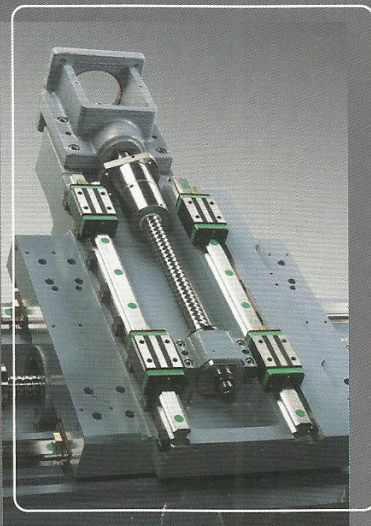


TC-210 高剛性高精度 的結構設計

- 一體成型的機台、30度低重心及正斜床的設計提供了主軸頭、刀塔及尾座穩固的基座。
- 透過電腦有限元素分析法，使床台一體成型之設計最佳化；堅實的結構不但能承載重負荷之加工，並維持機台的高精度及高剛性，延長加工刀具的使用期限。
- 一體鑄造之高效能加強肋之床台，採高張力米漢納鑄鐵，搭配熱流平衡設計，可長時間持續的加工；米漢納鑄件能減低震幅並降低變形，展現機台耐用特性。
- X、Z軸以AC伺服馬達驅動，能提供快速的加減速運動及強大推力。

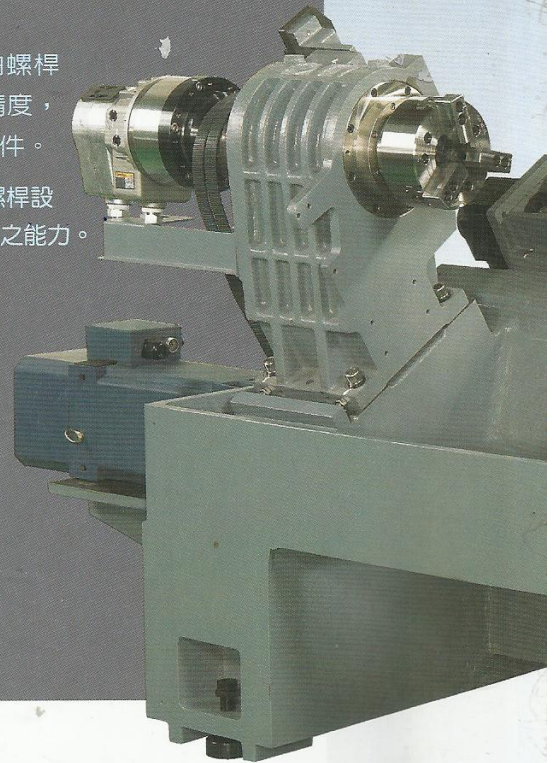


高精度的傳動系統

High Accuracy Transmission Unit

- 直結式傳動之X、Z軸馬達及精密高速滾珠螺桿的設計。
- 配合預拉裝置，增加螺桿剛性，減少熱變形，提高精密度。
- 具備潤滑裝置的X/Z軸螺桿傳動軸承，確保軸承精度，適用於車削高精度之零件。
- 預拉之C3及大直徑滾珠螺桿設計，確保高剛性、高精度之能力。

- The servo motors and high precision ballscrews are direct coupled on X/Z axes.
- The ballscrews have been preloaded to increase its rigidity and to lower the thermal deformation and increase the precision.
- Lubrication system is applied onto the bearings mounted on the X/Z driving ballscrews which maintain accuracy constant. It is suitable for the high precision parts machining.
- The enlarged preloaded ballscrews diameter with C3 grade to assure the high rigidity and high precision.

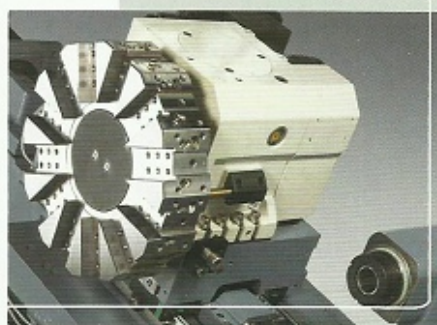


HIGH RIGIDITY, HIGH ACCURACY CONSTRUCTION DESIGN

- One-piece construction of main body. The 30 degrees low gravity slant bed assures the headstock, turret, and the tailstock as well an excellent standing and supporting.
- The reinforced ribs design enhances the one-piece mechanism construction with much capability to deal the extreme rigidity for heavy cutting or high speed cutting. It also provides the cost down advantage for the life extension of cutting tools.
- The one-piece Meehanite high tension cast iron making of the major constructive components, it gives structure long-lasting life and outstanding stability and precision.
- The X and Z axes are driven by AC servo motors. The powerful motor provides fast acceleration, deceleration movement and tremendous thrust force.

