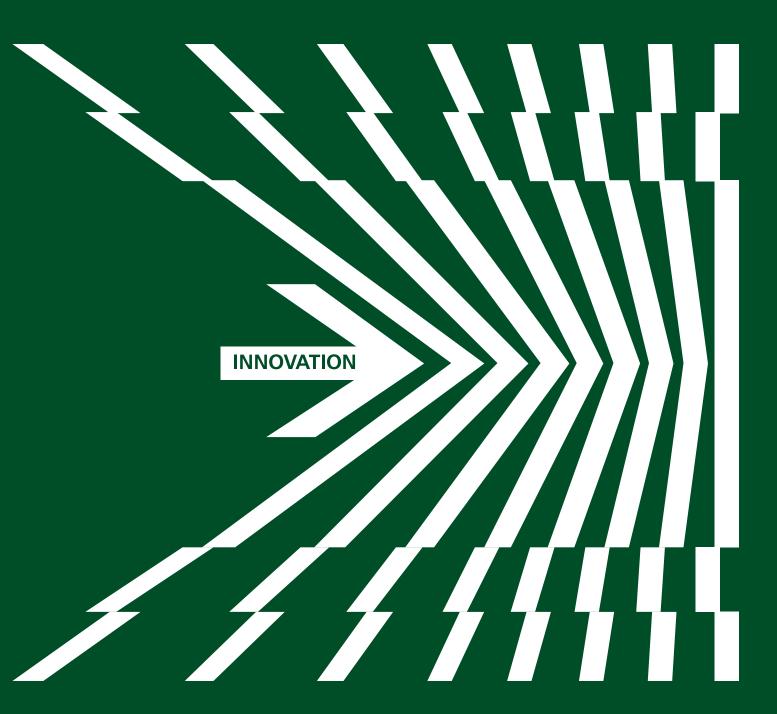


VERTICAL 5 AXIS MACHINING CENTER

KFO-620-5AX CV-400U/A CV-500U/A



Visual Design Master creates designs covering all aspects





Over fifty years, KAFO has become the leading brand in Die & Molds field and Machining field based on its solid foundation of superior technology. "Steady Research & Development, Quality Control, Accumulate Experience" exceed customers' expectations and think globally, act locally.

We provide you comprehensive six senses performance, including Vision, Hearing, Smell, Touch, Taste, and Heart. As a visual design master, we create innovative designs covering all aspects. We understand and meet customers' needs from every corner of the world. Additionally, we smell the market demand and offer well-thought-out plans. Through strict quality control, we pursue excellent quality to achieve high and steady performance. Moreover, our professional team offer efficient 24/7 service which is worth experiencing. Operating with our Heart, we always stick to perfection. By means of accumulating experience, intensifying the know-how, focusing on the upgrading core competency of technology, and continuously improving the manufacturing process, KAFO realizes the commitment to customers for best quality products and also being rated as the benchmark of the industry.

Danio Sber Lin, Yen Huey

KAO FONG MACHINERY CO., LTD. President

SHEN, KUO-JUNG (DAVID SHEN)

KAO FONG MACHINERY CO., LTD. Chairman

LIN, YEN-HUEY

KFO-620-5AX

VERTICAL 5 AXIS

MACHINING CENTER

HIGH PRECISION HIGH EFFICIENCY

- X, Y, Z- axis are built using heavy duty roller type linear
- All structural parts of the machine are manufactured from high quality cast iron.



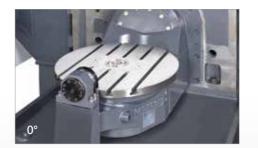
ROTARY TILT TABLE

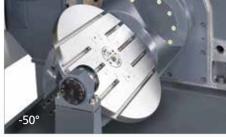
THE PRECISION ROTARY TILT TABLE ALLOWS FOR EITHER 3+2 OR 5 AXIS SIMULTANEOUS MACHINING.

- Optical encoders available for B and C axes (optional).
- Table tilt angle (B-axis) -50°~+110°
- Table rotary angle (C-axis): 360° continuous rotation.
- B and C axes are servo motor driven.

