KAO MING MACHINERY INDUSTRIAL CO., LTD

HEAD OFFICE
No.861, Sanfong Rd., Fongyuan District,
Taichung City, 42073 Taiwan

CTSP
No.53, Houke S. Rd., Houli District.,
Taichung City 42152, Taiwan
TEL:+886-4-25577650 FAX:+886-4-25577630
E-MAIL:km@kaoming.com.tw

http://www.kaoming.com

Cat.30 1404(E)*1000B

GANTRY

KAO MING

KMC-G SERIES

Taking the lead of
Gantry Portal
Manufacturing Technology

KAO MING KMC-G SERIES
GANTRY TYPE MACHINING CENTER

GANTRY
BEAM TRAVELING CONSTRUCTION

Built for Extra Long and Large Workpiece Machining

- Gantry type construction with fixed table and traveling crossbeam.
- Rigid structure is especially idea for extra long and large workpiece machining.
- Three-axes travels:
  X-axis: 6.5~14.5 M (256"~570.8")
  Y-axis: 2.5/3.1/3.7 M (98.4"/122"/145.6")
  Z-axis: 1.2 M (47.2")
- 25% floor space saving compare to conventional machine
- Fixed table provides maximum loading capacity of 10,000 kgf/m2.
- Step-slideways design on X, Y-axis.
- Z-axis ball screw supports are integrated with the saddle casting.
- 2-position AAC (Automatic Attachment Head Changer) is standard.
- 3~5-position AAC is optional.

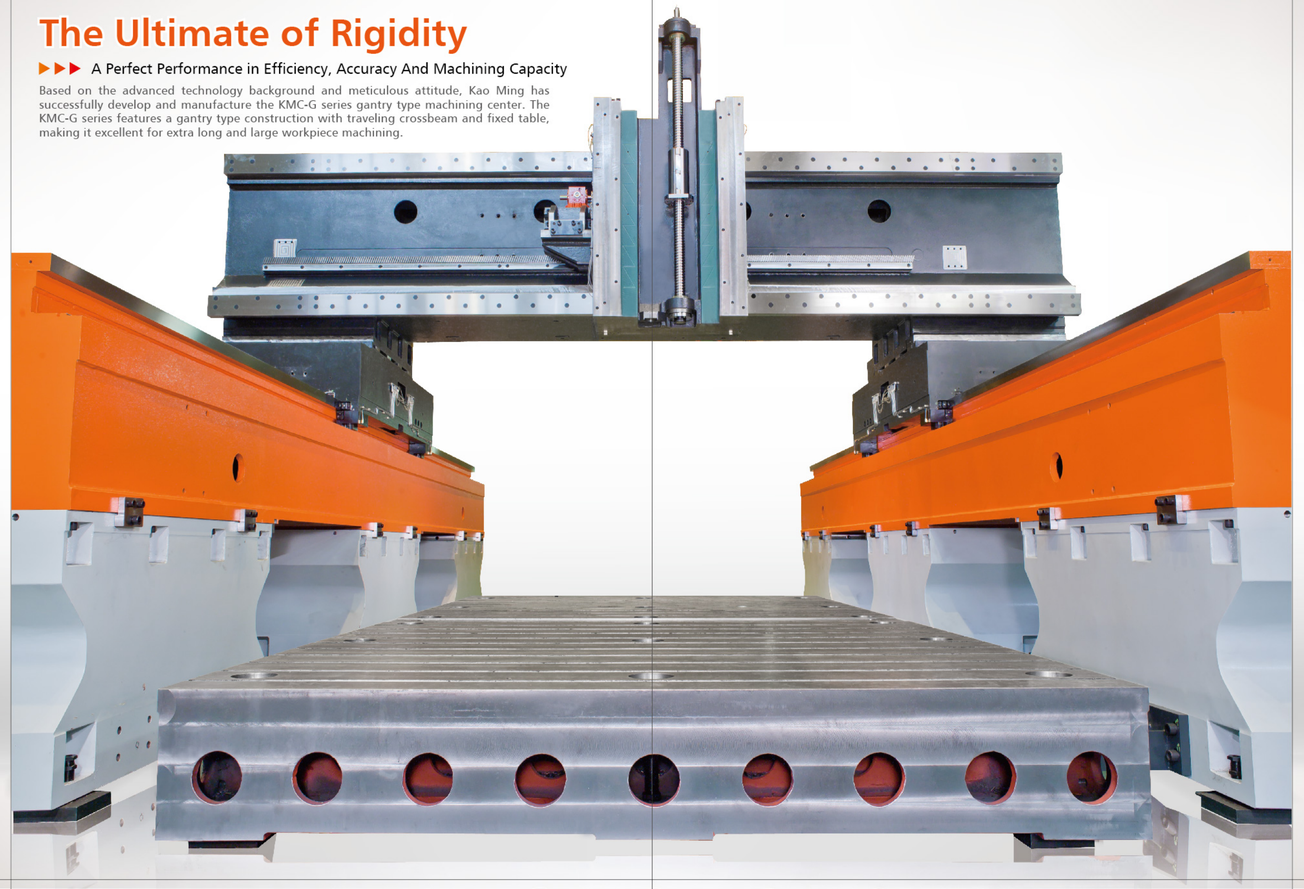
Designed and engineered with heavy cutting capacity and high efficiency in mind, the KMC-G series gantry type machining center by Kao Ming features an advanced gantry type construction, making large workpiece machining easier. Axis feed is driven through a rack and pinion transmission mechanism, allowing rapid traverse rate reaches up to 30 m/min without vibration. With Kao Ming KMC-G series, you will stay competitive in large workpiece machining.

