

*High quality and competitive*  
*NC machinery device*  
高品質與高性價比的  
數控機械配件

德川機械股份有限公司  
**detron Machine Co., Ltd.**

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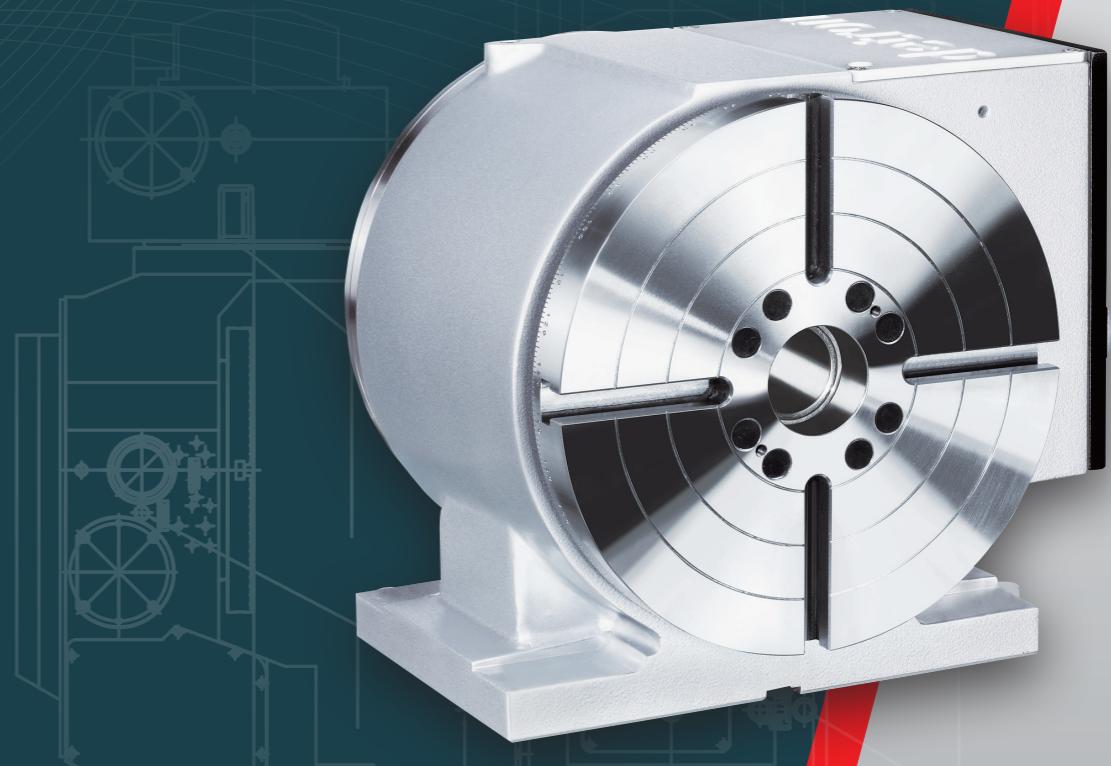


**detron** policy prohibits quoted products from  
being delivered to violate  
"The Wassenaar Arrangement" regulation.  
本公司遵守"The Wassenaar Arrangement"- 瓦  
聖納公約國際規範，相關高科技戰略性產品的海  
外輸出皆應按規定辦理。

We reserve the right to modify and withdraw any part of  
the content specified herein.  
為追求產品精進，本公司保留設計與產品規格變更權利。

New

**Direct- Drive CNC Rotary Table**  
DDM數控旋轉工作台



MAGNIFY THE VALUE OF MACHINERY

創造機械的附加價值

[www.detron.com.tw](http://www.detron.com.tw)

# Built-in Torque Motor for Direct Drive 高效能內藏直驅式DDM馬達



**Precision**  
高精度



**Rigidity**  
高剛性



**Protection**  
高防護



**Environmental**  
綠能環保



# Core Technology- High Speed and Precision 核心技術－高速高精度的保證

## Higher Speed and Torque Performance 轉速的比較

**detron**

Torque at Peak 峰值轉矩Tp	201.5 N·m ↑
Rated Continuous Torque 連續額定轉矩Tc	60 N·m ↑
Continuous Power Output 連續輸出功率	0.968 KW ↑
Max Speed 最高轉 (min⁻¹)	250 ↑

