



MULTI-FUNCTION CNC WORM GEAR SHAFT PROCESSING MACHINE

多功能數控蝸桿加工機



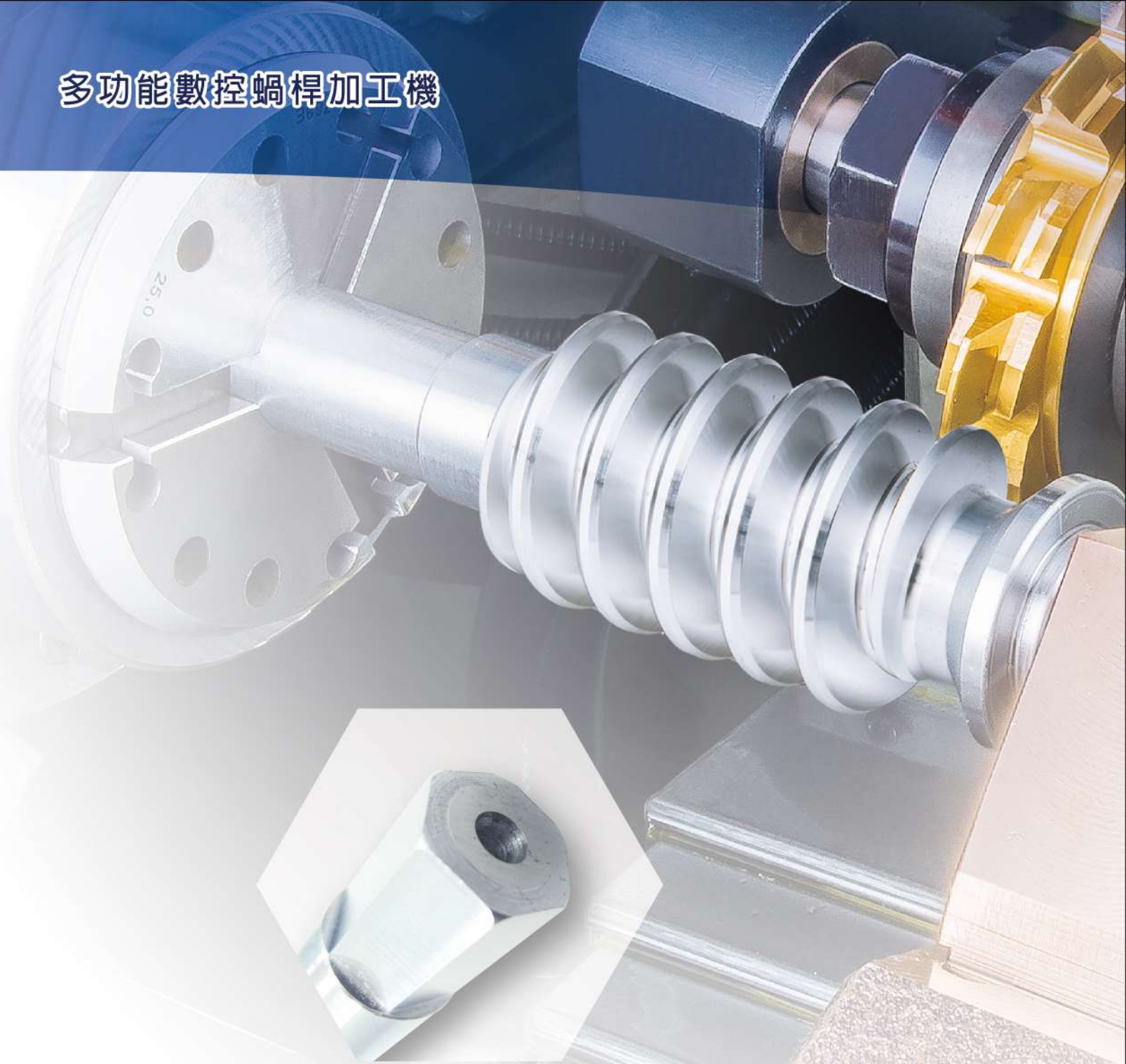
秉持不斷創新研發的鼎紳公司，再度推出最新型的蝸桿加工機，此系列機型具有更高的加工效率並搭載人性化的電腦控制器，提供操作者更簡易的操控特性。新推出的DS-1000HZ，除了適用於蝸桿及螺桿之滾牙加工，並兼具去除銳角及鍵槽加工功能。DS-1000HJ，則專為工件螺紋成型及銑栓槽加工而打造，有助於客戶降低機器投資成本。

