



# K 80

UNIVERSAL  
GRINDING MACHINE  
精密万能磨床



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Kellenberger is a traditional company with a long history in the manufacturing of precision machines. Since its founding, the company has continuously driven innovation and established itself as a reliable partner in the industry. With a strong focus on quality and technological advancement, Kellenberger has gained trust worldwide.

1890: SUPER PRECISION was founded by Henry and Franklin Hardinge in Chicago, USA. Known for ultra-rigid machines for hard turning, the brand would later become a legacy name within the group.

1917: KELLENBERGER was founded by Leonhard Kellenberger in St. Gallen, Switzerland, where the first universal cylindrical grinding machine was developed. The company quickly established itself as a leader in precision grinding.

1945: With the introduction of the first hydraulic universal grinding machine, KELLENBERGER significantly advanced automation and precision in grinding technology.

1960: KELLENBERGER expanded its expertise to include tool grinding machines, further strengthening its position in universal cylindrical grinding.

1980: VOUMARD introduced CNC-controlled internal grinding machines, setting new standards for precision and flexibility.

2008: KELLENBERGER merged with Hauser, Tripet, and Tschudin AG (HTT), uniting leading Swiss grinding technologies under one brand.

2024: KELLENBERGER separated from Hardinge and became independent. At the same time, USACH and SUPER PRECISION were integrated, bringing together decades of expertise in high-precision grinding under one roof.

2025: KELLENBERGER becomes the leading technology group.

克林伯格是一家在精密机床制造领域历史悠久的传统企业。自成立以来，公司持续推动创新，成为行业内值得信赖的合作伙伴。凭借对品质与技术进步的高度专注，克林伯格赢得了全球客户的信赖。

1890年：SUPER PRECISION 由亨利·哈丁与富兰克林·哈丁在美国芝加哥创立。该品牌以用于硬车削的超高刚性机床著称，日后成为集团内的经典品牌。

1917年：KELLENBERGER 由莱昂哈德·克林伯格在瑞士圣加仑创立，在此研发出首台万能外圆磨床。公司迅速确立了其在精密磨削领域的领先地位。

1945年：随着首台液压万能磨床问世，KELLENBERGER 大幅提升了磨削技术的自动化水平与精度。

1960年：KELLENBERGER 将专业领域拓展至工具磨床，进一步巩固了其在万能外圆磨削领域的地位。

1980年：VOUMARD 推出数控内圆磨床，为精度与柔性化树立了全新标准。

2008年：KELLENBERGER 与 Hauser、Tripet 及 Tschudin AG (HTT) 合并，将瑞士顶尖磨削技术汇聚于同一品牌之下。

2024年：KELLENBERGER 从 Hardinge 分拆，实现独立运营。与此同时，USACH 与 SUPER PRECISION 并入，将数十年高精磨削专业技术整合一体。

2025年：KELLENBERGER 成为行业内顶尖技术集团。

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## OVER 100 YEARS EXPERIENCE IN GRINDING 百年磨削技术积淀

### EFFICIENT

Robust construction & innovative design of machine bed, wheelhead, and workhead ensure a higher efficient grinding process

### RELIABLE

Well-known world top brand key components guarantee the machine working with stability and accuracy retention in its lifetime

### PRECISE

Kellenberger globally unified standard of design, manufacturing and assembly allows each machine to every customer is built with world-class quality

### EASY

Easy to follow setup pages allow the operator to digitize diamond and wheel positions by means of a simple user-friendly interface.

### SAFE

Full enclosure, bullet-proof glass windows, wheel protection, one button fall back, emergency button and interlock etc. offer operator a safe working environment

