



和太工業成立於1966年，成立以來一直致力於齒輪生產技能的提升。在台灣，工具機一直是台灣重要且十分有競爭力的產業，和太工業在不斷成長與進步的發展過程中，對於齒輪生產的量與質都非常的重視，對於生產高精度與高效率齒輪機械一直是和太工業技術提升與發展的重要的課題。自2003年起和太工業開始致力於CNC齒輪切削機械的研發，2005成立機械事業部，經歷不斷的研發與嚴格的品質與生產測試，如今以 "HARTECH" 為機械品牌在全球行銷。不斷創新提升齒輪製造工藝為和太工業一直追求的目標，結合和太工業專業的齒輪製造技術經驗，對於客戶的服務由提供單一加工機械到整個生產加工規劃的系統性服務。

HOTA Industrial Mfg Co., Ltd. was set up in 1966, and has been committed to gear production improvement since establishment. In Taiwan, machine tools have been an important and very competitive industry. Production quantity and quality of the gears are very important during company growth and development. Production of high-precision and high-efficiency gear machinery has been a vanguard for technology enhancement and development of Hota Industrial. Since 2003, Hota Industrial started to focus on R & D of CNC gear cutting machine and set up a machinery division in 2005. Through continuous R & D and strict quality and production test, it's now branded "HARTECH" for the global machine market. Continuous enhancement and innovation of gear manufacturing process has been the goal that Hota Industrial pursues. Combined with professional gear manufacturing experience of HOTA, we provide customer solutions from single process machinery to systematic planning of gear cutting production.



HGH 150 / HGH 250

高效能CNC滾齒機 HIGH EFFICIENT HOBBING MACHINE

採共用底座與模組化結構設計，機身結構剛性強大；EGB同步控制技術配合無背隙減速機主軸，可高速且穩定產出高精密等級齒輪。

HGH 150/250—The high performance CNC gear hobbing machine has outstanding rigidity and adopts modular construction design. Equipped with EGB synchro-control technology and backlash-free gear reducer spindle, HGH 150/250 has high stability and productivity to produce precise gears.



刀具之夾持與放鬆以油壓裝置操作方式快速完成，上部工件治具以ISO40介面及油壓裝置快速交換與夾持。

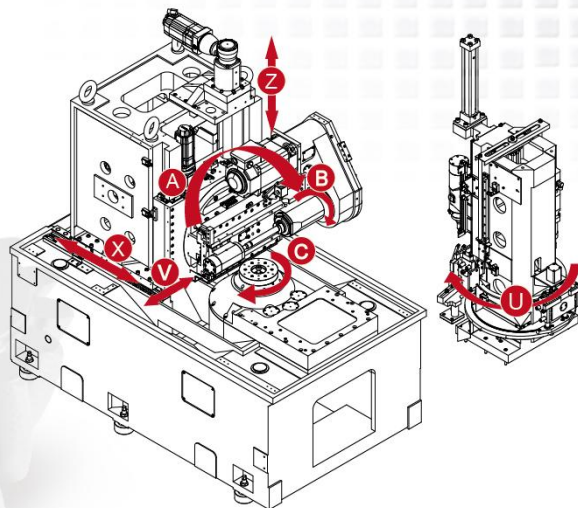
The changing of cutter and upper work arbor (ISO40 interface) is quickly done by hydraulic system.

油壓、潤滑及空壓裝置設計於機台正面，便於操作人員掌握機台狀態及機械維護人員作業。

The hydraulic, lubrication and air pressure system are located on the front side of the machine, and it is convenient for the operator and maintenance engineer to monitor and maintain the machine.

