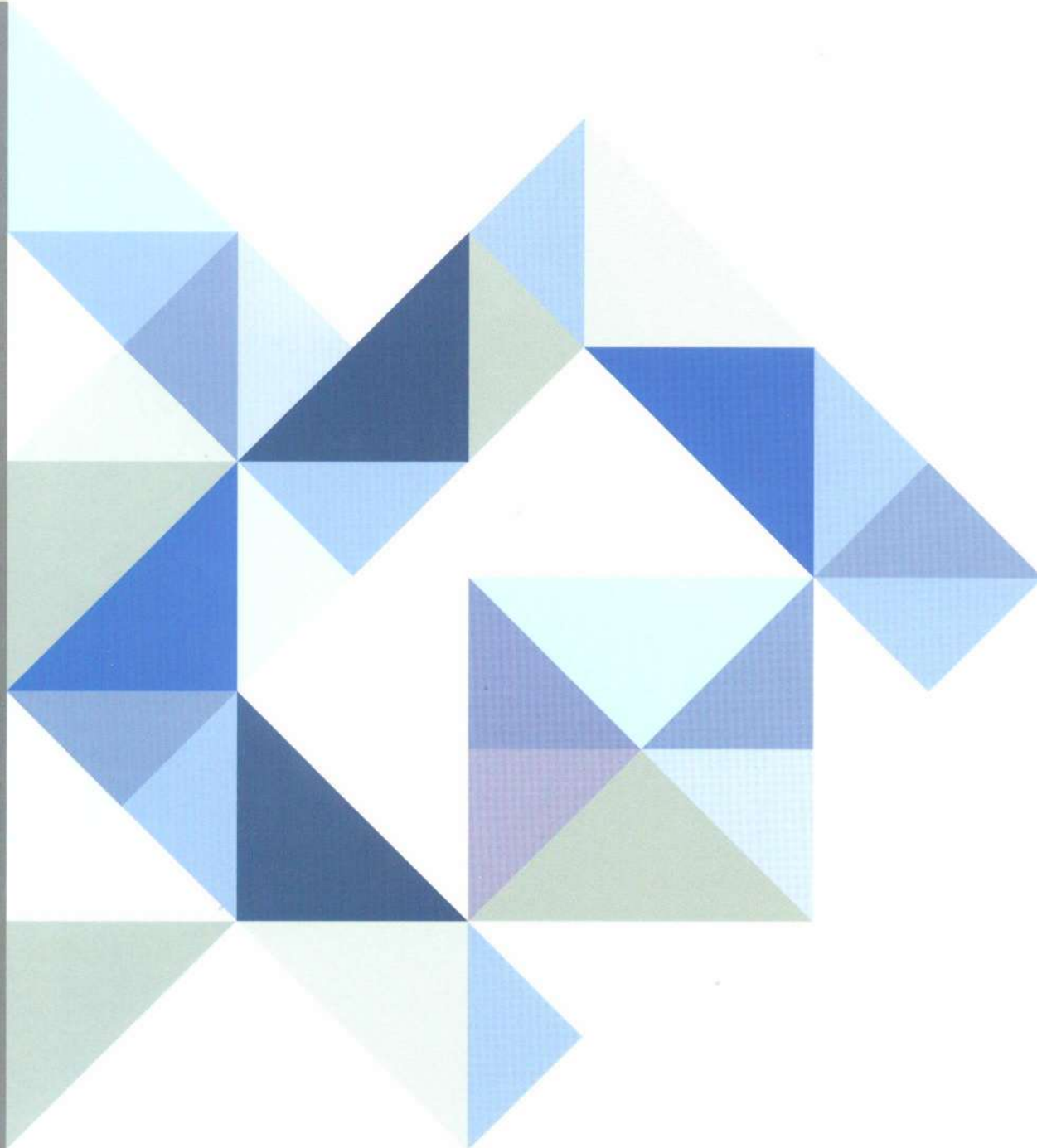
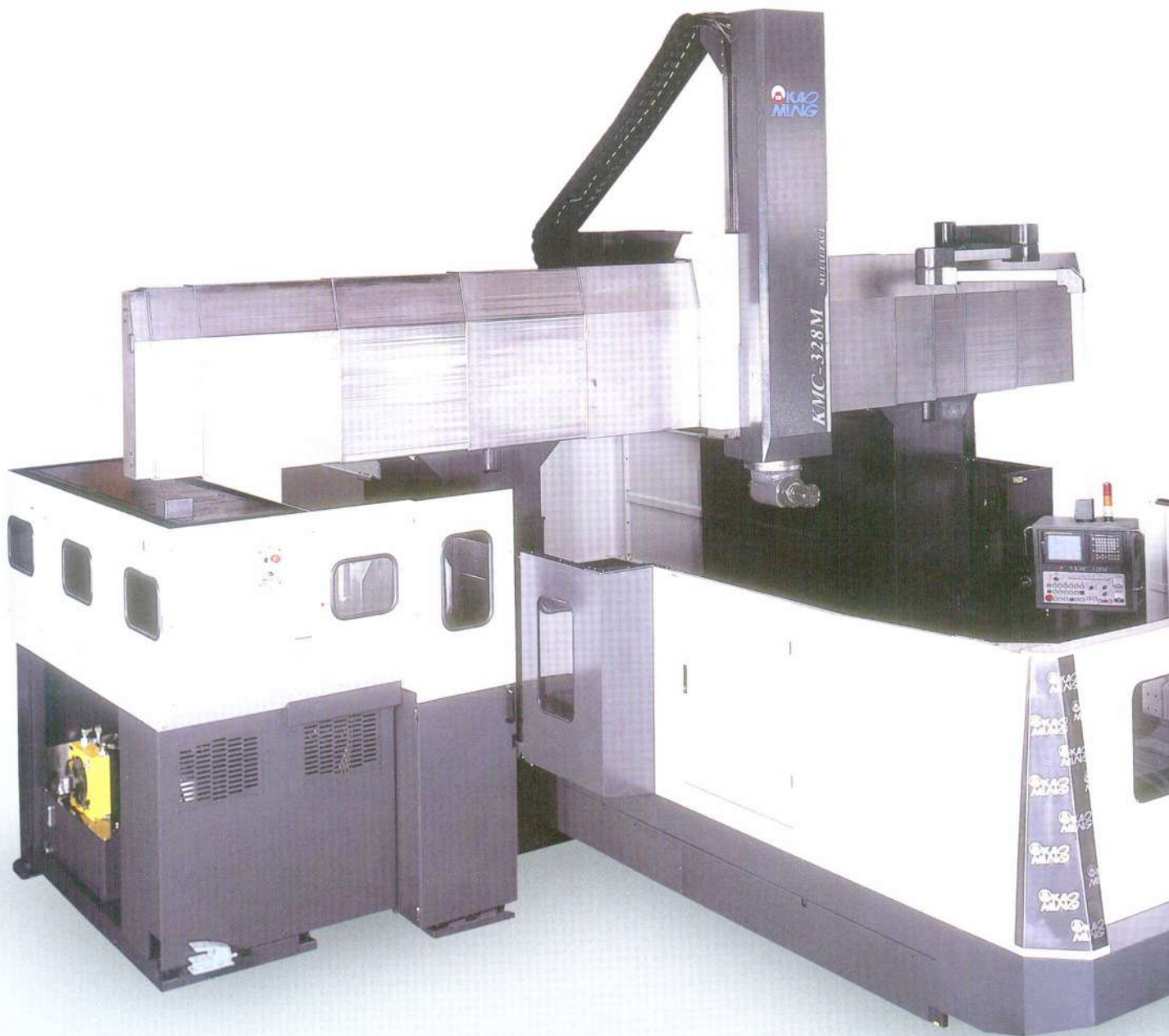