KAO MING KMC-G SERIES
GANTRY TYPE MACHINING CENTER

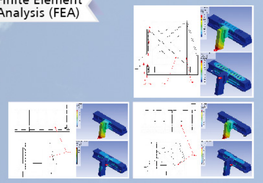
The Ultimate of Rigidity

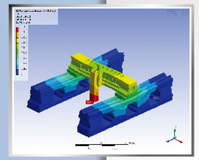
▶▶▶ A Perfect Performance in Efficiency, Accuracy And Machining Capacity

Based on the advanced technology background and meticulous attitude, Kao Ming has successfully develop and manufacture the KMC-G series gantry type machining center. The KMC-G series features a gantry type construction with traveling crossbeam and fixed table, making it excellent for extra long and large workpiece machining.



Finite Element Analysis (FEA)





Step Type Crossbeam

- The crossbeam is designed with step-slideways to exhibit exceptional rigidity of structure.
- Box type beam construction in combination with internal rib reinforcement enhance the outstanding stability of spindle head especially when performing heavy cutting.

Stable Column Construction

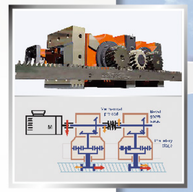
- The specially designed separated column structure assists in dramatic reduction of structural deformation.
- The column interior is reinforced by stiff ribs to achieve optimum bending and torsional stress.

Steel Inserted Box Ways And Link-Chain Type Roller Bearings on Three Axes

- The machining of long big parts always require heavy loading capacity and rapid feedrate, therefore the three axes of the gantry type machining center are designed with steel inserted box ways. All major moving surfaces are inserted with link-chain type roller bearings. Turcite-B and roller bearings are used together on normal force contacting faces.

X, Y-axis Transmitted Through Rack And Pinion

With the use of mechanically preloaded rack and pinion transmission mechanism on X, Y-axis, ultra high linear accuracy with backlash free can be obtained. Besides, torsional rigidity can reach 504 Nm/arc min and radial rigidity is of up to 675 N/μm. As such, the machine is capable of maintaining at the highest natural frequency without vibration even at the high speed feed of 30 m/min. (1181ipm)

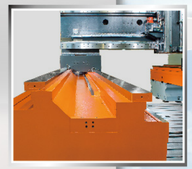


Eliminating Backlash Through Mechanical Preload

- The best solution to eliminate backlash is to use two reducers on which preload is created through two helical gears, fitted on their output shafts, that engage with the rack.