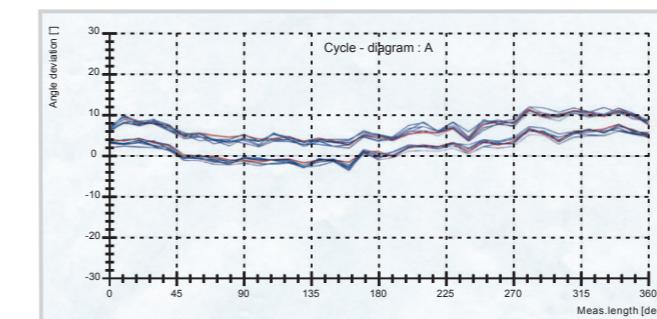
**Others 他社**

Torque at Peak 峰值轉矩Tp	184 N·m ↓
Rated Continuous Torque 連續額定轉矩Tc	46 N·m ↓
Continuous Power Output 連續輸出功率	0.75 KW ↓
Max Speed 最高轉 (min⁻¹)	200 ↓

## Strict Inspection Norm 嚴格的國際檢驗規範

**detron**

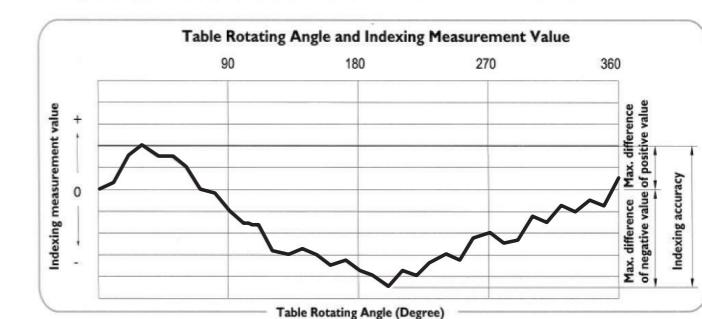
ISO 230-2 (JIS B6192) 國際標準



Accuracy inspection upon ISO 230-2 international norm is operated with **5 continuous runs** in clockwise and counterclockwise test. ISO 230-2 精度測定方式是通過連續五次正轉/反轉重覆測定，與國際高階規範接軌。

**Others 他社**

JIS單趟量測標準(JIS B6330)



Simplified inspection norm without number of laps indicated. 傳統定位精度誤差與檢驗次數未有定案，檢驗程序過於簡化。

## European High End Optical Encoder Applied 標準配置歐系高規格光學尺

**detron**



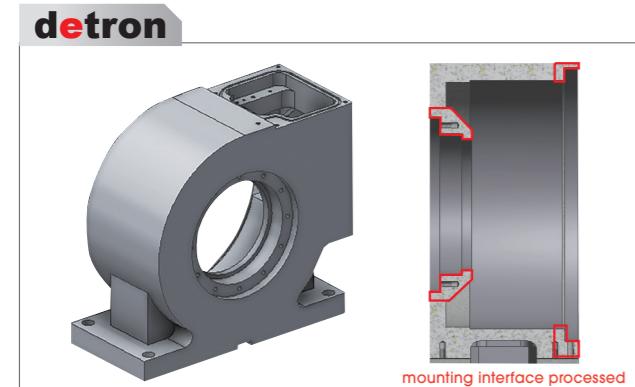
**Others 他社**



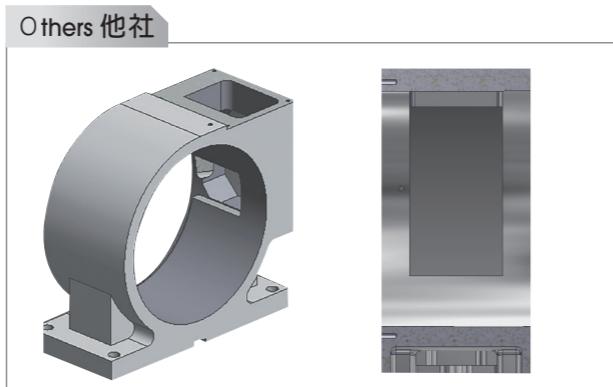
European Heidenhain or Renishaw are standard attachment for all detron DDM series. High resolution by ± 2.5 secs! 德川標準採用歐洲知名品牌光學尺，解析度達±2.5秒。保證最佳精度！

Economic encoder by ± 10 secs is applied, non-CNC purpose application. 他廠採用非數控工具機專用的低標光學尺(台灣或日本製造)，判讀精度竟達±10秒以上。僅適合精度極差加工。

