

表粗比較表

Roughness of surface comparison form

	Ra μm	CLA μ"	Rt μm	Rz μm	RMS μm	RMS μ"	France	England SUIZE	Russia Rajμm
▽14	0.008	0.32	0.08	0.04	0.009	0.30			
	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	9	N1	▽13
	0.020	0.80	0.20	0.10	0.022	0.90			
	0.025	1	0.25	0.12	0.027	1.10			
	0.030	1.20	0.30	0.15	0.033	1.30			
	0.032	1.25					10	N2	▽12
	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				
0.063	2.50	0.63	0.32	0.073	2.87				
0.080	3.2	0.80	0.40	0.088	3.50	11	N3	▽11	
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				
0.14	5.60								
0.16	6.30	1.30	0.85	0.177	7	12	N4	▽10	
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				
0.30	12	2.50	1.60	0.33	13.20	13	N5	▽9	
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				
0.50	20	4	2.50	0.55	22	14	N6	▽8	
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				
1.50	60					15	N7	▽7	
1.60	63			1.77	69.70				
1.80	72								
2	80			2.20	88				
2.50	100	15	10	2.70	108	16	N8	▽6	
3.2	125			3.55	140				
4	160			4.40	176				
5	200	30	20	5.50	220	17	N9	▽5	
6	240								
6.30	250			7.30	287				
8	320			8.8	350				
10	400	50	40	11	440	18	N10	▽4	
12.5	500			13.7	546				
16	630			17.7	697				
20	800	100	80	22	880	19	N11	▽3	
25	1000			27	1080				
32	1250								
40	1600	200	160	44	1760	20	N12	▽2	
50	2000								
63	2500								
80	3200	400	320	88	3500			▽1	
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



www.topking-tech.com



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X-6 CAM

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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。

機體

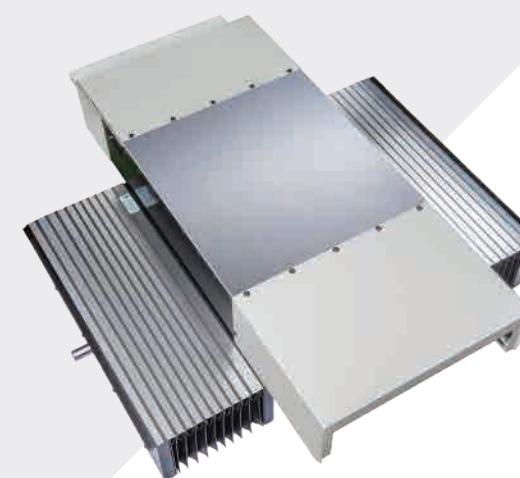
- 人造花崗岩床身，擁有極佳的耐震係數及熱穩定性。
- 機身佔地面積小，能更有效的運用工作空間。

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.



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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

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.

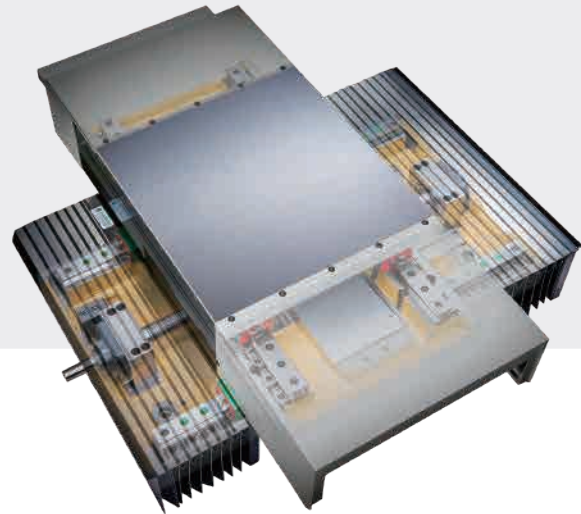


X軸線性馬達驅動

- 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

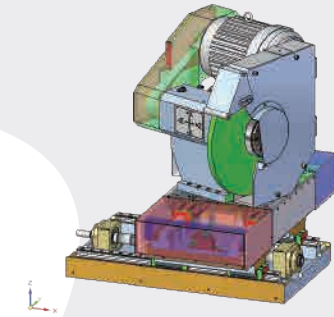
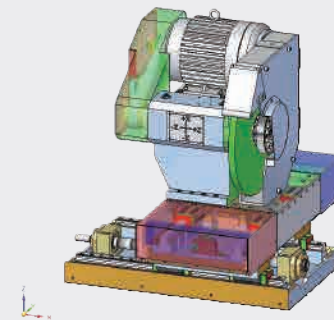


為何我們使用線性馬達取代滾珠螺桿?

