

KAFO

VERTICAL 5 AXIS MACHINING CENTER

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



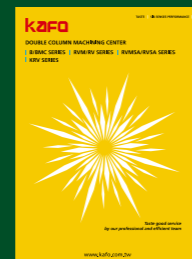
Hearing



Smell



Touch



Taste



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

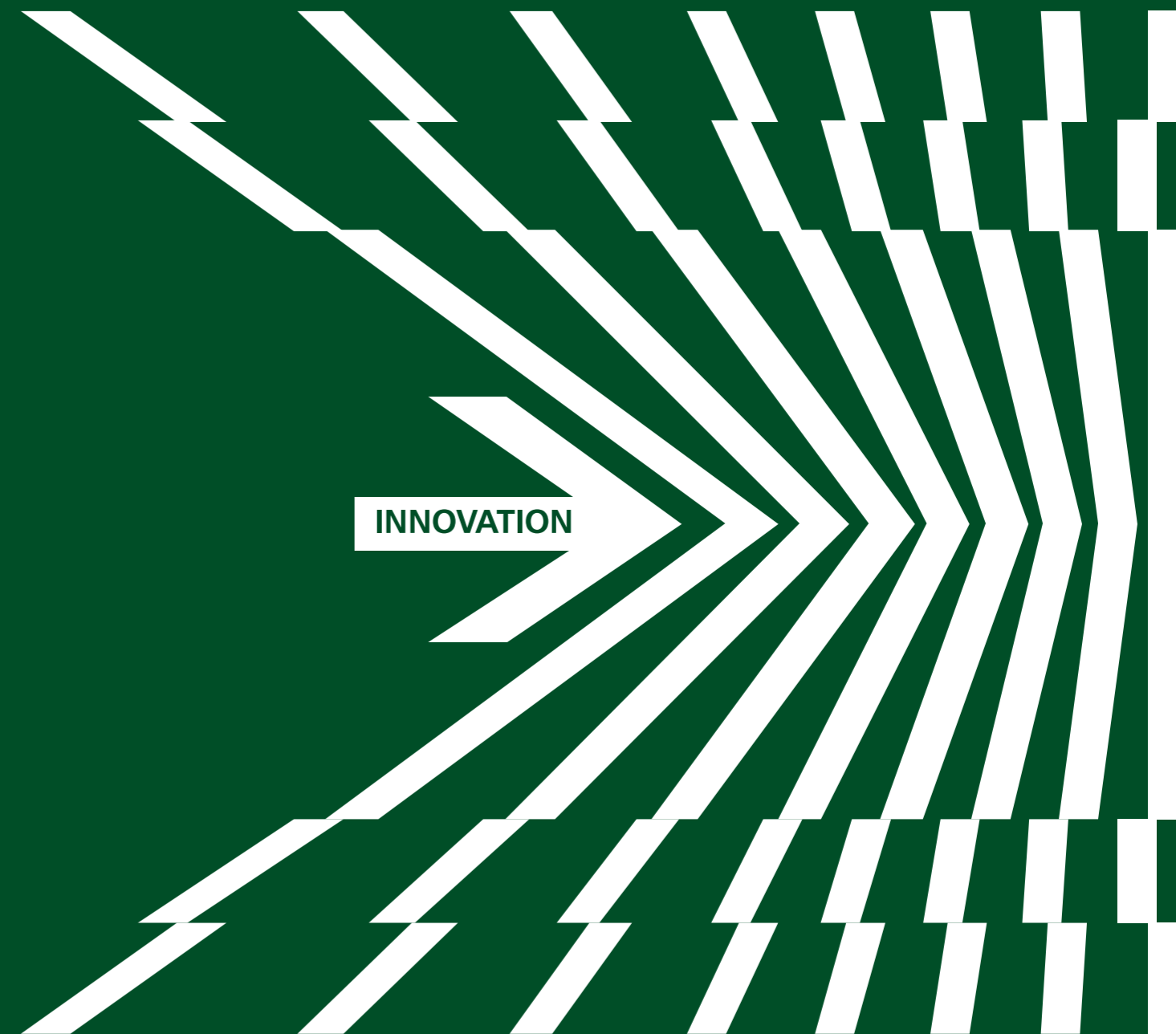
We focus on the enhancement of top core technologies and capabilities, and develop solidly to achieve excellent quality.

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.



KAFO



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*Visual Design Master
creates designs covering all aspects*

www.kafo.com.tw



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.