### 高效

高刚性设计的床身以及其他结构部件如砂轮架、工件头架、尾座等为更高效率的磨削工艺提供了保障。

### 稳定

机床上的关键部件如主轴、丝杠、轴承、导轨、电气、气动、液压、量仪等皆选用顶级的国际知名品牌产品，以确保机床在其寿命周期内的可靠性及精度保持性。

### 精密

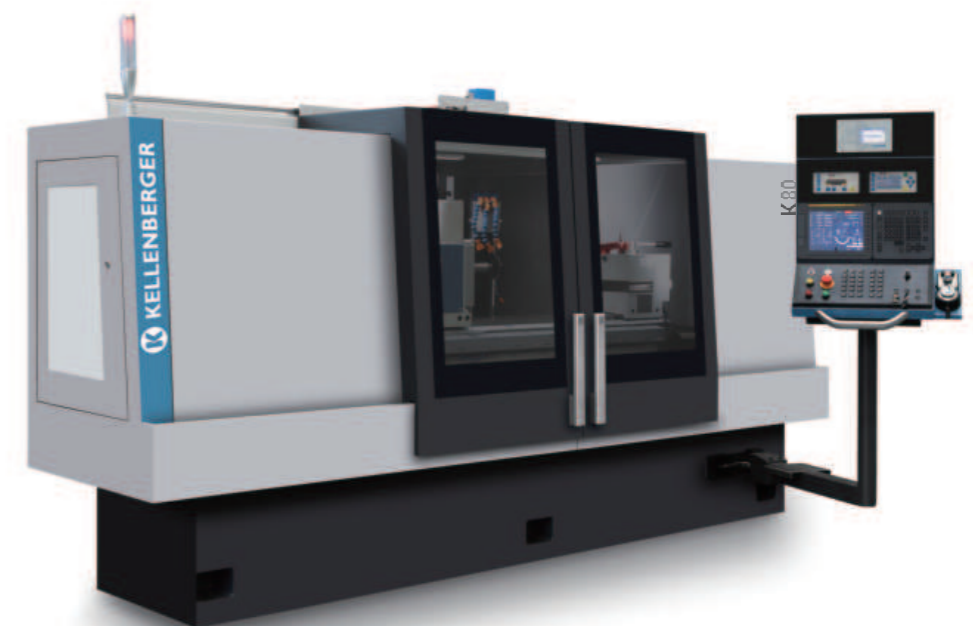
机床的设计标准、制造和组装工艺流程遵循克林伯格磨床全球统一标准，让每位用户使用的每一台机床都能够达到世界级的品质。

