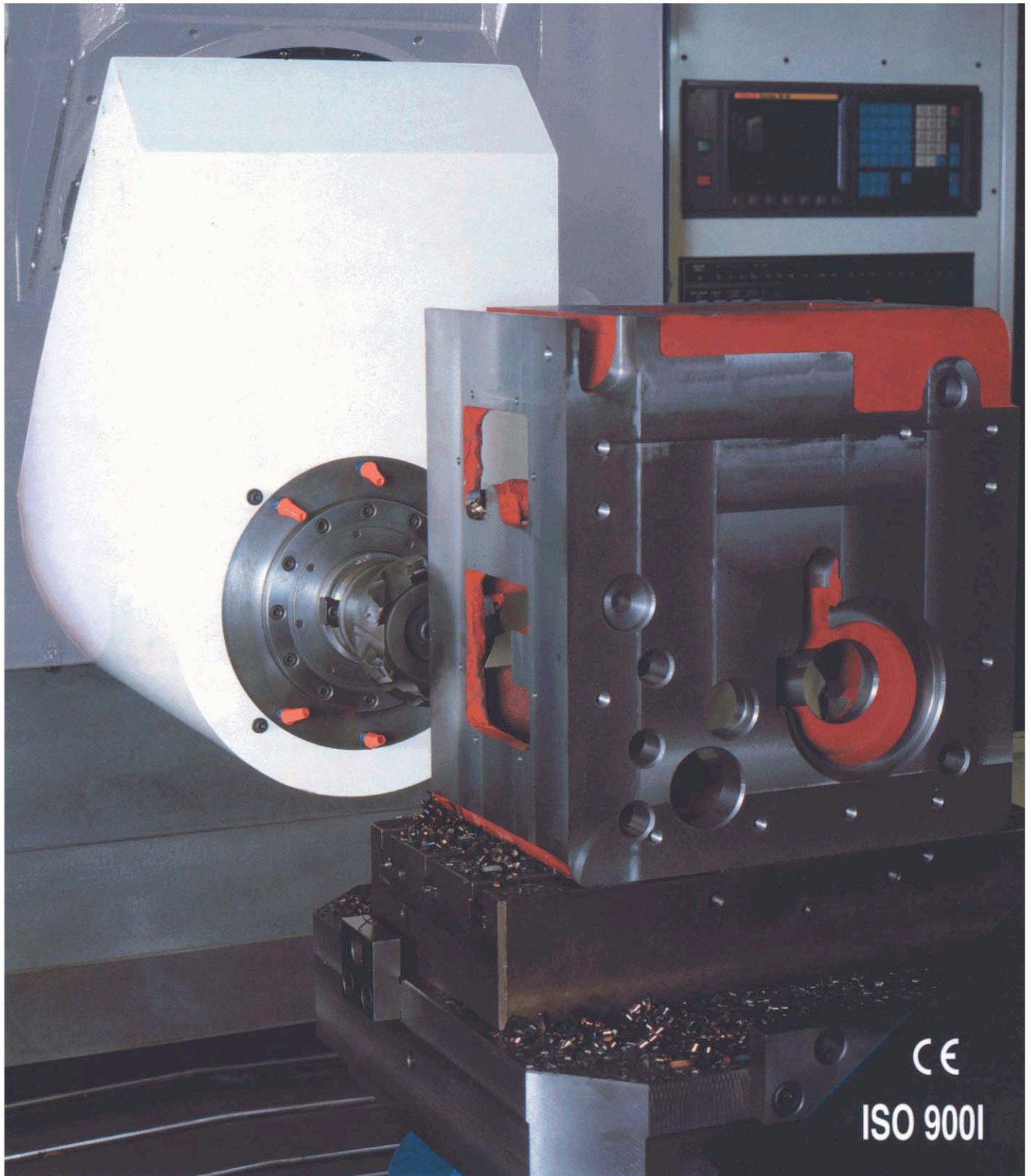




KMC-700HV
5-FACE MACHINING CENTER





KMC-700HV

5-FACE MACHINING CENTER

7 Seconds

Head Conversion Time(H↔V)



MAIN FEATURES

1. Vertical and horizontal machining centers are integrated into one. Five faces machining in just one setup.

2. High rigid SQUARE GUIDEWAYS on 3-AXIS and moving column construction suitable to precision heavy duty cutting.

3. High rigidity "T" shaped bed of 630 mm(24.8") thickness against heat induced displacement, ensure the geometrical accuracy and stability.

4. Z-axis guideways combined use of linear bearings and Turcite B provide better stability and lighter weight to effectively reduce sliding resistance of parts. Maintains long term precision and highly precise feed.

5. Symmetrical head and moving column construction reduce heat displacement of Y and Z-axis.

6. High rigidity gearless rotating head indexing and positioning of 180° is achieved by curvic coupling. This ensures the rigidity and precision of the spindle head.

7. Hydraulic static bearings are used in moving sections of the rotating head, this extends the service life of the bearings.