Linear Scales on X, Y-axis Positioning Accuracy ± 0.01/4000 mm

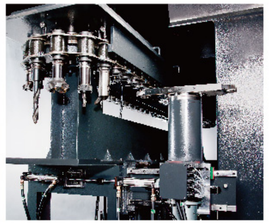
- The linear scales on X, Y-axis are able to accurately detect a micrometric deviation of machine accuracy due to heat growth. The deviation value will be directly fed back to the CNC system, that allows the machine to keep at the highest precision condition for a long time of operation.



Step Design of X, Y-axis Box Ways

X, Y-axis Box Ways Deployed As Step Type

- The box ways on the X, Y-axis are designed as a step type. The step difference between the upper and lower box ways on the Y-axis reaches 120 mm, and 70 mm of step difference on the X-axis (U-axis). This outstanding design enables the crossbeam and spindle head to demonstrate an extremely stable cutting performance even in heavy cutting or high feed speed.



30 / 40 / 50 / 60 / 90 - Tool Magazine

Magazine Loading Capacity

30 tools (standard)
40 / 50 / 60 / 90 tools (optional)

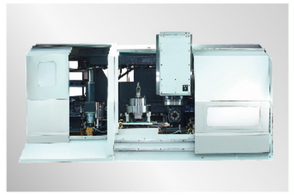
- The tool magazine is driven by a hydraulic index motor.
- The tool change arm rotation is driven by a hydraulic swing motor for quick, accurate and stable tool change motions.

Automatic Tool Changer & Automatic Attachment Head Changer

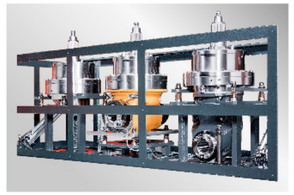
- The automatic horizontal tool changer is integrated into the original vertical tool changer which features simplified construction and innovative design.
- Standard head compartment can store two heads (vertical and horizontal heads) for automatic head change. Upon request, the head compartment loading capacity can be expanded to 3 – 5 positions.

Hydraulic Accumulator

The hydraulic system is equipped with an accumulator, which not only effectively suppresses the pulsation of hydraulic pressure while making hydraulic motions more stable.



2-position head compartment (standard)



3~5-position head compartment (optional)

Horizontal Spindle Transmitted Through Spiral Bevel Gears

The horizontal spindle is transmitted through high precision spiral bevel gears, hardened and precision ground, which effectively reduce vibration and noise and ensure running stability.

Innovative Two-Speed Gear Drive Spindle Head, In-Line Design

- The unique two-speed gear drive spindle head is designed with thermal symmetry and the spindle and motor are located at the center line of the head.
- Coolant flow straight through the motor, reducer, spindle and attached head (optional).
- Powerful 26 KW (35HP) spindle motor drives the spindle through a reducer. Maximum spindle speed is 6,000 rpm with maximum output torque of 670 Nm (68 kg-m). Heavy cutting is also possible at low speed of 375 rpm.
- The spindle can perform vertical and horizontal cutting with the use of an automatic indexing head.

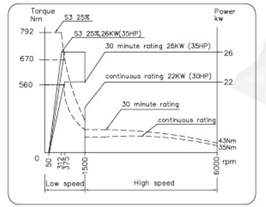
Horizontal Head Cutting Example

Face milling cutter	Ø125
Workpiece material	S45C
Spindle speed	400 rpm
Cutting width	100 mm
Cutting depth	5 mm
Feedrate	880 mm/min
Material removal rate	440 cm^3/min

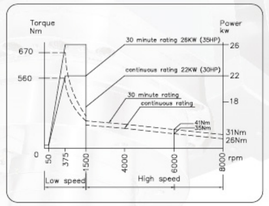
Spindle Power And Torque Output Diagram

FANUC SPINDLE MOTOR: 22/26 KW (35HP)

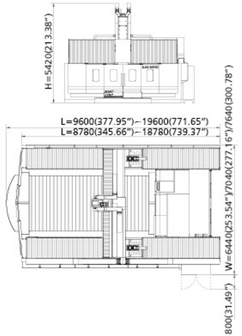
6000RPM



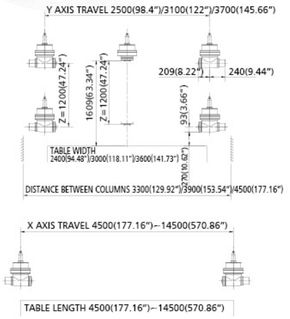
6000RPM / 8000RPM (opt.)