### 简便

图形化的软件设计，让操作者通过一个简单的用户友好的界面输入参数即可进行快速的修整和砂轮位置设置，生成相关修整和磨削程序。

### 安全

全封闭的机床护罩、防弹级玻璃观察窗、砂轮保护罩、一键回退、紧急停止、门锁联动等设计为操作人员提供了一个安全的工作环境。

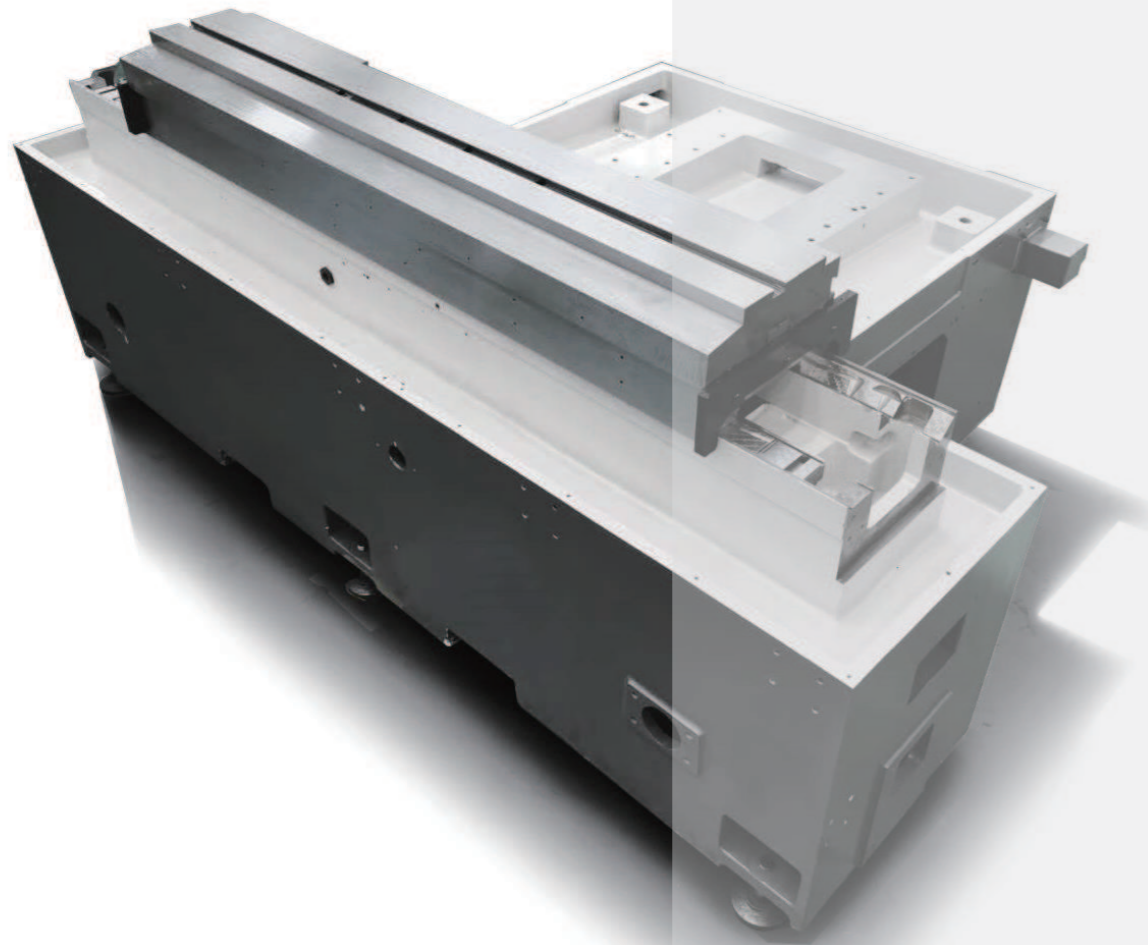


## ROBUST CAST IRON MACHINE BED 稳定坚固的床身

### 床身和主要部件的设计特点

在磨削过程中，我们最需要的是精度的保持。而精度的保持对于热稳定性的依赖要远远大于抗振性能。整体床身就有一个很低的热膨胀系数。机床在生产过程中会产生大量的热，这些热可以迅速通过床身均匀地传导出去，从而让机床保持极其稳定的状态。

先进的一体式工作台取代了传统老式的分体式工作台设计，机床的整体刚性得到加强。由于数控技术的高速发展，插补磨削精度达到了相当精密的程度，磨削锥度时无需再搬动工作台，真正实现一次装夹完成多个工位的磨削。



### Design benefits of bed and major mechanical elements

Precision from the cylindrical grinding process generally relies far more on thermal stability than vibration damping. The machine bed ensures a lower level in thermal expansion and the heat produced during the production can also be quickly transmitted through the machine bed. All structural elements ensure a homogenous, continuous and stable medium with all major parts having the same low coefficient of thermal expansion.

Advanced one-piece working table replaces the traditional separated working table which gives a higher rigidity to the machine.

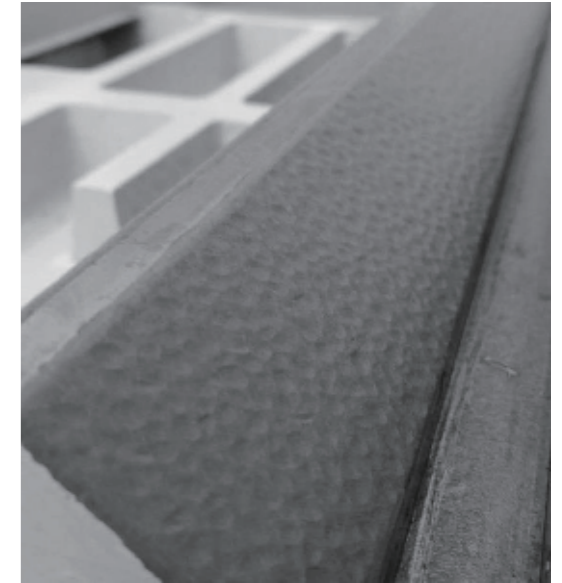
## INFEED AND MOVEMENT 进给与移动

### 工作台全支承导轨

工作台为全支承 V-平导轨，特点是刚性好，承载大。导轨表面完全由手工铲刮而成，以达到最高等级的精度。导轨移动顺滑，表面覆以特殊复合材料涂层，具有自润滑功能，让摩擦系数达到最低，消除了低速爬行可能，最大程度地减少导轨的磨损。

### Fully supported table slideways

The high-grade cast iron table slideways are precision hand scraped for smoothness of movement and the highest accuracy. Lubricated special material ensures low friction, significantly reduced stick-slip differentials and minimal wear on the slideways.



