screen		●Help function		●Self-diagnosis function		●Memory card input/output		●Screen hard copy		●Machine interface (DI/DO)													
Controlled axis		4 axes (X,Y,Z & W)		Positioning (rapid feed)		3 axes ※2		Linear interpolation		3 axes ※2		Circular interpolation		2 axes		Least input increment		Linear axis		0.001mm(0.0001")		Maximum programmable dimension		Linear axis		±99999.999mm(±3937.0078")		●HRV control		●Interlock		●Machine lock		●Emergency stop		●Stored stroke check1		●Mirror image		●Automatic operation (Memory/MDI/DNC)		●Program number search		●Sequence number search		●Wrong operation prevention		●Buffer register		●Dry run		●Single block		●Manual continuous feed (JOG)		●Manual reference position return		●Nano interpolation		●Positioning (G00)		●Exact stop mode (G61)		●Exact stop (G09)		●Linear interpolation (G01)		●Circular interpolation (Multi-quadrant is possible) (G02,G03)		●Dwell (per second) (G04)		●Skip (G31)		●Reference position return/check (G27,G28,G29)		●2nd reference position return (G30)		●Rapid traverse override (F0,25%,50%,100%)		●Feed per minute (mm/min)		●Tangential speed constant control		●Cutting feedrate clamp		●Feedrate override (0 to 200% (per every 10%))		●Override cancel		●Linear ACC/DEC after cutting feed interpolation		●Tape code (EIA/ISO automatic recognition)		●Label skip		●Control in/out		●Program file name (32 characters)		●Sequence number (N8 digit)		●Absolute/incremental programming (G90,G91)		●Decimal point programming/pocket calculator type decimal point programming	
Simultaneous controllable axes		3 axes ※2		Linear interpolation		3 axes ※2		Circular interpolation		2 axes		Least input increment		Linear axis		0.001mm(0.0001")		Maximum programmable dimension		Linear axis		±99999.999mm(±3937.0078")		●Tape format for FS15		●Macro executor		●Spindle serial output		●Spindle override		●Spindle orientation		●Rigid tap		●Tool offset pairs		●Cutter compensation		●Part program storage size		●Number of registrable programs expansion		●Background editing		●Run hour and parts count display		●Multi-language display		●RS-232C Ch1		●Fast Ethernet/Data server		●External data input		●Synchronous control		●Cs contouring control		●10.4" color LCD																																													
G65 to G67 (Common variables:Total600)		G73,G74,G76,G80 to G89,G98,G99		G62		G68,G69		●3-dimensional coordinate system conversion		●Programmable mirror image		G50.1,G51.1		●Tool offset pairs		Total:99		●Cutter compensation		G40 to G42		●Part program storage size		256Kbyte		●Number of registrable programs expansion		Total:500		●Background editing		●Run hour and parts count display		●Multi-language display		English/Japanese		●RS-232C Ch1		1unit		●Fast Ethernet/Data server		1GB		●External data input		●Synchronous control		●Cs contouring control		●10.4" color LCD																																																					
Additional optional functions		●Inch/metric conversion		G20,G21		●Sequence number comparison and stop				●Program restart				●3-dimensional manual feed		For manual tool axis movement		●Helical interpolation		G02,G03		●High-speed skip				●Addition of workpiece coordinate system		48 pairs		●Optional chamfering corner R		●Scaling		G50,G51		●Spindle output switching function				●Tool offset pairs		Total:200		Total:400		Total:499		●Tool offset memory C				●Tool life management				●Part program storage size		Total:512Kbyte		Total:1Mbyte		Total:2Mbyte		Total:4Mbyte		●Multi-language display		German, French, Spanish, Italian, Chinese Korean, Portuguese, Dutch, Danish Swedish, Polish, Russian		Tool path drawing		Total:2 units		Protocol B only		●Dual position feedback		4GB		●Fast Ethernet/Data server																									
SNK standard optional functions		●Stroke limit check before move				●Stored/interpolation type pitch error compensation				●Manual handle feed		0.001,0.01,0.1mm/pulse		●Handle interruption		G60		●Single direction positioning		G60		●3rd/4th reference position return				●External deceleration				●Optional block skip		Total:3		●Workpiece coordinate system		G52 to G59		●Graphic function		●RS-232C Ch2		●RS-232C buffer function		●Dual position feedback		●Fast Ethernet/Data server				●Dual position feedback		4GB		●Fast Ethernet/Data server																																																			

