

# Twinhorn

## 五軸暨五面加工機綜合型錄

5-Axis & 5-Sided Machining Center  
General Catalogue

[www.mft-technology.it](http://www.mft-technology.it)





五軸加工機

GRANDER系列為動柱式結構之加工中心機，適用於中/大型工件之高效率加工。其機械結構、軌道及控制系統確保有效地運用大功率高扭力之主軸特性及高精度之加工效能，並整合高動態回饋。其模組化結構有以下特點：

- 門寬自2000mm 至 3000mm，X軸行程可自4000mm以上至40m
- 運用各式銑頭(五面或五軸)達到加工最佳化及產能高效率化
- 當X軸行程足夠時可規劃多工作區以節省工件裝卸時間

GRANDER is a line of vertical machining center with lower gantry configuration for the efficient machining of medium/large size components.

The mechanical structure, the guide and control systems guarantee the efficient utilization of the available spindle KW/NM and high accuracy performances combined with high dynamic response. The modular configuration allows for:

- DBC from 2000 to 3000 mm and X stroke from 4000 mm up.
- Process optimization and production efficiency (5 faces or 5 axes machining) via the use of an intelligent range of milling heads
- Pendulum operation over two work zones when sufficient X axis stroke will be available.



TTFE3
HT
35/49 kW
120/170 Nm
⌀ 17500 rpm HSK 63
C-ax ±200°
A-ax +95°/-120°



TTFG1
34kW
860/1110Nm
⌀ 4000 rpm BT-50 (DIN-50)
C-ax ±200° index 0.001°
A-ax ind. ±95° x 0.001°



TT 2s
18.5 / 30kW (220V)
698/1130Nm
⌀ 4000 rpm BT-50 (DIN-50)
C-ax ±185° index 5°, 0.001°