油壓刀塔 Hydraulic Turret Unit

- 標準12刀刀塔。
- 可自由選用油壓刀塔或伺服刀塔，以符合使用者需求。
- 採用特大刀盤便利刀具安裝。



- 12 stations hydraulic turret is standard equipment.
- Servo turret is offered for user's optional selection.
- Equipped with large disc for consideration of easy tool setting up.



主軸系統/ 3爪油壓夾頭

Spindle Unit / 3-jaw Chuck

- 超高精度之P4等級的主軸軸承，排列設計為最佳化跨距二點支撐，滿足重切削的平穩度及長時間加工的精密度。
- 3爪油壓夾頭加硬爪及軟爪為標準配備。
- The high precision P4 grade is adopted for the spindle bearings. The bearings configuration is designed at optimal span to satisfy the stable, heavy cutting as well as long working hours demand.
- The 3-jaw hydraulic chuck is standard equipment and comes with hard and soft jaws.



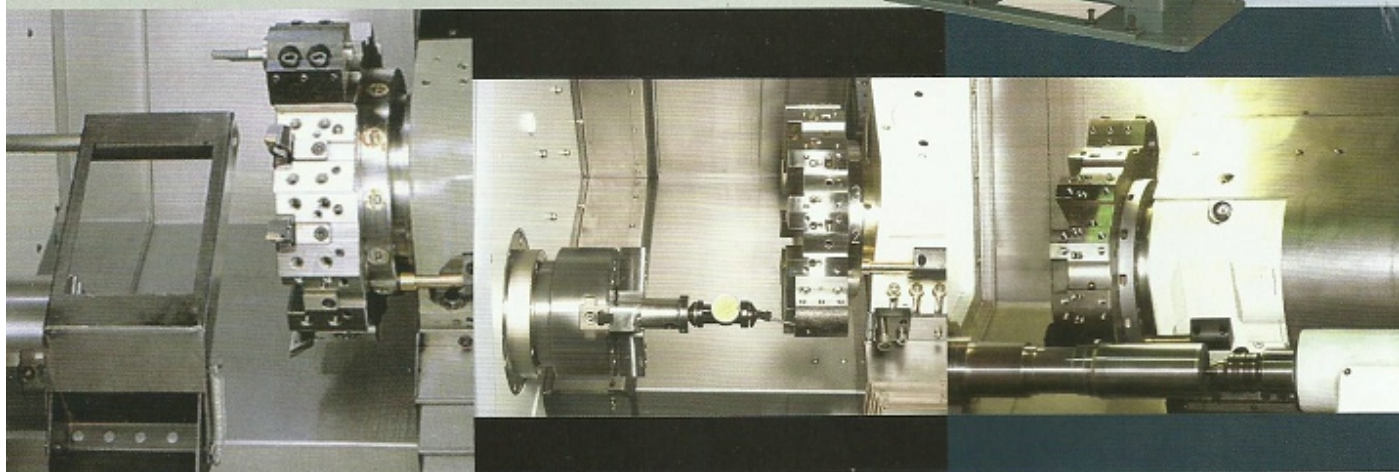
自動潤滑系統 Auto Lubrication Unit

- 自動潤滑系統提供潤滑液給傳動及尾座系統，確保全天候的作動順暢。
- 可以依照需求設定潤滑油的流量及頻率。
- 沒油會亮起警示燈。
- The auto. lubrication device provides lubrication oil to all slideways, ball screws and tailstock to ensure smooth motions at all time.
- Oil volumn and lubricating frequency is set as requirement.
- An alarm lamp will light on in case of running out of oil.

棒材輸送系統 Bar Feeder

棒材輸送機可大幅提升加工效率，與工件接收器配合時，可在機器上進行完整的棒材自動加工。

The bar feeder is very useful for managing of the massive production. The bar feeding system can be integrated with the parts catcher device for full automatic operation.



工件接收器

Parts Catcher

工件加工完成後，接收器自動承接工件，送到門外工件收集盒內，不必開門即可取得工件，配合自動送料機，大幅提升效率。

Workpiece is taken by parts catcher after machining. Productivity can be increased when connecting with barfeed units.