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X	徑向進給	Radial infeed
Z	軸向進給	Axial infeed
B	刀具主軸	Hob spindle
C	工件主軸	Work table revolution
A	刀具頭迴轉軸	Hob head swivel
V	刀具移動軸	Hob shifting
U	工件交換軸	Work change



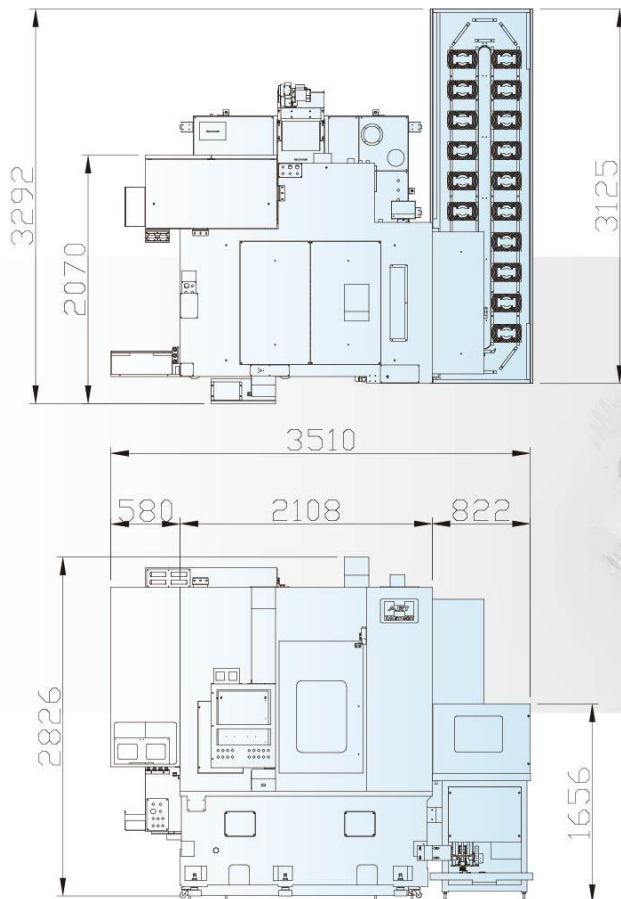
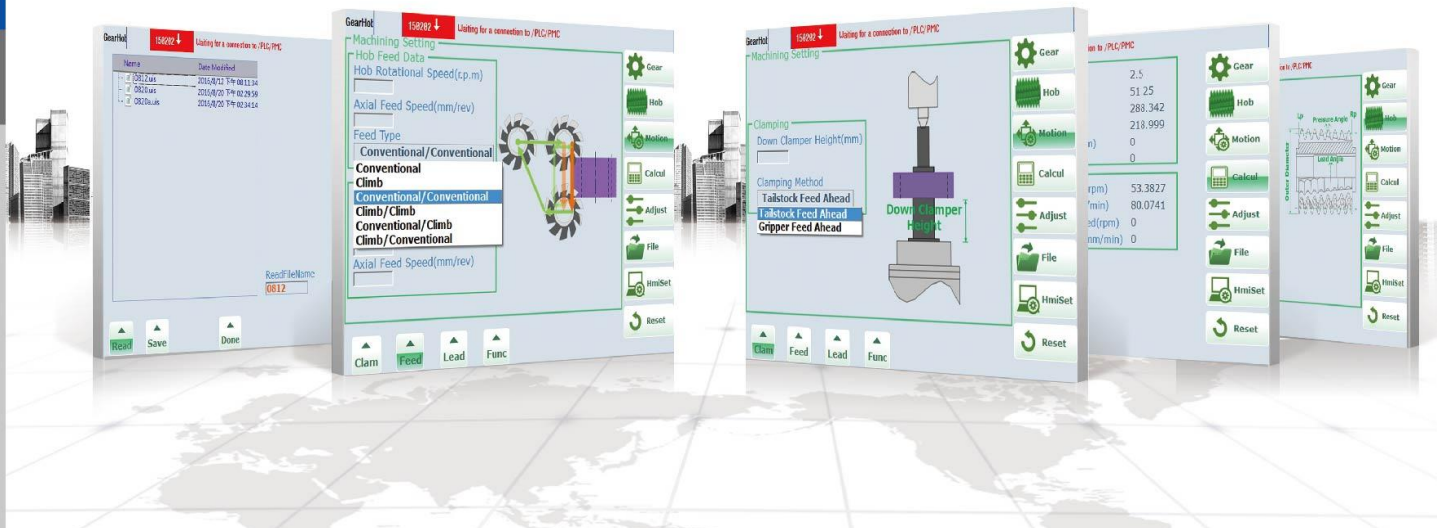
CNC齒輪滾齒機 技術規格：Specification

