

CHEVALIER®

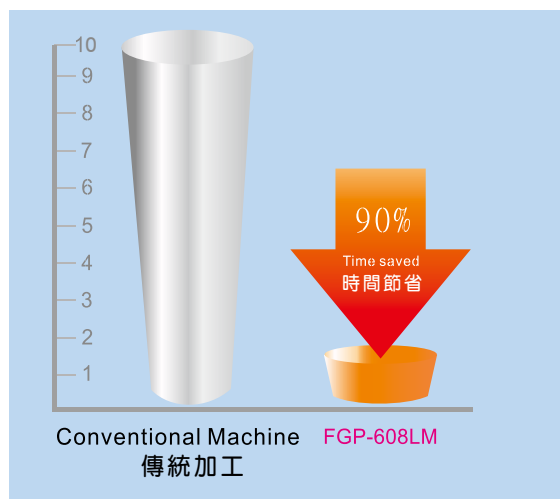
高效率線性馬達CNC磨床 CLOSED LOOP LINEAR MOTOR CNC PROFILE GRINDER

FGP-608LM



MACHINE FEATURES

機 械 特 性



Below picture shows 90% tungsten carbide puncher grinding time reduced by using linear motor grinder (compare with conventional grinding)

以下圖沖子為例 節省研磨時間超過90%



Punch grinding
沖子加工

FGP-608LM

FGP-608LM

CLOSED LOOP LINEAR MOTOR CNC PROFILE GRINDER

高速線性馬達驅動研磨加工機

608LM offering **2.5G** acceleration for your ultra hard workpiece high speed grinding.

608LM以**2.5G**的加速度,大幅提升您超硬材料的研磨效益。

Y、Z axes min. Setting value/Y、Z軸最小設定單位為: 0.1μm

Y、Z axes positioning accuracy/Y、Z軸定位精度: 0.002mm

Y、Z axes repeatabilities/Y、Z軸重覆精度: 0.001mm

Table size/工作台面積:150x200mm

Spindle center to table/工作台面至主軸中心線最大距離:350mm

Wheelhead down feed/輪頭垂直進給:0.0001mm

Spindle rpm/主軸驅動轉速: 2000-10000rpm

Spindle motor/主軸馬力: 3.7kw(5hp) servo/伺服馬達

X-axis linear motor/X軸線性馬達: 4.2kw (5.6Hp)

Wheel size(ODxWxID)/建議砂輪(外徑x寬度x孔內徑):

200x12x31.75mm



FGP-608LM

Note:Machine shown with optional accessories/註:圖示包含特別附件

CLOSED LOOP LINEAR MOTOR CNC PROFILE GRINDER

高效率線性馬達CNC磨床

CONTROL FEATURES

控制器特性

FGP-608LM with Fanuc 18iM Control and Fanuc Linear motor on X axes
FGP-608LM with PC based control and high speed Linear motor

SMART Control/控制器

PC-BASED control system with high speed linear motor, equipped with Chevalier's Graphic conversational programming system, operators can edit and run the machine without knowing G-codes or M-functions.

PC-BASED 控制器控制線性馬達再加福裕公司開發之圖形對話功能不用編寫程式,即可操作研磨加工。

Features/特性:

- Program preview function
兼具預讀功能之圖形對話控制器。
- Various useful built-in grinding cycles
多種內建可程式固定循環功能。
- Standard Surface/Plunge/Profile grinding functions
平面/溝槽/Z字/成型等多功能研磨模式。
- Highly advanced graphic programming function,
for both CNC grinding and wheel dressing/
強大的繪圖程式輸入機能, 研磨及修整均適用。
- Easy operation, operators can combine grinding cycle and wheel dressings + auto. wheel



- Table Acceleration 1.8G
加速度高達1.8G
- Table Reverse 500 Times/min
工作台往覆每分鐘500次
- Table Speed 60 m/min
工作台快送每分鐘 60米