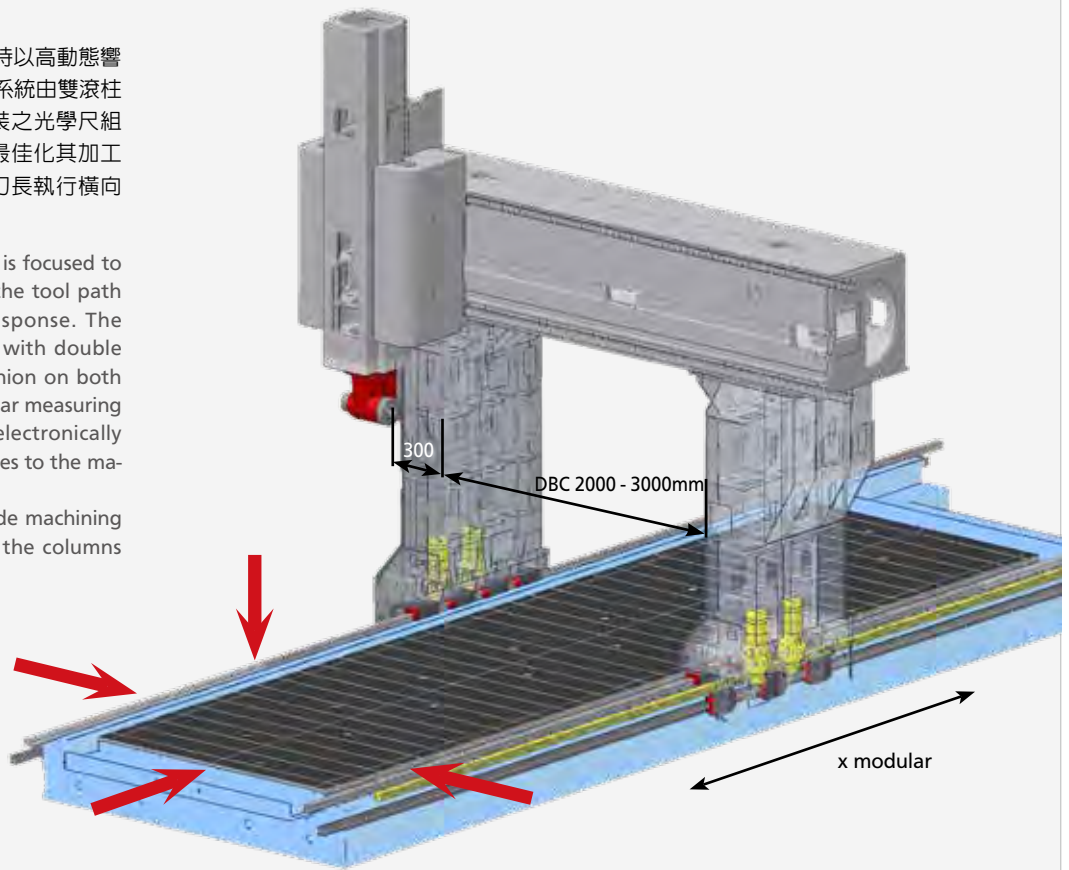


TT 2i
37kW
500/700Nm
⌀ 5000 rpm BT-50 (DIN-50)
C-ax = 0.001°
A-ax = 2.5° (OPT : 0.001°)

GRANDER的進給系統於軸向位移時以高動態響應提供絕佳之幾何精度。X軸進給系統由雙滾柱線軌、雙排齒系統及動柱兩側安裝之光學尺組成，其雙排齒系統由電子預壓以最佳化其加工效能表現。Y軸行程容許300mm刀長執行橫向加工。

The feed system of the GRANDER is focused to provide geometrical accuracy of the tool path combined with high dynamic response. The X axis feed system is configured with double linear ways and double helical pinion on both sides of the gantry and double linear measuring system. The double pinions are electronically preloaded, optimizing performances to the machining task.

The Y axis stroke allows for the side machining of a part that can clear through the columns with a tool 300 mm long.



鍊條式自動換刀機構跟隨門柱移動，並可同時供立臥兩用換刀。

The chain type ATC moves together with the gantry. It allows for the handling of cutting tools with length/weight functional to the machine. It can serve the spindle both, in its vertical axis position as well as in its horizontal axis position.



為了進一步提升加工彈性、工件變化性以及生產效率，並減少多次裝卸工件以及更換刀具之需求，GRANDER亦提供自動換頭系統。頭部儲存於儲頭倉內以避免汙損法蘭盤及頭部連接處。頭部交換動作皆自動完成，減少操作人員之工時。

In order to further expand machine flexibility, part variety and production efficiency, reducing the need of multiple set-ups and the use of different machine tools, an Auto Head Change system is available for the GRANDER. The heads are stored in a container to avoid any form of contamination of the flanges and connectors. The head exchange procedure is completely automatic, requiring minimum operator's attendance.



雙柱間距	mm	2000 - 3000	3500 - 4500	mm	DBC
行程					strokes
X軸行程	mm	4000 - 40000	6000 - 40000	mm	X axis
Y軸行程	mm	3000 - 4000	4600 - 5600	mm	Y axis
Z軸行程	mm	1000 - 1250	1500 (1650 opt)	mm	Z axis
工作台					work table
寬度	mm	1700 - 2400	3000 - 4000	mm	width
每平方米工作台最大負載	kgs	2000	2000	kgs	max load per sqm
主軸鼻端至工作台面最小距離	mm	200	200	mm	min distance vertical spindle/table
T型槽	尺寸/距離	22/240	22/250	mm	size/pitch
快速進給	m/min	20	20	m/min	rapid
ATC刀庫					auto tool changer
刀具數量	T	30 - 40 - 60 - 80	30 - 40 - 60 - 80	T	tool storage capacity
最大刀具直徑(有鄰刀)/無鄰刀	mm	125/240	125/240	mm	max tool diameter/with gap
最大刀具長度	mm	400	400	mm	max tool length
最大刀具重量	kgs	28	28	kgs	max tool weight
機械重量 (門寬 2500 x 8000 mm)	kgs	52.000		kgs	gross weight (DBC 2500 x 8000 mm)