Double-Column Multi-Center





 **Double-Column Multi-Center**





MAIN FEATURES

1. KMC-M series are designed to meet the needs of multi-face machining the larger LCD molds and machine constructions in one set-up. That increases productivity and makes the cost down.
2. All 3-axes travels are fully supported by boxway hereby ensuring the rigidity and stability.
3. 3-Axes have larger travel range; extraordinarily Z-axis stroke is 1100mm (43.3").
4. Strong columns and crossbeam are like La Grande Arche, giving the best rigid structure.
5. Machine base has four-boxway to support by **sliding** and **rolling** combined design. Central boxway for main support is hardened and ground, covered with Turcite-B which features strong absorb ability enhancing dynamic rigidity. Moreover, 2-side boxway is as same as central boxway but further employs extra roller-type recirculating bearing to strengthen support. This design can get less loading and more tolerance.
6. The table with strong ribs layout provides optimum bending and torsion stress.
7. The Y-axis utilizes a superior design whereby the lower slideway is offset a full **70mm (2.76")** forward from the upper slideway. This greatly enhances the static rigidity.
8. A properly preloaded and pretension, large diameter ballscrew is used for three axes. X-axis has a hollow ballscrew with oil cooled and is equipped with a special design to cool the ballscrew bearings by air for getting the better positioning accuracy.
9. The mounting brackets for the Y and Z axes ballscrews are integrated with the saddle and crossbeam to maximize the rigidity further.
10. All 3-axes utilize an external feedback pulse coder for positioning. The pulse coder is coupled to the opposite end of the ballscrew and feedback to servo system directly. This allows for high positioning accuracy.
11. Mechanical safety couplings are used where the drive motors adapt to the ballscrews. These devices greatly minimize damage that may occur during a collision or overload condition.
12. Specially designed tool unclamp cylinder which totally eliminates any outside forces from being applied to the spindle bearings when releasing the tool.
13. Tool magazine is driven by hydraulic index motor, and the arm is rotated by hydraulic swing motor for stable and speedy consideration.
14. Coolant through spindle system (optional) can clean chips from high speed cutting and restrain heat.
15. The spindle head is hydraulically clamped to the curvic coupling.
16. Horizontal spindle employed high-precision hardened and ground spiral bevel gears that could reduce shocks and noises effectively to ensure running stability.
17. With optional FANUC Data Server, 64-bit RISC processor and NURBS interpolation to achieve Hi-speed and Hi-accuracy Die/Mold machining.

