





ACE-HISeries

HM 500 HM 630 HM 800

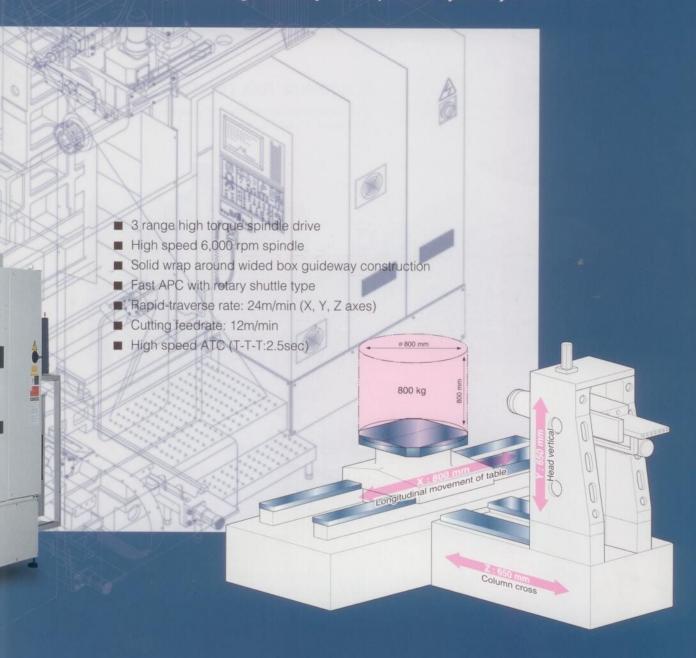


DOOSAN
Doosan Infracore

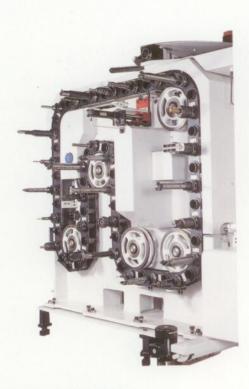
High Power and Precision Designed and Built for Today's Competitive edge.



The ACE-HM500 combines a high torque spindle drive and powerful axis drives for a large chip removal rate. The massive meehanite cast structure and wrap around box guideways provide the rigidity required for both heavy cutting and superb surface finishes. The machine is exceptionally stable and maintains excellent positioning accuracy and repeatability in any environment.



ACE-HM500



1 TOOL MAGAZINE

The ATC is composed of tool magazine and change arm. ATC is located separately from the machine in order to prevent adverse effects on accuracy due to vibration or other causes even when the ATC is operated during machining operation. The tools are selected by fixed address method that follows the shorter path. All tools are returned to the pots from which they were originally taken so that collision problems involving large-sized tools need to be considered only once when they are first mounted. A bi-directional magazine takes the shortest path. [std:40tools, opt:60/90/120/180/240tools]





@ AUTOMATIC TOOL CHANGER

Sophisticated mechanisms drastically reduce non-cutting time. [Tool-to-tool: 2.5 sec,Chip-to-chip: 8.0 sec]



® BED AND COLUMN

The machine is designed to build rigidity into a stable body. The construction of the machine was thoroughly examined from the stage of basic design to ensure consistent high-speed and high-accuracy operation. The deformation of the bed when subject to a load at the center was simulated to secure high level rigidity against bending.

■ Measures against thermal distortion

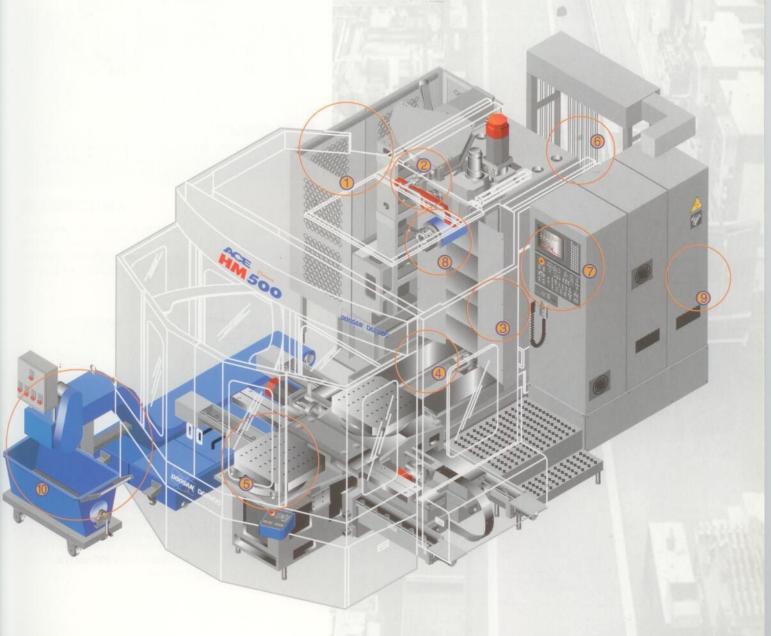
The machine proper is insulated from heat sources to provide high, stable machining accuracy. Machine-generated heat, such as from the control panel, spindle lubricant temperature controller or hydraulic unit, is more likely than the ambient temperature to distort the bed or column, causing machining accuracy to decline. This is avoided on the ACE-HM500 by covering the back of these units with heat shields and using a fan to radiate heat away from the machine.