/ B AXIS ROTATIONS



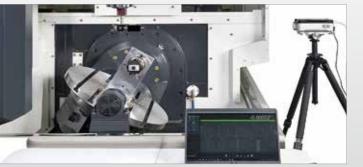




LASER CALIBRATION

X, Y, Z, B, C axes are laser calibrated for linear positioning



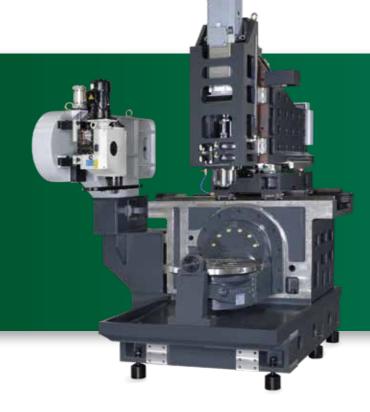


VERTICAL 5 AXIS

MACHINING CENTER

RIGID CONSTRUCTION

• All major structural parts are manufactured from Meehanite cast iron with maximum material stability, annealed and vibratory stress relieved. Finite Element Analysis is conducted to optimize the machine structure to meet the requirement of 5-axis

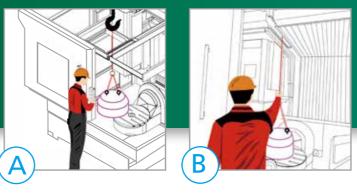


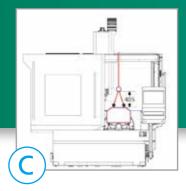
A. When lifting the workpiece, the spindle moves to the second reference position, the bellows cover is opened by cylinder, then the wire rope is accessible.

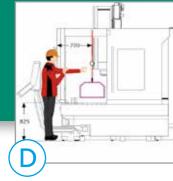
Full enclosure with bellows cover(option)

B. The channel for wire rope is 60mm. Beware of collisions.

If need more lifting point to balance the workpiece, please use wire rope or safety sling with branches.







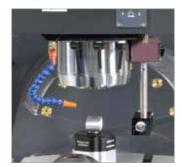
Unit: mm

24 STATION TOOL CHANGER

Optional: 30 / 32 / 40 station

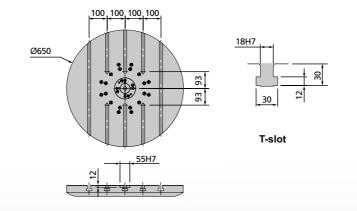
- 12000rpm Direct-driven spindle
- Optional BBT/CAT/DIN-40 and HSK-A63 for 15000rpm Direct-driven or 20000rpm Built-in type





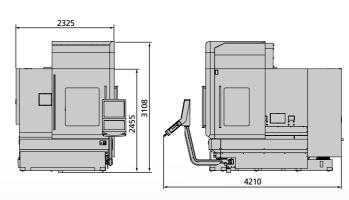
/ TABLE DIMENSION

Unit: mm

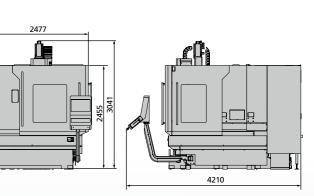


/ DIMENSIONS

• Standard (full enclosure)

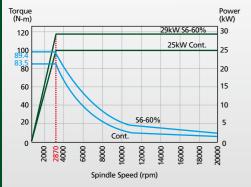


Option (full enclosure with bellows cover)