David Shen

KAO FONG MACHINERY CO., LTD.
President & CEO
SHEN, KUO-JUNG (DAVID SHEN)

KFO-620-5AX

VERTICAL 5 AXIS MACHINING CENTER

HIGH PRECISION HIGH EFFICIENCY

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

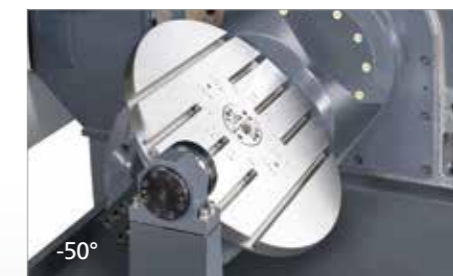
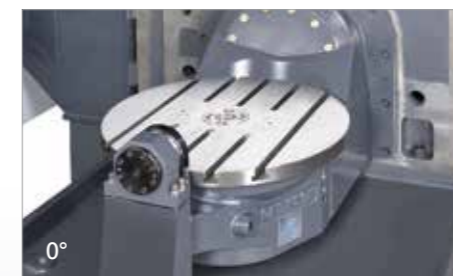
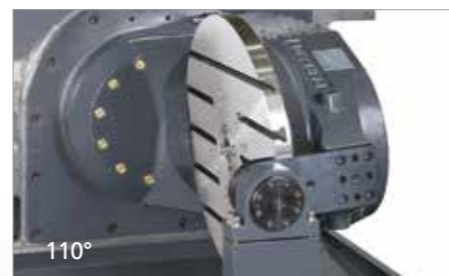


ROTARY TILT TABLE

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

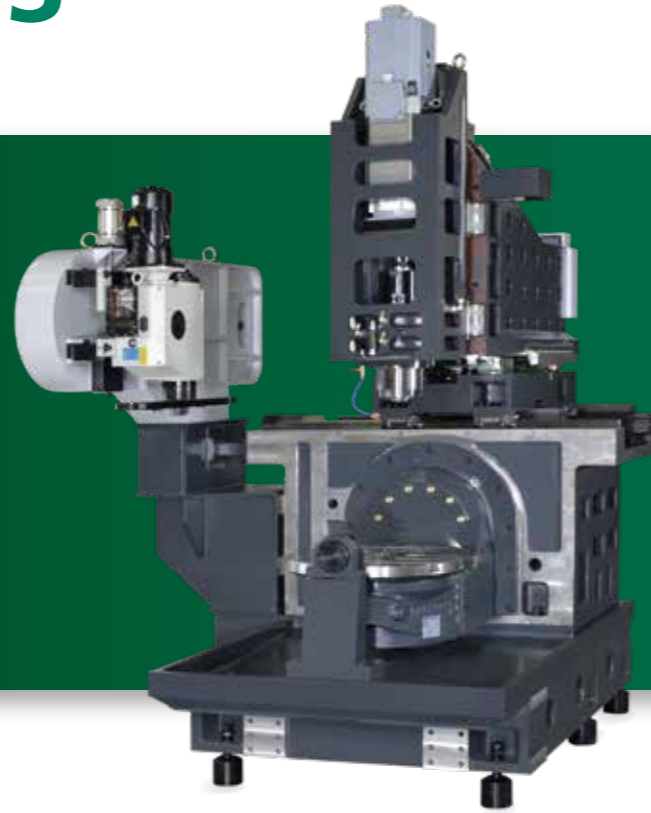
- X, Y, Z, B, C axes are laser calibrated for linear positioning and angular accuracy.



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 machining.

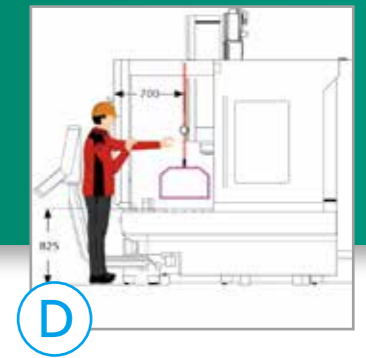
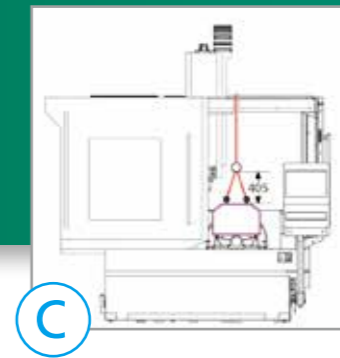
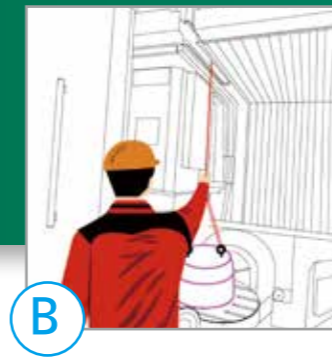
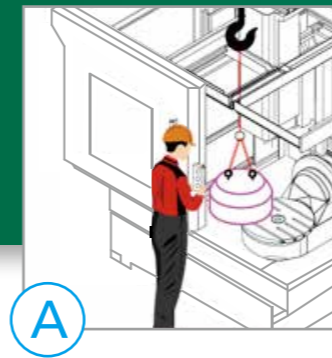


• Full enclosure with bellows cover(option)

LIFT THE WORKPIECE

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.