機械特性

1. 蝸桿加工，滾牙、去除銳角、鍵槽加工一氣呵成，免除工件重複裝卸。
2. 雙導程螺牙一次加工完成，確保最佳導程精度及縮短工時。
3. 斜鞍座結構使切削更穩定，降低工件震動，有效改善加工精度及減少刀具損耗。
4. 油壓夾頭配合油壓尾座，工件裝卸更方便，更快速。
5. 搭載新代電腦控制器，性能提升，操控簡易。
6. 全密閉式護罩。
7. 一機多功能，適用各種砂輪開槽加工、蝸桿、螺桿、栓槽軸加工。
8. 獨創設計，榮獲多國專利，精度與速度，同步升級。

PATENTED MACHINE FEATURES:

1. Worm machining, screw milling, chamfering, and keyway milling can be processed continuously on the single machine without workpiece repetitively loading unloading.
2. Dual lead screw is machined at the same procedure to ensure high accuracy and shorten the machining time.
3. Slanted saddle structure provides better cutting stability and reducing vibration which effectively secure cutting accuracy and reducing tool wear.
4. Hydraulic chuck and tailstock make part loading / unloading operations more convenient and faster.
5. Equipped with Syntec computer controller for upgraded performance and user-friendly operations.
6. Oil splash prevention cover.
7. A multi-function machine suitable for grinding wheel slotting and machining of worms, lead screws and spline shafts.
8. All above patented features bring outstanding speed, accuracy, and thereby total efficiency.



WORM MILLING MACHINES THE EVOLUTION OF EFFICIENCY AND PERFORMANCE

The newly developed DS-1000HZ combines worm & screw machining, chamfering, and keyway machining functions in one machine.

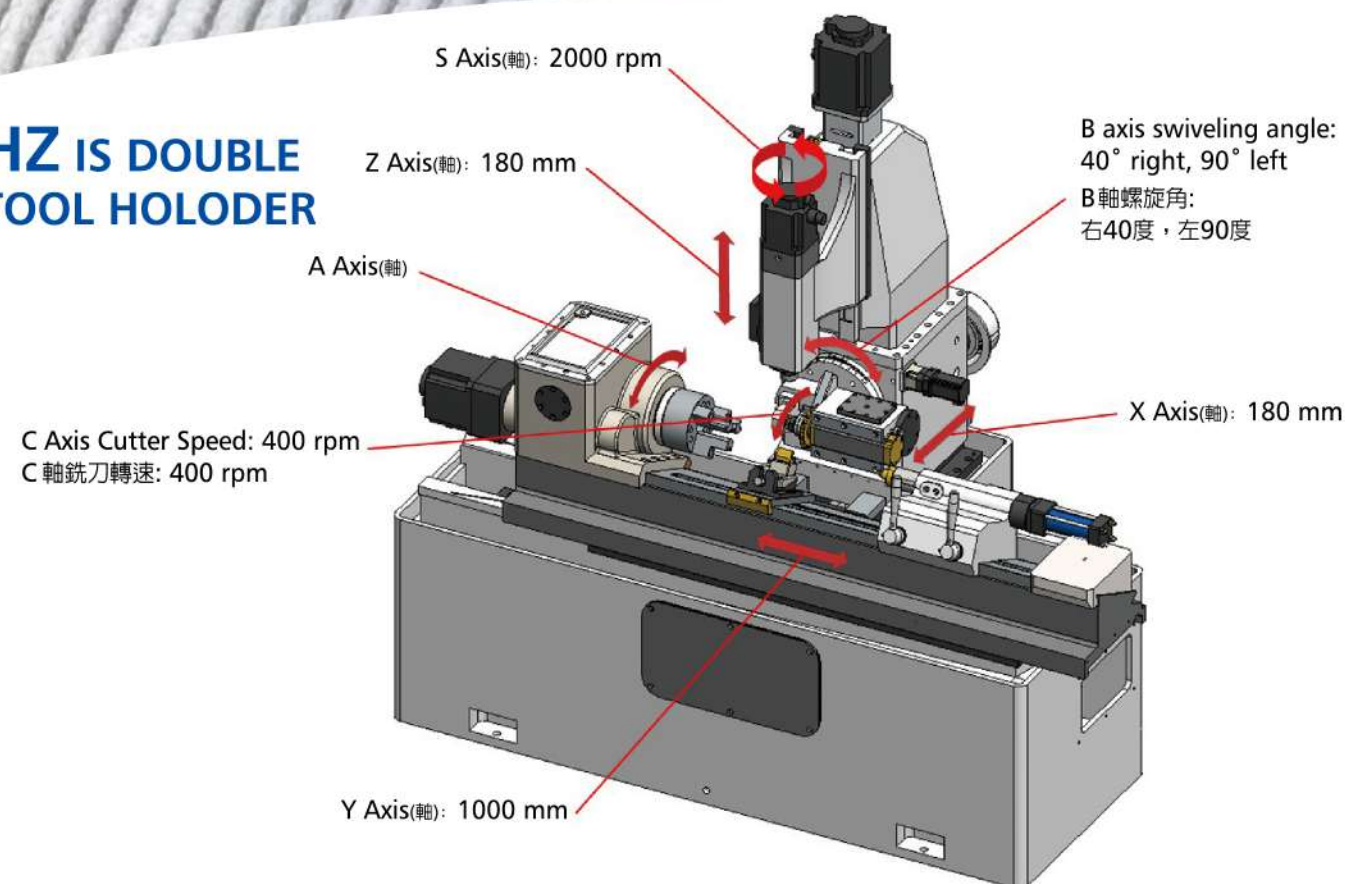
The DS-1000HJ, on the other hand, is only designed for thread forming and spline shaft milling for customers who would like to save on machine investment cost.



