

**KAFO**

VERTICAL 5 AXIS MACHINING CENTER

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



INNOVATION

*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.

*David Shen*

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

*Lin, Yen Huey*

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 guideways.
- All structural parts of the machine are manufactured from high quality cast iron.

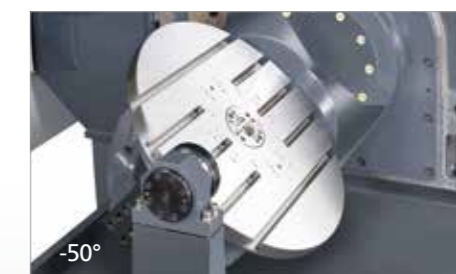
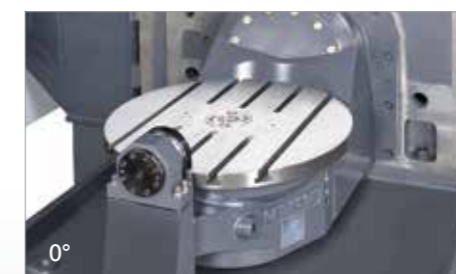
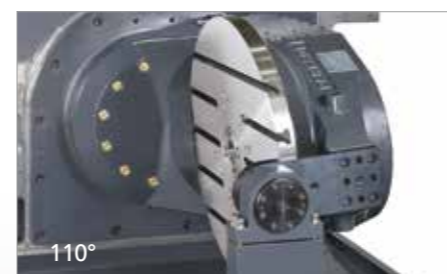