項目	Articles	敘述 Description	HGH 250 規格 Capacities	HGH 150 規格 Capacities	HGH 180 規格 Capacities
工件	Works	最大工件外徑 Max. O.D.	250 mm	150 mm	180 mm
		最大模數 Max. Module	6 mm	6 mm	3.5 mm
徑向進給X軸	Radial infeed X-axis	刀具軸至工件軸中心距離 Distance between hob and work	25~215 mm	25~190 mm	25~190 mm
軸向進給Z軸	Axial infeed Z-axis	最大行程 Max. in feed		250 mm	
刀具頭迴轉A軸	Hob head swivel A-axis	迴轉角度 Swivel angle		±45°	
刀具軸向進給V軸	Hob shifting V-axis	最大行程 Max. infeed	180 mm	180 (140) mm	180 (140) mm
		最大刀具長度 Max. hob length	220 mm	220 (160) mm	220 (160) mm
刀具主軸B軸	Hob shifting B-axis	最高轉速 Max. rpm	1500 rpm		4000 rpm
		最大刀具外徑 Max. hob O.D.	130 mm	90 mm	90 mm
工件迴轉主軸C軸	Work spindle C-axis	最高轉速 Max. rpm	300 rpm		400 rpm
電力規格	Power	工作電壓 Input power (V±10%)		3Φ 380 V AC	
		頻率 Frequency		50-60 Hz	
		控制電壓 Controlled voltage		24 V DC	
油壓單元	Hydraulic Unit	馬達 Motor power		1.5 KW	
		油箱 Oil tank		80 Liter	
控制器	Controller	伺服控制軸 NC axis	SIEMENS / FANUC		
			B、C、X、Z、A、V 伺服軸 Servo motor		
操作介面	Interface	型式/語言 Type/Language	對話式 / 中文或英文 Dialog function / Mandarin or English		
		加工方式 Cutting method	標準6種加工模式 Standard : 6 methods / 鼓型齒 Crowning / 蝸輪 Worm		
切削模式	Cutting mode	切削方式 Cutting mode	乾式 / 溼式 Dry cut / Wet cut		
機台尺寸	Dimension	寬 x 深 x 高 W x L x H	2688 x 2630 x 2830 mm		
機台重量	Weight		9000 KG		

INTERFACE

HARTECH 滾齒機的操作介面採用對話式程式，結合圖形說明，一目了然的操作環境可以很容易讓使用者了解操作方式，縮短學習時間。

HARTECH dialog operation interface with assistant drawings is a friendly operating program. Operators can easily understand and learn it.



註：圖片僅供參考用 依實際尺寸為主

HGH 80

高效能滾齒加工 HIGHLY EFFICIENT HOBBING

HGH80 臥式CNC滾齒加工機，採用直驅式主軸配合EGB同步控制技術可超高線速度滾齒加工

HGH 80—The horizontal CNC gear hobbing machine. Equipped with built-in spindle and EGB synchro-control technology, HGH80 could perform high speed and high precision cutting.