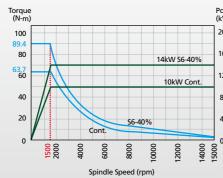


/ SPINDLE POWER & TORQUE DIAGRAM

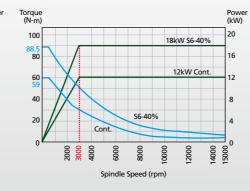
• Built in Type ATE AC170 / 200 / 4



HEIDENHAIN QAN200UH



SIEMENS 1PH8107



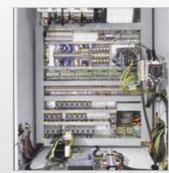
/ FEATURE DESCRIPTION



Lift-Up Chip Conveyor



Spindle Oil Cooler



Electrical Cabinet

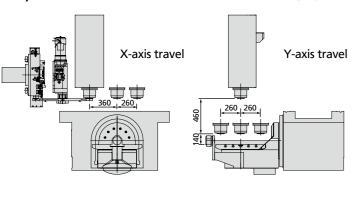


 Stainless Steel Water-proof Way Cover

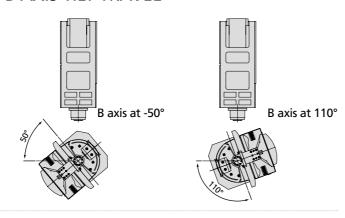
VERTICAL 5

AXIS MACHINING

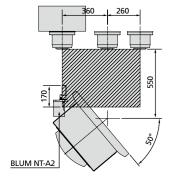
/ X, Y AXIS TRAVELS

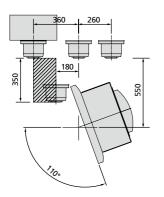


/ B AXIS TILT TRAVEL

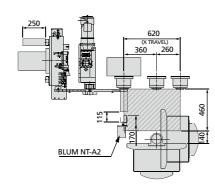


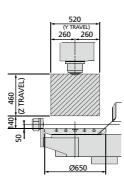
/ INTERFERENCE AREA



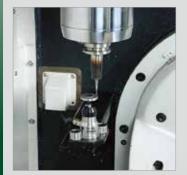


/ CUTTING AREA

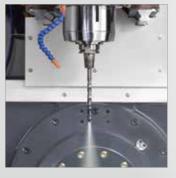




OPTIONAL ACCESSORIES



/ TOOL LENGTH **MEASUREMENT DEVICE**



/ COOLANT THROUGH **SPINDLE**



X, Y, Z HEIDENHAIN optical linear scales



/ OPTICAL LINEAR SCALE / B-AXIS, C-AXIS HEIDENHAIN optical encoder











BLUM TC-50 infrared probe for automatic kinematic measurement and calibration of 5 axis positioning.

SPECIFICATION

MODEL		KFO-620-5AX
Travel		
X/Y/Z Axes Travel	mm	620/520/460
B(A)-axis Tilting Range	degree	-50°~ +110°
C-axis Minimum Increment	degree	0.001°
Spindle Nose to Work Table Surface	mm	140~600
B/C Axes		
Work Table Diameter	mm	Ø650
Center Bore Diameter	mm	Ø55H7x12
T-Slot (Number×Width×Pitch)	mm	5x18x100
Max. Workpiece Size	mm	Ø520x330L
Max. Loading Capacity (90° /Horizontal)	kg	200/300
Spindle		
Spindle Speed (ST)	rpm	Direct-Driven 12000
Spindle Speed (OP)	rpm	Direct-Driven 15000/ Built-In 20000
Spindle Taper	typo	#40
Spindle Taper Spindle Bearing Bore Diameter	type mm	Ø70
Feed Rate	111111	670
Rapid Travel Rate (X/Y/Z)	m/min	36
Cutting Rate	m/min	1-10
B(A), C-axis Rapid Travel		25
ATC		25
Tool Shank	type	MAS BT-40 (*BBT-40/*CAT-40/*DIN-40/*HSK-A63)
Pull Stud	type	MAS BT-40/P40-T (*BBT-40/*CAT-40/*DIN-40/*HSK-A63)
Magazine Capacity (ST)	tools	24 (Cam Type)
Magazine Capacity (OP)	tools	30/32/40 (Cam Type)
Max. Tool Diameter/ (Without Adjacent Tool)	mm	Ø75/(Ø127)
Max. Tool Length	mm	250
Max. Tool Weight	kg	7
Motor		Heidenhain Siemens
Spindle Motor (\$1/\$6-40%)		10/14 12/18
Feed Motor (X/Y/Z)		5.1/5.1/6.5 3.3/3.3/4.87
B(A), C-axis Servo Motor		8.6/4.5 8.17/3.3
Power Supply		
Power Supply	kVA	45
Compressed Air Supply	MPa, l/min	0.6 , 500
Coolant Tank Capacity	L	420
Controller		iTNC 640 HSCI/840D sl
External Dimension		
Width	mm	4210
Length	mm	2325
Height	mm	3108
Net Weight	kg	9500

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- 3. The temperature of machine installing environment must be 5~40 degrees, the surrounding temperature difference should be within 4 degrees, 0.67 degrees per hour, under 4 degrees within 6 hours.
- 4. As for more details, please refer to operating manual or contact with KAFO

