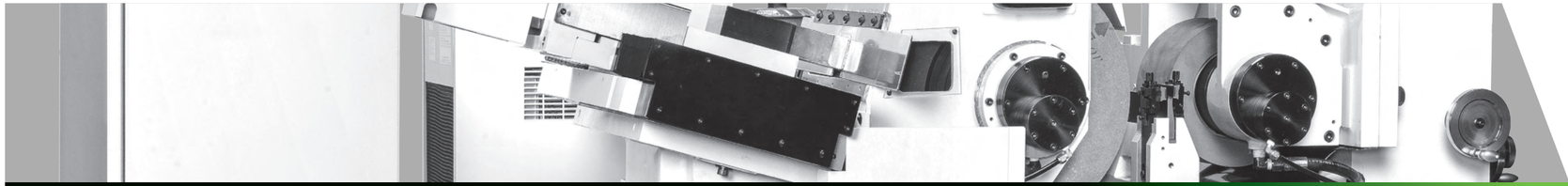
ROUGHNESS OF SURFACE COMPARISON FORM

表粗比較表

	Ra μm	CLA μ"	Rt μm	Rz μm	RMS μm	RMS μ"	France		
	0.008	0.32	0.08	0.04	0.009	0.30			
	0.010	0.40	0.10	0.05	0.011	0.40			▽14
	0.012	0.50	0.12	0.06	0.013	0.50			
	0.016	0.63	0.16	0.08	0.018	0.70	9	N1	▽13
	0.020	0.80	0.20	0.10	0.022	0.90			
	0.025	1	0.25	0.12	0.027	1.10			
	0.030	1.20	0.30	0.15	0.033	1.30			
	0.032	1.25					10	N2	▽12
	0.040	1.60	0.40	0.20	0.044	1.80			
	0 050	2	0.50	0.25	0.055	2.20			
	0.060	2.40	0.60	0.30	0.066	2.65			
	0.063	2.50	0.63	0.32	0.073	2.87			
	0.080	3.2	0.80	0.40	0.088	3.50	11	N3	▽11
	0.090	3.6			0.10	4.20			
	0.10	4	0.90	0.50	0.11	4.40			
	0.125	5	1.05	0.60	0.137	5.40			
	0.14	5.60							
	0.16	6.30	1.30	0.85	0.177	7	12	N4	▽10
	0.18	7.20			0.20	8			
	0.20	8	1.60	1	0.22	8.80			
	0.25	10	2	1.20	0.27	10.80			
	0.30	12	2.50	1.60	0.33	13.20			
	0.32	12.50			0.35	14	13	N5	▽9
	0.35	14							
	0.40	16	3	2	0.44	17.60			
	0.45	18	3.50	2.25	0.50	20			
	0.50	20	4	2.50	0.55	22	14	N6	▽8
	0.63	25	5	3	0.73	28.70			
	0.80	32			0.88	35			
	1	40							
	1.25	50	10	6	1.37	54.60			
	1.50	60					15	N7	▽7
	1.60	63			1.77	69.70			
	1.80	72							
	2	80			2.20	88			
	2.50	100	15	10	2.70	108	16	N8	▽6
	3.2	125			3.55	140			
	4	160			4.40	176			
	5	200	30	20	5.50	220	17	N9	▽5
	6	240							
	6.30	250			7.30	287			
	8	320			8.8	350			
	10	400	50	40	11	440	18	N10	▽4
	12.5	500			13.7	546			
	16	630			17.7	697			
	20	800	100	80	22	880	19	N11	▽3
	25	1000			27	1080			
	32	1250							
	40	1600	200	160	44	1760	20	N12	▽2
	50	2000							
	63	2500							
	80	3200	400	320	88	3500			▽1
	100	4000							