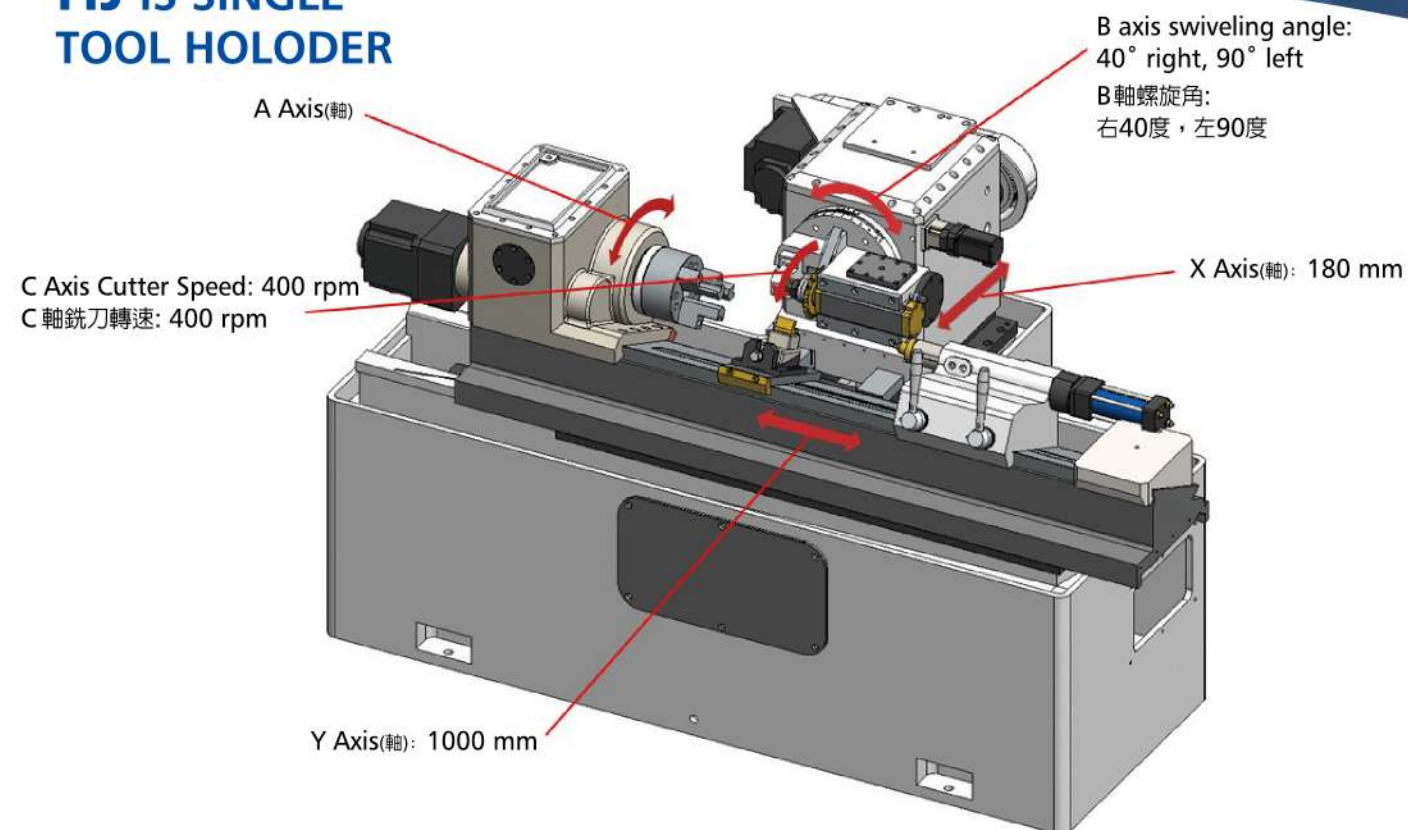
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多功能數控蝸桿加工機