### 砂轮进给导轨

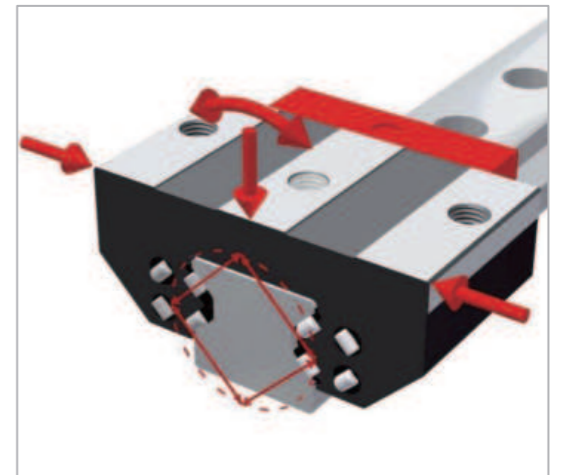
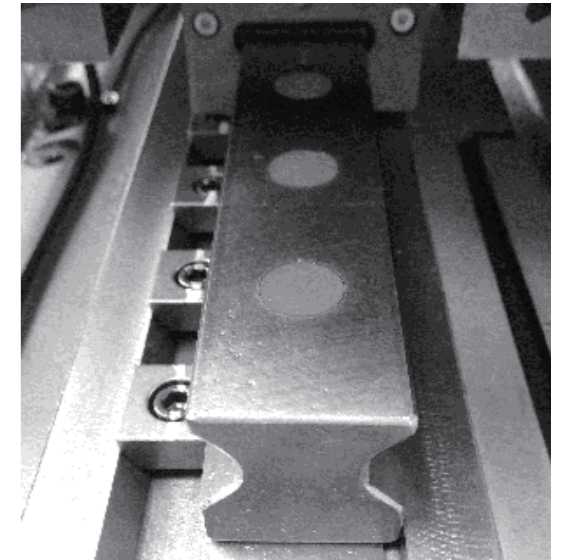
砂轮进给导轨为直线导轨，可以保证一个高精度和低摩擦的直线运动。

导轨内部为自循环滚子结构，载荷向四周方向散发，承载能力极高。导轨内部滚柱以“O”型结构进行排布，并结合滚道偏置 90°设计，这样可以吸收从四周传过来的力，从而大幅提高承载刚性。

### Infeed linear guide O-geometry

The linear guideways guarantee a high level of precision and low friction linear movement. The guideways are equipped with recirculating roller bearings designed to take loads from all directions and support extremely high capacities.

Large internal spacings of the load carrying surfaces are implemented with what is called an O-arrangement of the guideway. In conjunction with roller tracks that are offset by 90°, this achieves a uniform and high absorption of forces from all directions and provides high moment rigidity.



## MODULARIZED WHEELHEAD 模块化砂轮头架

### U 型万能砂轮架

模块化设计的砂轮架，有多种形式的磨削主轴配置可以选择，1 外 1 内、2 外 1 内、2 内 1 外、双外等。在一次装夹中完成外圆、内孔、端面、锥面以及曲线轮廓等复杂的磨削工作。也可以根据应用需求来配置多个外圆或内圆磨头。

外磨砂轮主轴为高性能电主轴，功率达 9kW，砂轮直径最大达  $\varnothing 500 \times 80 \text{mm}$ ，令磨削效率倍增。能够达到更高的磨削速度，提高磨削效率。角接触滚珠主轴轴承采用最优化的结构。