### Main Cartridge Structure 主體鑄件比較



- Consolidated main cartridge with spindle mounting interface reserved.
- Least isolated components, accumulated error reduced.
- Excellent rigidity dynamic balance while high speed operation, low inertia and run-out concern.
- Closer distance between optical encoder and bearing for higher positioning detection.
- 德川DV機種鑄件一體加工, 保留主心軸軸承重要元件直接鎖固介面。
- 分離部件少, 免除累積誤差。
- 整體剛性優異, 高速動態加工時, 動平衡佳, 偏擺慣量最低。
- 光學尺距離軸承距離較近, 定位偵測更精準。

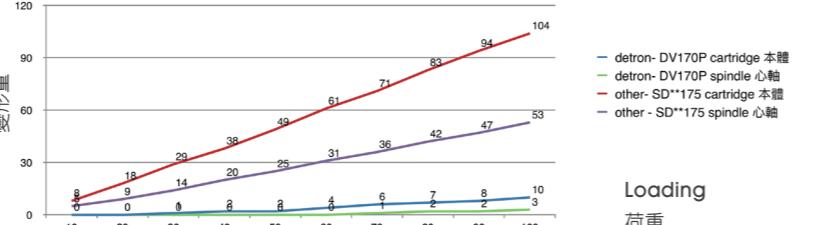


- Weak and hollow cartridge without mounting interface reserved. Spindle is installed by isolated flanges.
- Isolated parts caused more accumulated errors.
- Instable rigidity and deformation, mass inertia, low loading capability. Not recommended for high speed processing.
- Longer distance between encoder and bearing, positioning detection is limited.
- 他廠DDM工作台鑄件簡易單薄, 直接通孔貫穿, 主軸鎖固以外加法蘭介面轉接。
- 分離轉接部件多, 累積誤差大。
- 刚性差, 慢度高, 不適合高速加工。變形量大, 荷重差。
- 光學尺距離軸承距離較遠, 定位偵測受限。

### practical test 德川測試實況

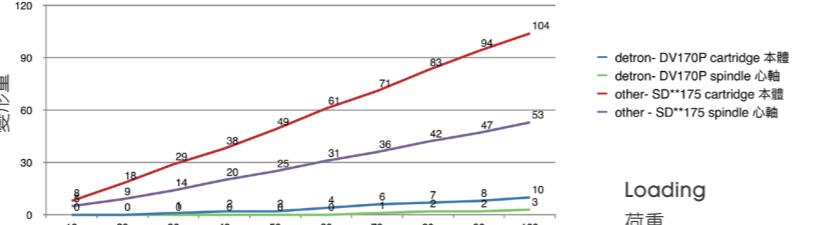


Dormancy



### Rigidity Experiment Analysis 變形實測分析比較

Loading



### 主軸結構與軸承比較



Cross Roller Bearing 交叉滾柱軸承 moment  $L_b$  is longer than  $L_c$ , better loading performance.  $L_b$ 力矩作用線大於  $L_c$ , 承受力表現更優異。

Cross roller bearing with high capability of axial and radial loading. Better moment to ensure dynamic rigidity. 標準採用交叉滾柱軸承, 兼顧徑向與軸向切削受力, 確保最佳動態剛性。



Taper Roller Bearing 斜角滾柱軸承 moment  $L_c$  is shorter than  $L_b$ , lower loading capacity.  $L_c$ 力矩作用線小於  $L_b$ , 承受力堪慮。

Low cost taper roller bearing, poor moment and less loading effect. 採用成本低廉的斜錐滾柱軸承, 占用較大空間但承受力低。

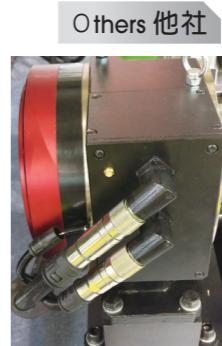
### Guarantee for Thorough Protection 高量產加工, 防護最佳