HZ IS DOUBLE TOOL HOLODER



HJ IS SINGLE TOOL HOLODER



DS-1000 HZ

- 滾牙
- 去除銳角
- 鍵槽加工
- THREAD MILLING
- SHARP EDGE REMOVING
- KEYWAY MACHINING

機械結構

1. X / Y / Z 軸行程: 180 x 1000 x 180 mm
2. 第一刀架可使工件螺紋成型及銑銼槽、砂輪開槽
3. 第二刀架(Z軸)可去除螺牙銳角、鍵槽加工、銑多角成型
4. 第一刀架(B)軸可傾斜, 以加工螺旋角右旋40度, 左旋90度
5. 滾牙刀(X軸)轉速: 400 rpm
6. 倒角刀(S軸)轉速: 2000 rpm

MACHINE STRUCTURES

1. Stroke of X, Y, Z axis 180 x 1000 x 180 mm.
2. The first tool holder is designed for thread forming, spline cutting, and grinding wheel slotting.
3. The second tool holder (Z axis) is designed for thread sharp edge removing, keyway machining, and polygon milling.
4. The first tool holder can be tilted for machining helical angles. (40° right hand angle and 90° left hand angle).
5. Angular speed of the thread milling cutter (X axis) is 400 rpm.
6. Angular speed of the sharp edge removing cutter (S axis) is 2,000 rpm.



DS-1000 HJ

- THREAD MILLING
(Single lead, dual lead, hypoid gear and Niemann type machining)
- SPLINE SHAFT MACHINING
- GRINDING WHEEL SLOTTING

- 滾牙 (單導程、雙導程、戟齒、尼曼式)
- 銼槽加工
- 砂輪開槽

機械特性

1. X / Y 軸行程: 180 x 1000 mm
2. 第一刀架可使工件螺紋成型, 銑銼槽及砂輪開槽
3. 第一刀架(B)軸可傾斜, 以加工螺旋角右旋40度, 左旋90度
4. 滾牙刀(X軸)轉速: 400 rpm

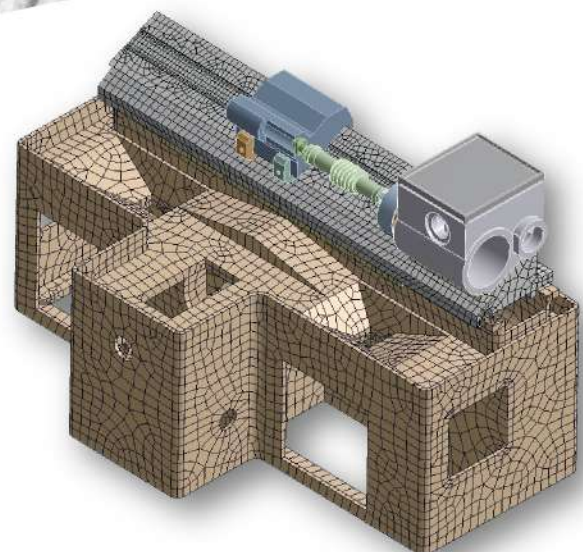
MACHINE STRUCTURES

1. X, Y-axis travel: 180 x 1000 mm.
2. The first tool holder is designed for thread forming, spline cutting, grinding wheel slotting.
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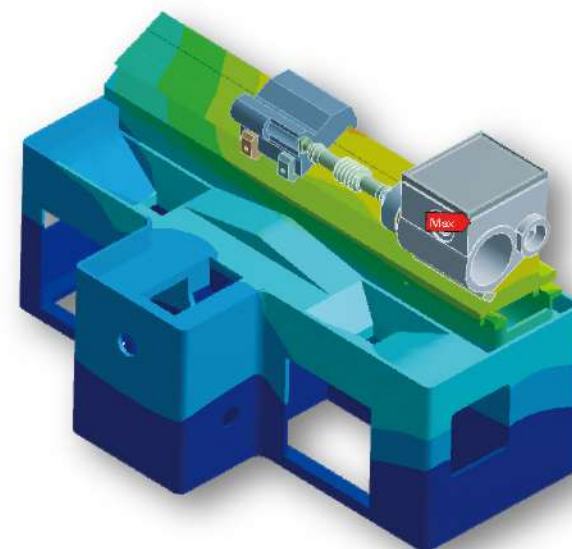