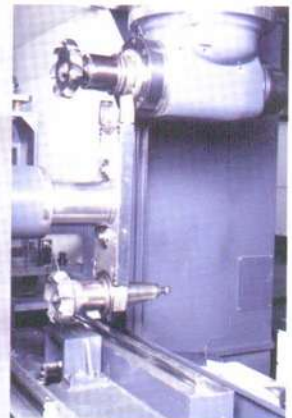


Double-Column Multi-Center



ATC-V (Vertical)

ATC-H (Horizontal)



AUTOMATIC TOOL CHANGER AND AUTOMATIC ATTACHMENT CHANGER

- ATC-H (Horizontal) is integrated into original ATC-V(vertical) which features simple construction and innovative design.
- **2-position** AAC (Automatic Attachment Changer) is designed for improving productivity.
- Angular attachment and vertical head cap are put in AAC magazine which has upper and lower seat and moves back and forth - separately or together. The unique design of AAC magazine can be allowed to extend more stations for application.
- Automatic angular attachment can be indexed **72 positions** in 5° increment, and has ± 3 sec. index repeatability accuracy.



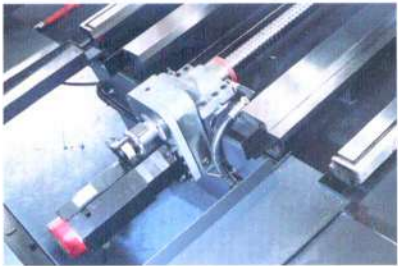
AAC (V-cap)

AAC (H-head)

