

表粗比較表
Roughness of surface cmparison form

	Ra μm	CLA μ"	Rt μm	Rz μm	RMS μm	RMS μ"	France	England SUIZE	Russia Rajμm
	0.008	0.32	0.08	0.04	0.009	0.30	9	N1	▽14
	0.010	0.40	0.10	0.05	0.011	0.40			
	0.012	0.50	0.12	0.06	0.013	0.50			
	0.016	0.63	0.16	0.08	0.018	0.70			▽13
	0.020	0.80	0.20	0.10	0.022	0.90			
	0.025	1	0.25	0.12	0.027	1.10	10	N2	▽12
	0.030	1.20	0.30	0.15	0.033	1.30			
	0.032	1.25							
	0.040	1.60	0.40	0.20	0.044	1.80			
	0.050	2	0.50	0.25	0.055	2.20			
	0.060	2.40	0.60	0.30	0.066	2.65	11	N3	▽11
	0.063	2.50	0.63	0.32	0.073	2.87			
	0.080	3.2	0.80	0.40	0.088	3.50			
	0.090	3.6			0.10	4.20			
	0.10	4	0.90	0.50	0.11	4.40			
	0.125	5	1.05	0.60	0.137	5.40	12	N4	▽10
	0.14	5.60							
	0.16	6.30	1.30	0.85	0.177	7			
	0.18	7.20			0.20	8			
	0.20	8	1.60	1	0.22	8.80			
	0.25	10	2	1.20	0.27	10.80	13	N5	▽9
	0.30	12	2.50	1.60	0.33	13.20			
	0.32	12.50			0.35	14			
	0.35	14							
	0.40	16	3	2	0.44	17.60			
	0.45	18	3.50	2.25	0.50	20	14	N6	▽8
	0.50	20	4	2.50	0.55	22			
	0.63	25	5	3	0.73	28.70			
	0.80	32			0.88	35			
	1	40							
	1.25	50	10	6	1.37	54.60	15	N7	▽7
	1.50	60							
	1.60	63			1.77	69.70			
	1.80	72							
	2	80			2.20	88	16	N8	▽6
	2.50	100	15	10	2.70	108			
	3.2	125			3.55	140			
	4	160			4.40	176	17	N9	▽5
	5	200	30	20	5.50	220			
	6	240							
	6.30	250			7.30	287			
	8	320			8.8	350	18	N10	▽4
	10	400	50	40	11	440			
	12.5	500			13.7	546			
	16	630			17.7	697	19	N11	▽3
	20	800	100	80	22	880			
	25	1000			27	1080			
	32	1250					20	N12	▽2
	40	1600	200	160	44	1760			
50	2000								
	63	2500							▽1
	80	3200	400	320	88	3500			
	100	4000							
1μm = 0.001mm=39.37μ" 1μ"0.000.001=0.0254μm									



X-6 CAM

CNC 外圓磨床-異形研磨專用機

CNC CAM CYLINDRICAL
GRINDING MACHINE

X-6 CAM

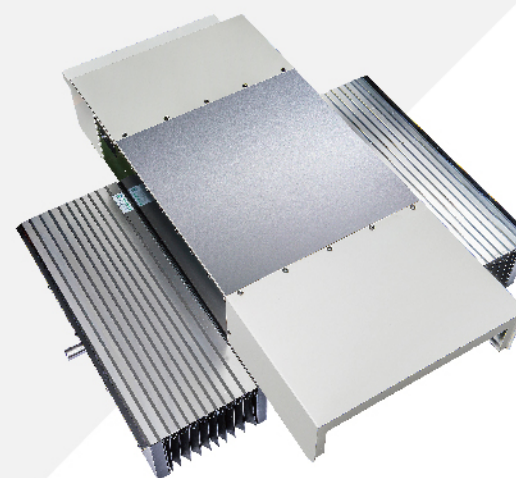
X-6 CAM

CNC 外圓磨床-異形研磨專用機

CNC CAM CYLINDRICAL
GRINDING MACHINE

X-6 CAM 是一台針對偏心圓及異形研磨所設計的專用機種。

應用於研磨偏心軸、凸輪軸、曲柄軸、多邊形沖頭..等異形工件，特別適用於製造汽機車零件、自動化設備零件等產業。其搭載高階西門子控制系統及配合金格專屬的作業畫面，可快速設定加工訊息，提供給客戶最高品質的加工精度及操作環境。