最佳化機體結構

機器之主結構體包括底座與鞍座經由先進的有限元素分析。在結構體上施以最大負荷之情況下，底座幾乎無變形，而鞍座之變形量小於 $10\mu\text{m}$ 。事實證明DS-1000之非凡結構剛性。

The structural parts of DS-1000, such as base and saddle, are analyzed by using advanced finite element analysis software. Under the maximum cutting load, there is almost no structural deformation on the base, and the structural deformation on the saddle is less than $10\mu\text{m}$. The results of analysis show that DS-1000HZ and DS-1000HJ has excellent rigidity.

OPTIMIZED MACHINE STRUCTURE HIGH RIGIDITY! DEFORMATION FREE



加工種類：

1. 滾牙 (單導程、雙導程、錐度加工、載齒加工、尼曼式加工)
2. 栓槽加工
3. 砂輪開槽
4. 螺牙銳角去除功能
5. 可加工鍵槽
6. 銑多角成型

MACHINING APPLICATIONS:

1. Thread Milling (Single Lead, Dual Lead, Taper, Hypoid Gear and Niemann Type Machining)
2. Spline Shaft Machining
3. Grinding Wheel Slotting
4. Removing Sharp Edge on the Threads. (DS-1000HZ only)
5. Applicable for Machining Keyways. (DS-1000HZ only)
6. Milling Polygon Workpiece. (DS-1000HZ only)



標配
Standard

油壓三爪夾頭 (選配)

1. 工件夾持方式採用 $\varnothing 6''$ 油壓三爪夾頭，提供工件之自動夾料與放料。
2. 油壓夾頭動作可由腳踏開關及面板上之按鈕控制。



油壓迴轉缸

1. 油壓三爪夾頭採用油壓迴轉缸控制，重量輕，且高速運轉時極穩定。

HYDRAULIC ROTARY CYLINDER

1. The hydraulic chuck is controlled by a hydraulic rotary cylinder that offers light weight and maximum stability during high speed running.



斜鞍式結構

1. 本機採用斜鞍式結構設計，配合鞍座滑軌為T型硬軌。結構剛性優異，有助於提高鞍座之穩定性。

SLANT SADDLE STRUCTURE

1. The slant saddle is designed with T-shape hard rail which shows an exceptional structural rigidity, and increases work pieces stability.

中心架二點支撐

1. 中心架採用高級磷青銅製成，耐磨耗性佳。
2. 中心架與工件同時移動，有效降低中心架之磨耗。
3. L型中心架採用雙面包覆支撐設計，可將刀具加工時之震動度降到最小程度，進而提升工件精度與加工面之精細度，並減少刀具損耗。

TWO-POINTS SUPPORT OF CENTER REST

1. The center rest is manufactured from high quality phosphor bronze with excellent wear resistance.
2. The center rest and workpiece move simultaneously to effectively reduce the wear of center rest.
3. The L-shaped center rest provides two-points support for minimizing vibration during cutting, while upgrading machining accuracy and surface finish as well as reducing tool wear.



第一刀架

1. 可加工蝸桿、雙導程蝸桿、錐形蝸桿及載齒加工、尼曼式加工。
2. 可加工6, 8, 10槽栓槽軸。具有自動分度設計，免除人工分度之麻煩。
3. 只需一次工件夾持，即可完成各種蝸桿之加工。確保蝸桿精度，縮短工時、大幅提升加工效率。
4. 使用鑽石銑刀即可做砂輪開槽。

FIRST TOOL HOLDER

1. Designed for machining worm, dual-lead worm, hypoid gear and Niemann type machining.
2. Also, applicable for machining spline shaft with 6, 8, or 10 grooves. Featuring automatic indexing to eliminate time-consuming manual indexing.
3. Machining of various types of worms is accomplished with only one setup of workpiece. This design may ensure worm accuracy, shorten production times and dramatically raise efficiency.
4. When using a diamond milling cutter on the first tool holder, this machine is capable to perform slotting on grinding wheel.



選配
Optional

高剛性主軸頭

1. 主軸採用超大雙滾柱軸承配合金屬襯套支撐，在重切削滾牙加工時，更展現最佳的加工穩定性。
2. 主軸頭內部零件採用浸油式潤滑，運轉順暢，低噪音。

HYDRAULIC 3 JAW CHUCK (Optional)

1. Workpiece Rigid headstock is clamped by a $\varnothing 6''$ hydraulic 3 jaw chuck that allows for automatic clamping and unclamping operations.
2. The hydraulic chuck motions can be controlled by means of a foot switch and a push button on the control panel.