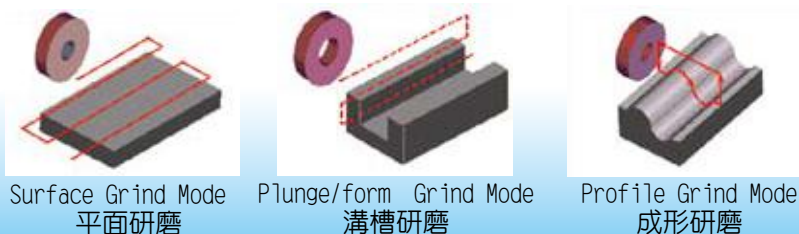


FANUC Control/控制器

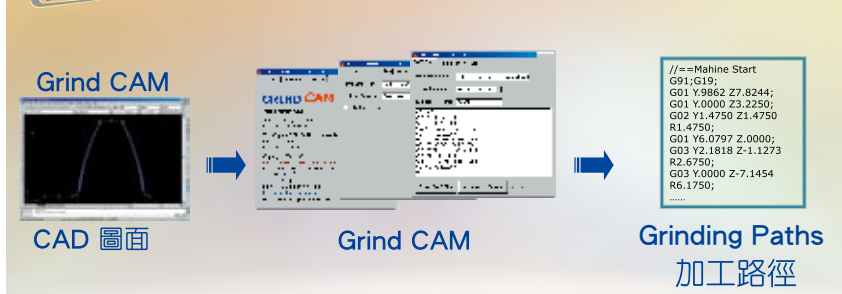
- Table Acceleration 2.5G
加速度高達2.5G以上
- Table Reverse 700 Times/min
工作台往覆每分鐘達 700 次
- Table Speed 100 m/min
工作台快送每分鐘 100 米

Conversational automatic wheel dressing

圖形對話CNC自動砂輪修整與補正



SMART 智慧型輔助應用軟體



CAD's DXF drawing file can be converted by GRIND CAM into Smart G-codes and grinding paths.

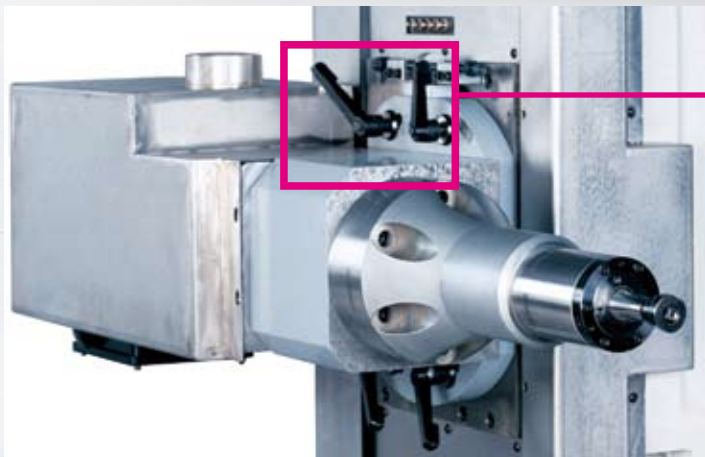
Grind CAM 軟體提供簡單、快速的操作介面, 可以很快速的將CAD軟體所輸出之DXF圖檔轉換成福裕Smart機台成型編輯可接受的G碼或加工路徑。

FEATURES

機械結構

Spindle mechanical design

Spindle is supported by four ultra precision angular contact ball bearings, best span space design obtaining highest spindle Rigidity. Adjustable grinding head swivel angle with $\pm 5^\circ$ adjusting range for various grinding application.



主軸結構設計

主軸加工程序中施以超深冷處理，並以四個超精密斜角滾珠軸承支撐，最佳化跨距排列以得到最大剛性。並設計主軸頭部可做角度調整，可調整角度為 $\pm 5^\circ$ 以提供更多樣之工件研磨需求。



主軸微調裝置

Spindle 2000~10000rpm Design
主軸轉速:2000~10000rpm



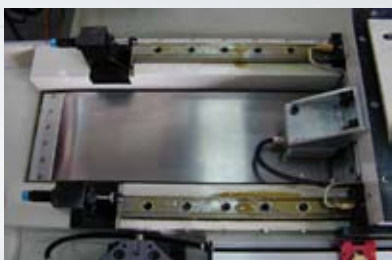
SMART Control/控制器

Linear motor structure

Table (X axis) is driven by high speed linear motor, offering 100 M/min. rapid movement speed, 700 times/min. reversing speed. Linear motor is cooled by internal circular type water chiller, avoid the thermal growth inside the linear motor.

完美的線性馬達機構

工作台X軸傳動部份採用線性馬達，提供高速驅動。快送速度每分鐘 100 米，工作台往覆每分鐘高達 700 次。馬達冷卻方式採循環式設計，避免馬達因高速所產生之過熱現象。



Linear Motor's Dust/Chip/Water Proof Design

Complete sealed linear motor protection cover for dust/chips/water proof.