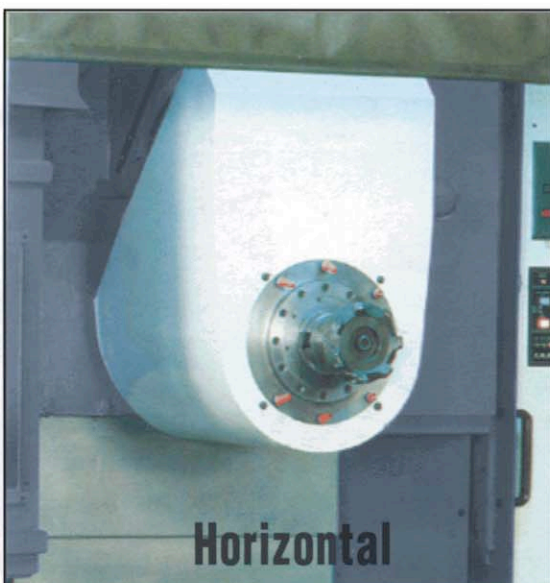
8. Housing a large size 15/20HP built-in spindle motor features low noise and low vibration. Spindle speed up to 6000rpm.

9. Head is precisely maintained at a fixed position since both vertical and horizontal changes in the center of gravity during head rotation are absorbed by a counterbalancing force.

10. 3-axis ball screws are equipped with air blast cooling system to minimize heat displacement. (standard accessories)

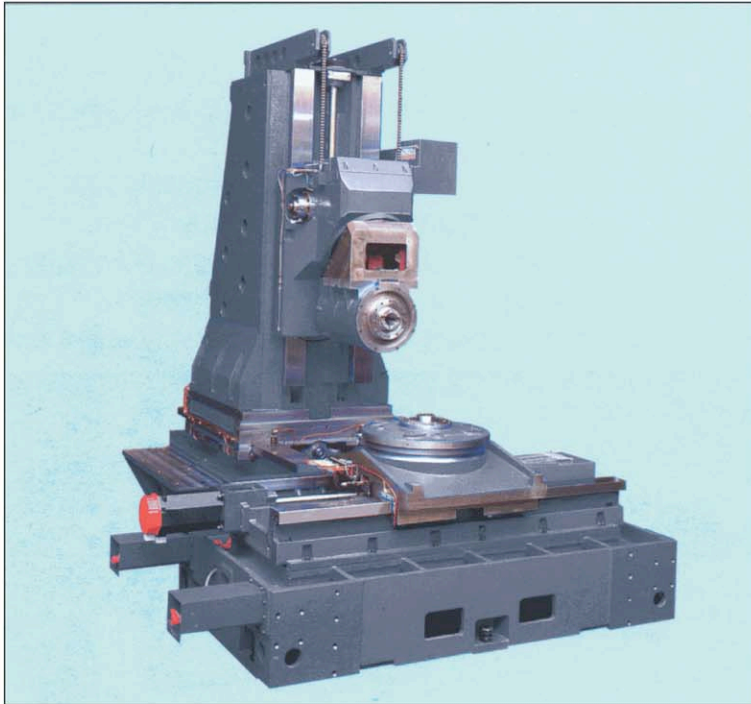
KMC-700HV UNIQUE ADVANTAGES

- ONE 5-FACE MACHINING CENTER EQUALS VERTICAL-HORIZONTAL MACHINING CENTER FLOOR SPACE REQUIREMENT.....1/2
TOOL EXPENSES.....3/4
OPTIONAL ACCESSORY EXPENSES.....1/2
- ONE SET-UP, 5-FACE MACHINING, ACCURACY PROVED SET-UP TIME.....1/2
LOADING/UNLOADING TIME.....1/2
JIG & FIXTURE EXPENSES.....1/2
- REDUCTION OF TOTAL LEAD TIME, MACHINING PROCESSES AND IN-PROCESS INVENTORY. RESULTING IN A LABOR SAVING AND LOWER COST SYSTEM, BEYOND 1/3 PRODUCTION COST IS SAVED. THIS IS THE BEST EQUIPMENT FOR THE FACTORY AUTOMATION.



7 Seconds





HIGH RIGID T-SHAPED BED

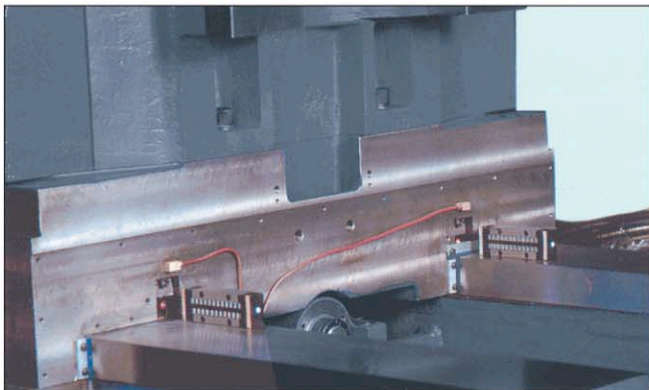
The T-shaped bed of 630mm (24.8") thickness thorough measures rigid enough to prevent the hardened and finish-ground steel guideways from deformation caused by temperature difference existing in guideways. Moreover, it is not subject to torque resulted from heavy-duty cutting.