1μm = 0.001mm=39.37μ" 1μ"0.000.001=0.0254μm



H-series

高速液靜壓無心磨床

HIGH SPEED HYDROSTATIC CENTERLESS GRINDING MACHINE

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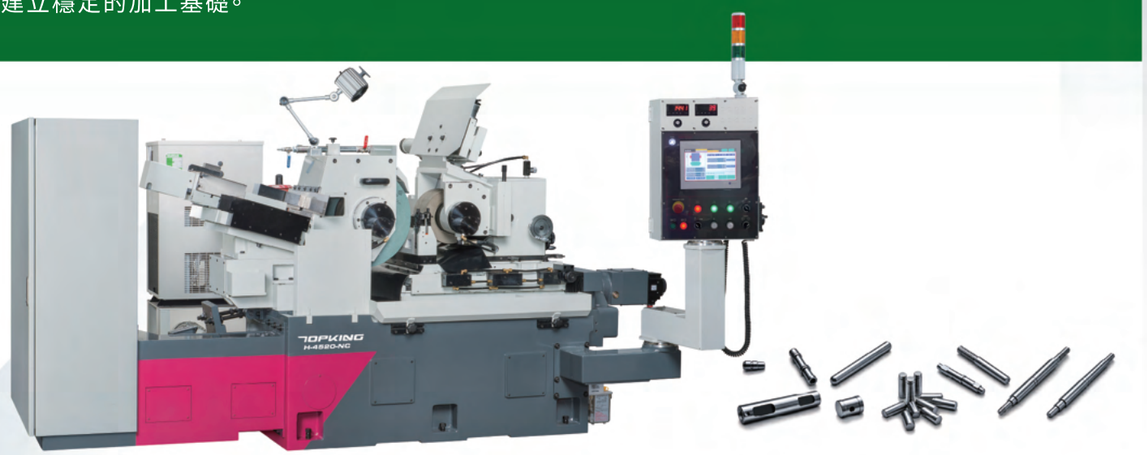
HYDROSTATIC TECHNOLOGY
液靜壓技術

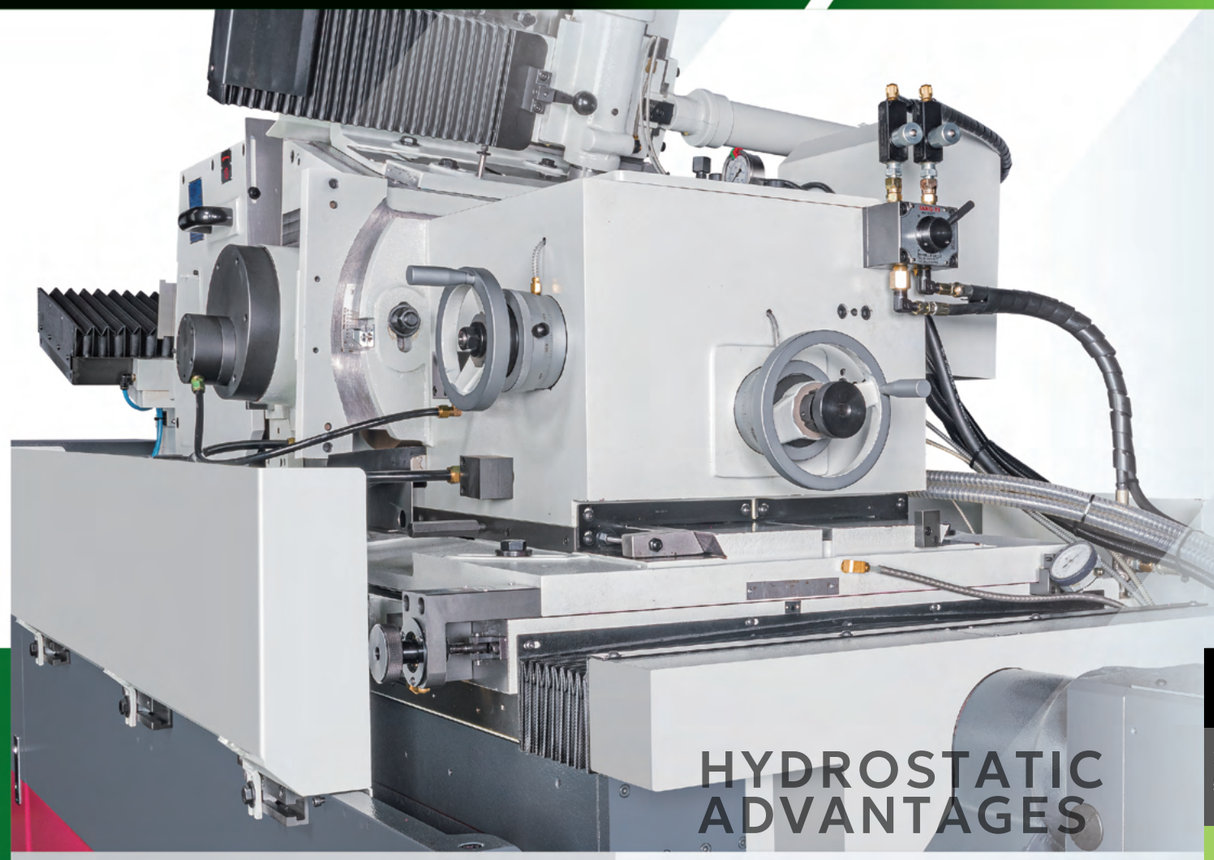
HYDROSTATIC SPINDLE & INFEED SYSTEM

The TOPKING H Series features hydrostatic technology in both the grinding-wheel and regulating-wheel spindles, as well as the regulating-wheel infeed system. Pressurized oil films support the spindles without metal-to-metal contact, reducing friction and wear while ensuring stable rotation. Hydrostatic guideways provide smooth, low-friction movement of the regulating-wheel slide. Combined with servo-driven infeed and fine adjustment control, the system supports precise, stable infeed motion during continuous production.