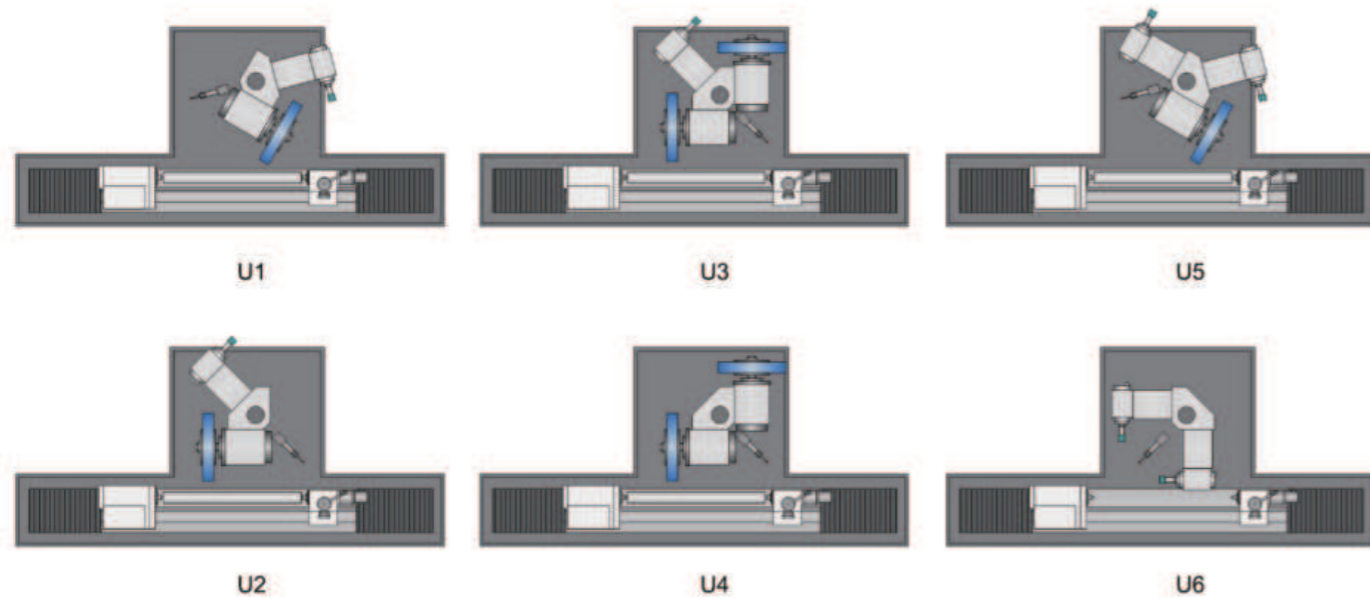
内磨主轴的布置也非常多样化，常规转速范围从 30000 转到 60000 转可以选择，也可根据应用的需要来配置内磨主轴。

所有主轴由集成的水冷系统进行冷却，确保砂轮头架一直保持在一个热稳定的状态下工作。

### 数控“B”轴

砂轮头架回转轴由力矩电机直接驱动，让砂轮头架获得更高的刚性，运行更加平稳、快速，并且达到更高的精度。精巧的 B 轴设计让所有的移动部件在全封闭的单元内运转，没有暴露的开口，机床的使用寿命更长，维护成本更低。

全封闭的 B 轴拥有超高的精度，最小分度精度达  $0.0001^\circ$ ，自动分度。重复精度达到  $\pm 4''$ 。



### U model universal wheelhead

Modular wheelhead design ensures multiple external and internal grinding wheels combination to achieve OD, ID, face and profile grinding in one clamping. The wheel head with 1 OD & 1 ID, 2 OD & 1 ID, 2 ID & 1 OD or 2 OD are all common configurations.

The wheelhead equipped high performance motor spindle as main grinding spindle which gives power up to 9kW and wheel sizes up to  $\varnothing 500 \times 80 \text{mm}$  for higher efficient grinding.

Various internal grinding spindle can be equipped. Speed range from 30000rpm to 60000rpm. More spindles solutions are available depends on the application.

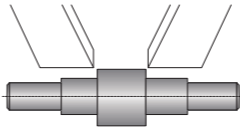
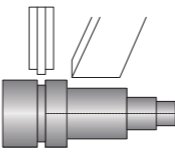
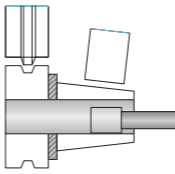
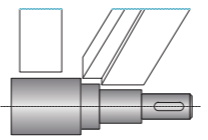
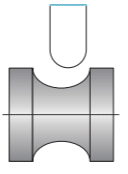
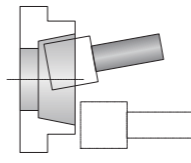
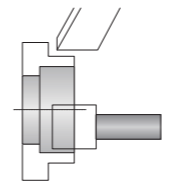
All spindles are cooling with water system to assist maintaining a consistent temperature.