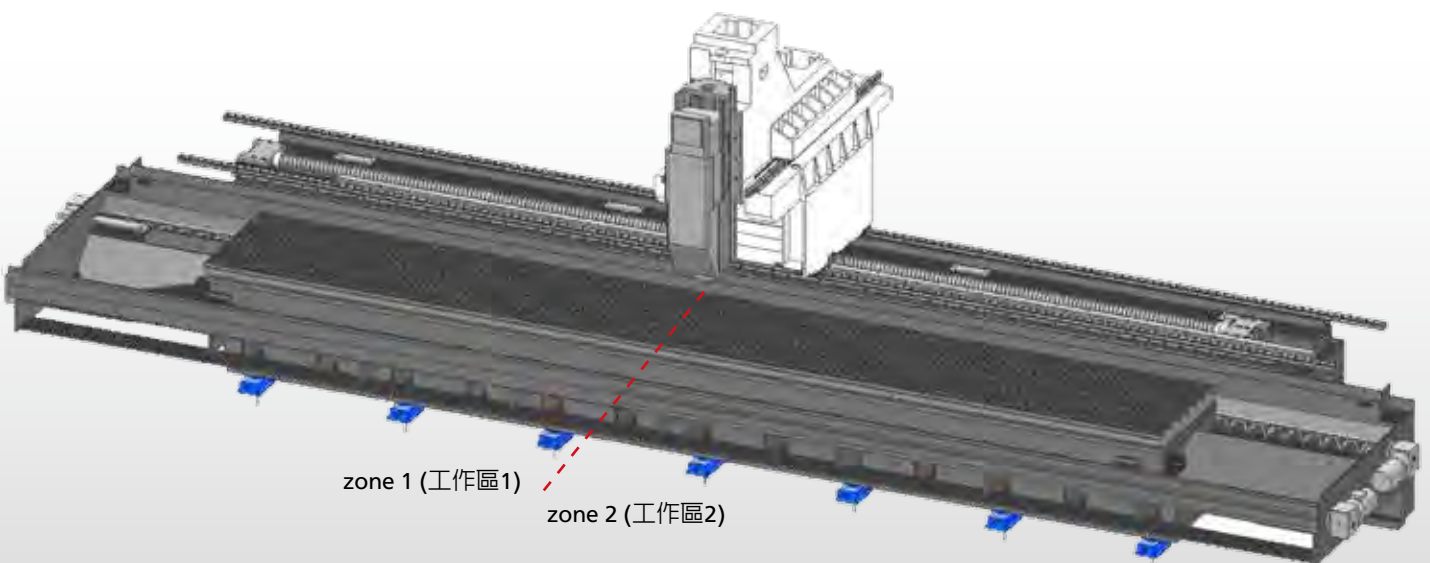
KOBRA的高剛性機械結構完美保證其性能表現及絕佳之加工精度。獨特的動柱式搭配固定工作台設計提供下列應用之可行性：

- X軸模組化設計，可提供行程範圍自2000mm到6000mm
- 提供彈性且廣泛的工件變化性，使用者可自行規劃工作區為獨立工作區或雙工作區甚至多工作區
- 亦適用於加工重型且龐大的工件
- 可加裝第四軸旋轉工作台，避免任何X軸行程損失
- 可加裝特別設計之夾治具避免干涉問題產生

The mechanical structure of the VMC is extremely rigid to guarantee high quality performances, dimensional stability and high precision.

The moving column with fix table configuration will allow for:

- modularity for the X axis stroke, ranging from 2000 to 6000 mm
- flexibility and wide part variety, arranging the table configuration in “single zone” or in “double zone” for pendulum operation
- productivity advantages superior to a palletized machine
- the machining of heavy and bulky parts
- the use of rotary tables (4th ax.) without any loss of X axis stroke
- the use of special clamping fixtures with no interference problems.



KOBRA提供兩種不同之主軸結構：

- 皮帶式主軸：轉速10000rpm，主軸錐度#40
- 內藏式主軸：轉速12000rpm(選配18000rpm)，主軸錐度#40或HSK-A63

The VMC is available with two spindle configurations:

- belt driven spindle for a max speed of 10,000 rpm and ISO 40 taper
- electrospindle with max speed of 12,000 or 18,000 rpm and ISO 40 or HSKA63 taper



KOBRA的結構可規劃為雙工作區，工作區一搭配第四軸旋轉工作台，工作區二則使用固定工作台，除了可增加機器加工應用彈性外，亦大幅提升加工效率。可達成一次性五面或五軸加工，最大容許旋徑為 $\psi$  700 H400mm。

The configuration with two work zones, one with fix table and the other with a roto-tilting table, will further expand machine flexibility and production efficiency, allowing for the machining of 5 faces in a single set-up or for 5 axes machining. Swing  $\psi$  700 mm h400 mm.