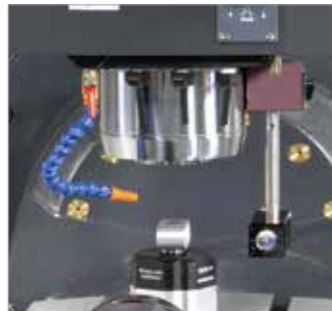
- B. The channel for wire rope is 60mm. Beware of collisions.
- C. If need more lifting point to balance the workpiece, please use wire rope or safety sling with branches.



24 STATION TOOL CHANGER

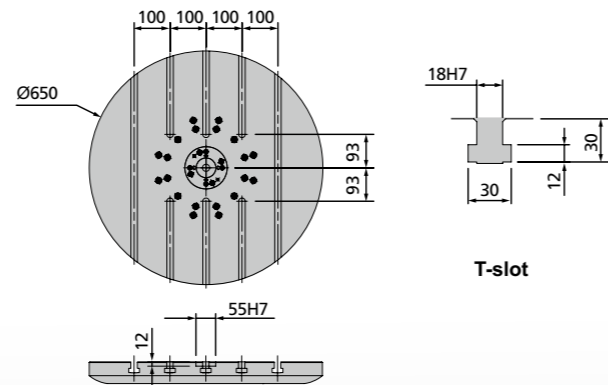
Optional: 30 / 32 / 40 station

- 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

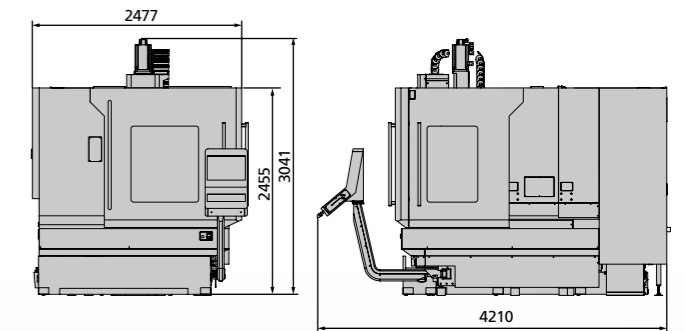
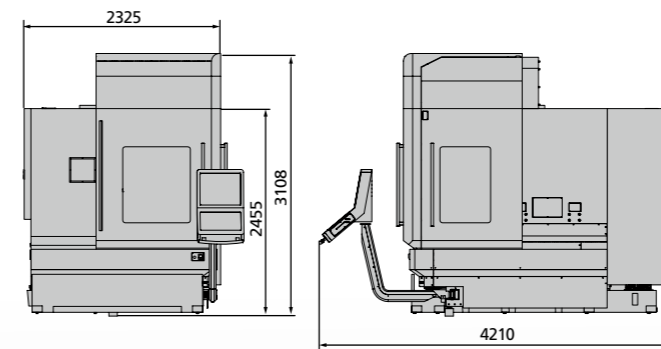


/ DIMENSIONS

Unit: mm

- Standard (full enclosure)

- Option (full enclosure with bellows cover)

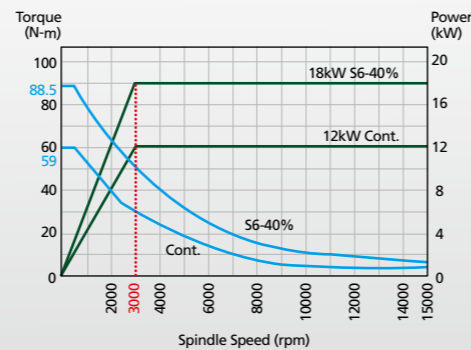
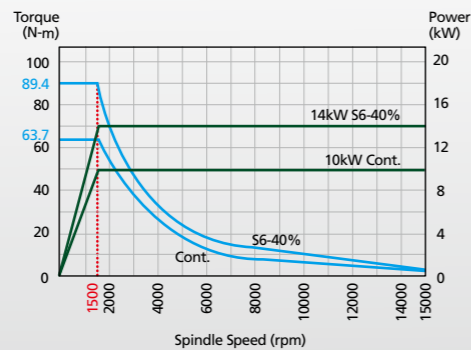
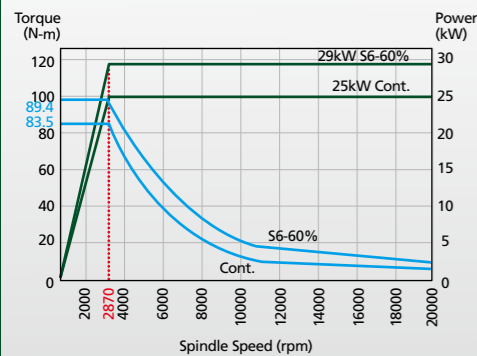