Dimensional Drawing Of Machine

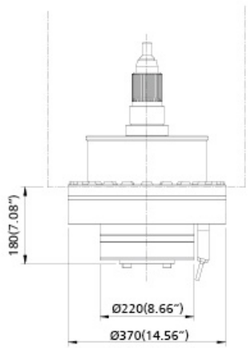
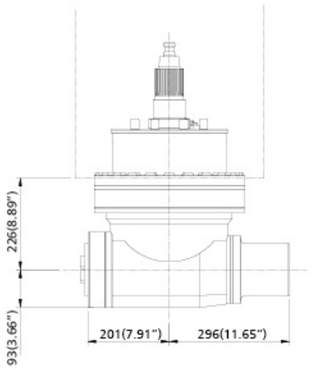
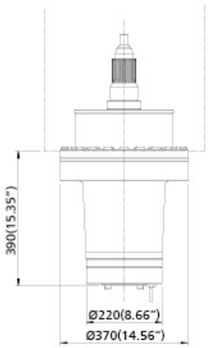
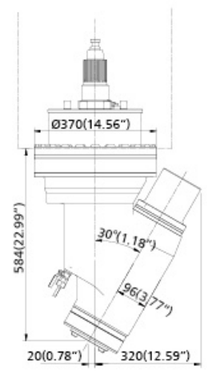
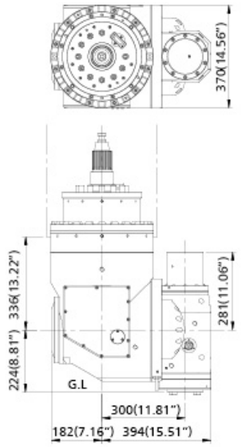


FLOOR SPACE OF KMC-G SERIES



MACHINING RANGE OF KMC-G SERIES

A Wide Variety of Milling Head

	Vertical Head	Horizontal Head	Extension Head	30-degree Angle Head	Automatic Indexing Universal Head
					
Max. speed	6000 / 8000 rpm	3500 rpm	4000 rpm	3500 rpm	3500 rpm
Spindle motor	22 / 25 kw	18.5 / 22 kw	22 / 25 kw	18.5 / 22 kw	25 kw
Application	Powerful vertical cutting	Powerful horizontal cutting	For narrow with deep cutting	For vertical wall-face cutting	For tilting surface cutting
Dimensional drawing					

STANDARD ACCESSORIES

- Vertical and horizontal attachment head
- Linear scale feedback system for X, Y-axis
- Coolant equipment
- Centralized automatic lubrication system
- Rigid tapping
- Splash guard
- Adjusting tools and tool box (1 set)
- Manual and electrical drawing (1 set)
- Leveling and foundation fittings
- Work light
- Spindle cooling system (Chiller unit)
- Alarm lamp
- Air blast
- Air conditioning electrical cabinet
- Automatic power off
- Operation finish lamp
- Screw-type chip conveyor
- Transformer (except 220V)

OPTIONAL ACCESSORIES

- Link-type chip conveyor
- Mist coolant unit
- NC rotary table
- CAT 50/ DIN 50/ ISO 50/ HSK-A100 tool shank
- Oil hole drills interface
- Automatic tool length measuring system
- Automatic touch probe centering system
- 3 to 5 – position AAC magazine
- Coolant through spindle system
- KMTCS – Kao Ming thermal compensation system