4 BALL SCREW & AXIS DRIVES

Doosan Infracore ACE-HM Series machining centers with oversized AC servo drives power through the toughest cuts in the toughest metal. The high torque servos are coupled directly to the ball screws. With no gears there is no risk of backlash or servo drag. The X and Z axes ball screws are center mounted, pretensioned and supported on both ends by high precision angular contact thrust bearings. This pretension design provides outstanding positioning repeatability with minimize thermal growth. In the event of a sudden impact, a flexible coupling on each axis flexes and absorbs the shock.



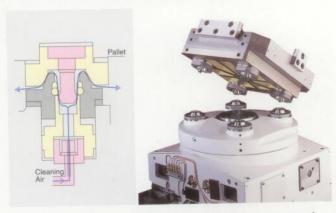
ACE-HM500



(5) AUTOMATIC PALLET CHANGER

ACE-HM500 machining center is equipped with rotary shuttle type APC(Automatic Pallet Changer) as a standard feature. It provides high reliability and wide working area for easy setup. Rotary shuttle APC provides faster changing time and easy adoption for automated system in small sized machine

TAPERED CONE CLEANING SYSTEM



The possibility that chips might degrade the meshing accuracy of the pallet positioning mechanism increases at higher machining speeds. On the ACE-HM500 strong jets of air are discharged from the tapered cones when a pallet is changed to clean any chips from the cones and assure accurate pallet positioning.



6 OIL COOLER

The temperature of the hydraulic oil is regulated by a refrigerated cooling system. It maintains uniform controlled temperature required for high accuracy.





OPERATOR'S PANEL

The newly designed operator's panel provides greater convenience in setting up and operating the machine. Operator's panel is designed for operator ease and convenience.



® SPINDLE HEAD

A stepped sleeve system is used for the axial fixation of the spindle bearing so that the bearings can be fixed at right angle to the machine. The 3-step spindle drive system provides a wide speeds for high-torque heavy-duty machining. The speed range is 20 to 6,000 rpm. Powerful high-speed and precision spindle configuration [Max 6,000rpm, 15 kW]



LUBRICATION

Automatic lubrication is provided to all guideways and ball screws. The way oil is delivered by piston distributors which precisely meter the volume. A low level alarm prevents the machine from restarting.



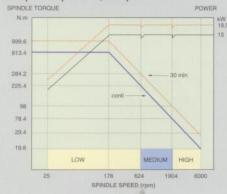
(1) CHIP CONVEYOR & COOLANT TANK

Separate chip conveyor and coolant tank provide easy cleaning and maintenance. The completely enclosed ACE-HM500 virtually guarantees the confinement of chips and coolant to the inside of the machining area. Screw conveyors clearly remove the chips out of the machine.

■ Spindle power-torque diagram

- Spindle motor power: 15kW
- Max.spindle speed: 6,000 rpm SPINDLE TORQUE 597.8 58.8 29.4 MEDIUM

- Spindle motor power: 18.5kW
- Max.spindle speed: 6,000 rpm



■ Chip conveyor outside machine (option)





Specifications o : Recommended × : Not applicable	Hinged type	Scraper
Chip		
Steel	0	
Cast iron	×	0
Aluminum and nonmetals	×	0
Mixture	×	0

- Chips max. 50 mm in length.
 Chip conveyors are available in various types for handling chips of different shape and material.
 Please contact Doosan for more information.

Designed for your productivity Horizontal Machining Center with Reliability • Flexibility



Get Reliability and Accuracy for a wider range of applications from DOOSAN Infracore Horizontal Machining Centers



ACE Scales HM 630/HM 800

ACE HMseries are built to world-class standards to assure world-class result. Powerful drive, heavy duty construction, and unsurpassed rigidity provide exceptional precision, high productivity, and years of trouble-free performance.