中心尋找規檢驗

Deviation Inspection of Spindle Center & Turret Tool Holder

所有機台於刀塔安裝完成後，皆需做刀具與夾頭中心對應校準量測，以確保車削精度。

Inspection of deviation of spindle center and turret tool holders is given to every machine often turret installed to ensure the cutting accuracy.

標準車削零件檢驗

Standard Workpiece Test Cutting

所有機台完成後，需經標準車削零件檢驗，以確保車削精度。

The standard workpiece cutting-test is carrying to ensure the certain range of accuracy on marching and performing.

高效率的排屑系統

High Efficient Chips Removal Device

配有鍊條式鐵屑輸送機與蓄屑車於機台前方，透過此排屑裝置，可有效處理大量的加工鐵屑。

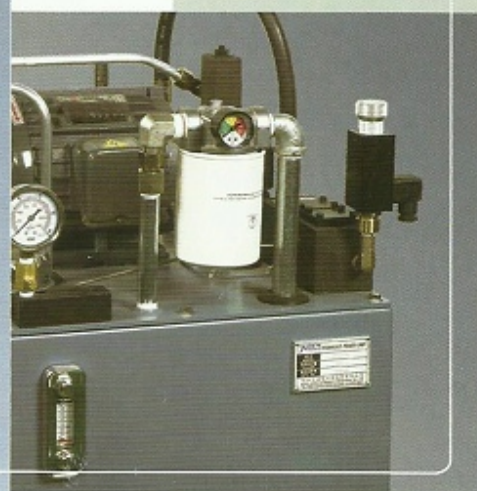
The chips conveyor is laid on and under the front side of the machine. This chain type device can easily convey away the large volume of chips generated during the turning process.



油壓單元 Hydraulic Unit

直結式油壓馬達具備高效率及低溫度的特性。

The high efficiency and low temperature direct-drive hydraulic motor.



分離式切削液水箱 Separated Coolant Tank

易於維護之分離式切削液水箱設計，採高壓冷卻馬達，有效移除加工所產生的熱量，確保精度。

The divided coolant tank is designed for easy maintenance. The high pressure pump and the large coolant flow capacity can efficiently remove away the generated heat to assure the accurate machining job.

油壓尾座 Hydraulic Tailstock Unit

- 大直徑之心軸及MT-5規格之高剛性尾座系統，確保頂心工作之絕佳精度。
- 尾座採鞍座帶動方式，達成省力高效能之人性化作業。
- 高剛性尾座本體，能降低震動幅度。

• The heavy-duty tailstock is attached to the lower guide of the machine base. The heavy casting, large diameter quill, and precision Morse taper center provide outstanding rigidity. In addition, the quill adjustment is hydraulic adding to the rigidity of the machine.

- High rigidity tailstock to eliminate vibration.



軌道平行度檢驗 Rail Parallelism Inspection

校正兩軌之運動真直度及平行度於線性滑軌安裝後，以確保精度。

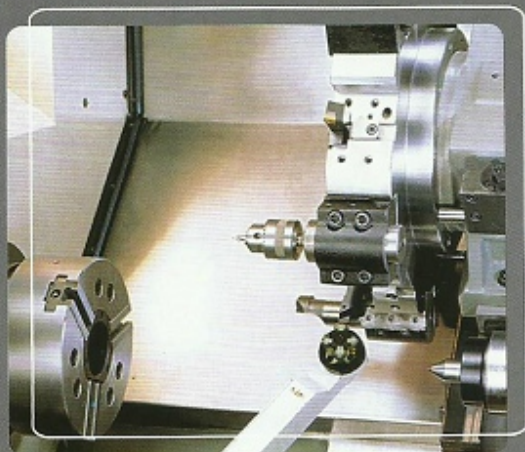
The linear guideways are calibrated the movement of straightness and parallelism to ensure the accuracy during the assembly and installation.



雷射檢驗 Laser Inspection

- 所有機器皆在ISO 9001品保體系下生產。
- 所有機器在生產線上皆進行靜態及動態成品最終檢驗，並以雷射量測進行補正。
- 所有機台於出貨前皆嚴格執行程式設定之72小時以上的實際運轉測試。

- All the machines are manufactured and assembled in accordance with ISO9001 quality management system.
- Every machine has been statically dynamical inspection and compensated by the laser measuring instrument.
- The 72 hours run-in test is strictly carried out as one of the standard procedure before delivery.