/ SPINDLE POWER & TORQUE DIAGRAM

- Built in Type ATE AC170 / 200 / 4

- HEIDENHAIN QAN200UH

- SIEMENS 1PH8107



/ FEATURE DESCRIPTION



• Lift-Up Chip Conveyor



• Spindle Oil Cooler



• Electrical Cabinet



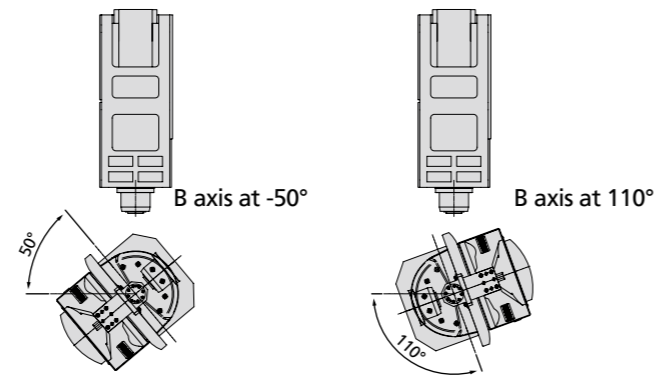
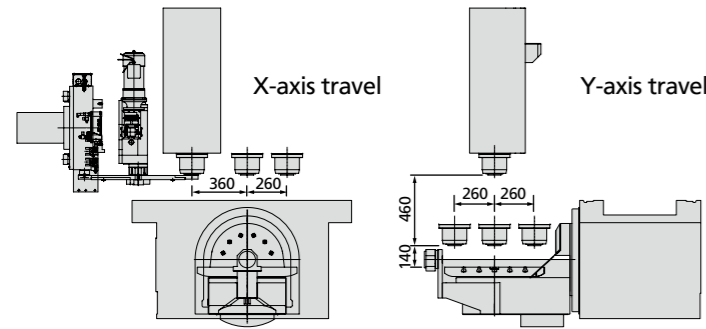
• Stainless Steel Water-proof Way Cover