液靜壓主軸與進刀系統

TOPKING H 系列將液靜壓技術應用於砂輪主軸、調整輪主軸及調整輪座進刀系統。主軸透過高壓油膜形成非接觸式支撐，降低摩擦與磨耗，維持穩定迴轉；調整輪座則採用液靜壓滑軌，提供平順、低摩擦的進退運動，搭配伺服驅動與精密進給控制，提升微量進刀的穩定性與控制精度，為長時間精密研磨建立穩定的加工基礎。





液靜壓特色

HYDROSTATIC ADVANTAGES

A HYDROSTATIC SPINDLES
液靜壓主軸

Stable Spindle Support 穩定主軸支撐

A pressurized oil film supports both the grinding-wheel and regulating-wheel spindles, providing smooth, stable rotation across a wide speed range.

高壓油膜穩定支撐砂輪與調整輪主軸，使其在不同轉速下維持平順迴轉，有助於提升研磨穩定性。

Non-Contact Support 非接觸式支撐

The hydrostatic oil film separates the spindles from their bearing surfaces, reducing metal-to-metal contact and mechanical wear.

穩定油膜避免金屬直接接觸，降低機械磨耗。

Reduced Friction and Heat Generation 低摩擦、低溫升

Non-contact oil-film support reduces friction and heat generation. Combined with oil temperature control, it helps maintain stable spindle operation and grinding accuracy.

非接觸式油膜支撐降低運轉摩擦與摩擦熱，搭配油溫控制，有助於維持主軸運轉及研磨精度的穩定性。

B HYDROSTATIC INFEED SYSTEM
液靜壓進刀系統

Smooth Infeed Motion 平順進刀

Hydrostatic guideways provide smooth, low-friction movement of the regulating-wheel slide, supporting stable and precise infeed control.

液靜壓滑軌提供平順、低摩擦的運動特性，使調整輪座進退更加穩定，有助於提升進刀控制精度。

Reduced Drive Backlash 降低傳動背隙

A servo motor paired with a harmonic reducer minimizes backlash in the regulating-wheel infeed drive while increasing drive torque.

伺服馬達搭配諧波減速機，降低調整輪座進刀傳動的背隙，同時提升驅動扭矩與進給控制穩定性。

Fine Infeed Control 微量進刀控制

The regulating-wheel infeed system allows manual fine adjustment in increments of 0.001 mm, with a minimum programmable NC infeed increment of 0.0005 mm.

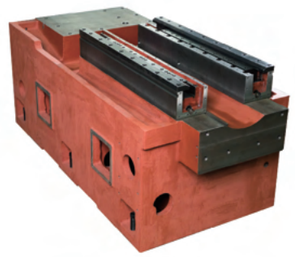
調整輪座手動微調最小進給量為 0.001 mm；NC 數控進刀最小設定增量為 0.0005 mm，滿足精密研磨的微量進刀需求。

RIGID MACHINE BASE

高剛性機體

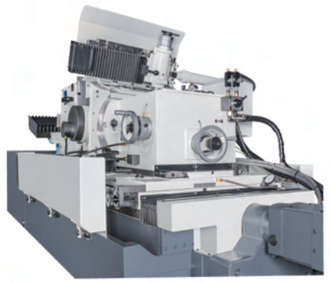
- **Machine Base** is made of high-quality Meehanite cast iron and stress-relieved before precision machining.
- **Sliding Surfaces** are induction-hardened and precision-ground to improve wear resistance and long-term structural stability.

機體：採用米漢納鑄鐵，經熱處理與應力消除後再進行精密加工。
滑軌：經高週波硬化與精密研磨，提升結構穩定性與耐磨耗性。



HYDROSTATIC GUIDEWAY

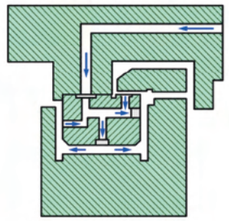
靜壓進刀滑軌





- **Automatically Lubricated Hydrostatic Guideway**
  Provides the structural foundation for precise infeed motion.
- **Servo Drive with Harmonic Reducer**
  Reduces backlash and improves transmission control.
- **Fine Infeed Control**
  Manual adjustment down to 0.001 mm
  NC-controlled infeed down to 0.0005 mm

- **自動潤滑靜壓滑軌**
  作為精密進刀運動的核心導引結構。
- **伺服驅動＋諧波減速機**
  降低傳動背隙，提升進刀控制穩定性。
- **微量進給控制**
  手動最小進給量 0.001 mm
  數控進給最小可設定至 0.0005 mm

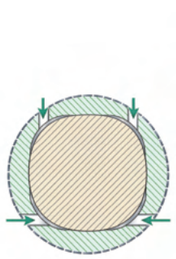


HYDROSTATIC SPINDLE CONFIGURATION

液靜壓主軸配置

Both the grinding-wheel and regulating wheel spindles feature hydrostatic bearings. A continuous pressurized oil film supports each spindle, ensuring stable, precise rotation with minimal mechanical wear.