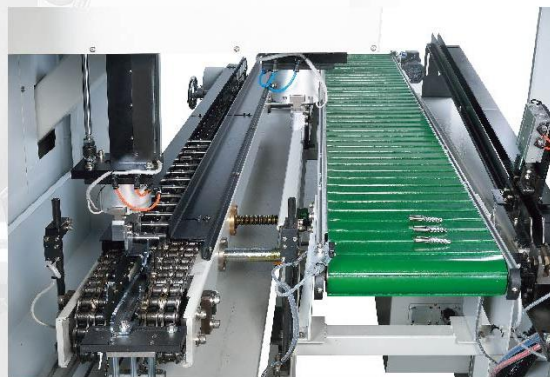
CNC齒輪滾齒機 技術規格：Specification

項目	Articles	敘述 Description	規格 Capacities
工件	Works	最大工件外徑 Max. O.D.	80 mm
		最大模數 Max. Module	2.5 mm
徑向進給 X軸	Radial infeed X-axis	行程 Stroke	100 mm
		刀具軸至工件軸中心距離 Distance between hob and work	10~110 mm
軸向進給 Z軸	Axial infeed Z-axis	行程 Stroke	350 mm
		與工件主軸端面距離 Distance between hob spindle	80~430 mm
刀具頭迴轉 A軸	Hob head swivel A-axis	迴轉角度 Swivel angle	±45°
		最大刀具長度 Max. hob length	130 mm
刀具主軸 B軸	Hob shifting B-axis	最高轉速 Max. rpm	6000 rpm
		最大刀具外徑 Max. hob O.D.	60 mm
刀具軸向移動 Y軸	Hob shifting Y-axis	移動行程 Stroke	110 mm
工件迴轉主軸 C軸	Work spindle C-axis	最高轉速 Max. rpm	500 rpm
		移動行程 Stroke	300 mm
工件頂心行程 W軸	Work center travel W-axis	頂心與主軸端面距離 Distance between hob spindle	280~580 mm
電力規格	Power	工作電壓 Input power (V±10%)	3Φ 380 V AC
控制器	Controller	—	SIEMENS
		伺服控制軸 NC axis	B、C內藏式主軸 Built-in / X、Z、A、Y、W 伺服軸 Servo motor
操作介面	Interface	型式/語言 Type/Language	對話式 / 中文或英文 Dialog function / Mandarin or English
		加工方式 Cutting method	標準6種加工模式 Standard : 6 methods / 鼓型齒 Crowning / 雙層齒加工 Double gear(選配 Option)
切削模式	Cutting mode	切削方式 Cut method	乾式 / 溼式 Dry cut / Wet cut
機台重量	Weight	—	7000 KG