KFO-620-5AX VERTICAL 5 AXIS MACHINING CENTER

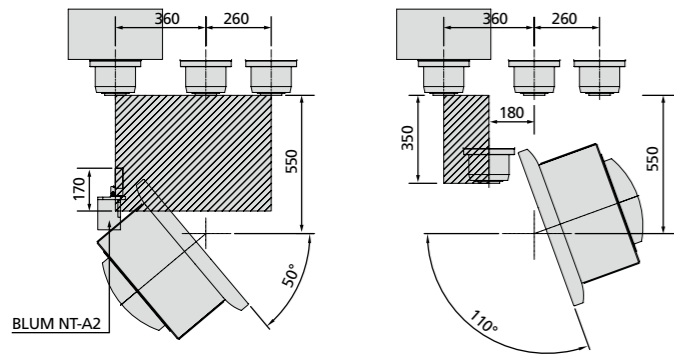
/ X, Y AXIS TRAVELS

Unit: mm

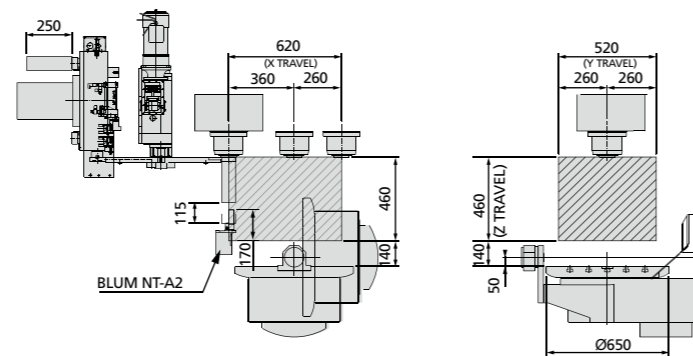
/ B AXIS TILT TRAVEL



/ INTERFERENCE AREA



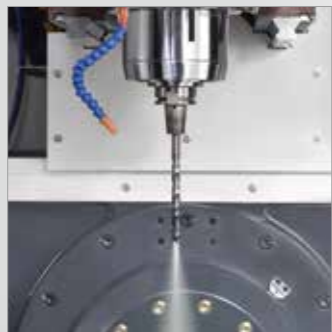
/ CUTTING AREA



OPTIONAL ACCESSORIES



/ TOOL LENGTH MEASUREMENT DEVICE



/ COOLANT THROUGH SPINDLE



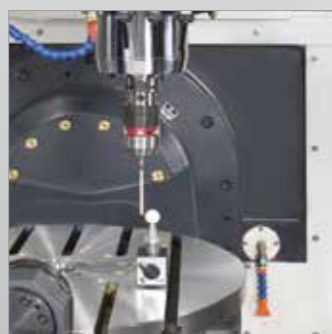
/ OPTICAL LINEAR SCALE
X, Y, Z HEIDENHAIN optical linear scales



/ B-AXIS, C-AXIS
HEIDENHAIN optical encoder



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



/ VISION | SIX SENSES PERFORMANCE



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	type	#40
Spindle Bearing Bore Diameter	mm	Ø70
Feed Rate		
Rapid Travel Rate (X/Y/Z)	m/min	36
Cutting Rate	m/min	1-10
B(A), C-axis Rapid Travel		25
ATC		
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 (S1/S6-40%)		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
Packing for Export		40' HQ

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

/ 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



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.