- **Reduced Mechanical Wear**
  Non-contact oil-film support reduces friction and wear, extending component service life.
- **Stable Oil-Film Support**
  Proper control of oil quality, filtration, pressure, and temperature maintains consistent spindle performance.
- **Lower Maintenance Costs**
  Reduced mechanical wear helps minimize maintenance requirements, downtime, and replacement costs.





砂輪與調整輪主軸皆採用液靜壓支撐，透過高壓油形成穩定油膜，使主軸保持精準迴轉，同時減少機械磨耗。

- **降低機械磨耗**
  非接觸式油膜支撐可減少摩擦與磨耗，延長相關零件使用壽命。
- **維持油膜穩定**
  妥善管理油品、過濾系統、供油壓力及油溫，維持主軸穩定運轉。
- **降低維修成本**
  減少機械磨耗，有助於降低維修需求、停機時間及零件更換成本。



OIL COOLANT SYSTEM

油溫冷卻系統

An oil cooler maintains a stable hydrostatic oil temperature, reducing thermal variation and helping preserve machining accuracy during continuous operation.

油溫冷卻系統可穩定控制液靜壓油溫，降低溫度變化對加工精度的影響，有助於長時間運轉下維持穩定加工品質。

ACCUMULATOR PROTECTION SYSTEM

蓄壓保護系統

In the event of a power failure, the accumulator temporarily maintains oil pressure to support the hydrostatic oil film while the spindle comes to a stop, reducing the risk of damage.

發生非預期斷電時，蓄壓器可暫時提供油壓支撐，使主軸停止前仍維持液靜壓油膜，降低因瞬間失壓造成主軸損傷的風險。

GRINDING & REGULATING WHEEL DRESSING SYSTEM

砂輪與調整輪修整裝置

The dressing units use heat-treated alloy cast iron for wear resistance and structural stability. Hydraulic traverse is standard, while servo-driven profile dressing is available for formed wheel profiles. Dressing speed can be continuously adjusted to suit different grinding requirements.

砂輪與調整輪修整座採用特殊合金鑄鐵，經熱處理提升耐磨耗性與結構穩定性。標準採油壓驅動修整，亦可依加工需求搭配伺服馬達進行成型修整；修整速度可無段調整，以配合不同研磨條件。



Grinding Wheel Dresser

The grinding wheel dresser uses a recessed dovetail slideway with a wide bearing surface to improve rigidity and stability during dressing.

砂輪修整結構

砂輪修整座下滑道採下凹式鳩尾槽設計，搭配較寬的滑動支撐面，提升修整過程中的剛性與穩定性。



Regulating Wheel Dresser

The regulating wheel dresser can be adjusted to suit the workpiece geometry, supporting accurate wheel setting and cylindrical grinding performance.

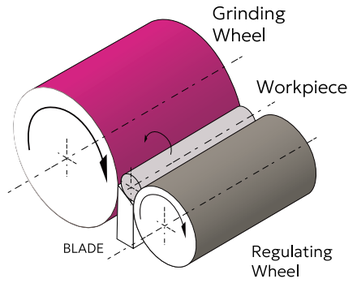
調整輪修整結構

調整輪修整座可依工件需求調整角度，配合不同加工條件進行修整，有助於維持工件圓筒精度。

CENTERLESS GRINDING 無心研磨

In centerless grinding, the workpiece is supported by the work-rest blade and regulating wheel without the use of centers or conventional clamping. The grinding wheel removes material, while the regulating wheel controls workpiece rotation and feed.

砂輪(G.W.)、調整輪(R.W.)與工作支撐刀片共同支撐工件，使工件在不使用中心孔與夾具的情況下旋轉並進行外徑研磨。砂輪負責材料去除，調整輪控制工件轉速與進給，工作支撐刀片則決定工件的支撐位置。



GRINDING METHODS 研磨方式



Thru-feed grinding

The workpiece moves continuously through the grinding zone, making through-feed grinding suitable for straight shafts and bars without shoulders that would interrupt axial movement. The regulating wheel angle generates the axial feed.

通過式研磨

工件連續通過磨削區，適合外徑連續且無肩部阻擋的軸類或棒材。調整輪傾斜角提供軸向推力，使工件沿磨削區持續前進。



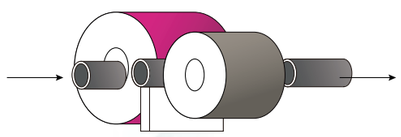
In-feed grinding

The workpiece remains in a fixed axial position during the grinding cycle. In-feed grinding is suitable for stepped, shouldered, and specially profiled components, depending on the wheel profile and dressing setup.