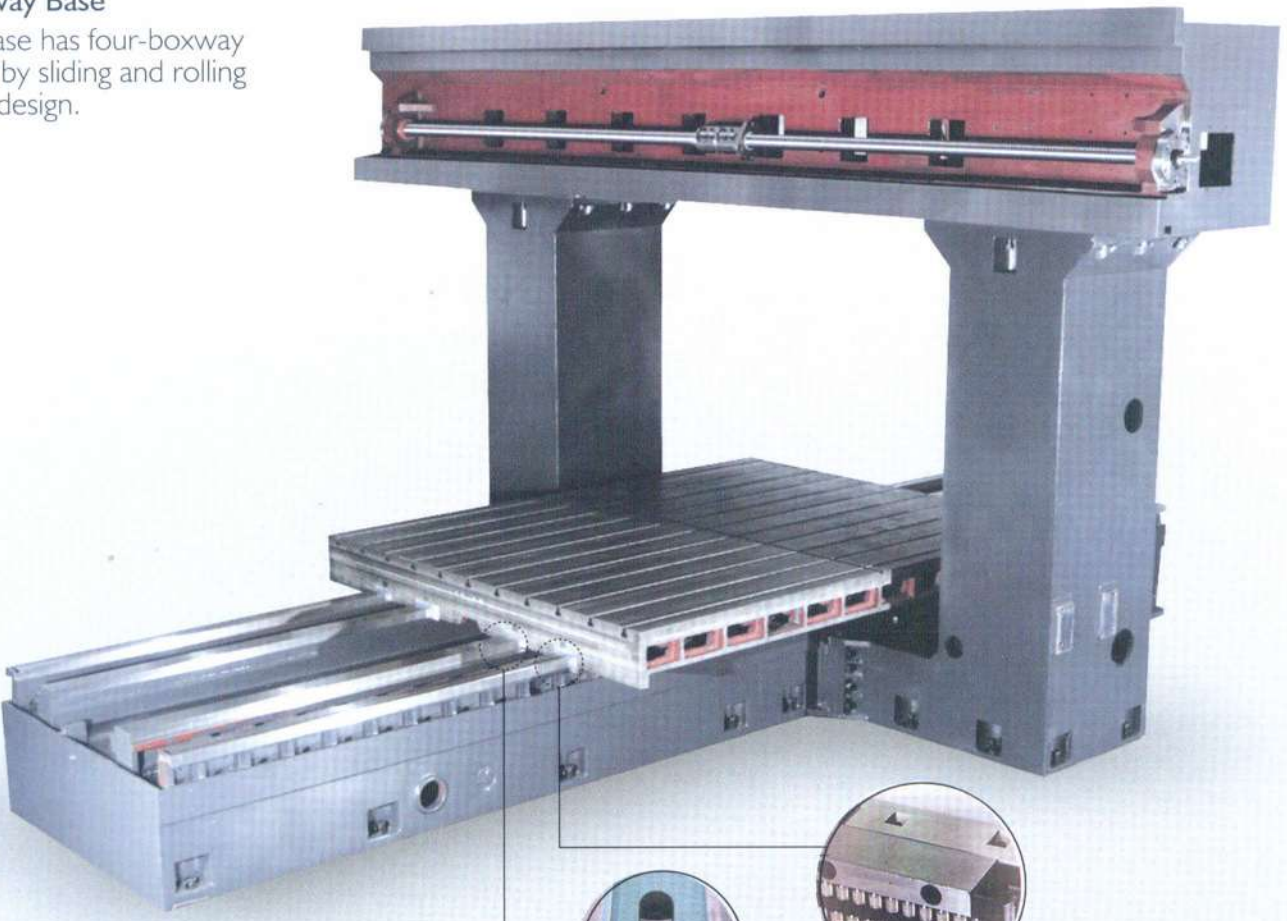




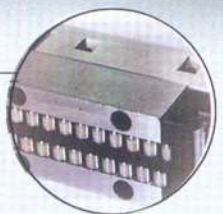
HIGH RIGIDITY "COMBINED SLIDING WITH ROLLING"



Four-boxway Base
Machine base has four-boxway to support by sliding and rolling combined design.



Precision Scraping

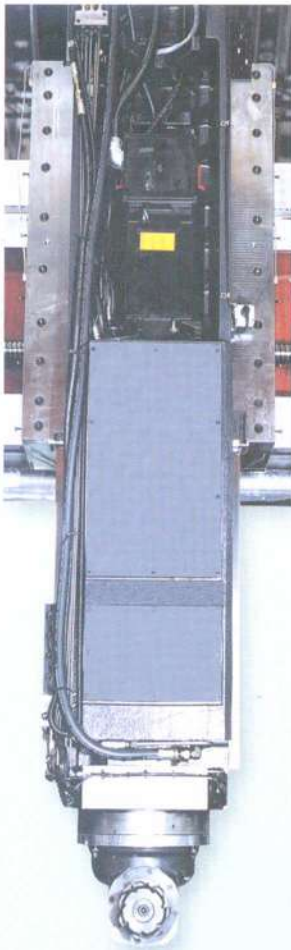


Roller-type recirculating bearing

INNOVATIVE TECHNIQUES "COMBINED POWER WITH BEAUTY"

Superior Arrangement for Z-axis Space & Spindle

- Thanks to the Z-axis space saving design for the extra long strokes **1100mm (43.3")**, the machine height is only **5080mm (200")**.
- The center of spindle and spindle motor are symmetrically designed to against Y-axis thermal displacement.
- The spindle is driven by a powerful **26KW (35HP)** spindle motor and through two-speed transmission by gears. The maximum spindle torque is **1018Nm (104kg-m)**, sufficient to make heavy-duty cutting.
- Three various range of spindle speeds-4000, 6500, 8000 rpm are integrated into common use the same spindle motor. KMTCS-Kao Ming Thermal Compensation System (optional) is beneficial to 8000 rpm high speed spindle for larger Die/Mold workpieces machining to control the thermal elongation and get the better stability.
- Spindle can make vertical and horizontal cutting through automatic attachment changer.
- Automatic 30 degree angle head, extension head and index universal head are optional accessories for wide application of 3-5 axis control.