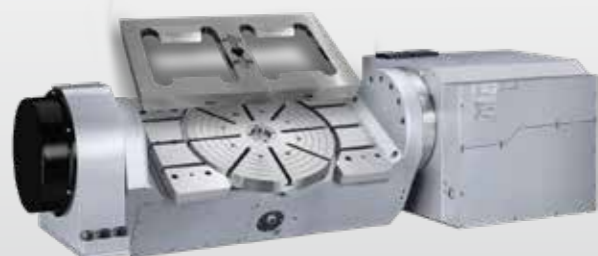
A/C AXIS ROTARY TABLE

- 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



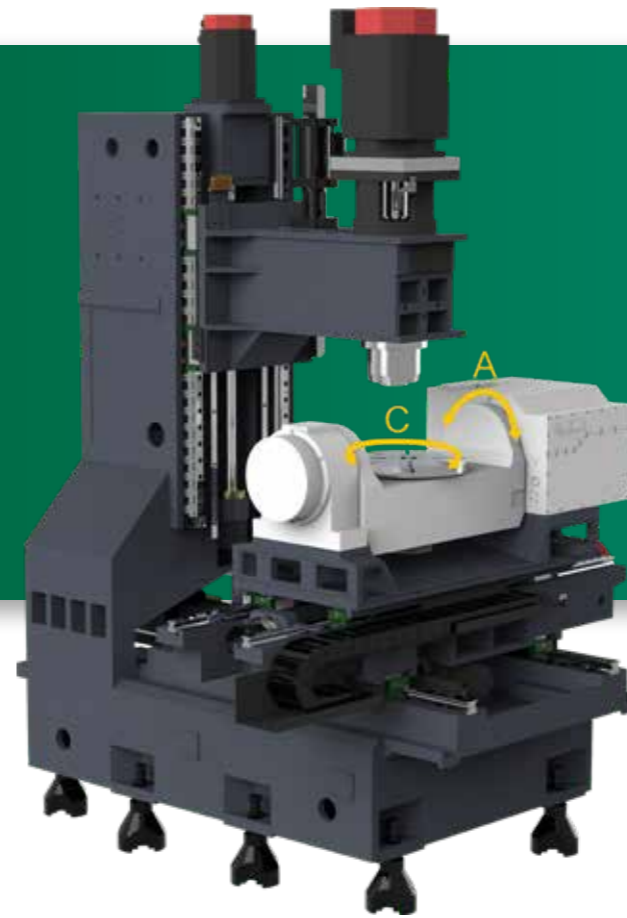
HIGH PRECISION FEED DESIGN

- 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



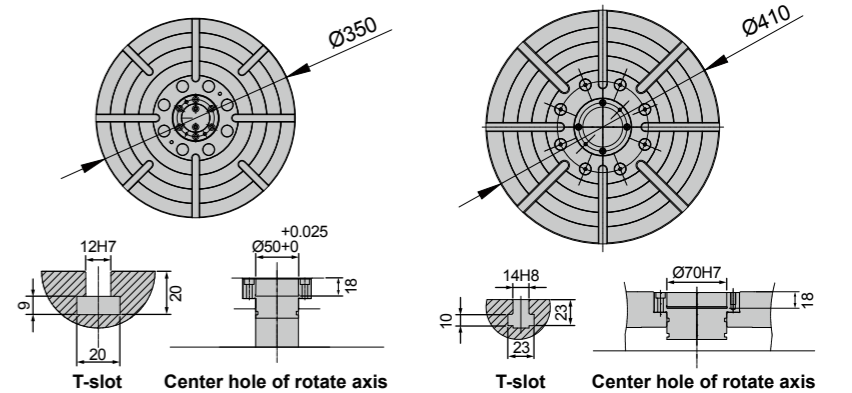
24 STATION TOOL CHANGER

Optional : 32/40 Station

- 12000rpm Direct-driven spindle.
- 15000rpm Direct-driven spindle or 20000rpm Built-in spindle; Spindle taper #40(BBT/CAT/DIN/HSK-A63)

/ TABLE DIMENSION

Unit: mm

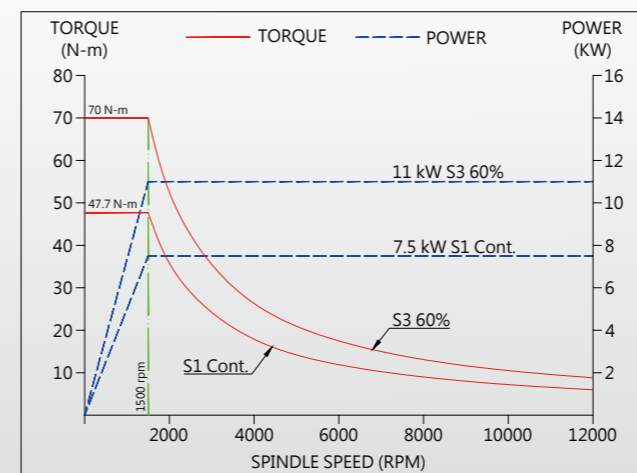


CV-400U/A

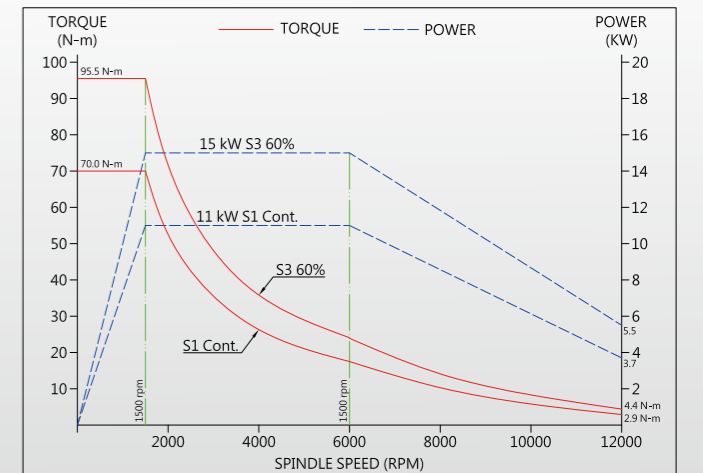
CV-500U/A

/ SPINDLE POWER & TORQUE DIAGRAM

FANUC ai8 / 12000i (Direct-driven)