十字滑台

X軸與Z軸採十字滑台設計，縮小占地面積。兩軸採用全密閉伸縮護罩，有效的保護量測與驅動系統，杜絕磨屑與冷卻液的汙染。

Cross-Slider

X axis and Z axis are designed as cross slider to reduce machine space. Two axes cover by enclosed telescopic covers. To avoid the measure and drive device be damaged by grinding mist or coolant liquid underneath the telescopic covers.

The model X-6 CAM is the specialized design for eccentric and not circular components grinding. It's applied to eccentric, cam shaft, crank shaft, polygon punch grinding. It's especially suitable for use in the automotive, automation equipment, mold industries. Control system equips with advanced SIEMENS controller and cooperates with TOPKING latest GUI work interface, increase parameter setting efficiency. Providing the best accuracy performance and operating environment

機體

- 人造花崗岩床身，擁有極佳的耐震係數及熱穩定性。
- 機身佔地面積小，能更有效的運用工作空間。

Machine Base

- Artificial granite machine base for excellent damping characteristics and favorable thermal behavior.
- Machine covers small mounting area. Get the utmost out of your working space.

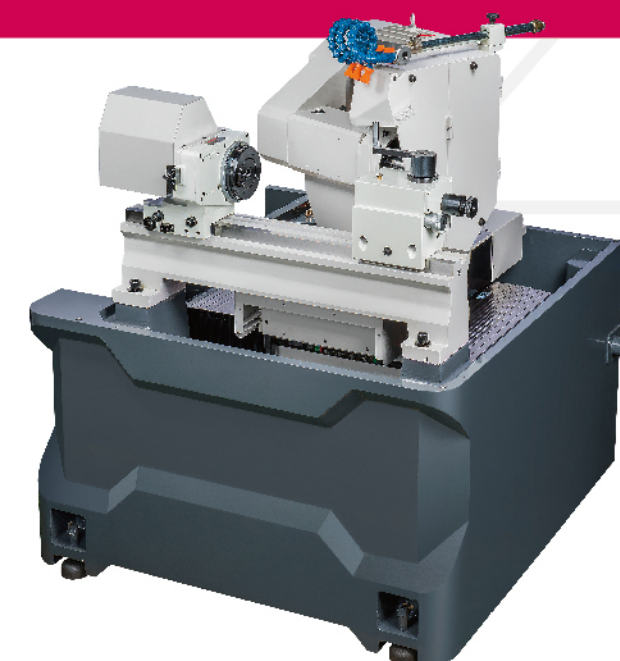


工作台

工作台始終固定於底座上，搭配X軸與Z軸十字滑台設計，縮短行程，提升加工速度與穩定性。

Working Table

The working table is bolted permanently to the machine. With cross-slide design to reduce travel. It could increase working speed and accuracy stability.

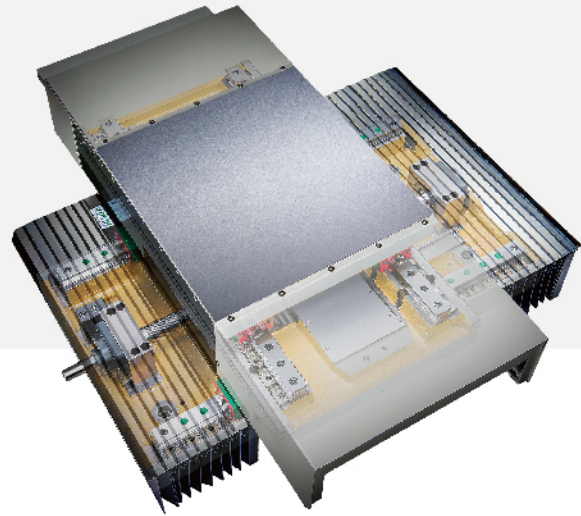


X軸線性馬達驅動

- X軸採線性馬達直接驅動搭配線性導軌，進給無背隙問題
- 十字滑台結構，進刀軸(X軸)裝載高速、高精度線性馬達配合全閉式迴路控制光學尺，進刀快速且精準，與C軸相互搭配，將角度與速度控制在最流暢的配合狀態。
- 移動速度快，每分鐘可達每分鐘15,000mm。
- 線性馬達本身主要由線圈及永久磁鐵構成，無磨耗，使用壽命較長。