彈性工件自動送料台與門型機械手臂

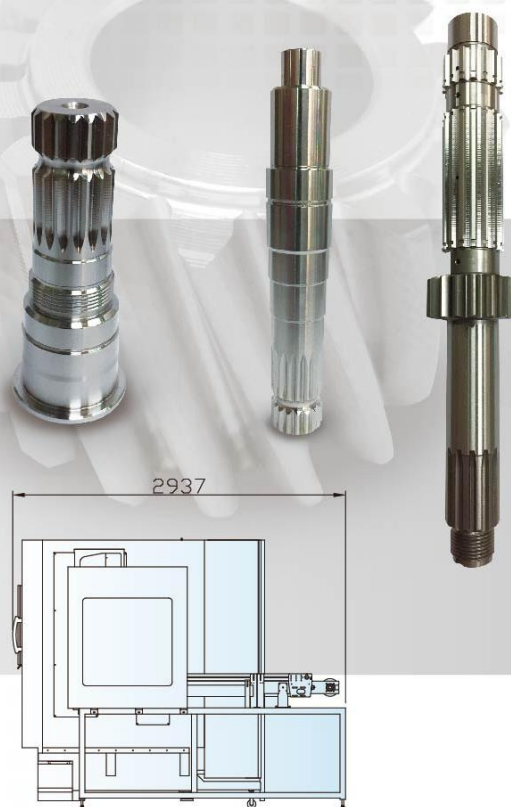
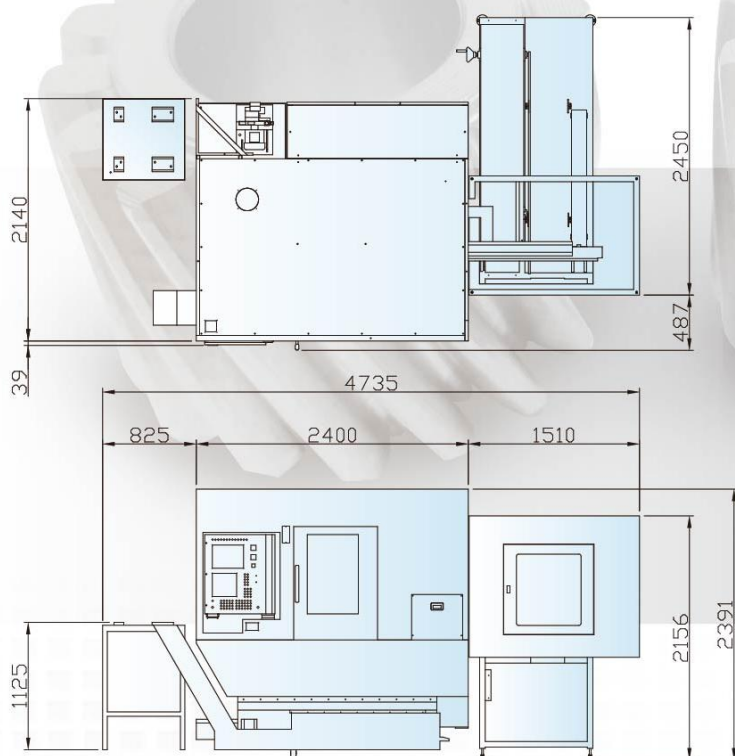
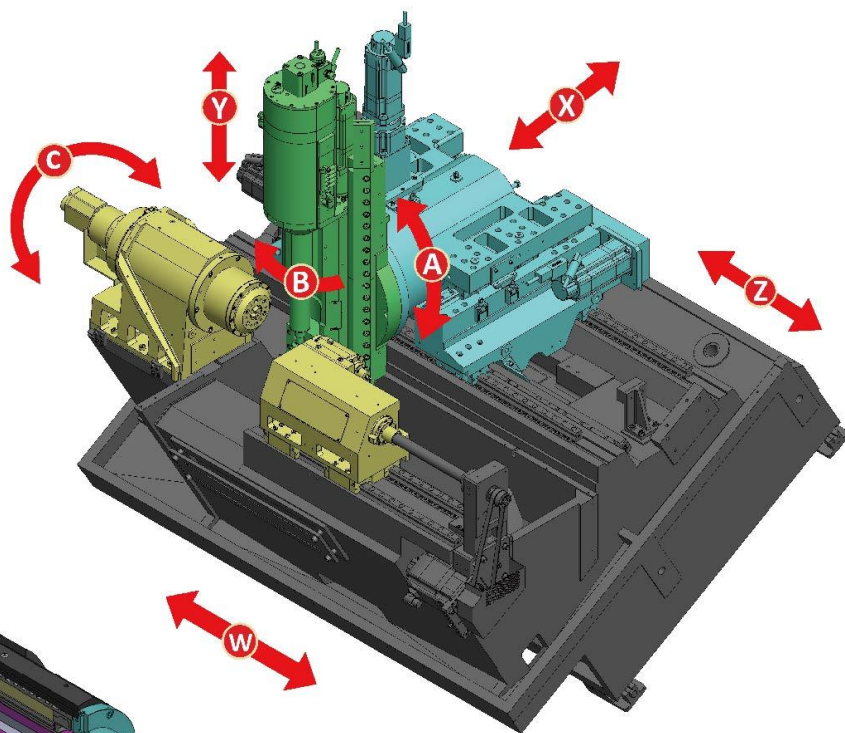
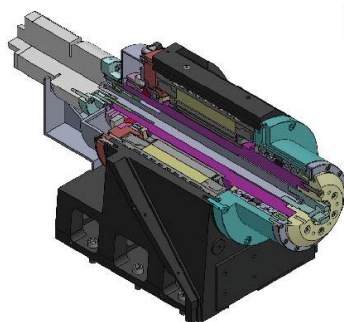
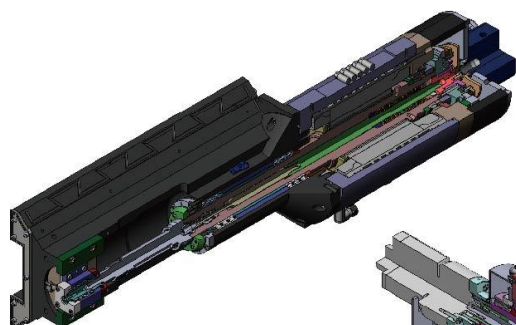
實現多樣性工件自動化與高速供料的作業。

The flexible auto feeding conveyor and gantry loader system adapt to variety components and achieve high speed workpiece feeding.