RIGID HEADSTOCK

1. The spindle is firmly supported by two oversized taper roller bearings in combination with metallic busing. It offers outstanding and stable machining on even heavy worm cutting.
2. All parts in the headstock are lubricated by an oil bath lubrication system to achieve smooth and low noise operation.



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多功能數控蝸桿加工機

Surpasses the Speed and Accuracy of Whirl Wind Type Milling Machine

超越旋風式銑床的精度，媲美旋風式銑床的速度

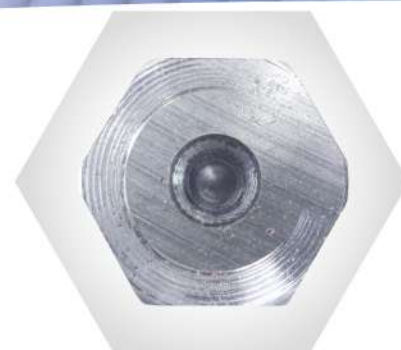
MACHING SPEED COMPARISON:

Base on: Mudule: M3

Material: S45C

Thread Length: 50 mm

TAIWAN	130 seconds. (RGL DS-1000 HZ & HJ)
GERMAN	646 seconds.
JAPAN	750 seconds.



- 銑六角加工件
- HEXAGONAL PART MACHINING



- 六柱槽加工件
- SPLINE SHAFT WORK PIECE



- 軟齒加工件 (配合傘齒輪用)
- WORK PIECE (TO MATCH WITH BEVEL GEAR)



- 蝸桿加工件
- WORM SHAFT WORK PIECE

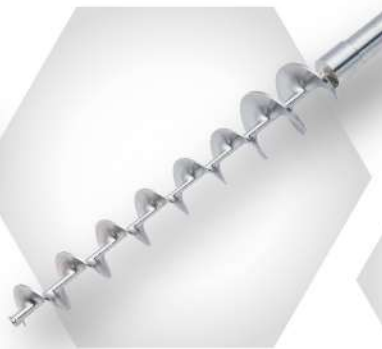


- 倒角後零件
- BALL SCREW

蝸桿滾牙加工測試:
Worm Teeth Cutting Test:
蝸桿材質 / WORM MATERIAL: S45C
模數 / MODULE: M3
長度 / LENGTH: 50 mm
精度 / ACCURACY: 5 μ m / 100 mm
工時 / TIME: 縮短 / SHORTENED BY: 70%



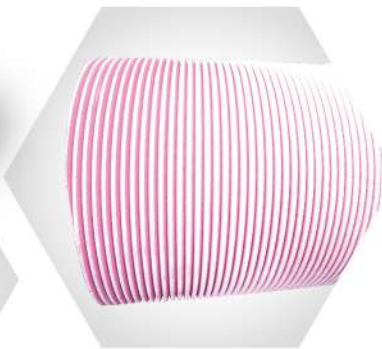
- 雙導程加工件
- DUAL-LEAD WORK PIECE



- 不鏽鋼螺桿零件
- INTEGRAL FORMING FEED ROD



- 尼曼式加工
- CAVEX / NIEMANN



- 砂輪加工
- GRINDING WHEEL MACHINING



砂輪開槽加工

1. 在第一刀架上安裝鑽石銑刀，本機及可執行砂輪開槽加工。

GRINDING WHEEL SLOTTING

1. After mounting a diamond milling cutter on the first tool holder, the machine is capable to perform slotting on grinding wheel.



第二刀架(限DS-1000HZ)

1. 螺牙銳角去除功能。
2. 可加工鍵槽。
3. 銑多角成型。
4. 經由第一刀架加工之螺牙銳角，隨即由第二刀架快速去除，以提升加工品質，縮短工時，節省人力成本。

SECOND TOOL HOLDER

(For DS-1000HZ only)

1. For removing sharp corners on the threads.
2. Applicable for machining keyways.
3. Polygon milling operations.
4. The sharp corners on the threads generated by the first tool holder are quickly removed by the second tool holder, leading to higher machining quality, shortened cycle time and dramatic savings on labor costs.



新代電腦控制器

1. 10.4" 彩色LCD螢幕
2. 介面清楚，易學易操作。
3. 對話式功能介面，即使不熟悉G碼，也可輕易編輯程式。
4. 最小控制單位: 0.0001 mm
5. 附電子手輪，使校機更方便。

SYNTEC COMPUTER CONTROL

1. 10.4" colorful LCD screen.
2. Clear interface makes the controller easy to learn and operate.
3. Conversational function allows for easy program editing even when being unfamiliar with G code.
4. Control unit: 0.0001mm.
5. Equipped with a MPG handwheel for convenient setup.