#### Chip and Water Proof 全面防屑防水

##### detron

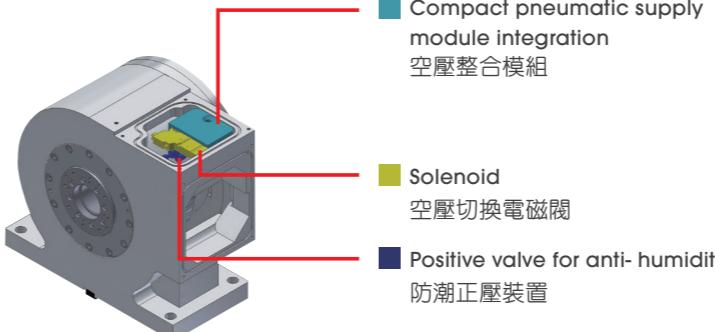


- European adherent connector guarantees safe water proof, signal/ power cable/ pneumatic tube are all integrated in 1 compact pipeline.
- All cables are shielded by anti- erosion pipe and the outer lattice prevents breakage by cutting chips.
- 德川DV機種標準採用歐洲規格防水接頭, 電源訊號整合, 一體式簡潔出線。
- 外層金屬保護管, 降低積屑破損, 線組完全內藏於內層耐酸鹼保護管, 不易進水, 使用壽命最高。



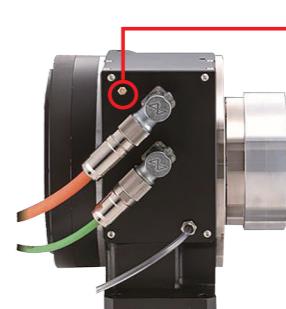
- Cables terminated in low cost plug connectors. Isolated electronic and pneumatic pipelines are randomly arranged.
- Poor pipe material. Erosion and chip cut concern on nylon pipes. High risk by frequent break-down.
- 他廠配線採軍規接頭, 訊號與電源線組分離, 管線雜亂。
- 線組外部僅為尼龍管, 容易沾附鐵屑造成刮損, 易受酸鹼侵蝕而破裂。線組長期外露, 較易磨損且容易進水。

##### detron



- Compact pneumatic supply module integration 空壓整合模組
- Solenoid 空壓切換電磁閥
- Positive valve for anti- humidity 防潮正壓裝置

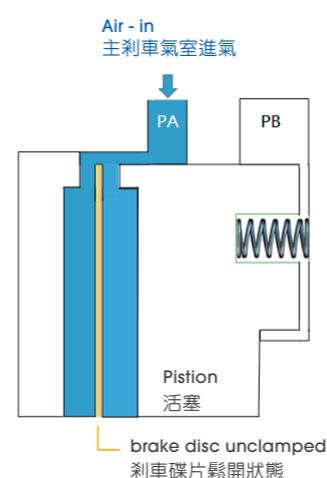
##### Others 他社



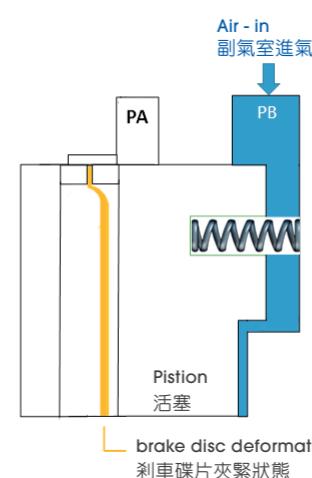
- Single direction valve exposed in cutting area. Poor function caused by chip accumulation.
- 外部裝單向閥, 加工切削容易堵塞失效

#### Brake in Various Condition 急停斷電時的自鎖保護

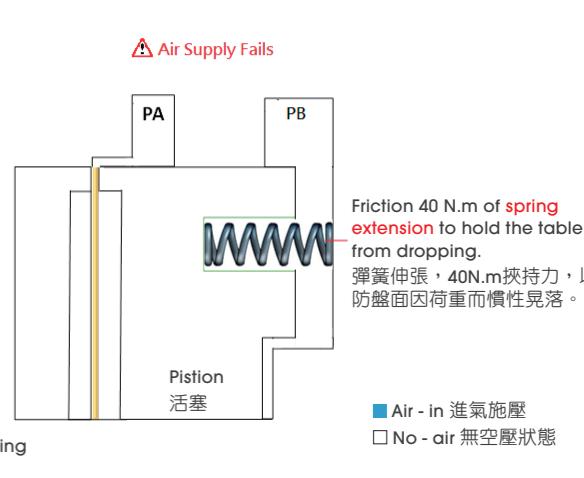
##### Table in Operation 工作台旋轉時



##### Table Positions 工作台定位時



##### Power Failure 電力失能時



## DDM Rotary Table 直結式高速旋轉工作台

DV-170P DV-255PII  
DX-320H

D V - 2 5 5 P

- P Pneumatic 表示空壓煞車
- Table size 表示盤面大小
- Vertical application 表示立式使用
- DDM direct drive (torque motor) 表示DDM直接驅動 (力矩電機)