Double-Column Multi-Center

HORIZONTAL CUTTING

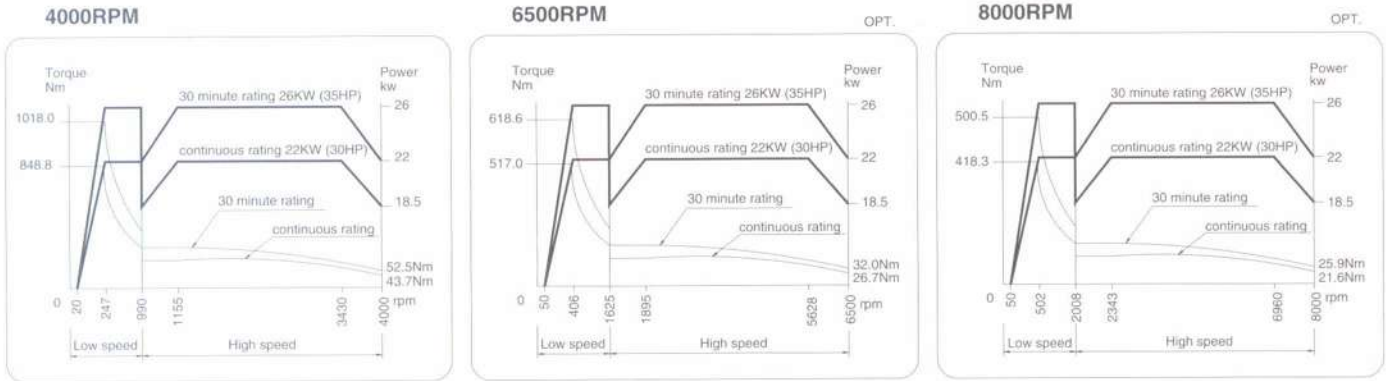


CUTTING EXAMPLE

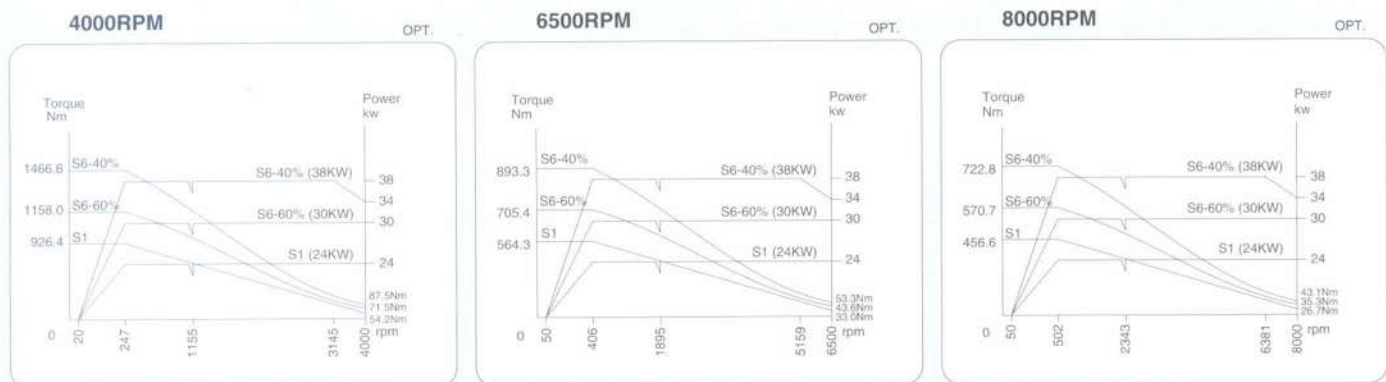
Face mill cutter	Ø125
Work material	S45C
Spindle speed (rpm)	400
Cutting width (mm)	100
Cutting depth (mm)	5
Feedrate (mm/min)	880
Cutting capacity (cm ³ /min)	440

SPINDLE OUTPUT AND TORQUE

FANUC SPINDLE MOTOR : α 22i, 22/26KW(30/35HP)



HEIDENHAIN SPINDLE MOTOR : QAN260U, 24/30/38KW

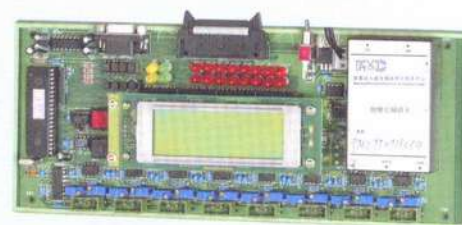




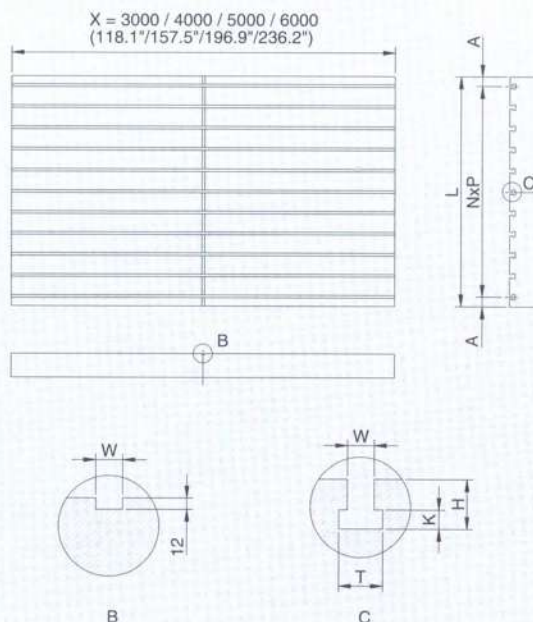
KMTCS-KAO MING THERMAL COMPENSATION SYSTEM (OPT.)

KMTCS is the unique integrated techniques of inverter thermostat spindle cooler, thermo-compensation card and PLC software. The system features to make the spindle always have the constancy of temperature by quickly changing the power factor of frequency compressor while spindle temperature rises up or down due to spindle speed change. For the necessity of high speed machining all day at maximum or fixed spindle revolution, such as finish-machining of die/mold, KMTCS is considerable due to its stable and accurate performance. In this case, to control the deviations of the spindle elongation within **0.02mm**, even **0.01mm** is possible under the conditions of neglecting the influences of environments from practical experiences. Furthermore, the other thermo-compensation system PMC-M is optionally available. PMC-M features intelligent use of shift function and the integration techniques of NC, PLC and thermo-compensation card.

KMTCS PMC-M THERMO-COMPENSATION SYSTEM (OPT.)