採用刀臂式自動換刀系統，刀對刀換刀時間3秒。刀庫隨X軸同時移動，任何不同的應用都可達到快速換刀的需求。

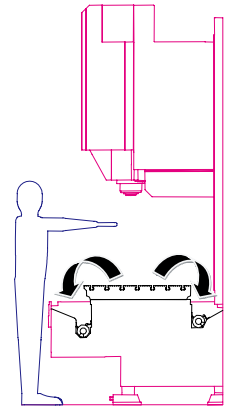
The ATC of the VMC is very quick for the use of a double gripper exchange arm (tool to tool time 3 sec).

The ATC magazine follows the spindle in any X axis position for a proper use of the pendulum mode of operation.



固定工作台結構讓操作者更易於裝卸及檢驗工件，且可極簡清理工作區鐵屑及切削液的時間。

The fix table configuration provides the operator with: ideal conditions for parts load/unload/inspection minimum attendance for chip and coolant evacuation from the work zone.



行程					strokes
X軸行程	mm	2000 - 6000	mm		X axis
Y軸行程	mm	800 - 1000	mm		Y axis
Z軸行程	mm	600	mm		Z axis
工作台					table
工作台尺寸	Y 800	mm	840 x 2130 - 6130	mm	Y 800
	Y 1000	mm	1050 x 2130 - 6130	mm	Y 1000
工作台最大負載		kgs	2500	kgs	max load per sq m
T-型槽 (寬度X數量)		mm	18 x 7	mm	T slots
主軸鼻端至工作台面最小距離		mm	120	mm	min. distance spindle nose/table
主軸					spindle
主軸錐度	皮帶式		BT-40 (DIN-40)	belt	spindle taper
主軸馬達馬力		kW	26(S1) 30(S6)	kW	power
主軸馬力扭矩		Nm	150(S1) 160(S6)	Nm	torque
主軸轉速		rpm	10000	rpm	max speed
主軸錐度	內藏式		BT-40 (DIN-40 / HSK 63)	electro	spindle taper
主軸馬達馬力		kW	23(S1) 42(S6)	kW	power
主軸馬力扭矩		Nm	110(S1) 200(S6)	Nm	torque
主軸轉速		rpm	12000/17500	rpm	max speed
快速進給		m/min	x 50 y-z 30	m/min u	rapid u
ATC刀庫					auto tool changer
刀具數量	T		30-40-60	T	tool pockets
最大刀具直徑(有鄰刀)/無鄰刀	mm		80/120	mm	max tool diameter/ with gap
最大刀具長度	mm		300	mm	max tool length
最大刀具重量	kgs		8	kgs	max tool weight
換刀時間	sec.		5	sec.	chip to chip time
機械重量 Y 800 X 3000 mm	kgs		14000	kgs	gross weight Y 800 X 3000 mm