X Axis Drive By Linear Motor

- X axis is drive by linear motor directly with linear guide way no backlash.
- Cross-slider construction with high speed precision linear motor and closed-loop control linear scale on X axis. Apply the smoothest working condition with C axis.
- Moving speed could reach 15,000mm/min.
- Linear motor constitute by coil and permanent magnet. No attrition for longer uses life

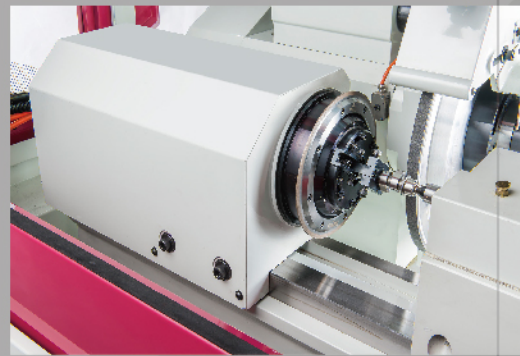


為何我們使用線性馬達取代滾珠螺桿?

- 線性馬達採用直接驅動的方式，可以減少定位系統的零件數目，降低機構複雜度，提高可靠度。
- 線性馬達的速度比滾珠螺桿快，有利於曲軸及異形研磨。
- 可以無限連接模組，所以基本上行程不受限制。滾珠螺桿行程長則會有下垂的問題。
- 線性馬達因為直接驅動所以沒有背隙的問題。

Why we use linear motor to instead ball screw?

- Linear motor drives directly. It could make the construction simpler and increase accuracy stability.
- Linear motor is move faster than ball screw. It's better for crankshaft and cam shaft grinding.
- No travel distance limit and no problem of rigidity problem.
- No backlash and attrition problem.

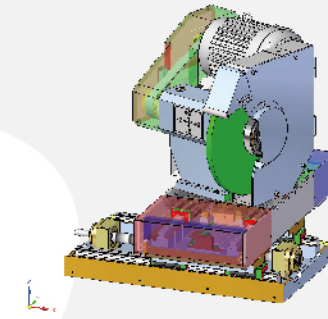
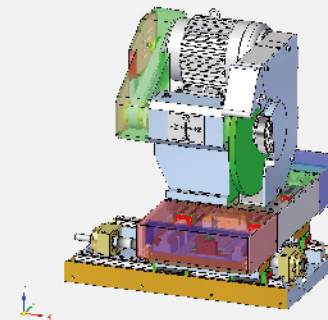


砂輪頭座機構?

砂輪主軸採用SNCM-220高級合金鋼材，經正常化、調質、滲炭熱處理、深冷處理等多重處理。再作精密研磨與鏡面處理，表面硬度達HRC62°以上。保證不變形、耐磨耗、永保高精度。砂輪裝配於右側，砂輪直徑達 $\phi 510\text{mm}$ ，並可選擇砂輪座0度的直進式樣或20度的斜進式樣。

Wheel Head

The grinding wheel spindle is precision machined from high quality alloy steel SNCM-220, normalized, tempered, carburized and sub-zero treated, precision ground and mirror-effect treated. Hardness reaches to over HRC 62°. No deformation, maximum wear resistance and lifetime accuracy are assured. The grinding wheel is installing on right side. The maximum G.W. dia. is $\phi 510\text{mm}$ and it could choose straight type or angular (20°) type.