equipped with optional table with T-slot  
T型溝盤面為選配

- Rotation speed exceeds 250 min<sup>-1</sup>, excellent speed and efficiency for mass production.  
轉速超過250min<sup>-1</sup>以上，高速定位適用於高產量定位加工。
- Low inertia- no gears or belts drive in direct drive system, resulting in lower inertia and greater acceleration / deceleration.  
無間接傳動機構，降低整體慣量，提高加速性。
- Equipped with high precision encoder to achieve high precision positioning.  
搭配高精度編碼器可達到高精密度定位。
- Backlash-free transmission improves workpiece accuracy and surface roughness.  
無間隙傳動，改善工作精度及表面粗糙度。
- Direct drive features reach zero-wear. 直接驅動實現零磨耗。

## SPECIFICATIONS 規 格

### MODEL 型 號

	Unit	DV-170P	DV-255P II
Worktable diameter 旋轉台直徑	mm / inch	STD : No table / OPT : Ø 170 標準: 無盤面 / 選配: Ø 170	STD : No table / OPT : Ø 255 標準: 無盤面 / 選配: Ø 255
Center bore diameter 中心孔直徑	mm / inch	Ø45H7	Ø50H7
Through-Bore diameter 中心貫穿孔直徑	mm / inch	Ø40	Ø40
Height of table (horizontal) 工作台高度(臥式位置)	mm / inch	-	-
Height of center (vertical) 中心高度(立式位置)	mm / inch	135	160
Width of guide block 導塊寬度	mm / inch	18	18
Clamping method and pressure 驅動方式/驅動壓力	Mpa / psi	Pneumatic 空壓 0.6~0.7	Pneumatic 空壓 0.55~0.7
Clamping torque 鎖緊扭矩	Nm / ft. lbs.	230	400
Transmission Method 減速比		Direct Drive 直傳	Direct Drive 直傳
Max. table speed 盤面最大轉速	min <sup>-1</sup>	250	200
Allowable loading capacity	Vertical 立式 kg / lb	30	75
容許負載容量	Horizontal 臥式 kg / lb	-	-
	Tailstock applied 使用尾座 kg / lb	70	150

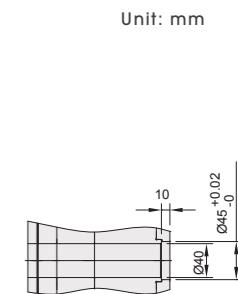
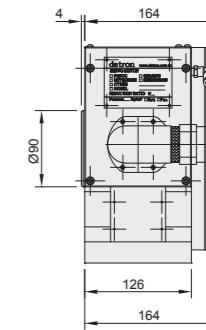
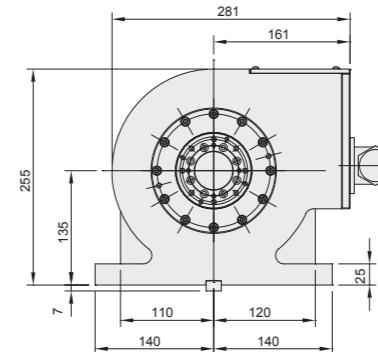
Allowable cutting force (while braking) 容許切削力(轉台夾緊時)	F	N / lbs	12700	14000
	FXL	Nm / ft. lbs.	740	1020
	FXL	Nm / ft. lbs.	230	400
Allowable cutting torque 連續切削扭矩	Nm / ft. lbs.	55	60	
Allowable loading inertia 容許負載慣性容量 ( $\frac{W \cdot D^2}{8}$ )	Kg.m <sup>2</sup>	0.11	0.61	
Resolution 最小設定單位	deg.	0.001	0.001	
Indexing accuracy 分度精度	sec.	20	20	
Repeatability 重覆精度	sec.	4	4	
Net weight (motor incl.) 淨重 (包含馬達)	kg / lb	47	70	
Cooling system 冷卻方式		Air cooling 自冷式	Air cooling 自冷式	

1.Torque motor (Direct Drive motor) can be chosen based on customers' control system. 力矩電機(即DD馬達)可隨客戶之控制系統不同而選擇不同的廠牌。