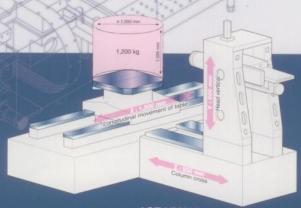
Superb Productivity

- · High speed 6,000rpm spindle drive
- · Fast 24m/min rapid traverse
- · Powerful 22kW high-torque spindle motor(opt.:26kW))
- · High-speed pallet change(2-station rotary type)

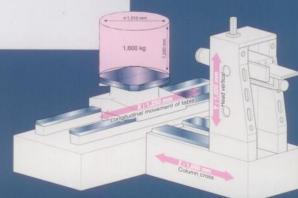
Superb Reliability

- · Massive Meehanite cast iron bed
- Large diameter pretensioned ball screws
- · Fanuc 18i-M controller
- · Wide induction hardened & precison box guideways

- Superb Design · Highly rigid bed supports sturdy machine design
 - Far fewer parts by advanced technology
 - All equipment integrated into a space-saving design

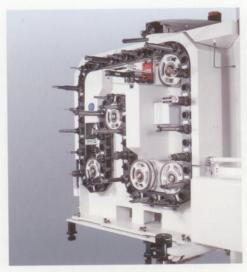


ACE-HM630



ACE-HM800

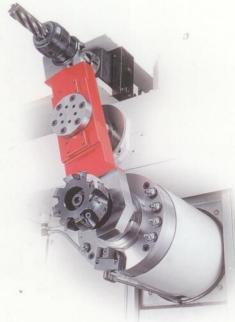
ACE-HM630/HM800



100L MAGAZINE

A bi-directional tool magazine takes the shortest path. [Std.:40 tools, Opt.:60/90/120/180/240 tools]





AUTOMATIC TOOL CHANGER

Sophisticated mechanism drastically reduces non-cutting time. High-speed ATC completes a tool change in just 2.5 seconds (tool-to-tool).

(3) BED AND COLUMN

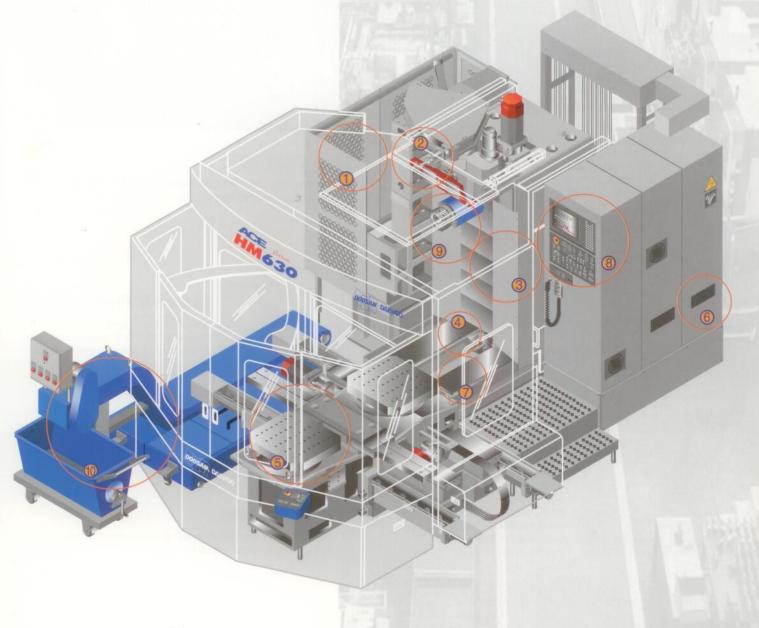
ACE HM 630/800 are engineered for deeper cuts at faster speeds with no sacrifice to precision or surface finish. It combines high torque spindles, powerful axis drives, rigid castings and solid box ways. The result is machining centers with the muscle to hog off tough metals, the rigidity to produce tenths precision, and the rugged durability to provide years of low-maintenance, trouble-free performance.

The bed and box-type column are rigid, castings that are ribbed to withstand extreme cutting forces. Finegrained meehanite castings impart excellent dampening characteristics. The column is supported on massive guideways. The pallet is positioned by four cones and a large diameter curvic coupling for superior positioning accuracy. An air-cleaning system removes contaminants such as chips and dust. Automatic tool changers are available with as many as 240 tool stations, and accept 50 taper tools to a maximum weight of 25 kg. The ATC is separated from the machine body, and fully protected from chips and coolant. The fixed pocket design automatically returns tools to their original magazine positions. This reduces the chance of collision when oversize tooling is used. A convenient foot switch releases the tool, making manual loading of the bidirectional magazine quick and easy. Tools in the magazine can be changed safely during operation.



4 BALL SCREWS & AXIS DRIVES

The axis is driven by a high-precision ballscrew that's centered between the guideways. The ballscrews are supported at each end with angular thrust bearings. This double pretension design provides outstanding positioning repeatability with no thermal growth. A 50 mm diameter ball screws connects directly to a powerful Fanuc AC servo drive motor. With no gears or belts, there's no backlash and servo lag.