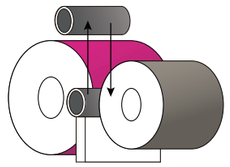
停止式研磨

工件進入磨削區後於固定位置加工，適合具有段差、肩部或特殊外形的工件，可依工件輪廓與修整方式進行定點研磨。

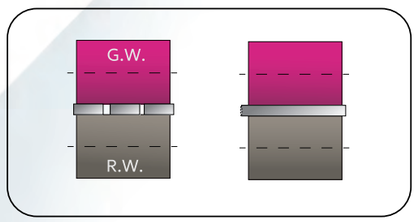
GRINDING PROCESS 研磨示意

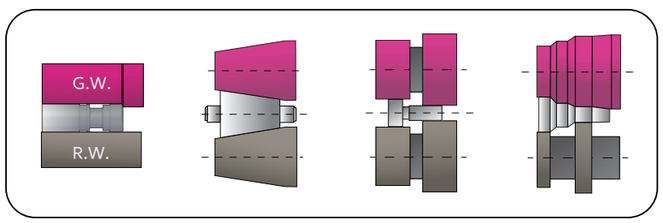


Thru-feed grinding 通過式研磨



In-feed grinding 停止式研磨





FLEXIBLE HANDLING SOLUTIONS FOR DIFFERENT PRODUCTION

依生產需求彈性整合送收料方案

The H Series supports integration with loading, unloading, and work-piece-handling systems to suit different production requirements. Solutions range from standalone automation to multi-machine line integration, configured around the workpiece and grinding process.

H 系列可依工件特性、生產需求與產線配置，整合不同形式的送料、收料及工件搬運系統。從單機送收料設備到多機連線，可依實際研磨製程進行配置。

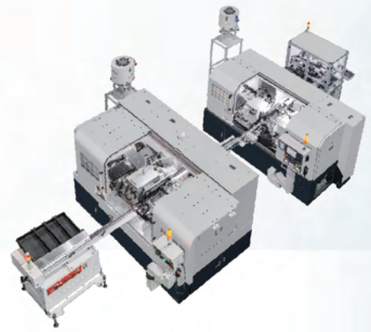


AUTOMATION SOLUTIONS 自動化方案



AUTOMATIC LOADING AND UNLOADING ATTACHMENT

通過式研磨自動送收料裝置



MULTI-MACHINE INLINE INTEGRATION

多機連線整合



VIBRATORY FEEDER

振動盤送料裝置



GANTRY-TYPE AUTOMATIC LOADING & UNLOADING ATTACHMENT

龍門式自動上下料裝置

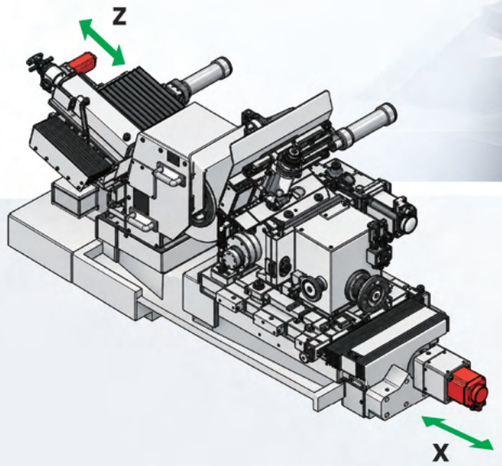
NC CONTROL

Simple Setup for Stable Production
操作直覺，適合穩定量產

The NC system combines PLC-based control with a graphical user interface (GUI), allowing operators to set grinding parameters directly on the screen without CNC programming. Servo-controlled infeed provides accurate, repeatable positioning for established production processes.

NC 系統以 PLC 為控制核心，搭配圖形化操作介面 (GUI)，操作者可直接於畫面設定加工條件，無需編寫 CNC 程式。伺服控制進刀可提供精準且可重複的定位，適合加工條件固定的量產製程。





NC AXIS ｜ NC 軸向說明

X	R.W. Lower Slide Infeed	調整輪下滑板進刀
Z	G.W. Vertical Dressing	砂輪垂直修整

1-AXIS ｜一軸

Infeed Control 進刀控制

For established grinding processes where automatic infeed and size adjustment are the main control requirements. Grinding wheel dressing is handled by the standard dressing unit.

適合加工條件固定，以自動進刀與尺寸調整為主要控制需求的量產製程。
砂輪修整仍由標準修整機構設定。

2-AXIS ｜二軸

Adds automatic grinding wheel dressing to the infeed axis, allowing dressing amount and infeed to be controlled numerically.