MOVING COLUMN CONSTRUCTION

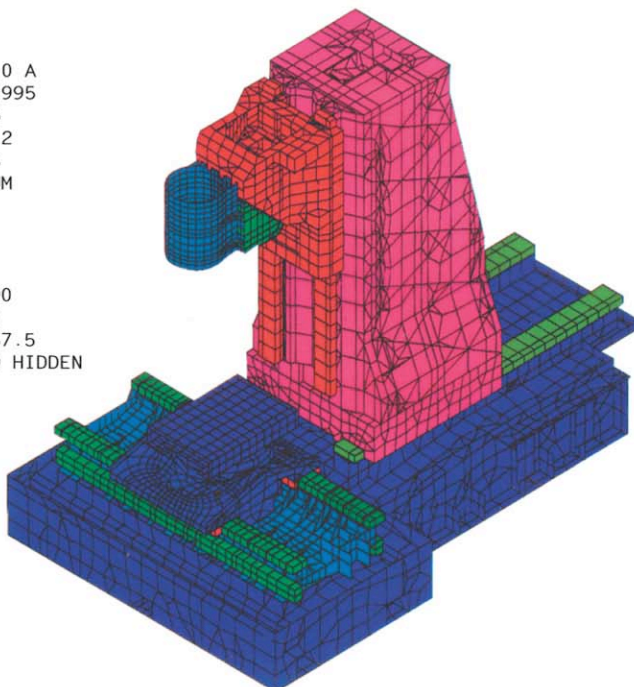
Fully supported moving column design over the Z-axis stroke can avoid table overhang, keep the workpieces steady and get the best machining accuracy. Symmetrical head and moving column construction reduce heat displacement of Y and Z-axis.

COMBINED DESIGN ON Z-AXIS

High rigid square guideways on 3-axis, Z-axis guideways combined use of linear bearings and Turcite B provide better stability and lighter weight to effectively reduce sliding resistance of parts. Maintains long term precision and highly precise feed.



```
ANSYS 5.0 A
JAN 26 1995
14:57:36
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TYPE NUM
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YV =1
ZV =1
DIST=2490
YF =770
AF =-387.5
CENTROID HIDDEN
```



FINITE ELEMENT ANALYSIS

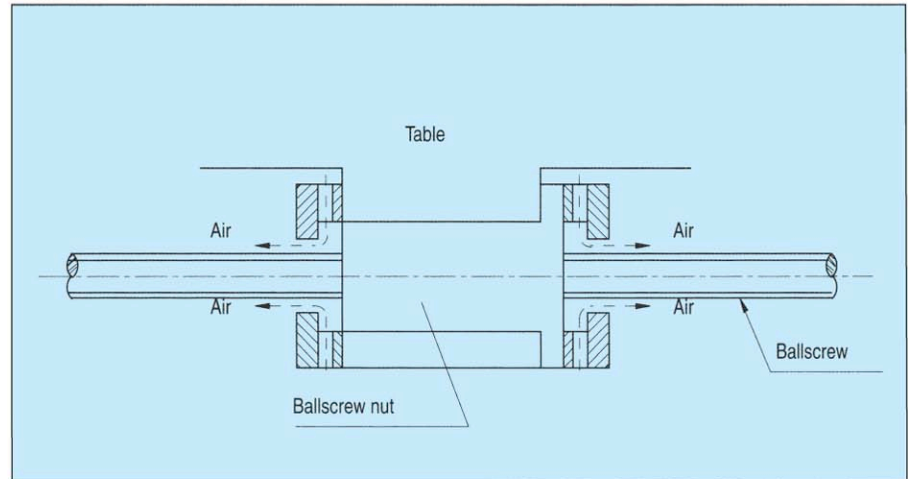
Finite Element Analysis(FEA) has been adopted to check the deformation and vibration mode of the machine structure to ensure getting best rigidity and optimum design.

BALL SCREWS AIR BLAST COOLING SYSTEM

3-axis ball screws are equipped with air blast cooling system to minimize heat displacement and ensure the positioning accuracy.

FEED SYSTEM

X, Y, Z-axis are driven by AC servo motors. The properly-preloaded and pretensioned $\phi 50\text{mm}$ ball screws are mounted as a double anchor in brackets. Super precision, high load capacity, angular contact ball screw support bearings are used to ensure the rigidity and accuracy of each feed system.



LINEAR SCALE FEEDBACK SYSTEM

3-axis feeds are equipped with linear scale feedback system as detecting devices. This allow high positioning accuracy to be maintained even if thermal deformation of the ball screw is present due to repeated high speed positioning. (standard accessories)

POSITIONING & REPEATABILITY ACCURACY

Item Inspected		KAO MING Standard	Example Measurement Results
Positioning	X,Y,Z-axis(full stroke)	$\pm 5 \mu\text{m}$	$\pm 3 \mu\text{m}$
	Index Table	$\pm 3 \text{ sec.}$	$\pm 2 \text{ sec.}$
Repeatability	X,Y,Z-axis(full stroke)	$\pm 2 \mu\text{m}$	$\pm 1 \mu\text{m}$
	Index Table	$\pm 1 \text{ sec.}$	$\pm 0.5 \text{ sec.}$

HEAVY-DUTY CUTTING

(Examples)

	Face Milling	End Milling	Drilling	Tapping
Tool	$\phi 150(6\text{'})$	$\phi 50(2\text{'})$	$\phi 50(2\text{'})$	M42xP4.5(1 3/4-5UNC)
Material	S45C	S45C	S45C	S45C
Spindle speed (RPM)	330	750	130	64
Feedrate (mm/min.(in/min.))	666(26.2)	340(13.4)	54(2.1)	288(11.3)
Cutting width (mm(in.))	100(3.94)	50(2)	-	-
Cutting depth (mm(in.))	6(0.24)	25(1)	-	-
Cutting capacity (cc/min(in ³ /min.))	400(24.4)	425(25.9)	105(6.4)	-
Spindle motor load(%)	130	98	70	75

HYDRAULIC STATIC BEARINGS FOR ROTATING HEAD

Needle Bearings are used for the head rotating. Static Bearings are used in moving sections of the rotating head, which pressure keeps the bearings "floating". And it is no metal-to-metal contact. Thus, it can extend the life of bearing unit.