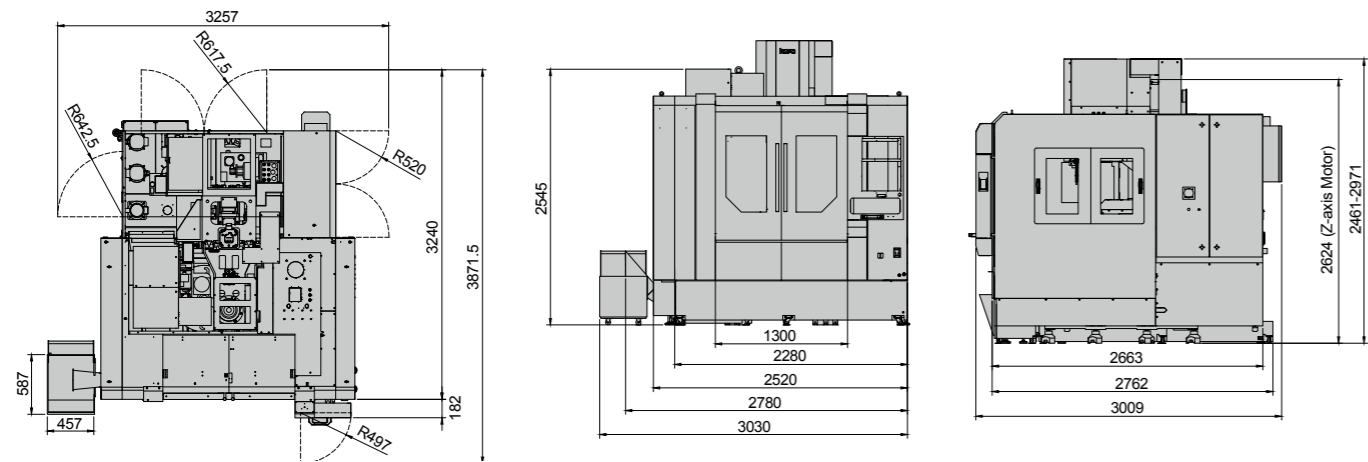


FANUC ai12 / 12000i (Direct-driven)