### ROTARY TILT TABLE

**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.

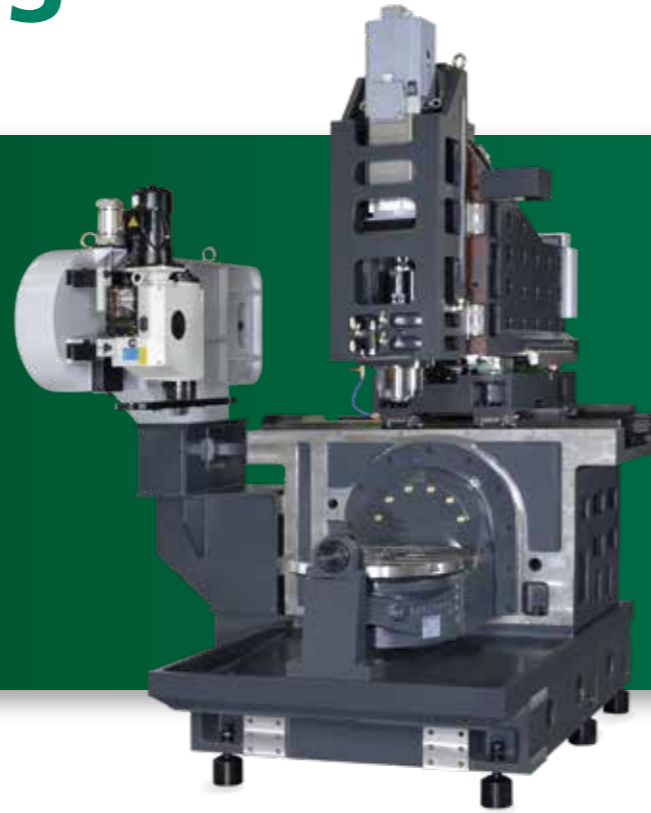




# VERTICAL 5 AXIS MACHINING CENTER

## 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.

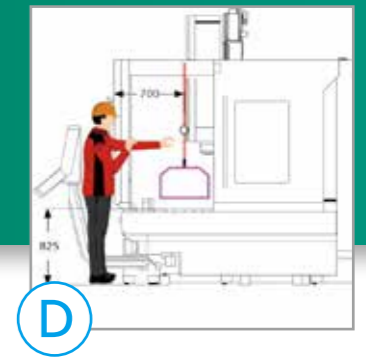
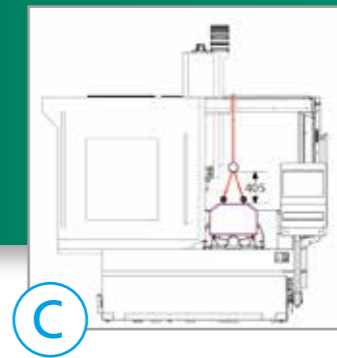
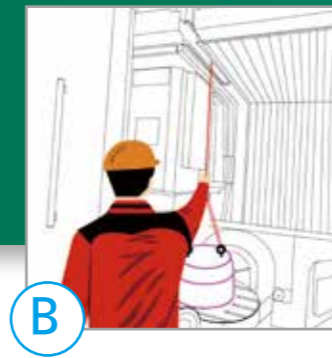
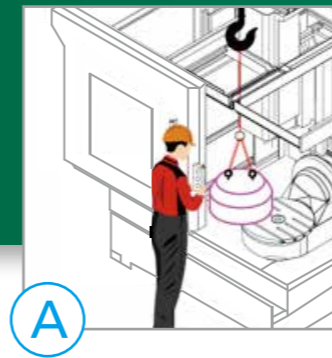


• Full enclosure with bellows cover(option)

## 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.

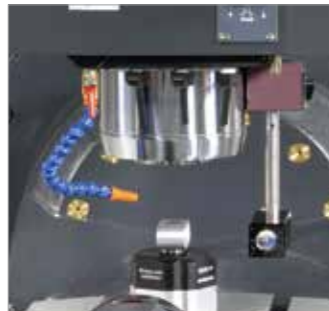
- B. The channel for wire rope is 60mm. Beware of collisions.
- C. If need more lifting point to balance the workpiece, please use wire rope or safety sling with branches.



## 24 STATION TOOL CHANGER

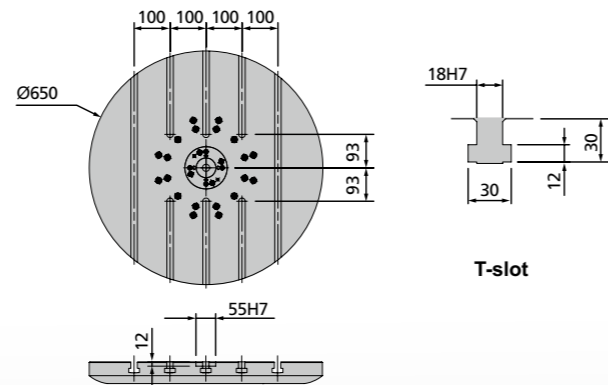
Optional: 30 / 32 / 40 station

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



## / TABLE DIMENSION

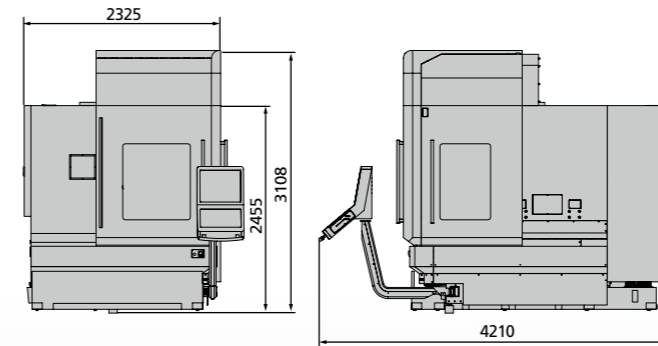
Unit: mm



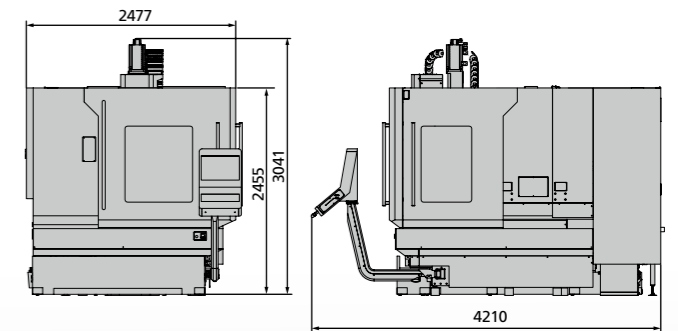
## / DIMENSIONS

- Standard (full enclosure)

Unit: mm



- Option (full enclosure with bellows cover)