# 加工應用 - applications

## GRANDER



## HELIOS



## KOBRA



## HORNET

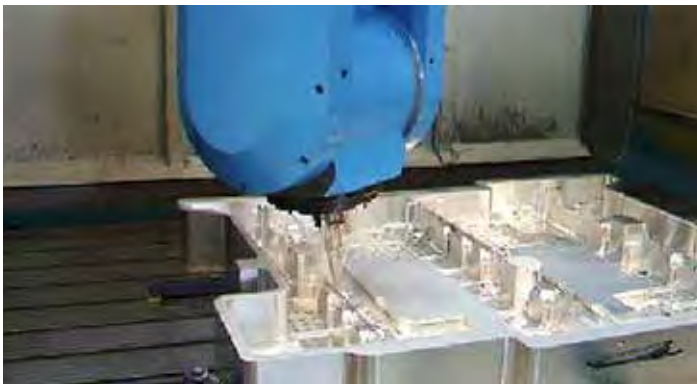


# 加工應用 - applications

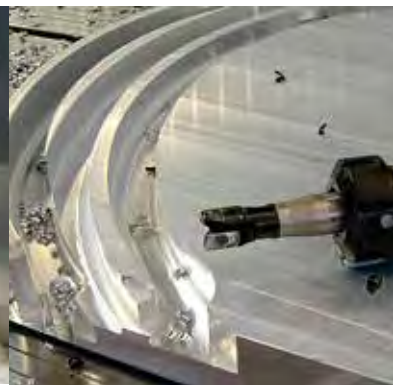
GRANDER



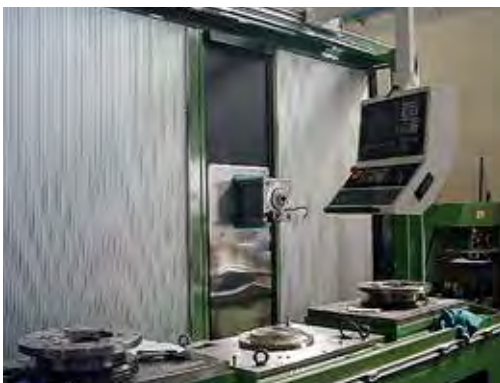
INSPIRER



KOBRA



HORNET



# 全系列彈性化頭部搭配

## A wide range of milling heads for flexible choice



### mod. TTFE-3

高剛性、簡潔、快速以及精確，確保高速高效能  
Rigid, compact, fast and accurate. It guarantees high performances with HS milling technology.



### mod. TTFG1

堅固、精確、擁有高效能之最佳彈性化設計  
Solid, flexible, accurate. A high performer with optimum flexibility

五軸同動銑頭 5-Axes Milling Head – 5 axes simultaneous movement control		
C軸旋轉角度	± 200° , 450 / 700 Nm	C-ax
A軸傾斜角度	+95° ~ -120° 450 / 630 Nm	A-ax
A軸最小分割	0.001° (cont.)	A-ax min index
C軸最小分割	0.001° (cont.)	C-ax min index
主軸型式	17500 rpm	Spindle type
	HSK 63 Built-in	
主軸功率	35 / 49 kW(380V)	Spindle power
主軸扭力	120 / 170 Nm	Spindle torque

五軸銑頭 – 四軸同動(X, Y, Z, C) 5-Axes Milling Head – 4 axes simultaneous movement control(X, Y, Z, C)		
C軸旋轉角度	± 200° , 1470 / 3675 Nm	C-ax
A軸傾斜角度	± 95° , 1470 / 3675 Nm	A-ax
A軸最小分割	0.001° (index)	A-ax min index
C軸最小分割	0.001° (cont.)	C-ax min index
主軸型式	4000 rpm	Spindle type
	BT-50(DIN-50) Gear-driven	
主軸功率	34 kW(380V)	Spindle power
主軸扭力	860 / 1110Nm	Spindle torque



### mod. TT2s

高剛性、絕對簡潔並且擁有絕佳幾何穩定性，是加工多角度工件的最佳設備  
Solid, flexible, accurate. A high performer with optimum flexibility



### mod. TT2i

簡潔、精確、彈性設計之萬能頭  
Compact, accurate and flexible for the “double index in the space” feature.

五面頭 5-Sided Milling Head		
C軸旋轉角度	± 185° 1200 / 1700 Nm	C-ax
C軸最小分割	5° , 0.001° (cont.)	C-ax min index
主軸型式	4000 rpm	Spindle type
	BT-50(DIN-50) Gear-driven	
主軸功率	18.5 / 30kW (220V)	Spindle power
主軸扭力	698 / 1130 Nm	Spindle torque

萬能頭 Universal Milling Head		
A軸最小分割	2.5° (index) (opt. 0.001° index)	A-ax min index
C軸最小分割	0.001° (cont.)	C-ax min index
C軸旋轉角度	± 185° , 1200 / 1700 Nm	C-ax
A軸傾斜角度	360°	A-ax
主軸型式	5000 rpm	Spindle type
	BT-50(DIN-50) Gear-driven	
主軸功率	37 kW(380V)	Spindle power
主軸扭力	500 / 700 Nm	Spindle torque

**Twinhorn**<sup>®</sup>  
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