KMC-M SERIES TABLE DIMENSIONS

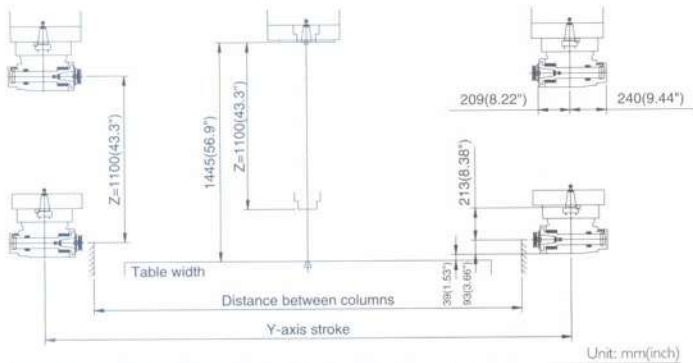


Unit: mm(inch)

Distance Between Columns	2800 (110.2")	3200 (126")	3600 (141.7")
L	2400 (94.5")	2600 (102.4")	3000 (118.1")
A	100 (3.94")	100 (3.94")	100 (3.94")
N	10	12	14
P	220 (8.66")	200 (7.87")	200 (7.87")
W	24H8 (0.94")	28H8 (1.102")	28H8 (1.102")
T	42 ^{+0.05} (1.65")	46 ^{+0.05} (1.81")	46 ^{+0.05} (1.81")
H	42 (1.65")	52 (2.05")	52 (2.05")
K	18 ^{+0.05} (0.71")	20 ^{+0.05} (0.79")	20 ^{+0.05} (0.79")

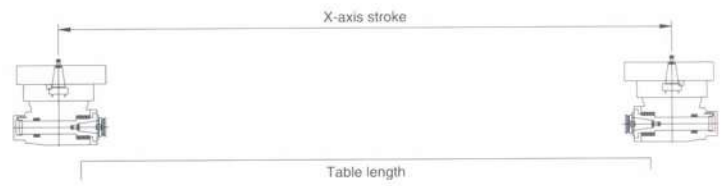


9 KMC-M SERIES MACHINING RANGE



Distance between columns	F	G	H
Table width	2400 (94.5")	2600 (102.4")	3000 (118.1")
Y-axis stroke	3450 (135.8")	3850 (151.6")	4250 (167.3")

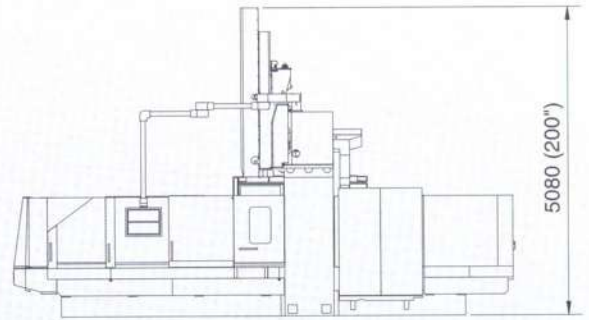
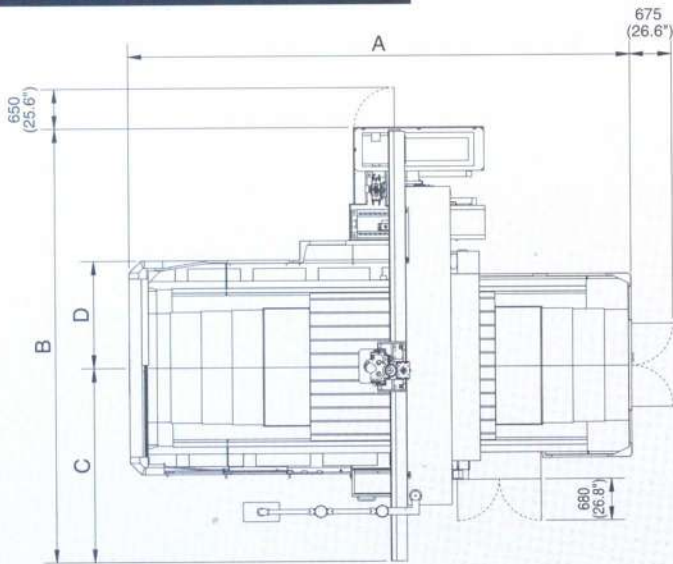
Unit: mm(inch)



	3000 (118.1")	4000 (157.5")	5000 (196.9")	6000 (236.2")
Table length	3000 (118.1")	4000 (157.5")	5000 (196.9")	6000 (236.2")
X-axis stroke	3230 (127.2")	4230 (166.5")	5230 (205.9")	6230 (245.3")

Unit: mm(inch)

9 KMC-M SERIES FLOOR SPACE



	328M	332M	336M	428M	432M	436M	528M	532M	536M	628M	632M	636M
A	8130 (320.1")			10130 (398.8")			12130 (477.6")			14330 (564.2")		
B	7078 (278.7")	7493 (295")	7913 (311.5")	7078 (278.7")	7493 (295")	7913 (311.5")	7078 (278.7")	7493 (295")	7913 (311.5")	7078 (278.7")	7493 (295")	7913 (311.5")
C	3175 (125")	3390 (133.5")	3610 (142.1")	3175 (125")	3390 (133.5")	3610 (142.1")	3175 (125")	3390 (133.5")	3610 (142.1")	3175 (125")	3390 (133.5")	3610 (142.1")
D	1740 (68.5")	1940 (76.4")	2140 (84.3")	1740 (68.5")	1940 (76.4")	2140 (84.3")	1740 (68.5")	1940 (76.4")	2140 (84.3")	1740 (68.5")	1940 (76.4")	2140 (84.3")