在自動進刀之外增加砂輪修整軸，使修整量與進刀量皆可透過數值設定。

For profile dressing, frequent changeovers and multi-axis control, CNC configurations are available.
若有成型修整、頻繁換線或多軸控制需求，可選擇 CNC 配置。

CNC CONTROL

Flexible Multi-Axis Control
多軸控制，提升製程彈性

The CNC system provides programmable multi-axis control for infeed and wheel dressing. Grinding programs and parameters can be saved and recalled for different workpieces, reducing setup time during changeovers and improving repeatability. The system also supports integration with automatic loading and unloading equipment.

CNC 系統提供可程式化的多軸控制，可整合進刀及砂輪、調整輪修整功能。不同工件的加工程式與製程參數可儲存並調閱，減少換線時的重新設定時間，並提升重複生產時的設定一致性；亦可配合自動上下料設備進行自動化整合。



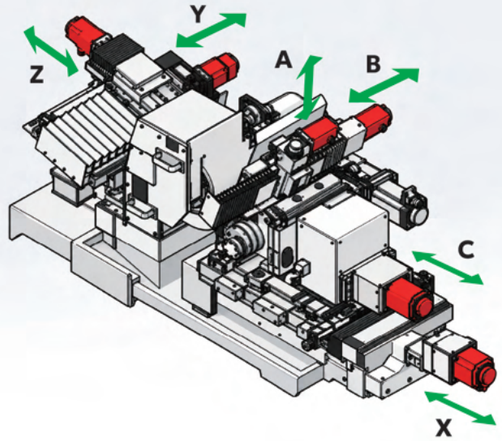
Standard:
MITSUBISHI (三菱)



Optional :
FANUC (發那科)



Optional: SIEMENS (西門子)



Z Y Profile dressing & wheel-form control
成型修整與砂輪輪廓控制

GRINIDNG WHEEL DRESSING ｜砂輪修整

The Z and Y axes control vertical and horizontal grinding wheel dressing. Two-axis movement supports programmed profile dressing for stepped, radiused, and chamfered wheel forms.

Z、Y 軸分別控制砂輪修整的垂直與水平方向，透過兩軸連動可依程式進行成型修整，對應階梯、圓弧及倒角等輪廓需求。

A B Regulating-wheel profile control
調整輪輪廓控制

REGULATING WHEEL DRESSING ｜調整輪修整

A and B control regulating wheel dressing in two directions, allowing the wheel profile to be adjusted to suit the grinding setup and workpiece requirements.

Synchronous dressing is also supported for multi-step in-feed grinding.

A、B 軸控制調整輪兩方向修整，可依研磨方式及工件需求調整調整輪輪廓；停止式多段差加工時亦可配合進行同步修整。

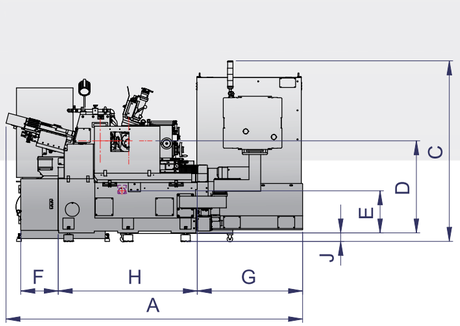
C X Infeed positioning & size control
進刀定位與尺寸控制

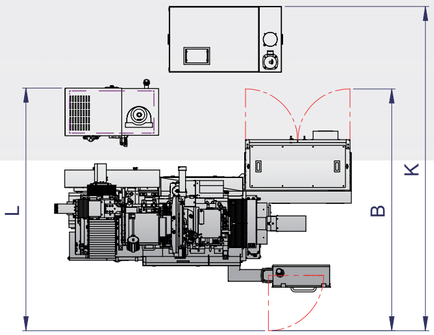
REGULATING WHEEL INFEED ｜調整輪進刀

C and X control the upper and lower regulating wheel slides. C provides upper-slide positioning and can serve as the infeed axis for selected in-feed applications, while X is used for fine infeed and size adjustment.