線馬護蓋&防撞裝置

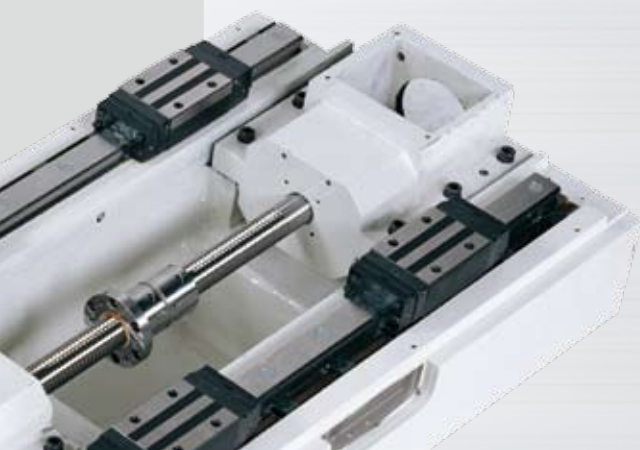
線性馬達護罩設計具有防塵、防屑、防水之功能。

Crossfeed Mechanism

Directly coupled Y-Z axis servo motors with highest C0 accuracy grade elevation ballscrew, cooperate with linear ways, offering smooth movements and high accuracy.

前後機構

本機昇降及前後機構採用線性滑軌及高精度C0級滾珠螺桿並配合同服馬達直接驅動，能達到高精度的研磨效果。



FGP-608LM

CLOSED LOOP
高效率線性



Extra large box type machine base and saddle

Extra large box type machine base and saddle is fixed on the machine base, this can reduce the vibration due to the high speed movement, providing more stable and smooth grinding, efficiently increase the grinding accuracy and cycle time. X/Y/Z axes are all linear way Design, low friction, smooth movement, no slip slivry problem.

超大矩形底座鞍座

鞍座採固定於底座方式，可減少因工作台高速運動所產生之震動，保持更平穩，安靜的狀態，而有效提升工件精度，提高生產效率。X.Y.Z軸均採精密級線性滑軌，阻力低，移動順暢，毫無遲滯現象，進刀精確穩定。



FANUC Control/控制器

X/Y/Z three axes high speed linear ways design
X/Y/Z三軸高速線軌設計

Column

The column is made of high grade dense cast iron which has been stress relieved. With ribbed and computer-analyzed structure, the stability and rigidity is greatly increased.

機身結構

機身結構採用高密度鑄鐵，經退火處理。結構以超強十字肋強化並經電腦分析，因此剛性穩定性大為提高。



Standard ether function connector.
支援標準網路連線功能。

Linear motor cooling System

線性馬達循環冷卻設計



Dual magnets induction

雙永磁感應驅動



LINEAR MOTOR CNC PROFILE GRINDER

馬達CNC磨床

X/Y/Z three axes linear scale standard

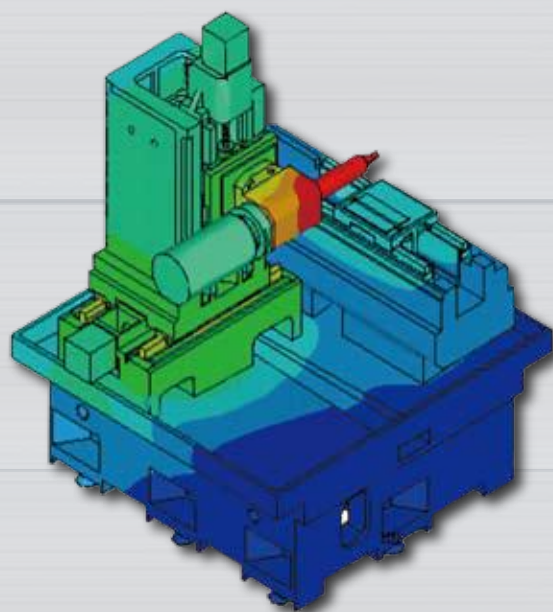
三軸X/Y/Z光學尺裝置 (標準配備)

Three axes with linear scale for closed-loop high accuracy positioning.

三軸搭配光學尺做回饋補償，提高機台精度。



X/Y/Z with linear scale (standard), least input value: 0.0001mm
X/Y/Z軸光學尺裝置 (標準配備) 最小輸入單位: 0.0001mm



Superior machine frame structure

All main frame components are Meechanite cast iron, offering optimal damping and reduce the deflection under high speed grinding. Pro-e designed and FEA structure analyzed, obtaining the best mechanical strength, providing superior rigidity and dynamic high speed grinding performance.