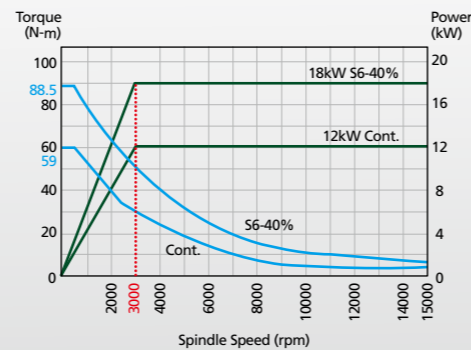
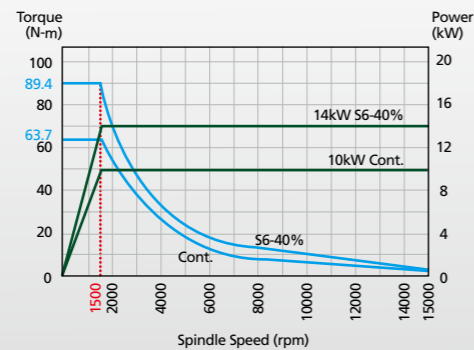
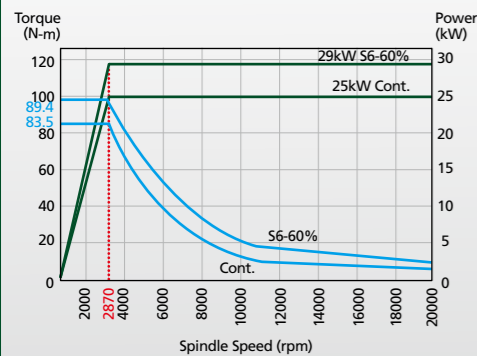


## / SPINDLE POWER & TORQUE DIAGRAM

- Built in Type ATE AC170 / 200 / 4

- HEIDENHAIN QAN200UH

- SIEMENS 1PH8107



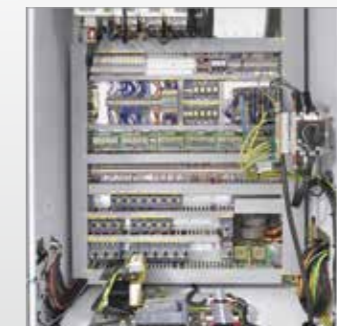
## / FEATURE DESCRIPTION



• Lift-Up Chip Conveyor



• Spindle Oil Cooler



• Electrical Cabinet



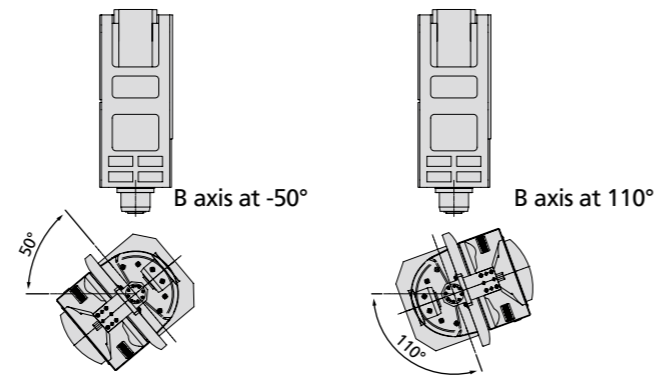
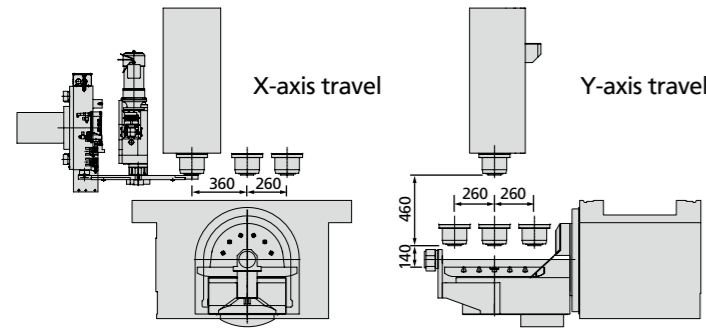
• Stainless Steel Water-proof Way Cover