Particularly, the excellent rotation is performed by Needle Bearings & Static Bearings.

COUNTERBALANCE FOR ROTATING HEAD

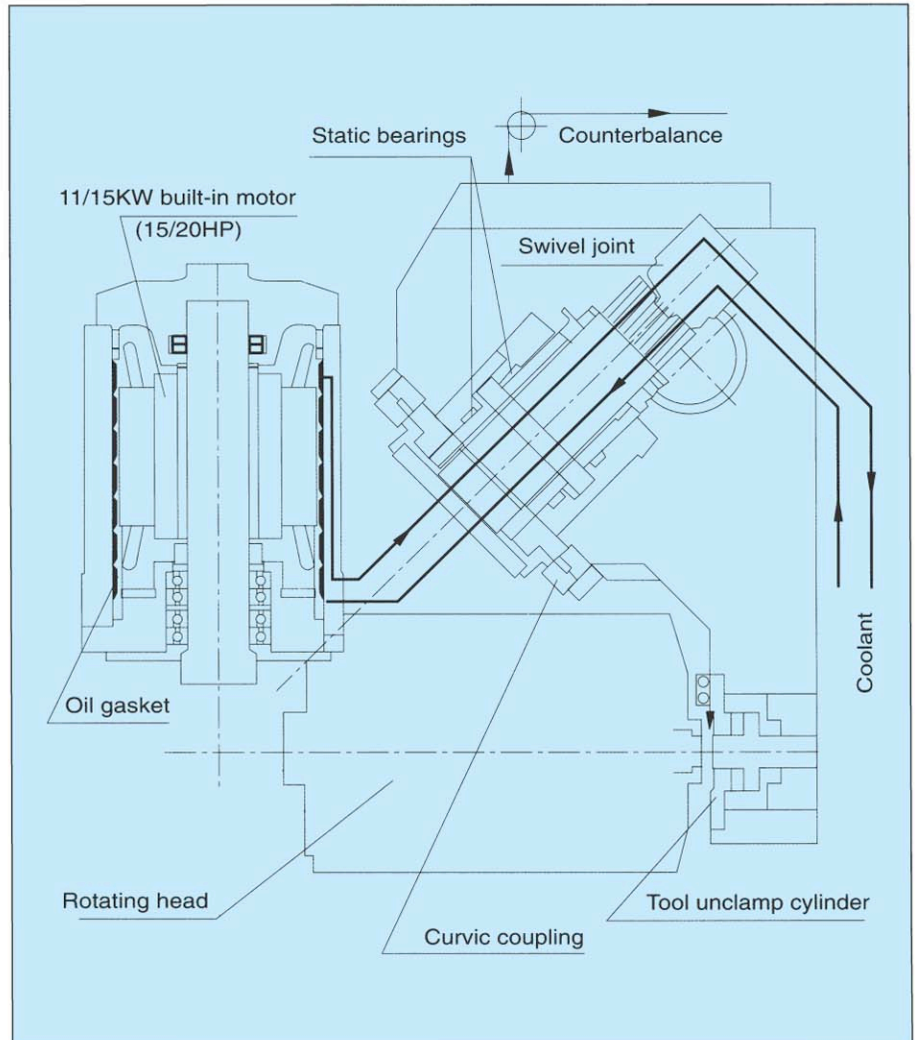
Head is precisely maintained at a fixed position. Since both vertical and horizontal changes in the center of gravity during head rotation are absorbed by a counterbalancing force.

COOLANT THROUGH ROTATING HEAD

Coolant and air supply is routed to the spindle center by a system using rotating coupling. This eliminates the use of external piping around the head.

HIGH RIGIDITY ROTATING HEAD

Gearless, high rigidity rotating head indexing of 180° and positioning is achieved by a curvic coupling Dia. 400mm. Hydraulic clamping force of the coupling up to 8500kg (18700lbs), this ensures the rigidity and precision of the rotating head with approx. 7 sec. head conversion time.



BUILT-IN SPINDLE MOTOR

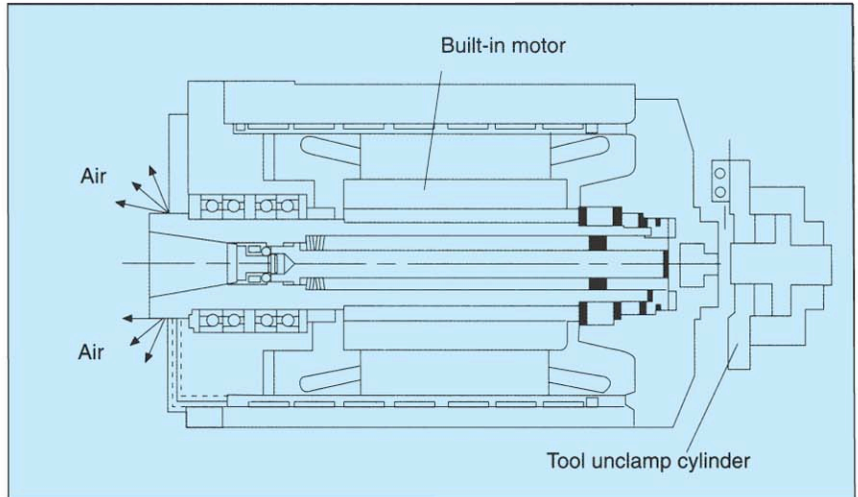
To keep the precision on high speed vibration and to minimize noise and vibration. The machine is integrated with gearless spindle head and 11/15kw (15/20HP) built-in spindle motor. Max. spindle speed 6000rpm, max. spindle output at 400rpm, and max. torque output 45.6kg.m (at 25%ED)