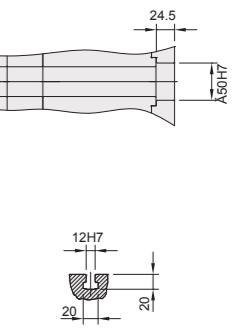
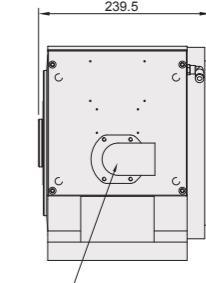
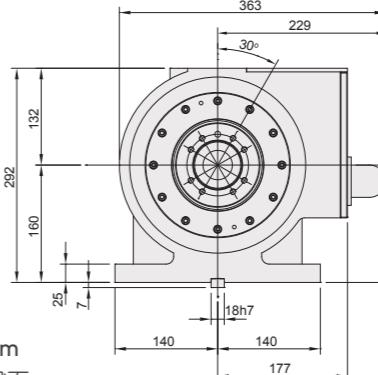
2.Index accuracy will be different depend on encoder type chosen by customer. 分度精度會因客戶所選的光學尺而有所不同

## DIMENSIONAL DRAWINGS 尺寸圖

### DV-170P

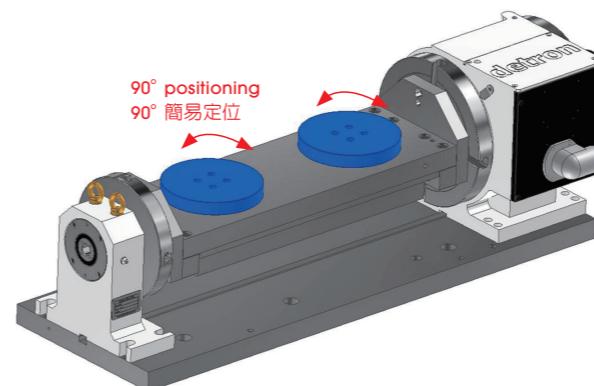


### DV-255P II



▲ with optional T-slot table in Ø 255mm  
為DV-255P II可選配 Ø 255mm T型溝盤面

### 相關選配應用



▲ 90° degree dividers  
多工位90度分割器



▲ Customized interface of quick change mold ,  
EROWA as example  
快速裝夾治具客製化介面, 圖例為EROWA夾頭

## DDM Trunnion Tilting Rotary Table

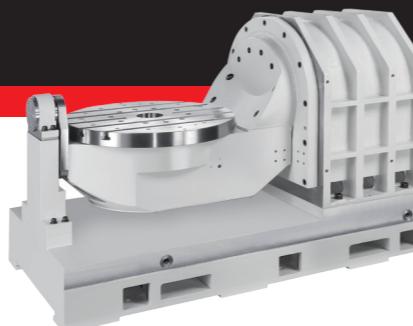
### DDM 五軸旋轉工作台

DTFS-170P DF-500H

D T F S - 1 7 0 P

Tilting axis in single support  
 表示空壓煞車  
 Five axes 表示為五軸  
 Low Gravity Design  
 表示DDM直接驅動(力矩電機)  
 DDM direct drive (torque motor)

Pneumatic  
 表示空壓煞車  
 Hydraulic  
 表示油壓煞車  
 Table size  
 表示盤面大小



▲ Machine base supplied by buyer  
底座由客戶提供

High Speed – The average rotation speed of a normal rotary table is 22.2 RPM. Whereas DDM Rotary Table runs at speeds exceeding 100RPM. Hence this is suitable for high speed turning and cutting applications.

高精度化，一般鍋輪鍋桿傳動轉速為22.2rpm，而DDM Rotary Table轉速達到100rpm以上，可應用於高速化切削加工。

High Precision – Direct drive design is without the normal worm gear transmission. Hence, there is no backlash and mechanical errors. This guarantees very high positional accuracy and repeatability.

高精度，採用直接驅動方式，不經過鍋輪鍋桿傳遞而造成精度誤差，進而達到高精度定位。

Superior Surface Finish – No Backlash, No Abrasion & Low Inertia – No gears or belts in direct drive system ensures superior surface finish.