刀具偵測器 Tool Setter

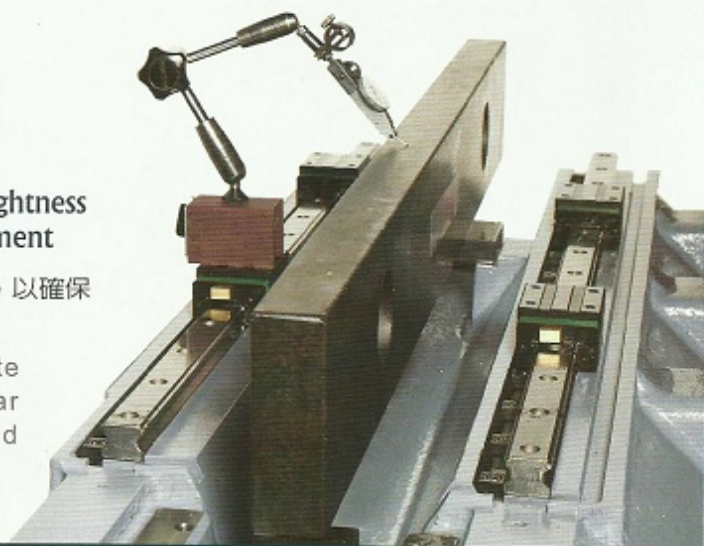
採Renishaw HPMA自動刀具設定器，可程控之量測，設定於加工數個工件後，偵測臂自動下降，刀具碰觸探針後，自動收回，繼續加工，有效提昇加工精度及良率。

The Renishaw HPMA automatic tool setter is one of optional accessories. The tool measure processing is fully automatic. The device is programmable to measure the tool automatically while the pre-set machining quantity is reached, the detective arm moves downward for the contact and gauge of problem against cutting tool. The non-stop operating of this device tremendously increases the good quality and productivity.

軌道真直度量測 Rail Straightness Measurement

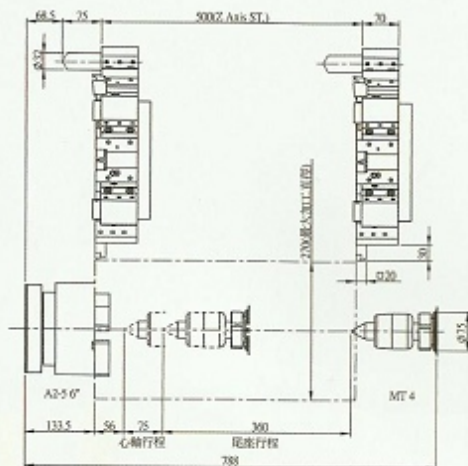
採高精度的電子水平儀，於軌道加工完成後量測，以確保精度。

Every rail is inspected by the high-accurate electronic level gauge to ensure the linear guideway accuracy before assembly and installation.