# KFO-620-5AX VERTICAL 5 AXIS MACHINING CENTER

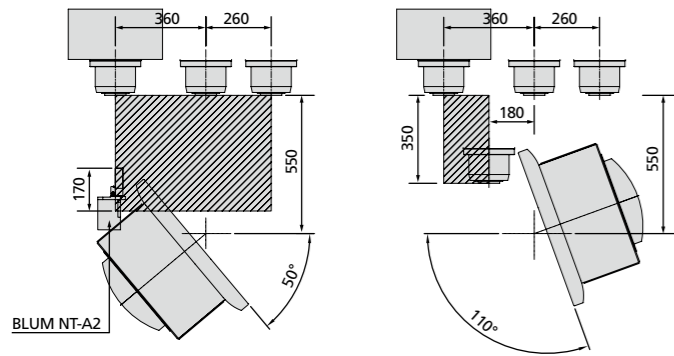
## / X, Y AXIS TRAVELS

Unit: mm

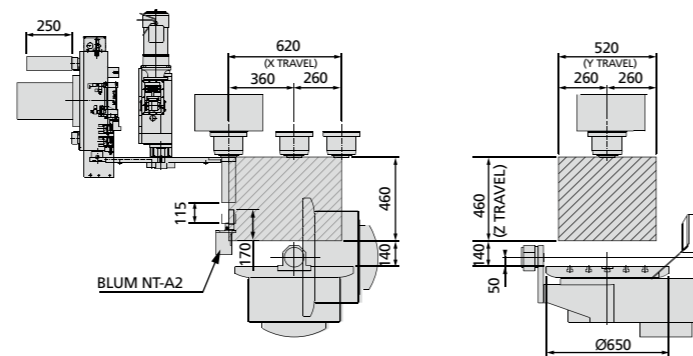
## / B AXIS TILT TRAVEL



## / INTERFERENCE AREA



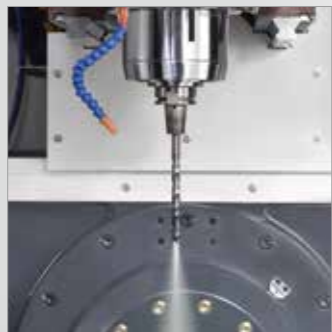
## / CUTTING AREA



## OPTIONAL ACCESSORIES



**/ TOOL LENGTH MEASUREMENT DEVICE**



**/ COOLANT THROUGH SPINDLE**



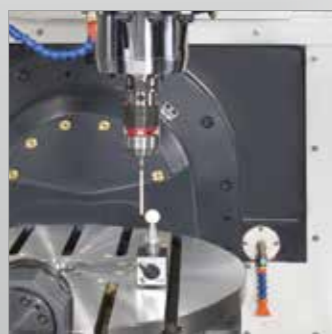
**/ OPTICAL LINEAR SCALE**  
X, Y, Z HEIDENHAIN optical linear scales



**/ B-AXIS, C-AXIS**  
HEIDENHAIN optical encoder



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



## SPECIFICATION

MODEL	KFO-620-5AX	
<b>Travel</b>		
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>B/C Axes</b>		
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
<b>Spindle</b>		
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
<b>Feed Rate</b>		
Rapid Travel Rate (X/Y/Z)	m/min	36
Cutting Rate	m/min	1-10
B(A), C-axis Rapid Travel		25
<b>ATC</b>		
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
<b>Motor</b>		
Spindle Motor (S1/S6-40%)		Heidenhain   Siemens 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
<b>Power Supply</b>		
Power Supply	kVA	45
Compressed Air Supply	MPa, l/min	0.6, 500
Coolant Tank Capacity	L	420
Controller		iTNC 640 HSCI/840D sl
<b>External Dimension</b>		
Width	mm	4210
Length	mm	2325
Height	mm	3108
Net Weight	kg	9500
Packing for Export		40' HQ

## / 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



1. The specification is for reference only. KAFO remains the right to modify machine specification, design or property and without prior notice.
2. The positioning accuracy inspection is only allowed to execute in KAFO's factory, may not provide inspection at other time after leaving.
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 sales.