A	刀具角度旋轉	HOB head swivel
B	刀具主軸	HOB spindle
C	工件主軸	Work spindle
W	工件頂心進給	Work center travel
X	刀具徑向進給	HOB radial infeed
Y	刀具移位進給	HOB shifting
Z	刀具軸向進給	HOB axial infeed

內藏式主軸 BUILT IN SPINDLE



註：圖片僅供參考用 依實際尺寸為主

Remark: The picture above is reference only. The real object should be considered as final.

HGS 4H-NC4 / NC5

CNC高精密刮齒機

GEAR SHAVING MACHINE



高剛性結構

High Rigidity Structure

溫昇補償模組

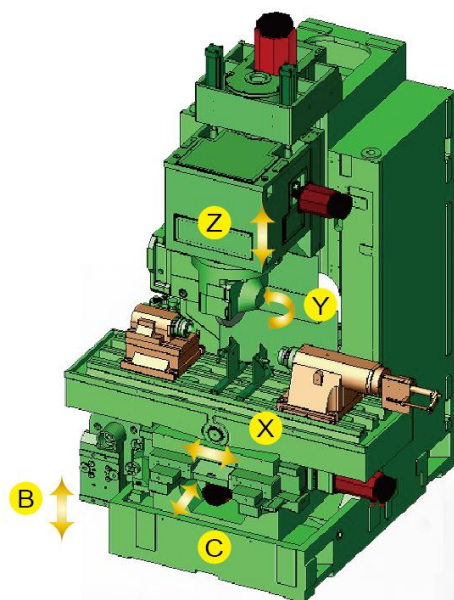
Thermal Compensation Module

高效能加工

High Efficient for cutting

機械規格：Specification

項目 Articles	敘述(摘要) Description	單位 Unit	規格 Capacities
			HGS 4H-NC5 / HGS 4H-NC4
加工齒輪 Work gear	外徑 Outer diameter	mm	25-400
	最大齒寬 Max. tooth width	mm	150
	模數 Module	-	1-8
加工台 X軸 Worktable X-axis	最大行程距離 Maximum stroke length	mm	±75
	進給速度 Feeding speed	mm/min	1-500
	左右尾座中心距離 Center distance between L&R tailstocks	mm	700
加工台 C軸 Worktable C-axis	最大行程距離 Max. stroke length	mm	±6
	進給速度 Feeding speed	mm/min	1-500
	刮齒刀最大刀徑 Shaving cutter max. diameter	mm	265
刀具頭(主軸頭) Cutter head	主軸直徑 Spindle diameter	mm	63.5
	刀具數 Cutter quantity	pc	1
	主軸迴轉速 Spindle speed	rpm	10-400
	刀具頭旋轉角度 Cutter head swivel angle	deg	±15
	角度單位設定 Angle increment	deg	0.001
	刀具頭進給行程 Max. feeding stroke	mm	180
Z軸進給 Infeed Z-axis	最高進給速率 Rapid feeding speed	mm/min	2000
	行程設定單位 Stroke setting unit	mm	0.001
馬達 Motors	刀具頭主軸馬達 Spindle motor	KW/AC	5.5
	Z軸進給馬達 Feeding motor(Z-Axis)	KW/AC	3
	X軸進給馬達 Feeding motor(X-Axis)	KW/AC	1.6
	C軸進給馬達 Feeding motor(C-Axis)	KW/AC	1.6
	Y軸旋轉馬達 Swivel motor(Y-Axis)	KW/AC	1.4
B軸進給馬達 Feeding motor(B-Axis)		KW/AC	1.4(NC5)
	NC unit	-	FANUC
加工方式 Cutting method			平行式 Conventional
			對角式 Diagonal
			橫移式 Under-pass
			直進式 Plunge
操作面板 Operation program			對話式(標準) Dialog function (Standard)
			中/日/英 English/Japanese/Mandarin
			參數式(選配) Variable input system (Option)
機械規格 Machine size	長 Length	mm	2423
	寬 Width	mm	2210
	高 Height	mm	2777
機械重量 Machine weight		kg	7000