### B axis

**Torque motor directly driven rotary “B” axis gives wheelhead in higher strength, smoothness of action and maximum accuracy.** The contraption encloses all parts in one unit which makes the machine longer life and lower maintenance cost.

Full enclosed B axis is very precise, with  $0.0001^\circ$  positioning resolution and  $\pm 4''$  arc repeatability

## GRINDING SOLUTIONS 解决方案

图例 Illustrate	说明 Description
	<b>双侧轴承位磨削</b> 回转 B 轴，左右砂轮分别磨削台阶轴的两侧，一次装夹下完成磨削。 Bearing positions grinding Wheel T1 and T2 grind both side with B axis in one clamping
	<b>外圆和环槽磨削</b> 右砂轮磨削外圆和轴肩，左砂轮修整成型磨削环槽。 OD and tread grinding Wheel T2 grinds OD and shoulder. Profiled wheel T1 grinds groove
	<b>槽、锥面和内孔磨削</b> 左砂轮修整成型磨削槽，右砂轮回转和锥面平行进行走刀磨削。再回转内磨主轴进行内孔磨削。 Slot, taper and ID grinding Profiled left wheel T1 grinds the slot. Wheel T2 grinds taper and wheel T3 grinds ID in one clamping.
	<b>台阶面成型磨削</b> 左砂轮完成外圆面走刀磨削，右砂轮修整成型进行斜切入磨削。 Multi diameter grinding Wheel T1 grinds OD with traverse. Profiled wheel T2 grinds with angle plunge.
	<b>轮廓磨削</b> 砂轮修整出 R，根据编写的 ISO 子程序磨削轮廓。 Contour grinding Wheel dressed with radius, and then grinds contour with ISO sub program.
	<b>端面和内锥面磨削</b> 仅使用内磨主轴完成内锥面和端面磨削。 Face and inner taper grinding The inner taper and face grinding can be done only by ID grinding wheel T3.
	<b>法兰盘磨削</b> 典型的内外圆结合磨削方式。可获得极高的位置精度。 Flange grinding Typical OD and ID grinding in one clamping for high requirement of positioning accuracy.

注：砂轮主轴的排布可以有更多的方案，将根据加工零件的实际情况来确定。

Note: The more arrangements of grinding spindles are requested on applications.

## HIGH PRECISION WORKHEAD 高精度工件头架

### 工件主轴

高刚性的定&活两用顶尖结构的工件头架，由高强度、高精度的滚子轴承支撑，从而最大限度地确保主轴的稳定性和卓越的刚性。

主轴内锥孔为莫氏 MT5，非常适合通用顶尖的安装。外锥为标准 A2-5 结构，可直接安装卡盘类夹具，提高装夹刚性。中心通孔直径 $\varnothing 38$  mm，可以让夹具的拉紧机构通过，或者让冷却液从中孔通过。

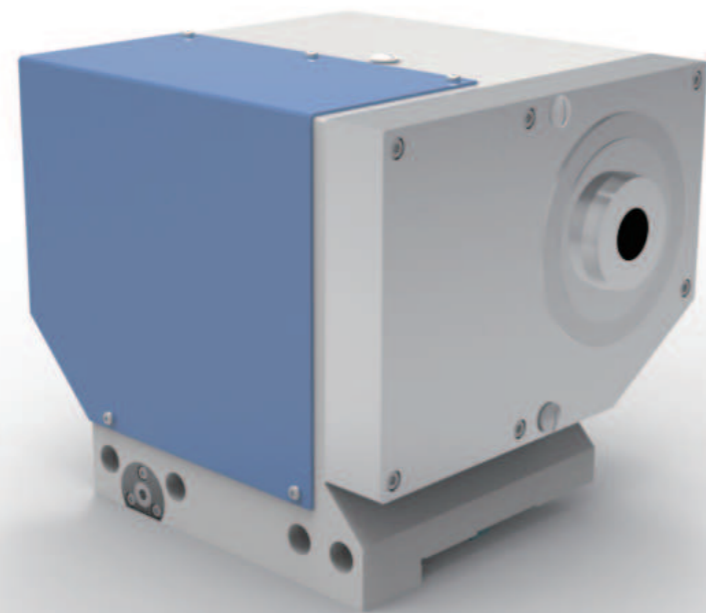
主轴由 Fanuc 数字 AC 伺服电机驱动，速度无级可调。

### Workhead

The rigid live and dead spindle workhead contains robust, high precision roller bearings assuring maximum spindle stability and superior stiffness.