# 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.

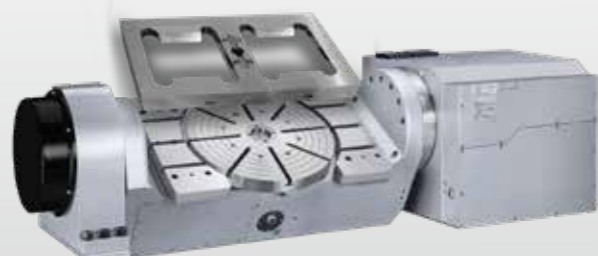
## A/C AXIS ROTARY TABLE

- 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

• Rotary encoder for A/C axis



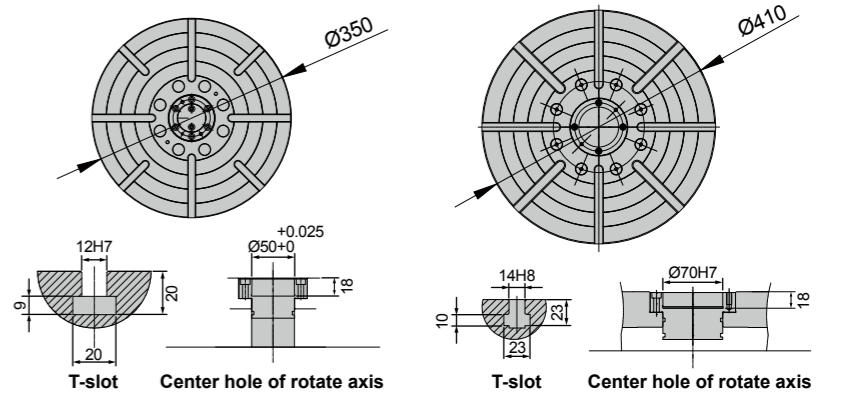
## 24 STATION TOOL CHANGER

**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

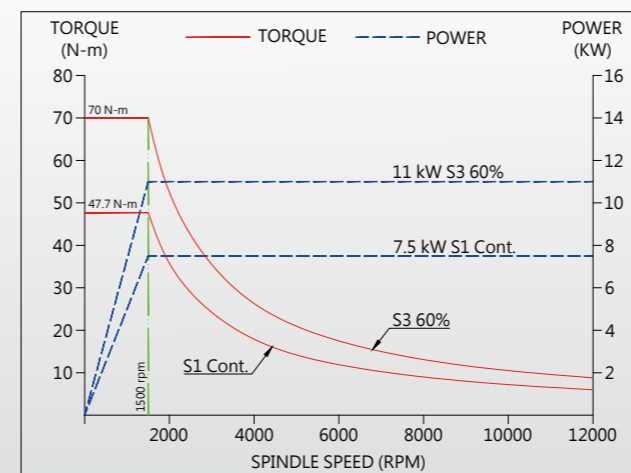


• CV-400U/A

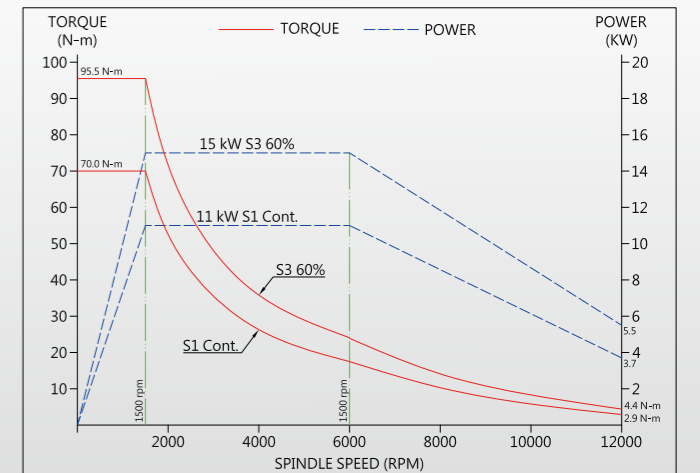
• CV-500U/A

## / SPINDLE POWER & TORQUE DIAGRAM

FANUC ai8 / 12000i (Direct-driven)



FANUC ai12 / 12000i (Direct-driven)







Hearing



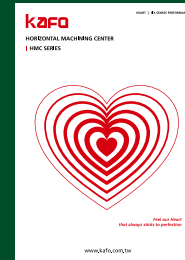
Smell



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.



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