HIGH PRECISION SPINDLE

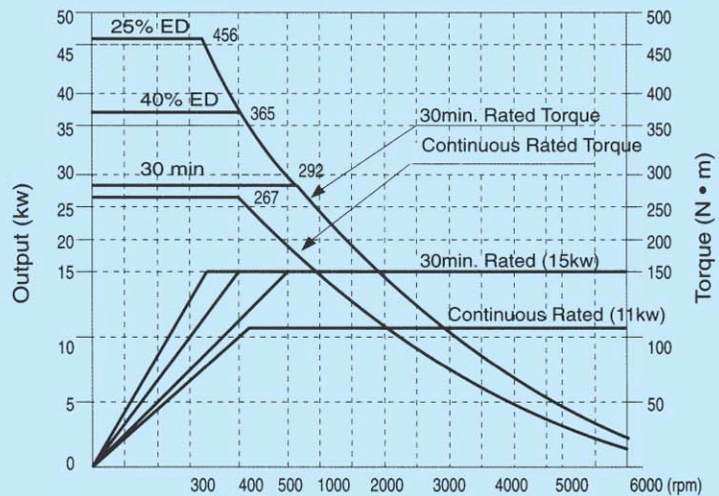
The spindle is supported by 4 rows grease packed superprecision angular contact ball bearings. Spindle dia. 100mm, tool clamping force 2000kg (4400lbs), Spindle cooling is force-cooled by the standard chiller unit.

AIR CURTAIN & AIR BLAST SYSTEM

Fluids such as coolant spray and oil, which tend to easily penetrate the spindle bearing while it is stopped, are prevented from entering by a protective curtain of air. Tool unclamp cylinder has air blast system to handle chip disposal. (standard accessories)

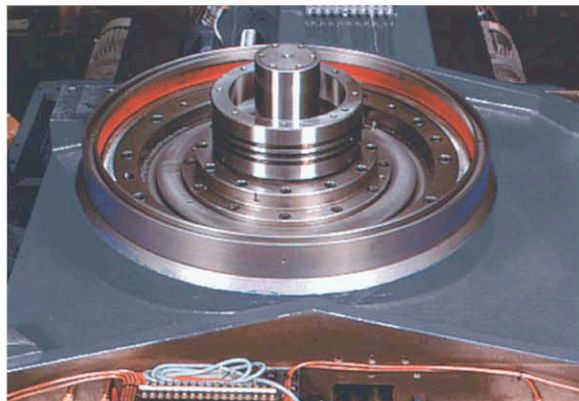


SPINDLE OUTPUT AND TORQUE



PRECISION INDEX TABLE

The 4-th axis index table is driven by AC servo motor. It can be indexed 1° by gear unit and curvic coupling, dia. 500mm (19.68"). Index tolerance ±3 sec. Clamping force 9000Kg (19800lbs)



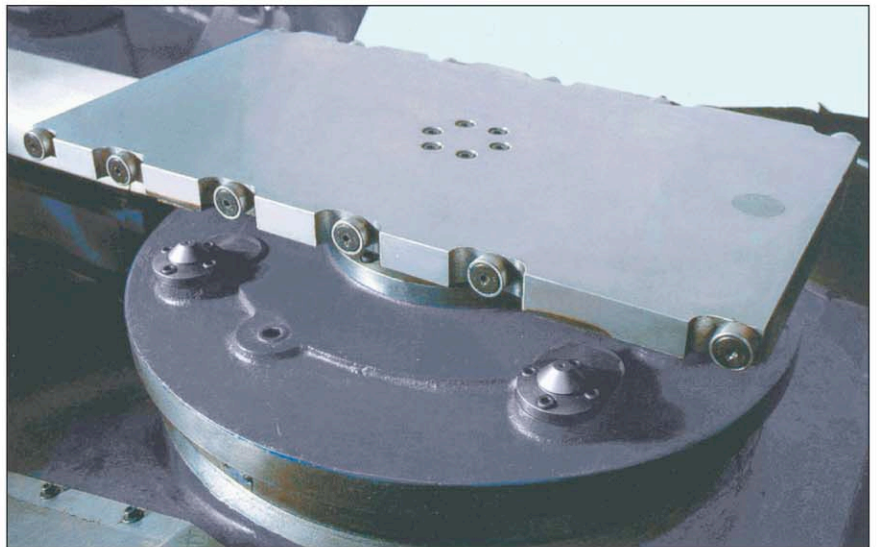
QUICK APC

A twin automatic pallet changer is standard. It is driven by AC servo motor through pulley unit and ballscrew. The quick APC pallet change time of 13 seconds and pallet travel speed of 30,000 mm/min(1181ipm), these specifications result in increasing the productivity. Cone-type pins are used in four locations to guarantee that the pallet tables are positioned with high repeatability.