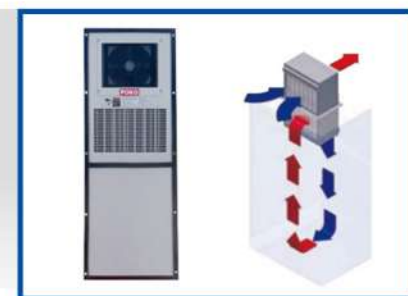


油壓尾座

1. 整體尾座鎖固在鞍座上，位置調整快速方便。
2. 尾軸管移動採用油壓致動，使工件夾料與放料更方便。
3. 尾軸管移動可經由面板上之按鈕控制。

HYDRAULIC TAILSTOCK

1. The tailstock assembly is securely clamped to the saddle with quick and convenient position adjustment.
2. The tailstock quill movement is actuated by hydraulic power, making workpiece clamping and unclamping operations more convenient.
3. The tailstock quill movement can be controlled by a push button on the control panel.



電氣箱熱交換器

1. 電氣箱附有熱交換器，除了可維持電氣箱內部之常溫運作，並且可延長電子元件之使用壽命。

HEAT EXCHANGER FOR ELECTRICAL CABINET

1. With a heat exchanger mounted on the electrical cabinet, the electrical cabinet interior can be maintained at a constant temperature which assures the least troubles and longer life of electronic system and component. In addition, it also helps to increase the service life of the electronic components.



磁吸式捲屑機

1. 內置旋轉機構，有效保護馬達。
2. 吸著力強，輸送量大。
3. 運轉中切削液可自然滴落。

MAGNETIC CHIP CONVEYOR

1. Equipped with a rotation mechanism to effectively protect motor.
2. Powerful suction force and great delivery capacity.
3. During running, cutting fluid drops naturally.



MULTI-FUNCTION CNC WORM GEAR SHAFT PROCESSING MACHINE

多功能數控蝸桿加工機

獨創設計-榮獲多國專利

Taiwan Patented



台灣專利
No. 487160

China Patented



2011年-大陸專利
No.1921971

China Patented



2013年-大陸專利
No.3255623

China Patented



2014年-大陸專利
No.3843859

Japan Patented



日本專利
No. 3193764

Germany Patented



德國專利
No. 20 2014 103 349.1

U.S.A Patented



美國專利
No. US9108259B1

Korea Patented



韓國專利
No. 20-0480155

CHRONICLE OF REGAL MACHINERY CO., LTD. & ITS SUBSIDIARY DING SHEN MACHINERY CO.,LTD.

1992 Regal Machinery is established, mainly produces worm gear reducers.

1993 Introducing gear reducers for wood working machinery.

1994 Assigned as the official supplier of Canadian company Power First.

1995 ~ 2011

Introduced worm gear reducers of aluminum alloy.

Assigned as the official supplier of Renault USA.

Introduced worm shaft driving rotation system for wheel type reducer.

Introduced special purpose gear reducer for mechanical car parking system.

Purchases production equipment from Switzerland, Germany and Japan for the capability of processing dual-lead, increases accuracy of gear reducer. Introduced aluminum alloy motor gear reducer of low temperature and noise level. Market stretches out to Europe and USA.

Introduced new models of CE-conformed gear reducers.

Assigned as the major supplier by US chocolate and ice cream manufacturers.

Developed NC worm shaft forming machine with own R&D capability.

Received Gold Medal Award of Taiwan Excellent Product.

2011 ~ 2016

Won and registered patent of innovation for features of DS-1000 in U.S.A, followed by Taiwan, Japan, China, Germany and Korea.

2014

Ding Shen Machinery Co.,Ltd. was established for producing NC worm shaft forming machine.

銳格精機&鼎紳精機-銳格團隊成立重大紀事

1992 年成立銳格精機 - 主力生產蝸輪減速機

1993 開發木工機專用減速機

1994 成為加拿大POWER FIST指定配合廠商

1995~2011

研發鋁合金蝸輪減速機

成為美國雷諾公司配合廠商

開發蝸桿驅動旋轉系統,製作圓軸式減速機

研發設計立體停車場專用減速機

投資設備,引進瑞士、德國、日本等加工機,具備雙導程加工能力,提昇減速機精密度,研發低溫、低噪音之鋁合金馬達減速機,行銷歐美,建立自有網站 www.rgl.com.tw