ACE-HM630/HM800



(5) AUTOMATIC PALLET CHANGER

ACE-HM630/HM800 are equipped with rotary shuttle type APC as a standard feature. It provides high reliability and wide working area for easy setup.

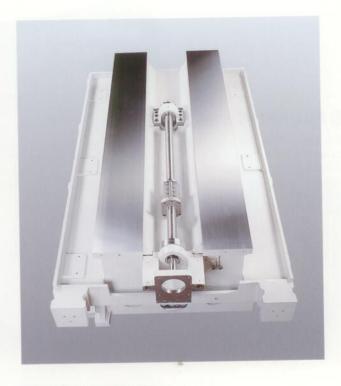
Four tapered cones on the table fit securely into tapered holes on the underside of of the pallet to provide the high accuracy.

Children Children	HM630	HM800 800X800mm	
Pallet size	630X630mm		
Max.workpiece size	ø1,000XH1,000mm	ø1,310XH1,200mm	
Max.workpiece weight	1,200kg	1,600kg	



6 LUBRICATION

Automatic lubrication is provided to the guideways, ball screws and spindle gearbox. Way lubrication oil is delivered by piston distributors which precisely meter the volume of oil. A low-level alarm prevents the machine from restarting.



OBOX GUIDEWAYS

Box guideways provide higher dampening property with best technology for heavy duty applications.



® OPERATOR'S PANEL

The operator's panel and portable manual pulse generator are designed for operator ease and convenience.

SPINDLE HEAD

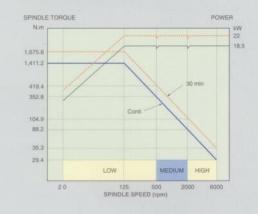
With a Max. 6,000 rpm and an output 22 kW, the spindle shows excellent performance for a wide range of materials from heavy-duty cutting of steel to high speed cutting of nonferrous materials.



Heavy duty, 50 taper spindles are supported by four, permanently lubricated angular-contact spindle bearings, precision class P4. The bearings are assembled using a stepped sleeve system. This permits precise adjustment, and eliminates the possibility of assembly damage typical of lock nut systems. A 22 kW AC motor delivers power to the three-speed geared head, and provides high speeds and low-end torques for a broad range of applications. An encoder, attached to the spindle, allows rigid tapping in both high and low gear ranges.

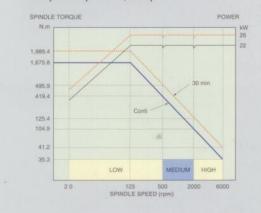
■ Spindle power-torque diagram

- Standard (HM630/HM800)
 - Spindle motor power: 22kW
- Max.spindle speed: 6,000rpm



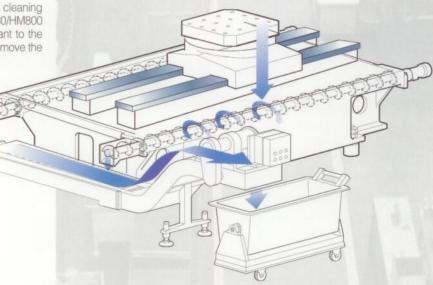
• Option (HM630/HM800)

- Spindle motor power: 26kW
- Max.spindle speed: 6,000 rpm



(10) CHIP CONVEYOR & COOLANT TANK

Separate chip conveyor and coolant tank provide easy cleaning and maintenance. The completely enclosed ACE-HM630/HM800 virtually guarantees the confinement of chips and coolant to the inside of the machining area. Screw conveyors clearly remove the chips out of the machine.



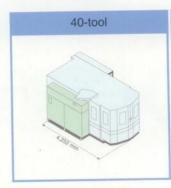


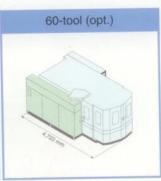
- High Productivity & availabilityFlexible production solutions
- Compact designed technology

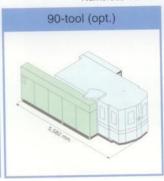


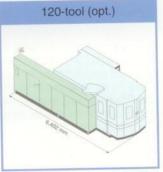
TOOL MAGAZINE

Numerous Variations to meet production efficiency needs.