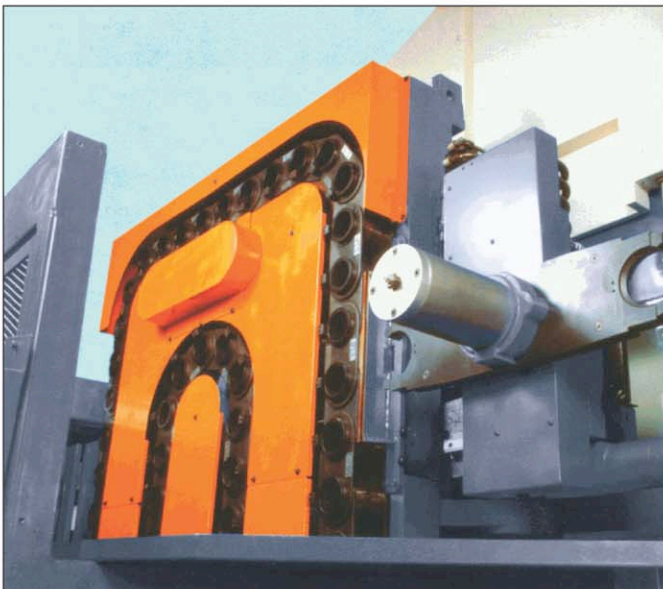
Tool MAGAZINE & HIGH SPEED ATC

A 60 tools capacity automatic tool changer is standard. The high speed ATC system changes tools quickly in approx. 5 sec. tool-to-tool. The ATC mechanism is kept outside the machine's working environment, keeping it free from chips and coolant.

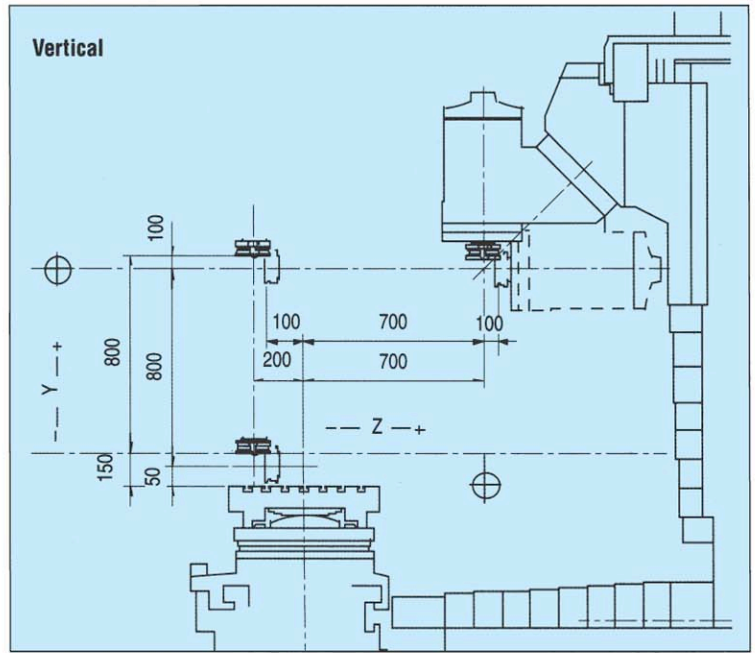
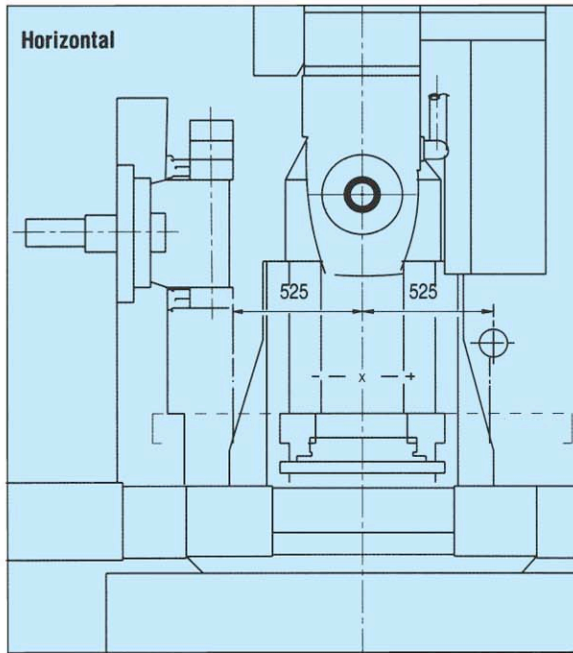


IDEAL CHIP REMOVAL

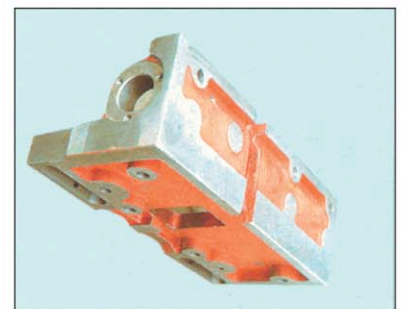
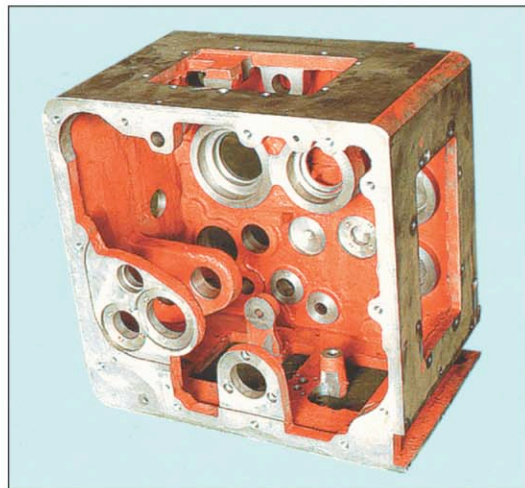
A twin-screw chip removal system located on both side of the table is standard. An external link-type chip conveyor is also available as an option.