/ Standard Accessories

- 3 Axes Roller Type Linear Guideways (Taiwan brand)
- Spindle Oil Cooler
- Hydraulic Unit
- Auto Lubrication System
- Oil Skimmer
- Water Gun
- Air Gun
- Full Enclosure
- Work Light & Alarm Light
- M30 Power Off
- Air Conditioner
- Lift-Up Chip Conveyor (Scraper Type)
- Bucket
- Chip Flushing System
- Worktable Tailstock Support

/ Optional Accessories

- 3 Axes Roller Type Linear Guideways (Japan/Germany brand)
- CE Conformity Specification
- Coolant Through Spindle
- Coolant Cooling System
- X/Y/Z Ball Screw Cooling System
- X/Y/Z Linear Scales (Heidenhain)
- B/C-Axis Optical Encoder (Heidenhain)
- Tool Length Measurement Device
- Workpiece Measurement Device
- Transformer
- Oil-Mist Collection System
- Anti-Collision Software
- Spindle Thermal Compensation
- Full Enclosure with Bellows Cover



VISION | SIX SENSES PERFORMANCE

VERTICAL 5 AXIS

MACHINING CENTER

FEATURE

U:4+1 Axes (5 Face Machining)

A: 5 Axis Simultaneous Machining

- Widely used in the complex and precision machining fields such as aerospace, electronics, automotive, medical, molding industries. And it could be equipped with Robotic Arm.
- Processing completed in one clamping to achieve high precision and machining quality, and shorten the installation and overall lead time.



A/C AXIS ROTARY TABLE

- A/C axis rotary table offers 4+1 axis fixed angle machining ,and fulfill any kind of complex processing.
- Adapting dual lead worm transmission with high efficiency & large tooth depth.
- Arrestment is driven pneumatically. Through the pressurized cylinder, it is as stable as hydraulic clamping without using the hydraulic unit, even has the advantages of environmental protection, energy saving, and space saving.
- Subsidiary table (dimension X x Y :530x320mm) is available as an option.
- Aluminum rim processing



Long workpiece processing/molding with subsidiary table



HIGH PRECISION FEED DESIGN

- Precise ball screw with direct-driven motor can offer high torque and reduce backlash.
- Tilting/rotating axes can be equipped high resolution close loop encoders to ensure better positioning and repeatability accuracy.

Accuracy	Positioning Accuracy	Repeatability Accuracy
3 Axes (X/Y/Z)	0.009mm	0.006mm
Tilt Axis	60 (20) sec	8 (4) sec
Rotate Axis	20 (10) sec	6 (4) sec

Remark: Value in () is encoder feedback in close loop

Roraty encoder for A/C axis

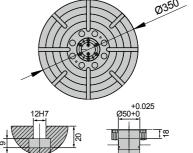


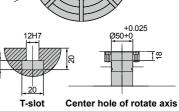


- Strongest design of whole structure makes the machine achieve the best performance of dynamic stiffness during high speed
- The full series equip ball screws with high rigidity and high precision. The ballscrews with hollow cooling have the features of large diameter and high dynamic load and can improve the axial rigidity, speed, service life, and thermal stability.
- The base is designed symmetrically . With 8 pcs of food pads and every pad has 3 points to enlarge the contact area and improve the machine stablity.

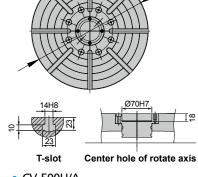
TABLE DIMENSION

Unit: mm





CV-400U/A



CV-500U/A

/ SPINDLE POWER & TORQUE DIAGRAM

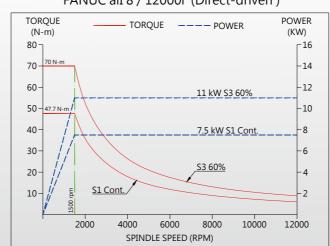
FANUC aiI 8 / 12000i (Direct-driven)

24 STATION TOOL CHANGER

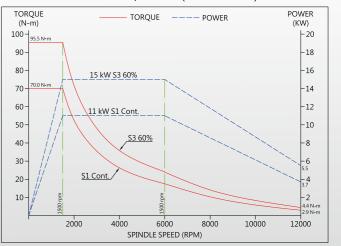
15000rpm Direct-driven spindle or 20000rpm Built-

in spindle; Spindle taper #40(BBT/CAT/DIN/HSK-A63)

Optional: 32/40 Station • 12000rpm Direct-driven spindle.