The dimension is HM500

APPLICATION OF MULTI PALLET SYSTEM

ACE-HM630 Name (2set) Number of Setup Station Storage Capacity 17 Stations (630 × 630)

Application technology of Multipallet system is the best solution for the high productivity in the machining shop.

unit: mm 1 ACE-HM630 ACE-HM630

Standard Features



Oil cooler & Hyd. unit



Operator call lamp (red/yellow/green)



FANUC 18i-M controller



Portable MPG





Work light



Screw conveyor

Optional Features







Multi Pallet Magazine



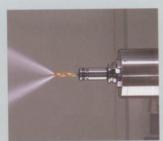
120 Tools



Shower coolant



Linear scale feedback system



Through the spindle coolant system



Chip conveyor / Bucket



T-slot pallet



FMS







Built in Rotary Table (0.001°)



Automatic measuring system



Automatic tool length measurement with sensor

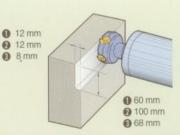
- Test bar
- Air gun
- Automatic power off
- Automatic door for APC guard
- Hydraulic line for fixture

- Tool monitoring system
- Oil skimmer
- CE certification

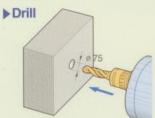
Cutting Performance

ACE-HM500

▶ Face mill

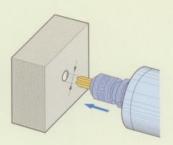


Tool	100 Face mill (6Z)	② Ø 125 Face mill (8Z)	∅ 100 Face mill (6Z)
Material	Aluminum (AC4B)	Gray casting (GC25)	Carbon steel (SM45C)
Spindle speed (rpm)	1,900	624	624
Feedrate (mm/min)	2,194	638	937
Machining rate (cm³/min)	1,580	766	510



Tool	Ø 75 Drill(2Z) Gray casting(GC25)	
Material		
Spindle speed(rpm)	137	
Feedrate(mm/min)	60	

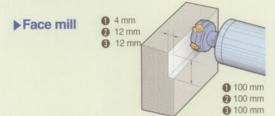
► Rigid tapping (M56 × P6.5)



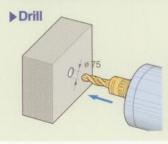
Workpiece material: Carbon steel (S50C)

Spindle speed: 56 rpm Feedrate: 308 mm/min

ACE-HM630/HM800

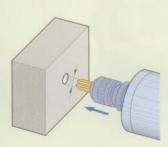


Tool	125 Face mill (8Z)	② Ø 125 Face mill (8Z)	(8Z) Ø 125 Face mill
Material	Aluminum (AL70)	Gray casting (GC25)	Carbon steel (SM45C)
Spindle speed (rpm)	2,600	334	308
Feedrate (mm/min)	10,500	1,463	1,000
Machining rate (cm³/min)	4,200	1,756	1,200



Tool	Ø 75 Drill(2Z)	
Material	Gray casting(GC30	
Spindle speed(rpm)	137	
Feedrate(mm/min)	72	

► Rigid tapping (M56 × P5.5)



Workpiece material: Carbon steel (S50C)

Spindle speed: 56 rpm Feedrate: 308 mm/min

· The above data is obtainly by standard specific machine.

The cutting data results indicated in this catalog are provided as an example. The results indicated in this catalog may not be obtained due to differences in cutting conditions and environmental conditions during measurement.

Sample Workpiece



Connecting Rod



Bearing Cap



Intake manifold



Cylinder Block



Cylinder Head



Transmission Case



Brake caliper



Tool Post Body



Turret Disc

Application



Housing



Pump Piston

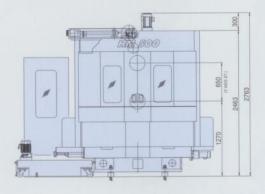


Control Arm

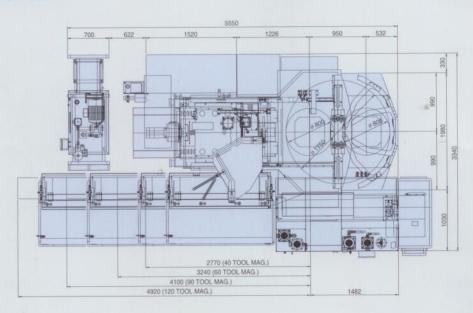


unit: mm

FRONT VIEW



TOP VIEW



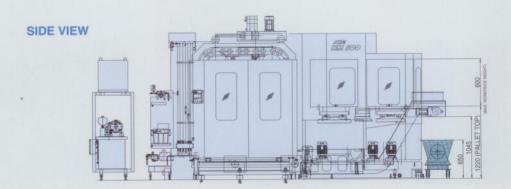
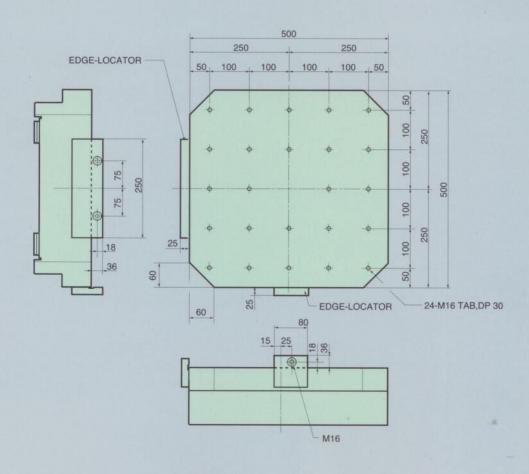