H & V-HEAD MACHINING AREAS



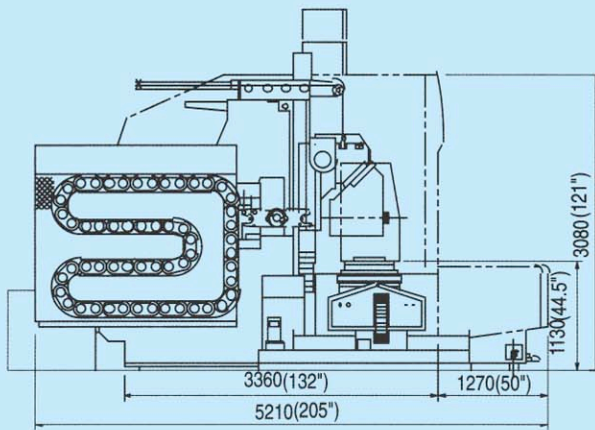
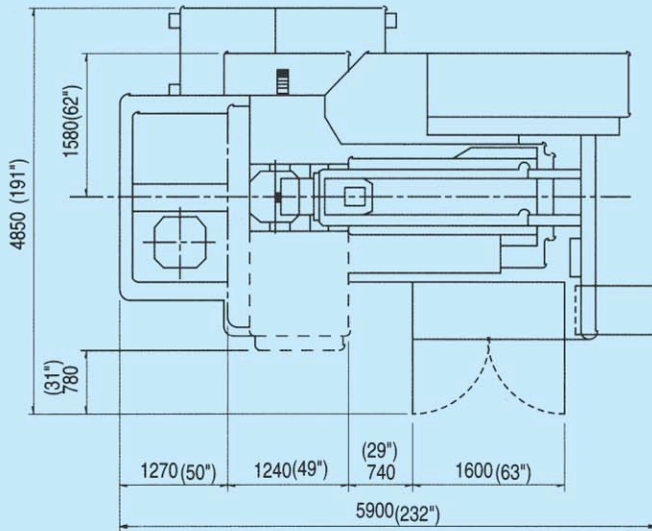
KMC-700HV PRACTICAL WORKPIECES EXAMPLES



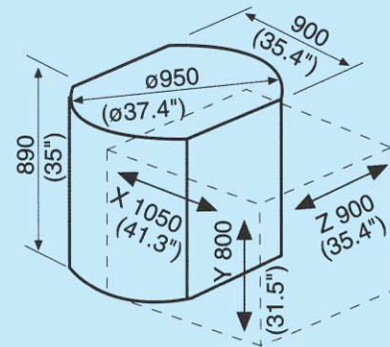
These are some of the practical workpieces examples such as gear box, bearing support, shaft bracket, axle seat...etc., also suit to the various industries.

DIMENSIONS

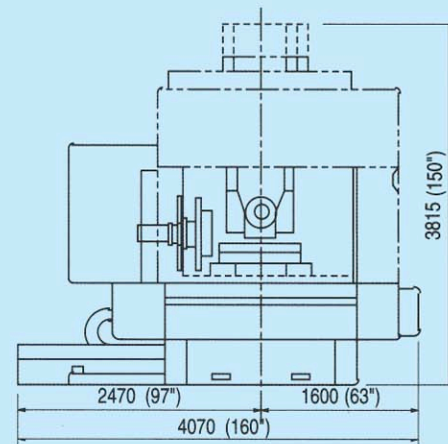
FLOOR SPACE



Dimensional limits on workpiece

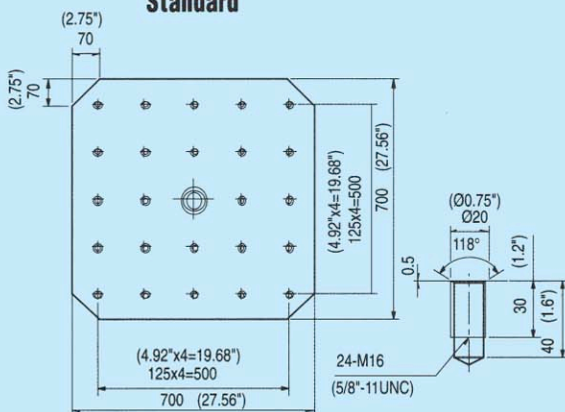


Max. load 1300kg (2860 lbs)

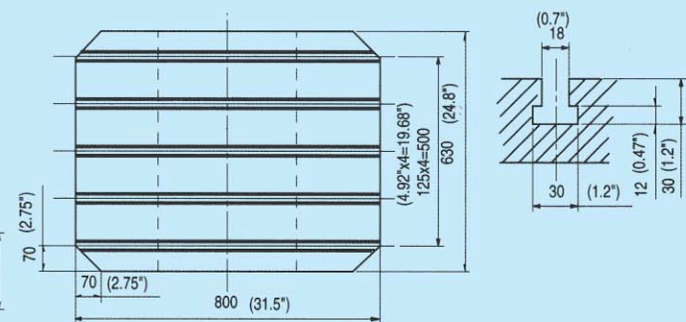


PALLET

Standard



Option



SPECIFICATIONS

Unit: mm (inch)