Double-Column Multi-Center

Double-Column Multi-Center

SPECIFICATIONS

	ITEM	F	G	H	KMC-328M	KMC-332M	KMC-336M	KMC-428M	
Travels	- Distance between columns	F	G	H	2800 (110.2")	3200 (126")	3600 (141.7")	2800 (110.2")	
	- X-axis (table longitudinal)					3230 (127.2")			
	- Y-axis (spindle lateral)	F	G	H	3450 (135.8")	3850 (151.6")	4250 (167.3")	3450 (135.8")	
	- Z-axis (spindle vertical)					1100 (43.3")			
	- Distance from table surface to spindle nose					345~1445 (13.6"~56.9")			
	- Distance from table surface to horizontal spindle center					132~1232 (5.2"~48.5")			
Table	- Table working surface	F	G	H	2400x3000 (94.5"x118.1")	2600x3000 (102.4"x118.1")	3000x3000 (118.1"x118.1")	2400x4000 (94.5"x157.5")	
	- Table configuration	F	G	H	24 [#] mmx11x220mm (0.94"x11x8.66")	28 [#] mmx13x200mm (1.102"x13x7.87")	28 [#] mmx15x200mm (1.102"x15x7.87")	24 [#] mmx11x220mm (0.94"x11x8.66")	
	- Max. table load					12000 kg (26400 lb) / *18000 kg (39600 lb)			
Spindle	- Spindle speed	Vertical			4000 (*6500, *8000) rpm				
		Horizontal			3500 rpm				
	- No. of spindle speed					Infinite variable, two steps			
	- Spindle taper					ISO 50			
	- Spindle motor (cont./30min)					AC 22/26 kw (30/35 HP)			
	- Max. spindle torque					1018 Nm (104 kg-m)			
Feed rate	- Rapid traverse (X, Y, Z)				(10, 12, 10) m/min (393, 472, 393) ipm	(10, 10, 10) m/min (393, 393, 393) ipm	(10, 8, 10) m/min (393, 315, 393) ipm	(10, 12, 10) m/min (393, 472, 393) ipm	
	- Cutting feed rate					1~5000 mm/min (0.1~196 ipm)			
Automatic tool changer (V/H)	- Tool shank shape					MAS403-BT50			
	- Pull stud					MAS-P50T-1			
	- Tool magazine capacity					30 (*40, *50, *60) tools			
	- Max. tool diameter ((without adjacent tools))					ø130 (5.11"), ((ø200/7.87"))			
	- Max. tool length					350 (13.8")			
	- Max. tool weight					20 kg (44 lb)			
Power sources	- Electrical power supply					70 KVA			
	- Compressed air supply					5~7 kg/cm ² (70~98 psi)			
Accuracy	- Positioning accuracy					±0.005/300 (±0.0002"/12")			
	- Repeatability					±0.003 (±0.0001")			
Angular attachment	- Indexing					90° x 4 (*5° x 72)			
	- Index repeatability					±3 sec			
Machine size	- Machine height					5080 (200")			
	- Floor space	F	G	H	8130 x 7078 (320.1" x 278.7")	8130 x 7493 (320.1" x 295")	8130 x 7913 (320.1" x 311.5")	10130 x 7078 (398.8" x 278.7")	
	- Machine net weight	F	G	H	42000kg (92400lb)	44000kg (96800lb)	48000kg (105600lb)	46800kg (102960)	
CNC controller	- FANUC-I8i series (*HEIDENHAIN)								

*Option Design specifications are subject to change without notice. (()) Max. tool diameter (without adjacent tools) Distance between two col

STANDARD ACCESSORIES

- Coolant equipment
- Centralized automatic lubrication system
- Rigid tapping
- Splash guard
- Adjusting tools and box (1 set)
- Manual and electrical drawing (1 set)
- Leveling and foundation fittings
- Work light
- Spindle cooling system (Chiller unit)
- Alarm lamp
- Air blast
- Automatic power off
- Operation finish lamp
- Screw-type chip conveyor
- Transformer (except 220V)

Unit: mm (inch)