Table Dimension

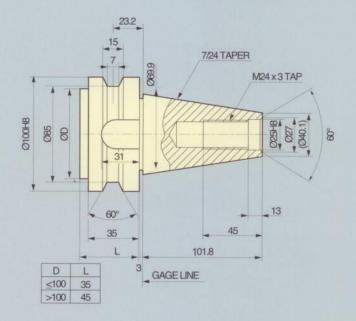
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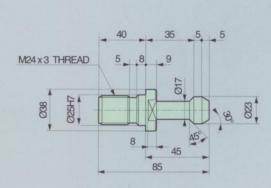


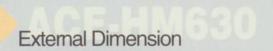
Tool Shank (BT50 tool)

(ACE-HM500/HM630/HM800: STANDARD)

unit: mm

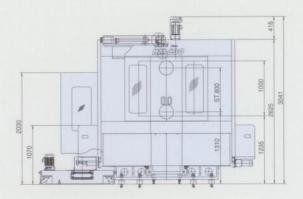




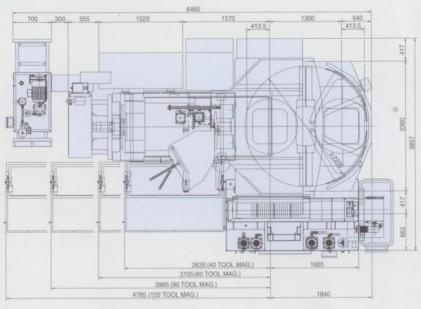


unit: mm

FRONT VIEW



TOP VIEW



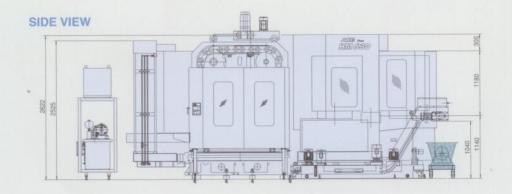
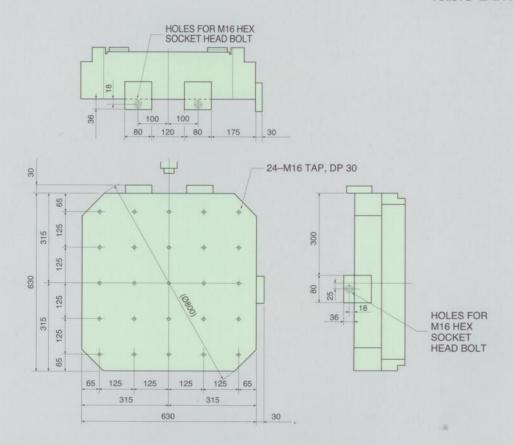


Table Dimension

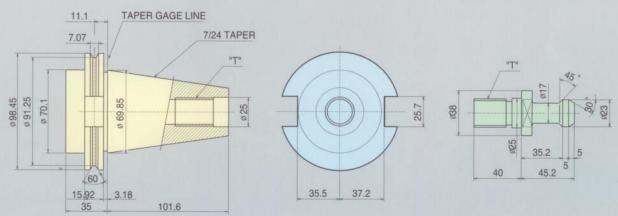
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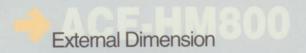


Tool Shank (CAT50 tool)

(ACE-HM500/HM630/HM800 : OPTION)

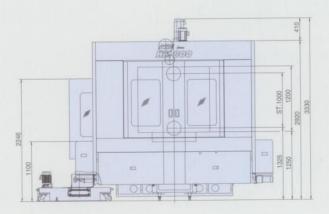
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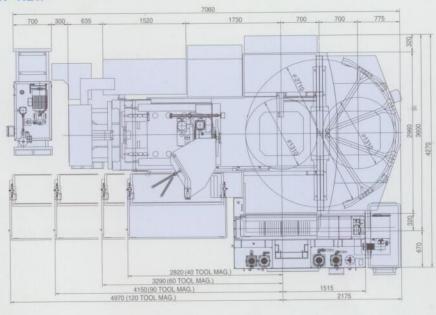