生產新型齒輪減速機,通過CE認證

成為美國大廠巧克力、冰淇淋製造機指定配合廠商

2010 自行研發電控螺桿成型加工機

2011 榮獲台灣優良產品金牌獎

2011~2016

通過美國螺桿成型加工發明專利

通過台灣螺桿成型加工機新型專利

通過日本螺桿成型加工機新型專利

通過大陸螺桿成型加工機新型專利

通過德國螺桿成型加工機新型專利

通過韓國螺桿成型加工機新型專利

2014

成立鼎紳精機生產電控蝸桿成型加工機

機械規格 / MACHINE SPECIFICATIONS

項目 / 型號	MODEL	DS-1000HZ	DS-1000HJ
加工能力	CAPACITY		
切削模數範圍	Range of module	M0.25 - M10 (Available with multiple feeds. 可採用多次進刀)	
可分割度數	Degrees of indexing	360°	
最大切削長度	Max. cutting length	900 mm	
最大切削外徑	Max. cutting diameter	250 mm	
最大刀具外徑(孔徑x鍵槽)	Max. tool dia. (hole x keyway)	130 * 31.75 * 7.93 mm	
		130 * 25.4 * 6.35 mm	
		130 * 32 * 8 mm	
螺旋角角度	Helical angle	右旋40度, 左旋90度 / R.H. 40°, L.H. 90°	
工件夾緊方式	Workpiece clamping method	6"油壓夾頭 (6" Hydraulic Chuck)	
尾座模式	Tailstock method	油壓 (Hydraulic)	
運(同)動軸數	Number of simultaneously moving shaft	七軸四連動 (7-Axis simultaneous processing)	五軸三連動 (5-Axis simultaneous processing)
速度	SPEED		
X 軸移動最高速率(前後)	Max. speed of X-axis (for. / back.)	5000 mm/min	5000 mm/min
Y 軸移動最高速率(左右)	Max. speed of Y-axis (right / left)	5000 mm/min	5000 mm/min
A 軸移動最高速率(夾頭)	Max. speed of A-axis (chuck)	4800 mm/min	4800 mm/min
Z 軸移動最高速率(上下)	Max. speed of Z-axis (up / down)	5000 mm/min	-
S 軸銑刀最高轉速	Max. angular speed of S-axis cutter	2000 rpm	-
C 軸銑刀最高轉速	Max. angular speed of C-axis cutter	400 rpm	400 rpm
加工切削時的最高速度	Max. speed of cutting stroke	5000 mm/min	5000 mm/min
精度	ACCURACY		
加工垂直度	Perpendicularity of machining	±5 μm / 100 mm	
工件精度等級	Workpiece precision	3~4 級	
工件表面粗糙度(μm)	Workpiece surface quality (μm)	Ra 0.8	
馬達	MOTOR		
C 軸銑刀馬達	C axis cutter motor	7.5 KW / 48 NM	7.5 KW / 48 NM
X 軸馬達	X axis motor	1.8 KW / 11.5 NM	1.8 KW / 11.5 NM
Y 軸馬達	Y axis motor	2.9 KW / 18.6 NM	2.9 KW / 18.6 NM
Z 軸馬達	Z axis motor	1.8 KW / 11.5 NM	-
A 軸馬達	A axis motor	1.8 KW / 11.5 NM	1.8 KW / 11.5 NM
S 軸銑刀馬達	S axis cutter motor	1.8 KW / 11.5 NM	-
B 軸馬達(刀具傾斜軸)	B axis motor (Cutter tilting axis)	0.4 KW / 1.27 NM	0.4 KW / 1.27 NM
切削油馬達	Cutting fluid motor	0.4 KW (1 / 2 HP)	0.4 KW (1 / 2 HP)
油壓用馬達	Hydraulic motor	0.75 KW (1 HP)	0.75 KW (1 HP)
油量控制器	Oil controller	0.15 KW	0.15 KW
捲屑機*2台	Chip conveyor x 2 unit	40W*1 / 0.2 KW*1	40W*1 / 0.2 KW*1
其他	MISCELLANEOUS		
總電力(KW)	Total power (kw)	20 KW / 30 KVA	16 KW / 20 KVA
淨重	Net Weight	4600 KGS	4000 KGS
毛重	Gross Weight	5200 KGS	4450 KGS
機械尺寸	Machine dimensions	340 * 271 * 209 CM	340 * 271 * 165 CM
裝箱尺寸	Packing dimensions	380 * 290 * 254 CM	380 * 290 * 210 CM

• 由於不斷的研究與發展, 本公司保有修改規格及不另行通知的權力。
• Due to continuous improvement and development, specifications are subject to change without prior notice.



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