C、X 軸控制調整輪上、下滑座。
C 軸可用於上滑座定位，部分停止式研磨亦可作為進刀軸；X 軸則負責微量進刀與尺寸補正。

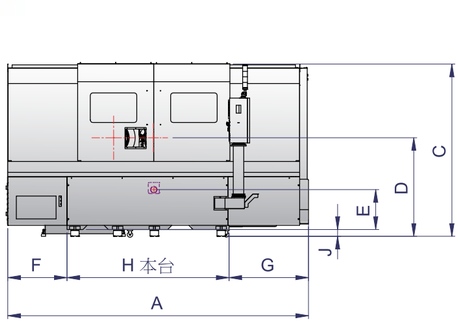
MACHINE FOOTPRINT 占地面積

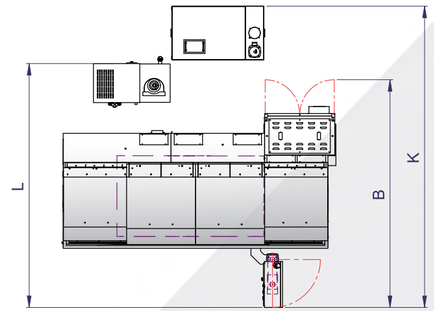




SEMI-ENCLOSED SPLASH GUARD 半罩

	A	B	C	D	E	F	G	H	J	K	L
H-4520-NC~II	2860	2480	1990	980	450	400	930	1485	90	3460	3460
H-4520-CNC~III	2970	2540	1930	980	450	400	930	1485	90	3520	3520
H-4520-CNCIV~VI	3170	2640	1930	980	450	400	1130	1485	90	3520	3520
H-5020(5025)-NC~II	3360	2790	2080	1090	470	500	940	1920	80	3550	3550
H-5020(5025)-CNC~III	3360	2860	2100	1090	470	500	940	1920	80	3620	3620
H-5020(5025)-CNCIV~VI	3560	2960	2100	1090	470	500	1140	1920	80	3720	3720





FULLY ENCLOSED SPLASH GUARD 全罩

	A	B	C	D	E	F	G	H	J	K	L
H-4520-NC(CNC)	3190	2780	2090	980	450	660	1050	1485	90	3570	3570
H-5020(5025)-NC(CNC)	3560	2970	2040	1090	470	700	940	1920	80	3930	3930

SPECIFICATIONS 規格表

		H-4520	H-5020	H-5025
GRINDING CAPACITY 研磨能力				
Standard grinding range (Dia.) 工作物直徑		Ø1 ~ Ø45 mm	Ø2 ~ Ø75 mm	Ø2 ~ Ø75 mm
Max Infeed Length 停止式最大長度		200 mm	200 mm	250 mm
Auto. Infeed Min. Increment 自動進給最小設定值		0.0005 mm	0.0005 mm	0.0005 mm
GRINDING WHEEL 砂輪				
Size (O.D. x width x I.D.) 尺寸 (外徑 x 寬度 x 內徑)		Ø455 x 205 x Ø228.6 mm	Ø510 x 205 x Ø304.8 mm	Ø510 x 255 x Ø304.8 mm
Linear Velocity 線速度		33 m/sec(45 m/sec)	33 m/sec(45 m/sec)	33 m/sec(45 m/sec)
REGULATING WHEEL 調整輪				
Size (O.D. x width x I.D.) 尺寸 (外徑 x 寬度 x內徑)		Ø255 x 205 x Ø127 mm	Ø330 x 205 x Ø177.8 mm	Ø330 x 255 x Ø177.8 mm
Speed 轉速		10 ~ 300 rpm	10 ~ 220 rpm	10 ~ 220 rpm
Tilt Angle 調整輪傾斜角度		+5° ~ -3°	+5° ~ -3°	+5° ~ -3°
Swivel Angle 調整輪旋轉角度		±5°	±5°	±5°
HANDWHEEL GRADUATIONS 手輪刻度				
Upper Slide Feed 上滑軌進刀手輪		4 mm/rev. (0.05 mm/graduation)	3.5 mm/rev. (0.05 mm/graduation)	3.5 mm/rev. (0.05 mm/graduation)
Upper Slide Micro-Feed 上滑軌微調手輪		0.08 mm/rev. (0.001 mm/graduation)	0.1 mm/rev. (0.001 mm/graduation)	0.1 mm/rev. (0.001 mm/graduation)
Trimming Device 修整進刀手輪		2 mm/rev. (0.01 mm/graduation)	2 mm/rev. (0.01 mm/graduation)	2 mm/rev. (0.01 mm/graduation)
DRIVE MORTORS 馬達				
Grinding Wheel 砂輪		7.5 kW (6P)	11.25 kW (6P)	11.25 kW (6P)
Regulating Wheel 調輪		3.5 kW (servo motor)	5.0 kW (servo motor)	5.0 kW (servo motor)
Lower Slide Feed (X axis) 下滑板進刀(X軸)		1.0 kW	1.0 kW	1.0 kW
Lubrication Oil Pump 潤滑油箱泵浦		1.5 kW	1.5 kW	1.5 kW
Coolant Pump 冷卻液泵浦		0.18 kW	0.18 kW	0.18 kW
Lubrication Oil Chiller 油溫冷卻機		0.37 kW	0.37 kW	0.37 kW
TANK CAPACITIES 容器容量				
Lubrication Oil Tank 潤滑油箱		90 L	90 L	90 L
Coolant Tank 水箱		160 L	160 L	160 L
MACHINE 機器				
Dimensions (LxWxH) 尺寸(長x寬x高)	*NC*	2860 x 2480 x 1990 mm	3360 x 2790 x 2080 mm	3360 x 2790 x 2080 mm
	CNC	3170 x 2640 x 1930 mm	3560 x 2960 x 2100 mm	3560 x 2960 x 2100 mm
Net Weight 淨重		4300 kg	6140 kg	6140 kg