Stroke	X axis travel (table longitudinal motion)	1050(41.3")	
	Y axis travel (Spindle head vertical motion)	800(31.5")	
	Z axis travel (Column in/out motion)	900(35.43")	
H position	Distance from table top to spindle centerline	50~850(19.7"~33.46")	
	Distance from table centerline to spindle nose	-100~800(-3.94"~31.50")	
V Position	Distance from column face to spindle centerline	850(33.4")	
	Distance from table top to spindle nose	150~950(5.91"~37.40")	
Table	Pallet size	700x700(27.56"x27.56")	
	Max. workpiece size	ø950x890H(ø37.4"x35"H)	
	Max. weight capacity	1300Kg(2860lbs)	
	Table indexing increment	1°x360 division	
	Table indexing time	4Sec(Per 90°)	
Spindle	spindle taper	ISO 50	
	Spindle speed	20~6000rpm	
	Spindle motor (continuous/30 min)	AC 15HP/20HP	
	No. of spindle speeds	Infinite variable, S4 coding	
Feedrate	Rapid traverse rate (X,Y,Z)	15 m/min (590 ipm)	
	Cutting feedrate	1-5000 (0.1-196 ipm)	
Tool	Max. tool dia.	ø130(5.11")	
	Max. tool dia.(adjacent pockets empty)	ø200(7.87")	
	Max. tool length	400(15.7")	
	Max. tool weight	25Kg(55 lbs)	
Magazine	Tool magazine capacity	60	
	Tool selection method	Random shortest path	
	Tool shank shape	BT50	
Accuracy	Positioning accuracy(3 axes, full stroke)	±0.005(±0.0002")	
	Repeatability accuracy (3 axes)	±0.002(±0.0008")	
Machine size	Floor space requirement	length	5900(232")
		width	4850(191")
		height	3815(150")
Packing dimension	Length x width x height (LxWxH)	1.4670x3400x3580(184"x134"x141") 2.3940x2390x2160(155"x94"x85")	
Machine net weight		20500kg(45100 lbs)	
Power supply		220V, 50/60HZ, 35KVA	
CNC controller		FANUC 0MC(*0MF,*15M) MITSUBISHI MELDAS (*M520,*M530)	

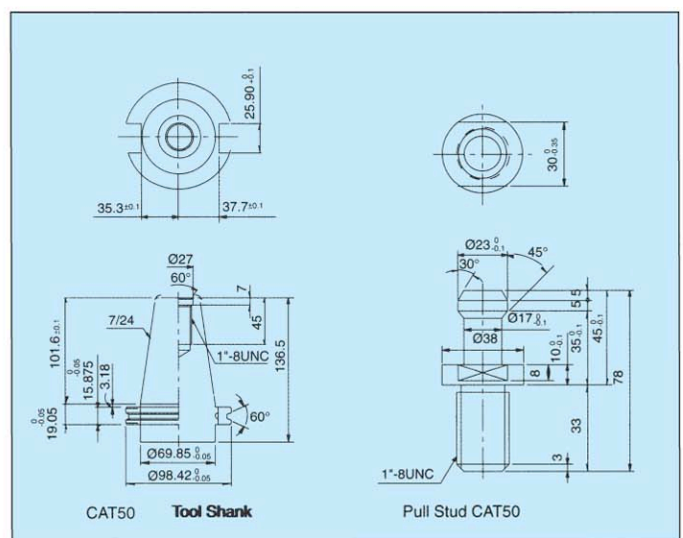
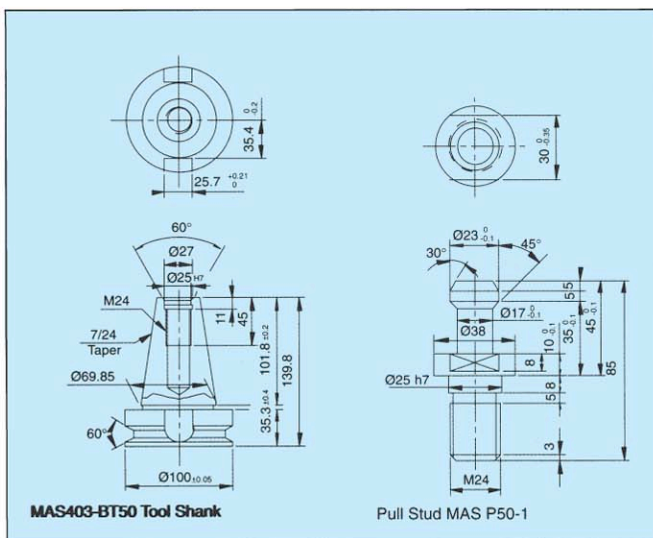
STANDARD ACCESSORIES:

1. Coolant equipment
2. Centralized automatic lubrication system
3. Splash guard
4. Adjusting tools and tool box (1 set)
5. Manual and electrical drawing (1 set)
6. Leveling and foundation fittings
7. Work light
8. Spindle cooling system (Chiller unit)
9. Alarm lamp
10. Air blast
11. Automatic power off
12. Operation finish lamp
13. Screw-type chip conveyor
14. Transformer (except 220v)
15. Two automatic pallet changer (2 APC)
16. Linear scale feedback system

OPTIONAL ACCESSORIES:

1. Link-type chip conveyor
2. NC rotary table
3. CAT50 tool shank instead of BT50
4. Oil hole drills interface
5. Automatic tool length measuring system
6. Automatic touch probe centering system

* Option Designed specifications are subject to change without notice.



KMC - SERIES MACHINING CENTER



ISO 9001

CE



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