工作主軸

工作主軸採直載式馬達驅動，搭配精密角度譯碼器，角度控制誤差控制於 $\pm 0.2''$ ，實行精確的角度控制來研磨各式各樣的偏心圓或異形工件。

Workhead

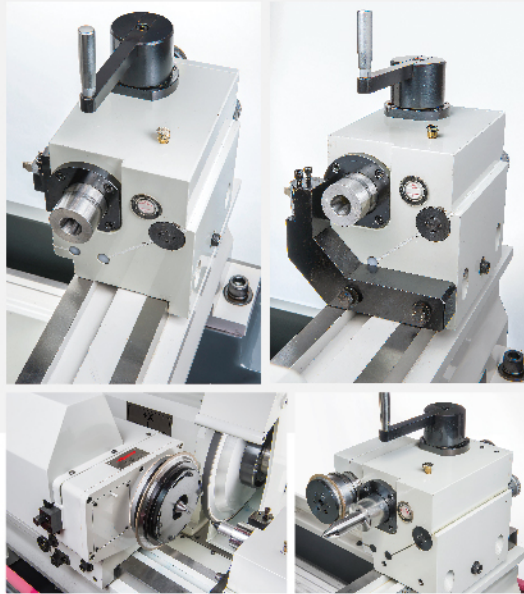
Working spindle equipped with Direct Drive motor and precision angle encoder. High resolution of angle tolerance control $\pm 0.2''$. Accurate angle control applies for various eccentric, cam shaft, crank shaft, polygon punch grinding.

微調式尾座

- 尾座潤滑採用油浴式潤滑系統，隨時確保尾座的高精度。
- 潤滑系統有附油量計，方便操作者檢視油量。
- 採用兩頂針固定式研磨時，尾座可作 $\pm 0.03\text{mm}$ 精密微調，進行錐度校正。

Tailstock

- An auto. oil bath lubrication system has been provide for tailstock to maintain high-level accuracy.
- An oil level gauge enables quickly and oil level check.
- Could adjust enables taper correction in centers fixed grinding way.



修整

- 多樣化的修整機構，可依需求選擇。
- 圖形對話式砂輪修整介面，簡易設定修整程式，可更簡易且更有效率的完成砂輪修整設定，自動修整成型，符合工件需求。
- 可配合工件及砂輪修整需求，選擇不同式樣的鑽石滾輪修整裝置(選配)。

Dressing

- Different kinds of dressing device could be chosen follow request.
- Graph conversational dress setting interface. It's easy to edit dressing parameter.
- Auto. profile dressing to match with workpiece shape.
- Could choose diamond roller dresser for workpiece and grinding wheel dressing request. (Optional)

規格 SPEC.	X-6 CAM	
能力 Capability	工作台最大旋徑 Swing Over Table	Φ230 mm
	兩頂心間最大距離 Distance Between Centers	200 mm
	最大研磨直徑 Max. Grinding Diameter	Φ200 mm
	兩頂心間最大承受重量 Max. Load Held Between Centers	5 KGS
	研磨長度 Grinding Length	Φ80-150mm
	中心高度 Height of Center	125mm
砂輪 Grinding Wheel	外徑x寬x內徑 OD x Width x ID	Φ510 x 75(MAX.) x Φ127mm
	線速度 Linear Velocity	2700 M / Min
工作主軸頭 Workhead	旋轉角度 Swiveling Angle	固定式 Fixed
	頂針斜度 Center	MT3
	主軸轉速 Spindle Speed	10~600 r.p.m
尾座 Tailstock	頂針斜度 Center	MT3
	尾座軸移動距離 Tailstock Stroke	35mm (手動 MANUAL)
	轉筒行程 Barrel Stroke	±30μm
X軸行程 Cross-slides: X axis	X軸進給方式 X axis driven by	線性馬達 8.7 KW Linear Motor 8.7 KW
	最小進給值 Min. Feed Value	0.001mm
	最大移動距離 Max. Travel	210mm
Z軸行程 Longitudinal Slide: Z axis	Z軸進給方式 Z axis driven by	伺服馬達 2.29KW Servo Motor 2.29KW
	最小進給值 Min. Feed Value	0.001mm
	最大移動距離 Max. Travel	260mm
電源 Power source	380V 3Phase	
馬達 Motor	砂輪馬達 G.W. Motor	7.5 KW
	工作主軸馬達 Workhead Motor	直結馬達 2.66 KW D.D. Motor 2.66 KW
	砂輪軸座進給 Wheel Head Feed	線性馬達 8.7 KW Linear Motor 8.7 KW
	Z軸進給 Z axis Feed	伺服馬達 2.29 KW Servo Motor 2.29 KW
	研削液泵浦 Coolant Pump	0.18 KW
機器 Machine	尺寸 Dimension	1300 x 2000 x 1800mm
	重量 Weight	4300 KGS