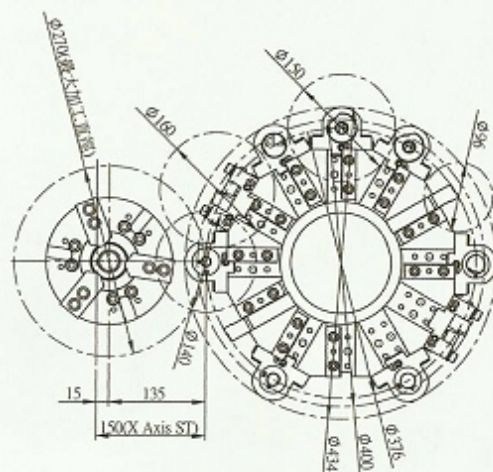
刀塔工作範圍

TOOL TURRET MOVABLE RANGE



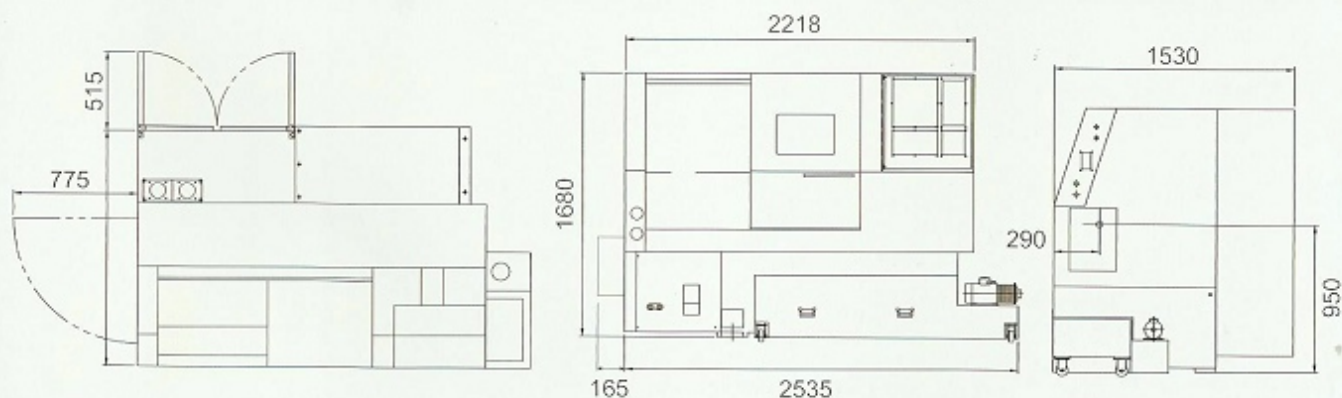
刀具干涉圖

TOOL INTERFERENCE DIAGRAM



機台尺寸圖

MACHINE DIMENSION



機械規格 / Specifications

MODEL		TC-210	
加工範圍	Capacity		
最大旋徑	Max. swing	mm(in)	ø450(17.7)
滑板上旋徑	Swing over cross slide	mm(in)	ø290(11.4)
最大加工直徑	Max. turning diameter	mm(in)	ø270(8.3)
最大加工長度	Max. turning length	mm(in)	420(16.5)
棒材最大徑	Bar capacity	mm(in)	ø51(2)
最大工件重量	Max. workpiece weight (with tailstock)	kg	114
行程	Travel		
X 軸	X axis	mm(in)	150(135+15)
Z 軸	Z axis	mm(in)	500(19.7)
主軸	Spindle		
主軸轉速	Spindle speed range	rpm	6000
夾頭尺寸	Chuck size	inch	6
主軸鼻端	Type of spindle nose		A2-5
主軸孔徑	Through spindle hole diameter	mm(in)	ø62(2.4)
主軸馬達出力	Spindle motor power	KW(HP)	11(14.7)
刀塔	Turret		
刀座數量	Number of tool stations		12
外徑刀柄尺寸	Shank height for square tool	mm(in)	ø20(0.78)
擴孔刀柄尺寸	Shank diameter for boring bar	mm(in)	ø32(1.25)
進給速率	Feedrate		
X軸快速位移	X axis rapid traverse	M(in)/min	20(787.5)
Z軸快速位移	Z axis rapid traverse	M(in)/min	24(944.9)
伺服馬達	Feed motors		
X軸馬達	X axis motor	KW(HP)	1.2(1.6)
Z軸馬達	Z axis motor	KW(HP)	1.2(1.6)
油壓單元	Hydraulic unit		
油壓泵動力	Pump motor	KW(HP)	1.5(2)
油壓泵性能	Tank capacity	L	30
冷卻系統	Coolant system		
水箱容量	Tank capacity	L	125
其他	Miscellaneous		
電力需求	Power supply	KVA	20
機械總重	Mass of machine	KG	3245
機械外觀尺寸(長)	Machine dimensions(L)	mm(in)	2385
機械外觀尺寸(寬)	Machine Dimensions(W)	mm(in)	1535
機外外觀尺寸(高)	Machine dimensions(H)	mm(in)	1810

標準配備 STANDARD ACCESSORIES

- 12 刀刀塔 12-Station Turret
- 三爪夾頭 3 jaw chuck
- 油壓系統 Hydraulic power unit
- 自動潤滑系統 Automatic lubricating system
- 內徑刀座 Boring bar holders
- 外徑刀座 Turning tool holders
- 全密封式護罩 Splash guard
- 地基墊塊 Leveling blocks & foundation bolts
- 操作手冊 Operator's & maintenance manuals
- 熱交換器 Heat exchanger
- 工作燈 Work light
- 手動油壓尾座 Manual hydraulic tailstock
- 冷卻系統 Coolant supply system
- 硬爪 Hard jaws
- 軟爪 Soft jaws

選購配備 OPTIONAL ACCESSORIES

- 刀具偵測器 Tool presetter
- 鐵屑輸送器及蓋屑車 Chip conveyor & bucket
- 夾頭中空吹氣 Air blow, chuck
- 自動門 Auto door
- 自動送料機 Bar feeder
- 拉料器 Bar puller
- 筒式夾頭 Collet chuck
- 接件器 Parts catcher
- 變壓器 Power transformer
- 油水分離系統 Lubricator and coolant separator
- 油霧收集器 Oil mist collection

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All specifications, designs and characteristics shown in this catalogue are subject to change without prior notice.