NC	CNC	NC	CNC	NC	CNC
H-4520-NC	*H-4520-CNC*	*H-5020-NC*	*H-5020-CNC*	*H-5025-NC*	*H-5025-CNC*
H-4520-NCII	*H-4520-CNCII*	*H-5020-NCII*	*H-5020-CNCII*	*H-5025-NCII*	*H-5025-CNCII*
	H-4520-CNCIII		*H-5020-CNCIII*		*H-5025-CNCIII*
	H-4520-CNCIV		*H-5020-CNCIV*		*H-5025-CNCIV*
	H-4520-CNCV		*H-5020-CNCV*		*H-5025-CNCV*
	H-4520-CNCVI		*H-5020-CNCVI*		*H-5025-CNCVI*

★ The mentioned specifications & dimensions are subject to change without notice. 本公司保有機械規格變更之權利，恕不另行通知。

STANDARD ACCESSORIES 標準配件

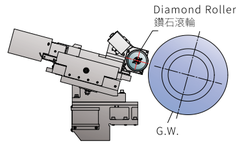
1.	Grinding Wheel	1 set
2.	Grinding Wheel Flange	1 set
3.	Regulating Wheel	1 set
4.	Regulating Wheel Flange (for H-50 series)	1 set
5.	In-feed Work Rest and Carbide Blade	1 set
6.	Thru-feed Work Rest and Carbide Blade	1 set
7.	Diamond Tools	1 set
8.	Electric System	1 set
9.	Lubrication System	1 set
10.	Coolant System	1 set
11.	Work Lamp	1 set
12.	Tools (Leveling Pad) and Tool Box	1 set
13.	Grinding Wheel Flange Extractor	1 set
14.	Regulating Wheel Flange Extractor (for H-50 series)	1 set

1.	砂輪	9.	潤滑油箱 (含泵浦)
2.	砂輪法蘭	10.	冷卻水箱 (含泵浦)
3.	調整輪	11.	工作燈
4.	調整輪法蘭(適用H-50系列)	12.	工具 (含腳墊)及工具箱
5.	停止式標準刀架及刀片	13.	砂輪法蘭卸下器
6.	通過式標準刀架及刀片	14.	調整輪法蘭卸下器 (適用H-50系列)
7.	鑽石修刀(2pcs/組)		
8.	電器箱標準附件		

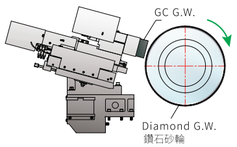
OPTIONAL ACCESSORIES 選購配件

1. Wheel Balancing Stand & Arbor
2. Profile Grinding Attachment
3. Diamond Roller Dressing Device
4. Free Abrasive Type Diamond G.W. Dressing Device
5. Hydraulic Work Ejector (In-feed Grinding)
6. Manual Feeder For In-feed Grinding (Up and Down)
7. Auto. Loading Attachment (Thru-feed Grinding)
8. Automatic Feeder (Thru-feed Grinding)
9. Auto. Unloading Attachment (Thru-feed Grinding)
10. V Type Supporter for Long Bar Grinding
11. Auto. Loading and Unloading Attachment (In-feed Grinding)
12. Vibratory Feeder (Thru-feed Grinding)
13. Fully Enclosed Splash Guard
14. Magnetic Coolant Separator
15. Paper Filter
16. Hydrocyclone coolant separator
17. X axis Linear Scale
18. Jib Crane for Grindnig Wheel

1. 平衡台及棒
2. 成型模板&支持刀片
3. 鑽石滾輪修整裝置
4. 游離式砂輪修整座
5. 油壓退料裝置(停止式)
6. 停止式手動送料裝置(上下起落架)
7. 通過式研磨自動送料裝置
8. 通過式研磨自動送料裝置(切齒式)
9. 通過式研磨自動收料裝置
10. 長棒支持架(手動V型)
11. 停止式自動送收料
12. 震動盤自動送料(通過式)
13. 全罩式鈑金
14. 電磁除屑機
15. 紙帶過濾機
16. 水力分離機
17. X軸光學尺
18. 砂輪吊架



Diamond Roller Dressing Device
鑽石滾輪修整裝置



Free Abrasive Type Diamond G.W. Dressing Device
游離式砂輪修整座