無背隙、無磨耗、低慣量，直接驅動不需要額外皮帶、齒輪等機構，達到無背隙、無磨耗、低慣量，改善工作之加工精度及粗糙度。

## SPECIFICATIONS 規 格

### MODEL 型號

	Unit	DTFS-170P		DTF-500H	
Worktable diameter 旋轉台直徑	mm	170		500 (650)	
Center bore diameter 中心孔直徑	mm	Ø40H7		Ø70H7	
Height of table (horizontal) 工作台高度(臥式位置)	mm	280		250	
Width of T-slot 工作台T型槽寬度	mm	12H7		18H7	
Width of guide block 導導塊寬度	mm	18		-	
Clamping method /pressure 驅動方式/驅動壓力	Mpa	pneumatic 空壓 0.6-0.7		hydraulic 油壓 3.5	
Max. table speed 盤面最大轉速	min <sup>-1</sup>	R 250	T 100	R 100	T 50
Allowable loading capacity 容許負載容量	In Horizontal 在水平 	kg	30		300
	In Tilt (0~90°) 在傾斜(0~90°) 	kg	30		300
Allowable unbalancing work moment 容許工件不平衡量	WxL 	Nm	20		300
Allowable cutting force (while braking) 容許切削力(轉台夾緊時)	F 	N	3000		40000
	FxL 	Nm	200		2500
	FxL 	Nm	430		4500
Allowable loading inertia 容許負載容量 (W·D <sup>2</sup> ) 	kg.m <sup>2</sup>	0.1		9.4	
Resolution 最小設定單位	deg.	0.001		0.001	
Indexing accuracy 分度精度	sec	20	30	10	20
Repeatability accuracy 重複精度	sec	4	4	4	4
Tilting angel range 可傾斜角度	deg.	-30 ~ +120		+110 ~ -110	
Net weight (motor incl.) 淨重(包含馬達)	kg	215		1200	
Cooling system 冷卻方式		Air cooling 自冷式		Oil cooling (shared with MC) 油冷式(與機床共用冷卻)	