- 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 $\psi 510\text{mm}$ ，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 $\psi 510\text{mm}$ and it could choose straight type or angular (20°) type.

工作主軸

工作主軸採直截式馬達驅動，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)



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 and polygon grinding could also create customized GUI against operator and work request.

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
週速度 Linear Velocity		45 m/s
工作主軸頭 Workhead	旋轉角度 Swivel angle	固定式
	頂針錐度 Center	MT. 3
	主軸轉速 Spindle Speed	0-300 rpm
尾座 Tailstock	頂針錐度 Center	MT. 3
	尾座軸移動距離 Tailstock Stroke	25 mm (手動)
X軸行程 Cross-slides: X axis	轉筒行程 Barrel Stroke	±30µm
	X軸進給方式 X axis driven by	線性馬達 Linear Motor
	最小進給值 Min. Feed Value	0.001mm
Z軸行程 Longitudinal Slide: Z axis	最大移動距離 Max. Travel	210mm
	Z軸進給方式 Z axis driven by	伺服馬達 Servo Motor
	最小進給值 Min. Feed Value	0.001mm
CNC 控制器 CNC Controller	最大移動距離 Max. Travel	260mm
	品牌 Brand	西門子 Siemens
馬達 Motor	電壓 Power Voltage	380V 3P
	砂輪馬達 G.W. Motor	5.5kw
	工作主軸馬達 Workhead Motor	2.28 KW (直結馬達 Direct Drive Motor)
	砂輪軸座進給 Wheel Head Feed	875N (線性馬達 Linear Motor)
	Z軸進給 Z axis Feed	2.29 KW (伺服馬達 Servo Motor)
機器 Machine	研削液泵浦 Coolant Pump	0.18 KW
	尺寸 Dimension	1300 x 2000 x 1800mm
	重量 Weight	4300 KGS
	地面起至頂針中心 Machine Center Height (From Grond to Center Tip)	1150 mm

本公司保有機械規格變更之權利，恕不另行通知 The above specification are subject to change without prior notice.

標準配件 Standard Accessories

西門子 840Dsl CNC控制器 Siemens 840Dsl CNC Controller	1 set
砂輪及砂輪法蘭 G.W. and G.W. Flange	1 set
頂針 Carbide Centers	2 pcs
冷卻水箱 (含泵浦) Coolant Tank"	1 set
砂輪修整座(尾座固定式) Diamond Tool Holder (Tailstock Mounted Type)	1 set
工作燈 Work Lamp	1 set
工具及工具箱 Tools and Kits	1 set
全罩式防護板金 Fully Splash Cover	1 set
X軸光學尺 Linear scale (for X axis)	1 set
C軸環形光學尺 Linear scale (for C axis)	1 set
X軸線性馬達 Linear Motor (for X axis)	1 set
直載式工作主軸 (含:工作主軸冷卻裝置) D.D. Motor for Work Spindle with Coolant Equipment	1 set
微調式尾座 Micro-adjustment Tailstock	1 set
油霧收集裝置 Oil Mist Collector	1 set
砂輪變頻器 G.W. Inverter	1 set

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
紙帶過濾器 Paper filter
磁鐵過濾器 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
自動砂輪平衡裝置Auto Grinding Wheel Balancer
平衡台及平衡棒Wheel Balancing Stand and Arbor
備用砂輪 / 砂輪法蘭Spare G.W. / G.W. Flange
氣壓尾座 Air-pressure Tailstock
客製化工件帶動治具Customized Workpiece Driving Fixture

標準占地面積 Standard Floor Occupation