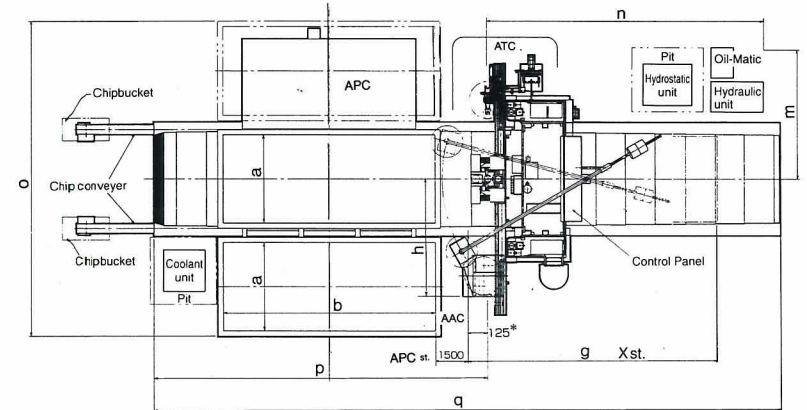
Machining samples with attachments



Floor Plan

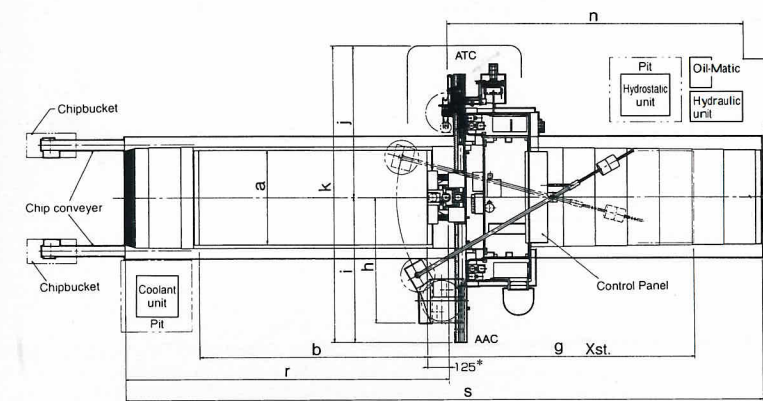


For machines with side-delivery type APC



Unit:mm(in)

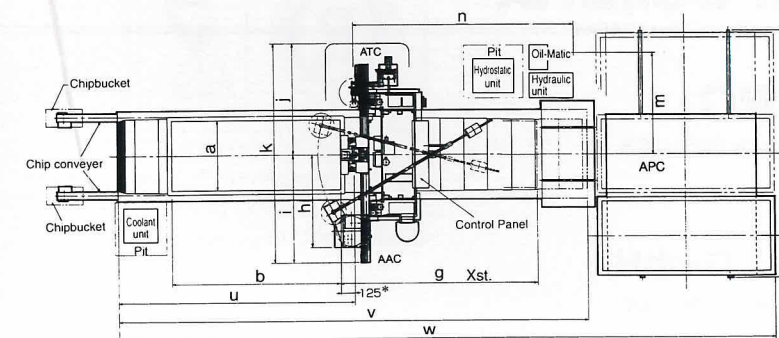
	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q
		※1	※1	※1			※1					※1		※2 ※3			※3
HF-3M	1500 (59.0)	4000 (157.4)	1750 (68.8)	1500 (59.0)	2000 (78.7)	2700 (106.2)	4250 (167.3)	3450 (135.9)	3750 (147.7)	3380 (133.1)	7130 (280.7)	6560 (258.3)	3350 (131.9)		5900 (232.3)	7250 (285.5)	12900 (507.9)
HF-4M	2000 (78.7)	5000 (196.8)	2000 (78.7)	1750 (68.8)	2500 (98.4)	3200 (125.9)	5250 (206.6)	3700 (145.7)	4000 (157.5)	3630 (143.0)	7630 (300.4)	6810 (268.2)	3600 (141.8)		7400 (291.3)	8280 (326.0)	14970 (589.4)
HF-5M	2500 (98.4)		2250 (88.5)	2000 (78.7)	3000 (118.1)	3700 (145.6)		3950 (155.6)	4250 (167.4)	3880 (152.8)	8130 (320.1)	7060 (278.0)	3850 (151.6)	6350 (250.0)	8900 (350.4)		
HF-6M	3000 (118.1)	6000 (236.2)	2500 (98.4)	2250 (88.5)	3500 (137.7)	4200 (165.3)	6250 (246.0)	4200 (165.4)	4500 (177.2)	4130 (162.6)	8630 (339.8)	7320 (288.2)	4100 (161.5)		10400 (409.5)	9370 (368.9)	17150 (675.2)
HF-7M	3500 (137.7)	7000 (275.5)	3000 (118.1)		4000 (157.4)	4700 (185.0)	8250 (324.8)	4450 (175.2)	4800 (189.0)	4380 (172.5)	9180 (361.5)	7820 (307.9)	4350 (171.3)				



*625mm(HF-7M)

For machines with no APC

	r	s
		※3
HF-3M	5650 (222.5)	11300 (444.9)
HF-4M	6700 (263.8)	13400 (527.6)
HF-5M		
HF-6M	7720 (304.0)	15440 (607.9)
HF-7M	9900 (389.8)	19800 (779.6)



For machines with back-delivery type APC

	t	u	v	w
			※3	※3
HF-3M	5900 (232.3)	5800 (228.4)	11650 (458.7)	16300 (641.8)
HF-4M	7400 (291.4)	6850 (269.7)	13750 (541.4)	19400 (763.8)
HF-5M	8900 (350.4)			
HF-6M	10400 (409.5)	7870 (309.9)	15790 (621.7)	22440 (883.5)

※1=The figures indicate standard specifications.
 ※2=In case that a 120-, 180- or 220-tool ATC is provided, add 2080mm(81.9") to this figure
 ※3=The location of the hydraulic unit may be changed for machines with shorter tables(or pallets).



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