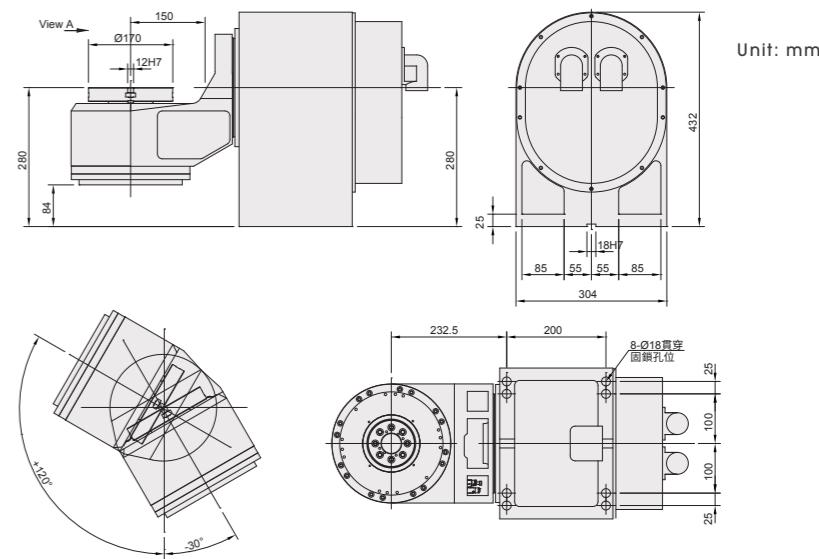
註: R: 旋轉軸 T: 傾斜軸

Direct- Drive CNC Rotary Table

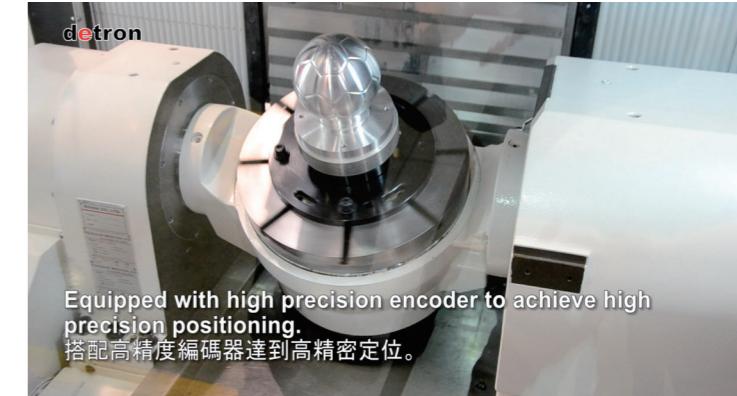
DDM數控旋轉工作台

## DIMENSIONAL DRAWINGS 尺寸圖

DTFS-170P



DF customization 客製化

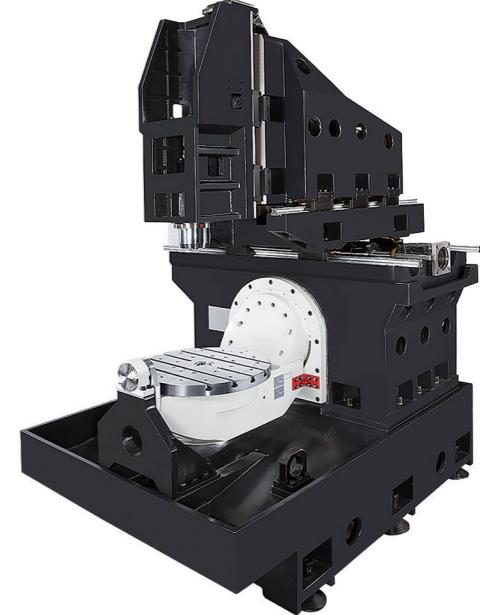
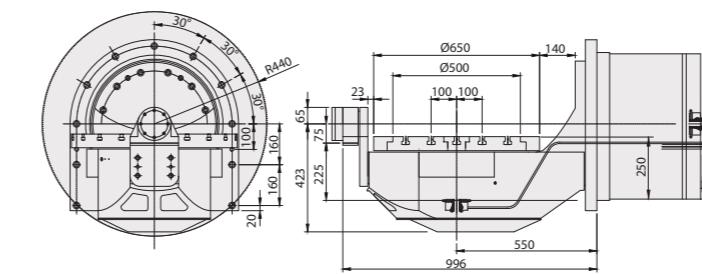


DTF-500H

customization 客製化



▲ Machine base supplied by buyer  
底座由客戶提供



# Compatible with Various CNC System

## 應用實例 – 與各大控制系統整合

**detron**

**FANUC**



Fanuc	DV-170P	DV-255P
Driver 驅動器規格	α iSV20- old 舊 : A06B-6117-H103 new 新 : A06B-6240-H103	α iSV40- old 舊 : A06B-6117-H104 new 新 : A06B-6240-H104
Optical encoder 光學尺	β iSV40- old 舊 : A06B-6130-H003 new 新 : A06B-6160-H003	β iSV80- old 舊 : A06B-6130-H004 new 新 : A06B-6160-H004
NC parameter 參數技術	Heidenhain or Renishaw 標準配置歐系光學尺	
Remark 其他必要條件	Exclusive tech of detron 德川獨家提供  Purchase software " electric pole detection" from NC service center: 向控制器原廠申請「磁極檢出功能」規格如下： Oi-MC A02B-0310-S744 Oi-MD A02B-0320-S744 Oi-MF A02B-0340-S744 FS-31i-B A02B-0326-S744	

**MITSUBISHI ELECTRIC**



Mitsubishi	DV-170P	DV-255P
Driver 驅動器規格	STD- with power supply 標準型-電源供應器式 MDS-D2-V1-40 (H&R)  Eco- with resistor 經濟型-濺放電阻式 MDS-D-SVJ3-20NA (H) MDS-DJ-V1-80 (H&R)*	STD- with power supply 標準型-電源供應器式 MDS-D2-V1-160 (H&R)  Eco- with resistor 經濟型-濺放電阻式 MDS-D-SVJ3-35NA (H) MDS-DJ-V1-100 (H&R)*
Optical encoder 光學尺	Heidenhain or Renishaw 標準配置歐系光學尺	
NC parameter 參數技術	Exclusive tech of detron 德川獨家提供	

**SIEMENS**



Siemens	DV-170P	DV-255P
Driver 驅動器規格	individual driver 書本型 6SL3121-1TE15-0AA3 compact type 緊湊型 6SL3420-1TE15-0AA3	individual driver 書本型 6SL3121-1TE21-0AA3 compact type 緊湊型 6SL3420-1TE21-0AA3
Optical encoder 光學尺	Heidenhain or Renishaw 標準配置歐系光學尺	
NC parameter 參數技術	Exclusive tech of detron 德川獨家提供	
Remark 其他必要條件	- purchase Siemens "SMC40" module while applying Heidenhain encoder. 採用Heidenhain光學尺時，須加裝西門子"SMC40"模組" - purchase Renishaw "A-977-0575" signal transerrer while applying Renishaw encoder. 指定採用Renishaw光學尺時，須加裝Renishaw"A-977-0575"訊號轉換模組"	