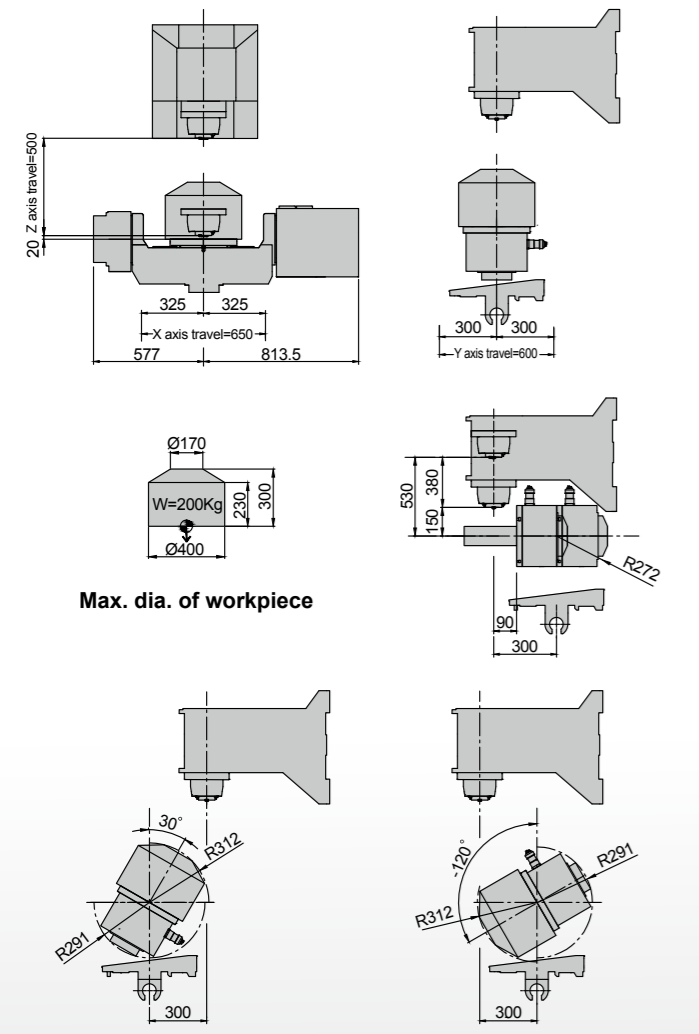


CV-400U/A | CV-500U/A VERTICAL 5 AXIS MACHINING CENTER

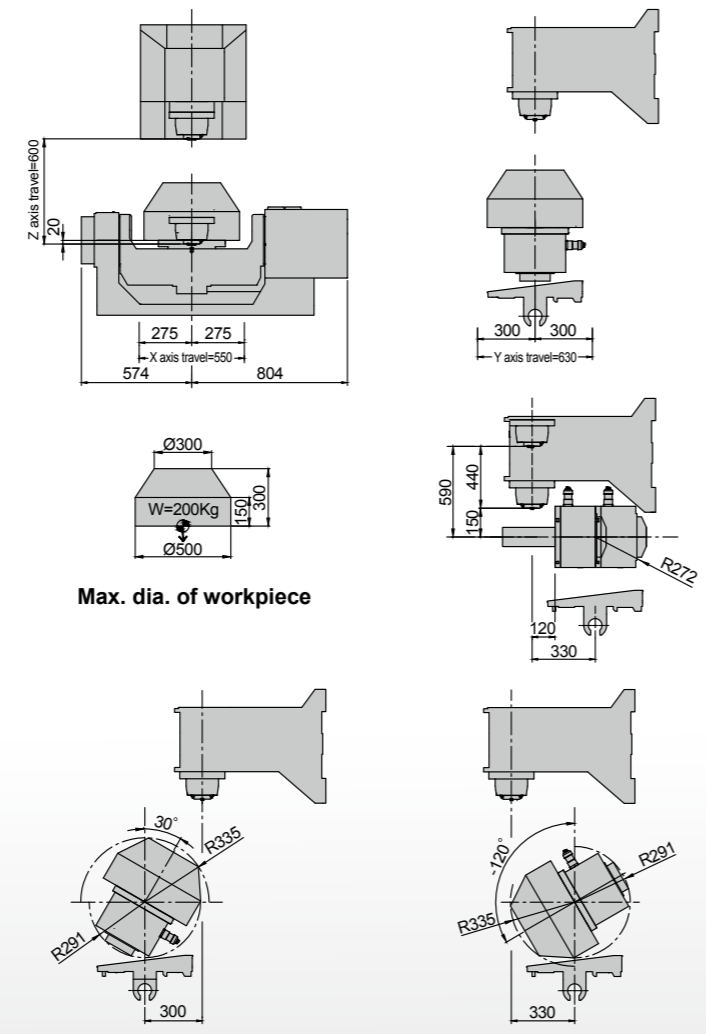
/ CV-400U/A LAYOUT



/ CV-400U/A MACHINING RANGE DIAGRAM



/ CV-500U/A MACHINING RANGE DIAGRAM



APPLIED FIELD



/ Aerospace
Turbine blade ,propeller blade etc.

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

/ Automotive
Aluminum rim, drive shaft, cylinder block etc.

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°~ +120°	
C Axis Rotating Range	degree 360°	
A/C Axes Rotating speed	rpm 25/25	11.1/16.6
Spindle		
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 200(19kg-m)	
Spindle		
Spindle Speed (ST)	rpm Direct-Driven 12000	
Spindle Speed (OP)	rpm Direct-Driven 15000/Built-in 20000	
Spindle Taper	type #40	
Spindle Bearing Bore Diameter	mm Ø70	
Feed Rate		
Rapid Travel Rate (X/Y/Z)	m/min 36/36/36	
Cutting Rate	m/min 1-10	
ATC		
Tool Shank	type MAS 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 Ø75	
Max. Tool Diameter (Without Adjacent Tool)	mm Ø125	
Max. Tool Length	mm 280	
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 4.0 / 4.0 / 7.0	
A/C-Axis Servo Motor	kW 3/1.4	3/1.6
Coolant Motor	kW 0.75x2	
Power Supply		
Power Supply	kVA 35	
Compressed Air Supply	MPa, l/min 0.6 , 500	
Coolant Tank Capacity	L 420	
Controller	Fanuc/Siemens/Mitsubishi/Heidenhain	
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

SPECIFICATION / MODEL	CV-400UA/ CV-500UA
Spindle	
BT-40 Direct-Driven 12000rpm(7.5/11kw)	●
BT-40 Direct-Driven 15000rpm(7.5/11kw)	○
BT-40 Direct-Driven 12000/15000rpm (11/15kw)	○
BT-40 Built-In 20000rpm(25/29kw)	○
Tool Magazine	
24 Tools (Cam Type)	●
30 Tools (Cam Type)	○
32 Tools (Cam Type)	○
40 Tools (Cam Type)	○
Tool	
MAS BT-40	●
Tool Shank CAT-40	○
DIN-40	○
Pull Stud MAS BT-40/P40-T-1	●
Coolant	
Coolant System	●
Coolant Through Spindle	○
Coolant Cooling System	○
Oil Skimmer	●
Oil-Mist Coolant System	○
Chip Flush Coolant System	○
Water Gun	●
Chop Disposal System	
Screw Type Chip Conveyor	●
Lift-up Chip Conveyor With Bucket	○
Air Blast Function For Workpiece (M07)	●
Spindle Air Blast	●
Oil Mist Collection System	○
Measurement System	
Tool Length Measurement	○
Workpiece Measurement	○
Operation Support	
Auto Power Off (M30)	●
Automatic Door	○
Manual Pulse Generator (MPG)	●
High Accuracy Control	
Linear Scales (axis X/Y/Z)	○
A/C Axis Optical Encoder	○
Pitch Compensation	○
Safety System	
Full Enclosure	●
Anti-Collision Software	○
Others	
Work Light & Tri-Color Status Light	●
Leveling Bolts & Pads	●
Tool Box	●
Spindle Oil Cooler	●
Air Conditioner Unit For Electric Cabinet	○
KAFO Customized Calculator Software Function	○
Hydraulic Unit	○

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