構超強整機結構

鑄件採高級米漢納鑄鐵，整機主件更經電腦執行結構強度及震動分析，預先消除結構盲點以獲得最佳化的結構設計，提供強而有力的主體結構以應付任何嚴苛的切削條件。

OPT. ACCESSORIES

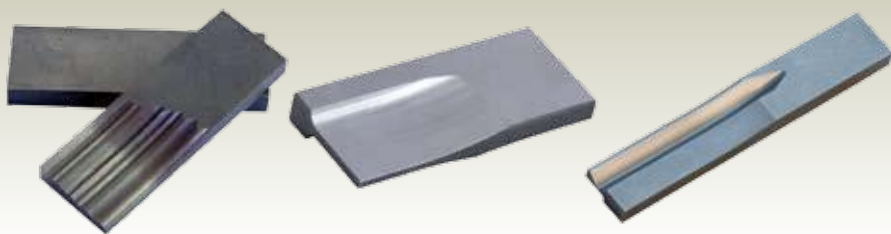
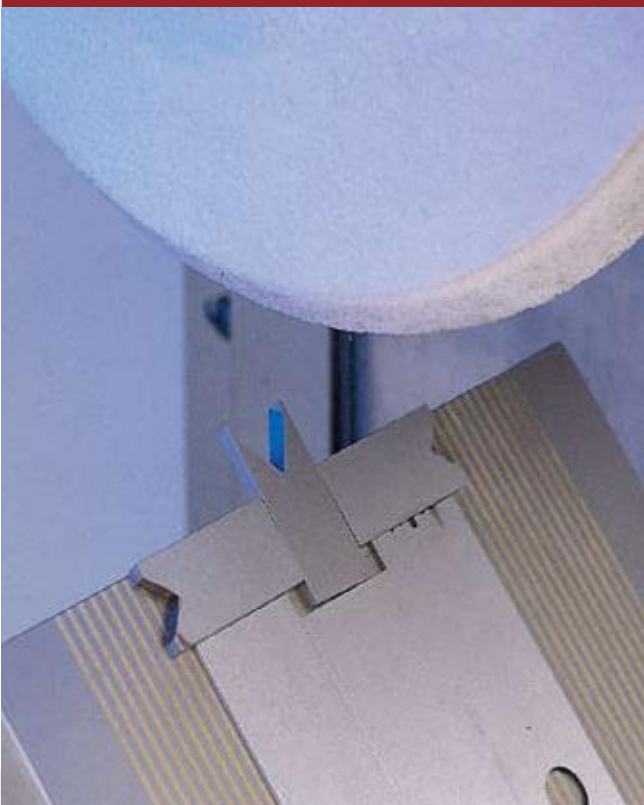
特別附件

1. Machine Lamp/石英工作燈 (24v/50w)
2. Wheel Flange/砂輪轂
3. Electromagnetic Chuck/
電磁鐵 (175x105mm)
4. Precision Vise/精密虎鉗 2"x3"(50x76mm)
5. Precision Vise/精密虎鉗 2.1/2"x4"(63x100mm)
6. Precision Vise/軌道式平衡台 2"x3"(50x76mm)
7. Balance Stand
8. Coolant System With Manual Paper
Feeding Device/過濾水機
9. Chuck Controller/ 脫磁器
10. Voltage Regulator/穩壓器

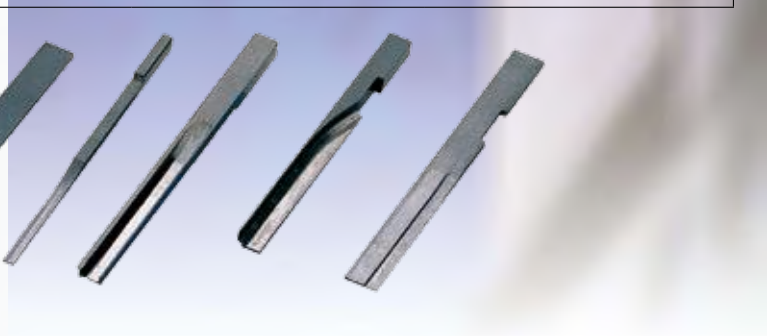
MACHINE FEATURES/機械特性

Max. Table stroke speed 最大工作台往復次/分	Conventional Machine 60~80 stroke/min +460%
	FGP-608LM 500~700次/分
Max. Table speed 最大工作台速度	Conventional Machine 15~30m/min +350%
	FGP-608LM 60~100m/min
Max. Table Acceleration 加速度	Conventional Machine + ↑
	FGP-608LM 1.8~2.5G
Max. Cutting speed 砂輪最大線速度	Conventional Machine 20~40m/s +300%
	FGP-608LM 80~100m/s