FANUC αiI 12 / 12000i (Direct-driven)



VERTICAL 5

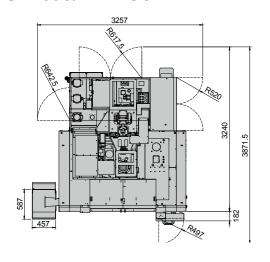
AXIS

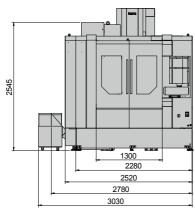
MACHINING CENTER

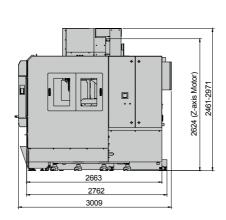
VISION | SIX SENSES PERFORMANCE

VERTICAL 5 AXIS MACHINING

/ CV-400U/A LAYOUT

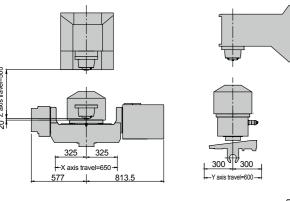


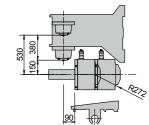


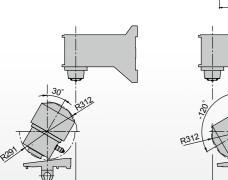


/ CV-400U/A MACHINING RANGE DIAGRAM

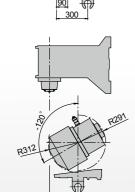


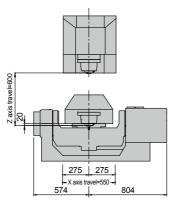




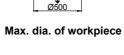


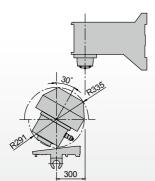
Max. dia. of workpiece

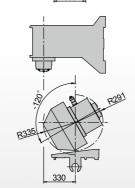












APPLIED FIELD



/ Aerospace



/ Biotech & Medical Artificial joint, teeth, aggregate etc.



Automotive Aluminum rim, drive shaft, cylinder block

SPECIFICATION

MODEL		CV-400U/A	CV-500U/A	
Travel				
X Axis Travel	mm	650	550	
Y Axis Travel	mm	600	630	
Z Axis Travel	mm	510	610	
A Axis Tilting Range	degree	-30°~	-30°~ +120°	
C Axis Rotating Range	degree	36	50°	
A/C Axes Rotating speed	rpm	25/25	11.1/16.6	
Spindle Nose To Work Table Surface	mm	20-530	-20-590	
Table				
Work Table Diameter	mm	Ø350	Ø410	
T Slot (Number x Width x Pitch)	mm	12H7x4	14H8x8	
Max. Workpiece Size	mm	Ø400xH300	Ø500xH300	
Max. Loading Capacity	kg		9kg-m)	
Spindle	Kg	200(1	okg III,	
Spindle Speed (ST)	rpm	Direct-Dri	iven 12000	
Spindle Speed (OP)			000/Bult-in 2000	
Spindle Taper	rpm		40	
	type			
Spindle Bearing Bore Diameter	mm		70	
Feed Rate	, .	26/5	26/26	
Rapid Travel Rate (X/Y/Z)	m/min		36/36	
Cutting Rate	m/min	1-	-10	
ATC				
Tool Shank	type		BBT-40	
Pull Stud	type	MAS BBT-	·40/P40-T-2	
Magazine Capacity (ST)	tools	24 (Cam Type)		
Magazine Capacity (OP)	tools	30/32/40 ((Cam Type)	
Max. Tool Diameter	mm	Ø	75	
Max. Tool Diameter (Without Adjacent Tool)	mm	Ø.	125	
Max. Tool Lenth	mm	2	80	
Max. Tool Weight	kgs		7	
Tool Change Time (tool to tool)	sec	•••••	2	
Tool Change Time (time to time)	sec		5	
Motor (FANUC)				
Spindle Motor (cont./30mins)	kW	7 5/11	(11/15)	
Feed Motor (X/Y/Z)	kW	7.5/11(11/15) 4.0 / 4.0 / 7.0		
A/C-Axis Servo Motor	kW	3/1.4	3/1.6	
Coolant Motor	kW			
	KVV	0.7	'5x2	
Power Supply	kVA	-)E	
Power Supply			35	
Compressed Air Supply	MPa, l/min		, 500	
Coolant Tank Capacity	L		20	
Controller		Fanuc/Siemens/Mit	tsubishi/Heidenha	
External Dimension				
Width (Front side without chip conveyor)	mm	3030	3230	
Length	mm	3009	3109	
Height	mm	2971	3031	
Net Weight	kg	6200	7500	
Packing Height (With tool magazine)	mm	2490	2490	