GANTRY TYPE MACHINING CENTER

SPECIFICATIONS

ITEM			UNIT	KMC-433G	KMC-439G	KMC-445G	KMC-633G	KMC-639G	KMC-645G	KMC-833G	KMC-839G	KMC-845G	KMC-1033G	KMC-1039G	KMC-1045G	KMC-1233G	KMC-1239G	KMC-1245G	KMC-1433G	KMC-1439G	KMC-1445G
TRAVEL	Distance between columns		mm(inch)	3300(129.92")	3900(153.54")	4500(177.16")	3300(129.22")	3900(153.54")	4500(177.16")	3300(129.92")	3900(153.54")	4500(177.16")	3300(129.92")	3900(153.54)	4500(177.16")	3300(129.92")	3900(153.54")	4500(177.16")	3300(129.92")	3900(153.54")	4500(177.16")
	X-axis (table: forth/back)		mm(inch)	4500(177.16")			6500 (255.9")				8500 (334.64")		10500 (413.38)			12500 (492.12")			14500 (570.86")		
	Y-axis (spindle head: right/left)		mm(inch)	2500(98.42")	3100(122.04")	3700(145.66")	2500(98.42")	3100(122.04")	3700(145.66")	2500(98.42")	3100(122.04")	3700(145.66")	2500(98.42")	3100(122.04")	3700(145.66")	2500(98.42")	3100(122.04")	3700(145.66")	2500(98.42")	3100(122.04")	3700(145.66")
	Z-axis (spindle head: up/down)		mm(inch)	1200 (47.24")			1200 (47.24")				1200 (47.24")		1200 (47.24")			1200 (47.24")			1200 (47.24")		
	Distance from vertical spindle nose to table surface		mm(inch)	409-1609 (16.1"-63.34")			409-1609 (16.1"-63.34")				409-1609 (16.1"-63.34")		409-1609 (16.1"-63.34")			409-1609 (16.1"-63.34")			409-1609 (16.1"-63.34")		
	Distance from horizontal spindle center to table surface		mm(inch)	363-1563 (14.29"-61.53")			363-1563 (14.29"-61.53")				363-1563 (14.29"-61.53")		363-1563 (14.29"-61.53")			363-1563 (14.29-61.53")			363-1563 (14.29-61.53")		
TABLE	Table working surface	X-axis	mm(inch)	4500 (177.16")			6500 (255.9")			8500	(334.64")		10500 (413.38")			12500 (492.12")			14500 (570.86")		
		Y-axis	mm(inch)	2400(94.48")	3000(118.11)	3600(141.73")	2400(94.48")	3000(118.11")	3600(141.73")	2400(94.48")	3000(118.11")	3600(141.73")	2400(94.48")	3000(118.11")	3600(141.73")	2400(94.48")	3000(118.11")	3600(141.73")	2400(94.48")	3000(118.11")	3600(141.73")
	T-slot		mm(inch)	28H8 x 200 (1.102"x7.87")			28H8 x 200 (1.102"x7.87")			28H8 x	200 (1.102"-7.87")		28H8 x 200 (1.102"x78.7")			28H8 x 200 (1.102"x78.7")			28H8 x 200 (1.102"x78.7")		
	Max. table load		kg/m²	10000			10000				10000		10000			10000			10000		
SPINDLE	Spindle speed	Vertical	rpm	6000 / *8000			6000 / *8000				6000 / *8000		6000 / *8000			6000 / *8000			6000 / *8000		
		Horizontal	rpm	3500			3500				3500		3500			3500			3500		
	No. of spindle speed			Infinitely variable, two steps			Infinitely variable, two steps			Infinitely	variable, two steps		Infinitely variable, two steps			Infinitely variable, two steps			Infinitely variable, two steps		
	Spindle taper (vertical / horizontal)			ISO50			ISO50				ISO50		ISO50			ISO50			ISO50		
	Spindle motor (cont. / 30 min.)		kw(Hp)	AC 22/26 (30/35)			AC 22/26 (30/35)				AC 22/26(30/35)		AC 22/26 (30/35)			AC 22/26 (30/35)			AC 22/26 (30/35)		
	Max. spindle torque		Nm(Kg-m)	670 (68)			670 (68)				670 (68)		670 (68)			670 (68)			670 (68)		