Model No.	HGS 4H-NC5	HGS 4H-NC4
X axis	●	●
C axis	●	●
Z axis	●	●
Y axis	●	●
B axis	●	

軸向敘述加工摘要

X軸:工作軸向行程

C軸:工作台徑向行程

Z軸:刀具進給行程

Y軸:刀具頭旋轉角度

B軸:冠齒及推拔行程

AXIS DESCRIPTION

X axis:Work table motion

C axis:Work table motion

Z axis:Cutter feeding stroke

Y axis:Cutter head swivel angle

B axis:Crowning and taper motion

高剛性結構

HIGH RIGIDITY STRUCTURE

機台以結構對稱均勻的高剛性立柱結構為基礎，並應用震動應力消除技術，提升結構精度。

High rigidity column constructed with symmetrical character and VSR (Vibratory Stress Relief) treatment.



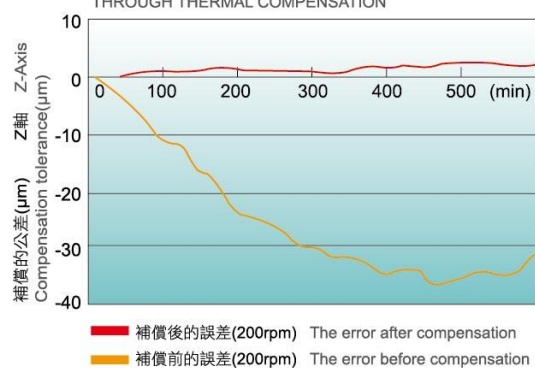
溫昇補償模組 THE COMPENSATION MODULE



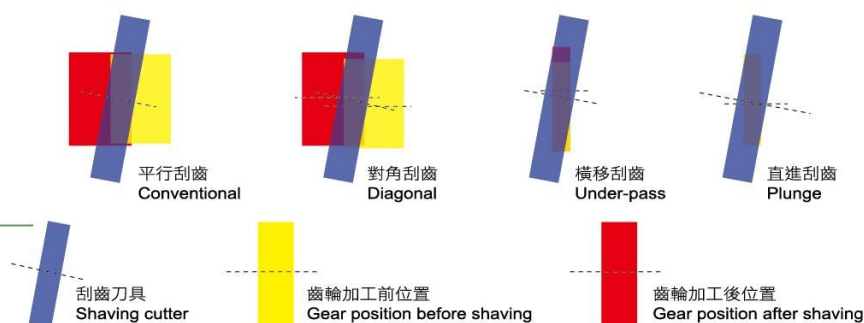
本機台所採用之溫昇熱變位補償技術，是透過長時間記錄結構多處溫測點與熱應變之數據為基礎，分析產生最佳溫度測定點與補償曲線，經補償後熱變形量低於 $4\mu\text{m}$ 。

Mathematical analysis of experiments in temperature fluctuation resulted in the development of the Thermal Compensation Module, capable of regulating thermal deformation's tolerance within $4\mu\text{m}$.

經溫昇補償後熱變形量結果
THE RESULT OF THERMAL DEFORMATION
THROUGH THERMAL COMPENSATION



加工方式敘述 THE DESCRIPTION OF MACHINING METHOD



9 www.hartech.com.tw

HGD 250-NC2

CNC齒輪倒角機 CNC GEAR DEBURRING MACHINE

高加工效率與高生產力，非常適用於大量工件生產。
High productive elasticity and cutting efficiency, especially fits for mass production.
特別適用於有肩部形狀或多層齒輪工件的倒角加工。
Especially capable for removing the burr and sharp angle of gear with shoulder feature.



倒角刀具
Deburring cutter.



自動搬運裝置 Auto loading device



機械規格 SPECIFICATIONS

項目 Articles	敘述 Description	單位 Unit	規格 Capacities
加工齒輪 Work gear	外徑 Max. Diameter	mm	250
	齒寬 Max. Tooth width	mm	50
	模數 Module	-	1.5~5
NC unit	Fanuc 0i-mate TD	-	-
其他 Others	機器尺寸 Machine size	長 Length	1650
		寬 Width	1050
		高 Height	2100
	機器重量 Machine weight	kg	850