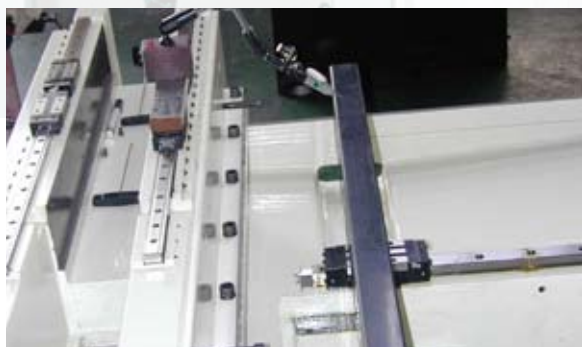
EXAMPLE/加工範例



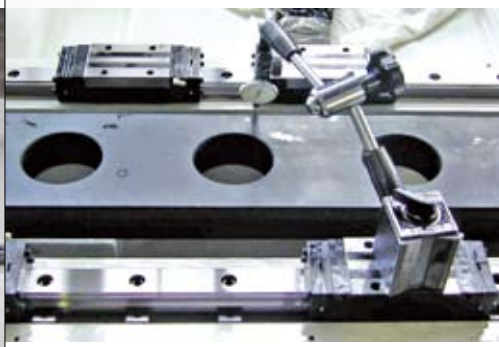
Workpieces 工件	Punch grinding 沖子加工	Punch grinding 沖子加工	Punch grinding 沖子加工
Material/加工材質	Tungsten Carbide	Tungsten Carbide	Tungsten Carbide
Hardness/硬度	HRC78	HRC78	HRC78
Dimension/材料尺寸	55x15x4mm	58x19x5mm	63x11x4mm



INSPECTION/精度檢驗



Saddle and machine base assembly alignment
鞍座與底座接合面校正



Saddle linear way alignment
鞍座線軌校正

SPECIFICATION 機 械 規 格

Description/項 目		FGP-608LM
Table Size/工作台面積		150x200mm (6"x7.9")
Max. grinding length/最大研磨長度	Longitudinal/縱向	290mm (11.4")
Max. grinding width/最大研磨寬度	Crosswise/橫向	175mm (6.9")
Max.distance from table surface to spindle centerline/ 工作台至主軸中心線最大距離		350mm (13.8")
Longitudinal movement of table/ 工作台縱向移動	Driving system/驅動系統	Linear Motor/線性馬達
Cross movement of table/ 鞍座橫向移動	Table speed/工作台速度	1-100mm/min(1~328ft/min)
Wheelhead vertical infeed/ 輪頭垂直進給	Feed Speed/移動速度	0-3m/min (0-10fpm)
Grinding Spindle drive/ 主軸驅動	Min. Setting unit/最小輸入單位	0.0001mm(0.00005")
Standard grinding wheel/ 建議使用砂輪	Feed Speed/移動速度	1-3m/min(0-10 ft/min)
	Min. Setting unit/最小輸入單位	0.0001mm (0.00005")
	Speed/轉速	2000~10000rpm
	Power rating/額定馬力	3.7kw AC Servo
	Diameter /外徑	Ø203mm(8")
	Width /寬度	Ø5-13mm(0.2"-0.5")
	Bore/內徑	Ø31.75mm(1.25")
Floor Space/馬達	Servo Motor Y,Z axes/伺服馬達 Y,Z軸	Y-1kw Z-1kw(SMART),Y-1.6kw Z-1.4kw(FANUC)
Controller/控制器	Linear Motor/線性馬達	6.3kw(SMART)/2.4kwx2 (FANUC)
Floor Space/空間		SMART / FANUC 18iM
	Total space required/廠房面積	2480x2210x2220mm (98"x87"x87")
Weights/重量	Net weight approx./淨重	5300kgs (11660lbs)
	Gross weight approx./包含裝箱	5800kgs (12760lbs)
Rated power, approx./總額定馬力(約)		11.5kw (15HP) / 9.4kw (12 1/2HP)
Packing dimensions/包裝尺寸(LxWxH)		1880x1840x2320mm (75"x74"x92")
※ Note: The manufacturer reserves the right to modify the design, specifications, mechanisms... etc. of the machine without prior notice. All the specifications shown above are just for reference./ 本公司隨時在進行研究改進的工作，因此保有隨時更改設計、規格尺寸及機械結構的權利。		

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