FEED RATE	Rapid traverse (X/Y/Z-axis)		m/min(ipm)	30/30/24 (1181/1181/944)			30/30/24 (1181/1181/944)			30/30/24	(1181/1181/944)		30/30/24 (1181/1181/944)			30/30/24 (1181/1181/944)			30/30/24 (1181/1181/944)		
	Cutting feed rate		m/min(ipm)	8 (314)			8 (314)				8 (314)		8 (314)			8 (314)			8 (314)		
AUTOMATIC TOOL CHANGER (V/H)	Tool shank shape			MAS403-BT50			MAS403-BT50				MAS403-BT50		MAS403-BT50			MAS403-BT50			MAS403-BT50		
	Pull stud			MAS-P50T-1			MAS-P50T-1				MAS-P50T-1		MAS-P50T-1			MAS-P50T-1			MAS-P50T-1		
	Tool magazine capacity			30 (*60) tools			30 (*60) tools				30 (*60) tools		30 (*60) tools			30 (*60) tools			30 (*60) tools		
	Max. tool diameter ((without adjacent tool))		mm(inch)	Ø130 (200) / Ø5.11" (7.87")			Ø130 ((200)) / Ø5.11" ((7.87"))			Ø130	((200)) / Ø5.11" ((7.87"))		Ø130 ((200)) / Ø5.11" ((7.87"))			Ø130 ((200)) / Ø5.11" ((7.87"))			Ø130 ((200)) / Ø5.11" ((7.87"))		
	Max. tool length		mm(inch)	350 (13.8")			350 (13.8")				350 (13.8")		350 (13.8")			350 (13.8")			350 (13.8")		
	Max. tool weight		kg(lb)	20 (44)			20 (44)				20 (44)		20 (44)			20 (44)			20 (44)		
POWER SOURCES	Electrical power supply		KVA	90			90				90		90			90			90		
	Compressed air supply		kg/cm²(psi)	5-7 (70-98)			5-7 (70-98)				5-7 (70-98)		5-7 (70-98)			5-7 (70-98)			5-7 (70-98)		
ACCURACY	Positioning accuracy		mm(inch)	±0.01/4000 (±0.0004"/157.5")			±0.01/4000 (±0.0004"/157.5")			±0.01/4000	(0.0004"/157.5")		±0.01/4000 (±0.0004"/157.5")			±0.01/4000 (±0.0004"/157.5")			±0.01/4000 (±0.0004"/157.5")		
	Repeatability		mm(inch)	±0.005 (±0.002")			±0.005 (±0.002")				±0.005 (±0.002")		±0.005 (±0.002")			±0.005 (±0.002")			±0.005 (±0.002")		
HORIZONTAL AUTOMATIC INDEXING HEAD	Indexing		degree	90°x4 (*5°x72)			90°x4 (*5°x72)				90°x4 (*5°x72)		90°x4 (*5°x72)			90°x4 (*5°x72)			90°x4 (*5°x72)		
	Indexing repeatability		sec	±3			±3				±3		±3			±3			±3		
MACHINE SIZE	Machine height		mm(inch)	5420 (213.4")			5420 (213.4")				5420 (213.4")		5420 (213.4")			5420 (213.4")			5420 (213.4")		
	Floor space	L	mm(inch)	9600 (377.95)			11600 (456.69")				13600 (535.43")		15600 (614.17")			17600 (692.91")			19600 (771.65")		
		W	mm(inch)	6440(253.54")	7040(277.16")	7640(300.78")	6440(253.54")	7040(277.16")	7640(300.78")	6440(253.54")	7040(277.16")	7640(300.78")	6440(253.54")	7040(277.16")	7640(300.78")	6440(253.54")	7040(277.16")	7640(300.78")	6440(253.54)	7040(277.16")	7640(300.78")
	Machine net weight		kg(lb)	35000(87500)	41000(90200)	48000(105600)	56000(123200)	65000(143000)	73000(160600)	80000(176000)	89000(195800)	97000(213400)	105000(231000)	114000(250800)	123000(270600)	132000(290400)	142000(312400)	153000(336600)	164000(360800)	176000(378200)	187000(411400)
OTHERS	CNC controller			FAUNC-Oi (*31i), (*HEIDENHAIN), (*SIEMENS) series																	

- Design and specifications are subject to change without notice. (( )) Max. tool diameter (without adjacent tools)