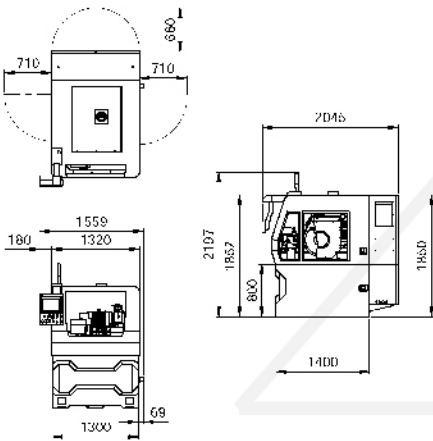
標準配件 Standard Accessories

X軸光學尺 Linear Scale for X Axis	1 set
砂輪及法蘭 Grinding Wheel and Grinding Wheel Flange	1 set
尾座修整座 Diamond Tool Holder (Tailstock Mounted type)	1set
工具及工具箱 Tools and Kits	1 set
頂針 Carbide Tipped Work Centers	2 pcs
切削液冷卻裝置 Cutting Liquid Cooling Equipment	1 set
工作燈 Work Lamp	2 set
水溫冷卻機 Water Chiller	1 unit

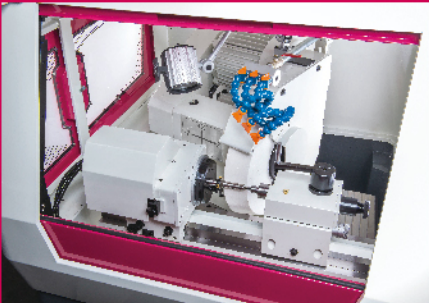
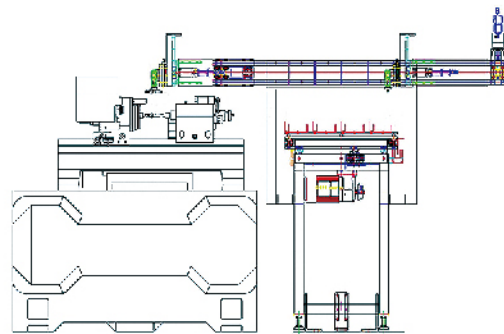
選擇配件 Optional Accessories

平衡台及平衡棒 Wheel Balancing Stand and Arbor
砂輪自動平衡裝置 Automatic grinding wheel balancer
紙帶過濾機 Paper filter
磁鐵過濾機 Magnetic coolant separator
可調式三爪夾頭 Adjustable 3-jaw scroll chuck
端面量測裝置 Touch probe gauge
鑽石滾輪修整裝置 Diamond roller dressing device
油霧回收機 Oil mist collector
防撞裝置 Gap and crash control
CBN砂輪 CBN grinding wheel
CAD/CAM 軟體 CAD/CAM software
備用砂輪法蘭 Spare grinding wheel flange

標準占地面積
Standard Floor Occupation:



選配:自動送收料式樣 (客製化設計)
Optional: Auto. Loading and Unloading
Attachment (Customized Design)



自動上掀式滑門

便利自動上掀式滑門，可減少人工作業及增加便利性。

Auto. Open / Close Door

Convenient and reduce working time.



操作系統

搭載西門子840Dsl高階CNC控制系統，前端人機介面內建針對偏心軸研磨的圖形對話式操作畫面，可同步依工件需求為操作者規劃及設計專屬的異形研磨對話式操作畫面，配合靈敏的觸控螢幕，使參數設定更簡易，操作使用上更靈活。

Control System

The X-6 CAM equipped with high performance SIEMENS 840Dsl CNC control system. The HMI built-in TOPKING's latest version Graphical User Interface (GUI) exclusive for eccentric shaft grinding. Crankshaft, camshaft and polygon grinding could also create customized GUI against operator and work request.