unit: mm

FRONT VIEW



TOP VIEW



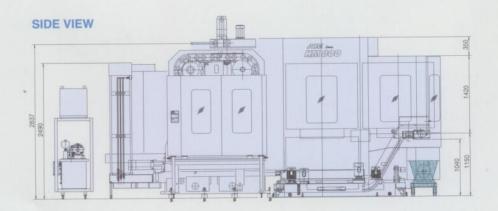
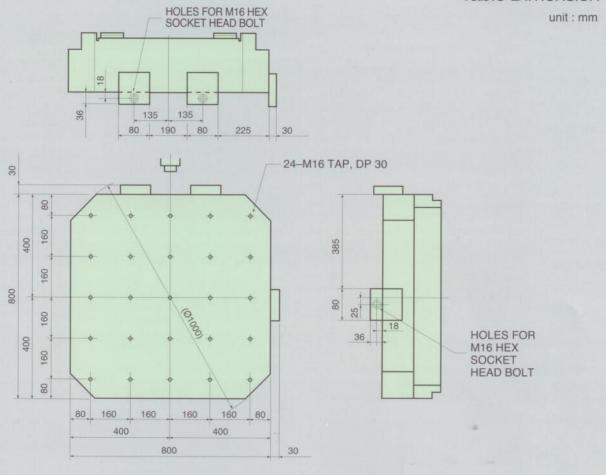
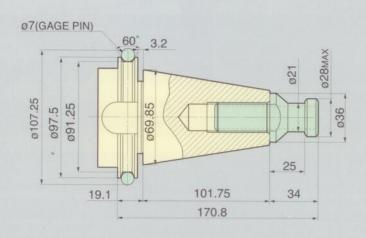


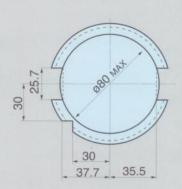
Table Dimension



Tool Shank (DIN50 tool) (ACE-HM500/HM630/HM800 : OPTION)

unit: mm





Machine Specitification

	Features		ACE-HM500	ACE-HM630	ACE-HM800
	X-axis(longitudinal movement of table)	mm	800	1,000	1,250
	Y-axis(head vertical)	mm	650	800	1,000
Travel	Z-axis(column cross)	mm	650	850	1,000
	Distance from spindle center to pallet top	mm	50-700	75-875	75-1,075
	Distance from spindle nose to table center	mm	150-800	150-1,000	200-1,200
	Pallet type			24-M16 × P2.0 Tap	
Table	Indexing degree	deg.		1°{0.001°}	
	Table loading capacity	kg	800	1,200	1,600
	Pallet size	mm	500×500	630×630	800×800
	Max. spindle speed	rpm		6,000	
Spindle	Spindle taper		ISO #50 7/24 Tapper		
	Max. spindle torque	N.m	813.4{999.6}	1,675.8	[1,989.4]
Facilitate	Rapid traverse rate(X,Y,Z)	m/min		24	
Feedrate	Cutting feedrate	tting feedrate mm/min 1~12,000			
	Type of tool shank			MAS 403 BT50 (DIN,CAT)	
	Tool storage capacity			40{60/90/120/180/240}	
	Max. tool diameter	mm		135	
	Max. tool diameter without adjacent tools	mm		250	
Automatic	Max. tool length	mm	400	5	50
tool	Max. tool weight	kg		25	
3	Max tool moment	N.m		34.3	
	Method of tool selection		Fixed address		
	Tool changing time(tool-to-tool)	sec		2.5	
	Tool changing time(chip-to-chip)	sec	8	8.5	9
	Number of pallets	EA		2	
Automatic	Туре			Rotary type	
pallet changer	Pallet change time	sec	14	25	29
3	Pallet rotation in loading station			90° Index	
	Spindle drive motor(30 min.)	kW	15(18.5)	15(18.5) 22(26)	
Motor	Feed motor(X/Y/Z/B)	kW	3.0/4.0/4.0/1.6	.6 4.0/7.0/7.0/3.0	
	Electrical power supply (Rated capacity)	kVA	43.2	60.7	56.3
Power source	Compressed air supply	MPa		0.54	
F	Coolant tank capacity	1		550	
Tank capacity	Lubrication tank capacity	1		4.3	
,	Machine height	mm	2,763	3,041	3,330
Machine size	Machine dimensions	mm	5,550 × 3,340	6,485×3,857	7,060 × 4,270
	Machine weight	kg	13,500	18,000	20,000

Note: Dimensions in { } are optional.

Design and specifications subject to change without notice.
We do not responsible for difference between the information in the catalogue and the actual machine.