ACCESSORIES

Standard

VERTICAL 5 AXIS MACHINING

, teels	JOTHES (Option
SPECIFICATI	ON / MODEL	CV-400 CV-500
Spindle		CV-500
•	-Driven 12000rpm(7.5/11kw	/) •
	-Driven 15000rpm(7.5/11kw	
	-Driven 12000/15000rpm	
(11/15kw)	D11VC11 12000/150001p111	0
	n 20000rpm(25/29kw)	0
Tool Magazi	• • •	
	24 Tools (Cam Type)	•
Magazine	30 Tools (Cam Type)	0
Capacity	32 Tools (Cam Type)	0
	40 Tools (Cam Type)	0
Tool	· , , ,	
	MAS BT-40	•
Tool Shank	CAT-40	0
	DIN-40	0
Pull Stud	MAS BT-40/P40-T-1	•
Coolant		
Coolant Syst	em	•
	ough Spindle	0
Coolant Coo	·•··· T ·······	0
Oil Skimmer		•
Oil-Mist Coo	lant System	0
	oolant System	0
Water Gun		•
Chop Dispos	al System	
Screw Type (Chip Conveyor	•
Lift-up Chip	Conveyor With Bucket	0
Air Blast Fur	ction For Workpiece (M07)	•
Spindle Air E	Blast	•
Oil Mist Coll	ection System	0
Measureme	nt System	
Tool Length	Measurement	0
	/leasurement	0
Operation S	• •	
Auto Power	Off (M30)	•
Automatic D)oor	0
	e Generator (MPG)	•
High Accura		
Linear Scales		0
	ical Encoder	0
Pitch Compe		0
Safety Syste		
Full Enclosur		•
Anti-Collisio	n Software	0
Others		
	& Tri-Color Status Light	•
Leveling Bol	ts & Pads	•
Tool Box	•••••	•
Spindle Oil O		•
	ner Unit For Electric Cabine	et o
	mized Calculator Software	0
Function Hydraulic Ur	*-	0

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- 4. As for more details, please refer to operating manual or contact with KAFO sales.







Smell



Touch





Heart

The design idea of KAFO new catalogues is providing comprehensive six senses performance, including Vision, Hearing, Smell, Touch, Taste, and Heart.

Vision: Visual Design Master creates designs covering all aspects

We create innovative designs covering every aspect to develop perfect machines.

Hearing: Hear your needs from every corner of the world

We hear and comprehend customers' needs actively from every corner of the world, and we practice thoroughly to exceed customers' expectations.

Smell: Smell the market demand and offer well-thought-out plans

We have superior market insights and perfect strategic ability to be the strong support of customers.

Touch: Pursue excellent quality to achieve high performance

We focus on the enhancement of top core technologies and capabilities, and develop solidly to achieve excellent quality.

Taste: Taste good service by our professional and efficient team

We provide efficient, professional, and comprehensive services, and establish permanent and deep relationships with customers.

Heart: Feel our Heart that always sticks to perfection

We manage business with all our heart, and stick to perfection, to create maximum benefits for customers.









Kao Fong Machinery Co., Ltd.

No.16, Keya Rd., Daya Dist., Taichung City 428323, Taiwan

TEL: +886-4-25662116 FAX: +886-4-25671001 E-Mail: kafo@kafo.com.tw

www.kafo.com.tw Version: February, 2023