KMC-432M	KMC-436M	KMC-528M	KMC-532M	KMC-536M	KMC-628M	KMC-632M	KMC-636M
3200 (126")	3600 (141.7")	2800 (110.2")	3200 (126")	3600 (141.7")	2800 (110.2")	3200 (126")	3600 (141.7")
4230 (166.5")		5230 (205.9")			6230 (245.3")		
3850 (151.6")	4250 (167.3")	3450 (135.8")	3850 (151.6")	4250 (167.3")	3450 (135.8")	3850 (151.6")	4250 (167.3")
1100 (43.3")		1100 (43.3")			1100 (43.3")		
345~1445 (13.6"~56.9")		345~1445 (13.6"~56.9")			345~1445 (13.6"~56.9")		
132~1232 (5.2"~48.5")		132~1232 (5.2"~48.5")			132~1232 (5.2"~48.5")		
2600x4000 (102.4"x157.5")	3000x4000 (118.1"x157.5")	2400x5000 (94.5"x196.9")	2600x5000 (102.4"x196.9")	3000x5000 (118.1"x196.9")	2400x6000 (94.5"x236.2")	2600x6000 (102.4"x236.2")	3000x6000 (118.1"x236.2")
28 [#] mmx13x200mm (1.102"x13x7.87")	28 [#] mmx15x200mm (1.102"x15x7.87")	24 [#] mmx11x220mm (0.94"x11x8.66")	28 [#] mmx13x200mm (1.102"x13x7.87")	28 [#] mmx15x200mm (1.102"x15x7.87")	24 [#] mmx11x220mm (0.94"x11x8.66")	28 [#] mmx13x200mm (1.102"x13x7.87")	28 [#] mmx15x200mm (1.102"x15x7.87")
0 kg (28600 lb) / *20000 kg (44000 lb)		14000 kg (30800 lb) / *22000 kg (48400 lb)			15000 kg (33000 lb) / *25000 kg (55000 lb)		
4000 (*6500, *8000) rpm		4000 (*6500, *8000) rpm			4000 (*6500, *8000) rpm		
3500 rpm		3500 rpm			3500 rpm		
Infinite variable, two steps		Infinite variable, two steps			Infinite variable, two steps		
ISO 50		ISO 50			ISO 50		
AC 22/26 kw (30/35 HP)		AC 22/26 kw (30/35 HP)			AC 22/26 kw (30/35 HP)		
1018 Nm (104 kg-m)		1018 Nm (104 kg-m)			1018 Nm (104 kg-m)		
(10, 10, 10) m/min (393, 393, 393) ipm	(10, 8, 10) m/min (393, 315, 393) ipm	(8, 12, 10) m/min (315, 472, 393) ipm	(8, 10, 10) m/min (315, 393, 393) ipm	(8, 8, 10) m/min (315, 315, 393) ipm	(7, 12, 10) m/min (276, 472, 393) ipm	(7, 10, 10) m/min (276, 393, 393) ipm	(7, 8, 10) m/min (276, 315, 393) ipm
1~5000 mm/min (0.1~196 ipm)		1~5000 mm/min (0.1~196 ipm)			1~5000 mm/min (0.1~196 ipm)		
MAS403-BT50		MAS403-BT50			MAS403-BT50		
MAS-P50T-I		MAS-P50T-I			MAS-P50T-I		
30 (*40, *50, *60) tools		30 (*40, *50, *60) tools			30 (*40, *50, *60) tools		
ø130 (5.11"), ((ø200/7.87"))		ø130 (5.11"), ((ø200/7.87"))			ø130 (5.11"), ((ø200/7.87"))		
350 (13.8")		350 (13.8")			350 (13.8")		
20 kg (44 lb)		20 kg (44 lb)			20 kg (44 lb)		
70 KVA		70 KVA			70 KVA		
5~7 kg/cm ² (70~98 psi)		5~7 kg/cm ² (70~98 psi)			5~7 kg/cm ² (70~98 psi)		
±0.005/300 (±0.0002"/12")		±0.005/300 (±0.0002"/12")			±0.005/300 (±0.0002"/12")		
±0.003 (±0.0001")		±0.003 (±0.0001")			±0.003 (±0.0001")		
90° x 4 (*5° x 72)		90° x 4 (*5° x 72)			90° x 4 (*5° x 72)		
±3 sec		±3 sec			±3 sec		
5080 (200")		5080 (200")			5080 (200")		
10130 x 7493 (398.8" x 295")	10130 x 7913 (398.8" x 311.5")	12130 x 7078 (477.6" x 278.7")	12130 x 7493 (477.6" x 295")	12130 x 7913 (477.6" x 311.5")	14330 x 7078 (564.2" x 278.7")	14330 x 7493 (564.2" x 295")	14330 x 7913 (564.2" x 311.5")
48300kg (106260lb)	54000kg (118800lb)	51500kg (113300lb)	53000kg (116600lb)	60000kg (132000lb)	56000kg (123200lb)	57800kg (127160lb)	66000kg (145200lb)

ns F=2800mm(110.2") G=3200mm(126") H=3600mm(141.7")

OPTIONAL ACCESSORIES

1. Link-type chip conveyor
2. Mist coolant unit
3. NC rotary table
4. CAT50, DIN50, ISO50 tool shank
5. Oil hole drills interface
6. Linear scale feedback system
7. Automatic tool length measuring system
8. Automatic touch probe centering system
9. Three of four stations AAC magazine
10. Coolant through spindle system (A, B type)
11. KMTCS-Kao Ming Thermal Compensation System



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