NC Unit Specifiations (Fanuc 18i-M)

AXES CONTROL		OTHERS FUNCTIONS (Operation, Set	ting & Display, etc)
- Controlled axes	4 (X,Y,Z,B)	- Alarm display	
- Simultaneously controllable axes		- Alarm history display	
Positioning(G00)/Linear interpolation(G01):	3 axes	- Clock function	
Circular interpolation(G02, G03):	2 axes	- Cycle start / Feed hold\	
- Backlash compensation		- Display of PMC alarm message	
- Emergency stop / overtravel - Follow up			isplay when PMC alarm occurr
- Least command increment :	0.001mm / 0.0001"	- Dry run	
- Least input increment :	0.001mm / 0.0001" 0.001mm / 0.0001"	- Ethernet function(Embeded)	Table attacked
- Machine lock	all axes / Z axis	- Graphic display - Help function	Tool path drawi
- Mirror image	Reverse axis movement	- Loadmeter display	
-	setting screen and M - function)		Couponed for data input, and tra
- Stored pitch error compensation Pitch error of		- Memory card interface	Keyboard for data input, soft-ke
	Overtravel controlled by software	- Operation functions	Tape / Memory / MDI / Manu
INTERPOLATION & FEED FUNCTION	overtiaver controlled by soltware	- Operation history display	rape / iviemory / ivib1 / iviant
- 2nd reference point return	G30	- Program restart	
- Circular interpolation	G02, G03	- Run hour and part number display	
- Dwell	G04	- Search function	Sequence NO. / Program N
- Exact stop check	G09, G61(mode)	- Self - diagnostic function	ooquonoo rrony rogramm
- Feed per minute	mm / min	- Servo setting screen	
- Feedrate override (10% increments)	0 - 200%	- Single block	
- Jog override (10% increments)	0 - 200%	OPTIONAL SPECIFICATIONS	
- Linear interpolation	G01	- 3-dimensional coordinate conversion	
- Manual handle feed(1 unit)		- 3-dimensional tool compensation	
- Manual handle feedrate	0.1/0.01/0.001mm	- 3rd / 4th reference return	
- Override cancel	M48 / M49	- Addition of tool pairs for tool life management	nt 128/512 pa
- Positioning	G00	- Additional controlled axes	max. 6 axes in to
- Rapid traverse override	F0 (fine feed), 25 / 50 / 100%	- Additional work coordinate system	G54.1 P1 - 48 (48 pai
- Reference point return	G27, G28, G29	- Additional work coordinate system	G54.1 P1 - 300 (300 pai
- Skip function	G31	- Al HPCC* (High Precision Contour Control)	with 64 bit Risc600 block previ
SPINDLE & M-CODE FUNCTION		- Automatic corner override	G
- M- code function	M 3 digits	- Chopping function	
- Spindle orientation		- Coordinate rotation	G68, G
- Spindle serial output		- Cylindrical interpolation	G07
- Spindle speed command	S5 digits	- Tool monitoring system	
- Spindle speed override (10% increments)	10 - 150%	- Data server	
TOOL FUNCTION		- Dynamic graphic display	Machining profile drawi
- Cutter compensation C	G40, G41, G42	- Exponential interpolation	
- Number of tool offsets	99EA	- Extended part program editing	
- Tool length compensation	G43, G44, G49	- EZ Guide i (Conversational Programming Se	olution)
- Tool number command	T3 digits	- F15 tape format	
PROGRAMMING & EDITING FUNCTION		- Figure copying	G72.1, G72
- Absolute / Incremental programming	G90 / G 91	- Handle interruption	
- Auto. Coordinate system setting		- Helical interpolation	
- Background editing		- High speed skip function	
	73, G74, G76, G80 - G89, G99	- Involute interpolation	G02.2, G03
Circular interpolation by radius programming Custom macro B		- Look ahead control	
		- Machining time stamp function	
- Decimal point input - I / O interface	D0 0000	- MDI / DISPLAY	10.4 inch color LC
	RS - 232C	- NANO AICC (AI Contour Control)	80 block previo
- Inch / metric conversion - Label skip	G20 / G21	- No. of Registered programs	200 / 400 / 1,000
- Local / Machine coordinate system	050.1050	- Number of tool offsets	200 / 400 / 499 / 9998
	G52 / G53 9999.999mm (±9999.9999 inch)	- Optional angle chamfering / corner R	O.F.L.
No. of Registered programs	125 EA	- Optional block skip addition	9 bloc
- Optional block skip	125 EA	- Part program storage	160 / 320 / 640 / 1,280 / 2,560
- Optional stop	M01	- Playback function	045.10
- Part program storage	80m	- Polar coordinate command	G15/G
- Program number		- Polar coordinate interpolation	G12.1 / G13
- Program protect	O4-digits	- Programmable mirror image - Remote buffer	G50.1 / G51
- Program protect - Program stop / end	M00 / M02,M30		050.0
Programmable data inputTool offset and work		- Scaling	G50, G
 Programmable data input i ool offset and work Rigid tapping 		- Single direction positioning	G
- Sub program	G84, G74	- Stored stroke check 2 / 3	
	Up to 4 nesting EIA Automatic discremination	- Tool life management	d Length / Dedice / W
1ape 000e 150 /	LIA Automatic discremination	- Tool offset memory C Geometry / Wear an	
- Thread cutting		- Tool position offset	G45 - G4

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Design and specifications are subject to change without prior notice.

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