The spindle has a MT5 taper with A2-5 nose which easy to adapt center and chucks for higher stiffness on clamping.  $\varnothing 38$ mm through bore to accommodate workholding devices and through bore coolant options.

A Fanuc digital AC servo drive to the spindle provides variable speed change, ensures fast, accurate spindle orientation



注：图片为常规配置，仅供参考。也可根据应用的需要配置其他形式的工件主轴。  
Note: Variant work spindles are possible for applications.

## TAPER ADJUSTABLE TAILSTOCK 锥度微调尾座

### Taper adjustable tailstock

The high accuracy plain bearing lever operated tailstock with optional fine taper correction adjustment can be manually adjusted in  $0.5\mu\text{m}$  increments or less with a total adjustment range of 0.06mm. Morse taper in tailstock is MT4.

### Air cushion lift to workhead and tailstock bases

Both the workhead and tailstock bases have the added benefit of being fitted with air lift pads to ensure easy, quick and accurate re-positioning. The lifting mechanism is simple to operate, reduces wear and ensures faster set-ups.

### 锥度微调尾座

高精度滑动轴承，水平调整；

手动操作，可在任意位置夹紧；

选项配置锥度微调装置，精调刻度  $0.5\mu\text{m}$ ；

最大调整范围 0.06 mm；

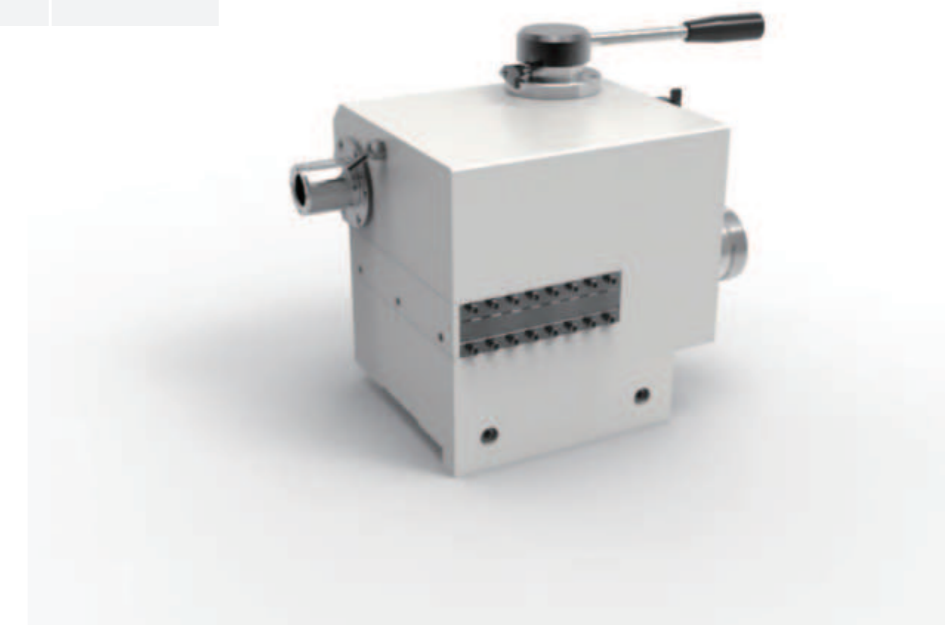
尾座锥度为 MT4；

### 头架尾座气垫

为了让头架和尾座底座移动轻松，在其底部设计了气垫装置。可以便利地进行移动和重新定位，减少磨损。气垫功能操作简单，加快机床设置。



	内锥 Taper	微调范围 Range	微调精度 Accuracy
锥度可调尾架 Taper tailstock	MT4	+/- 60 $\mu\text{m}$	0.0005mm

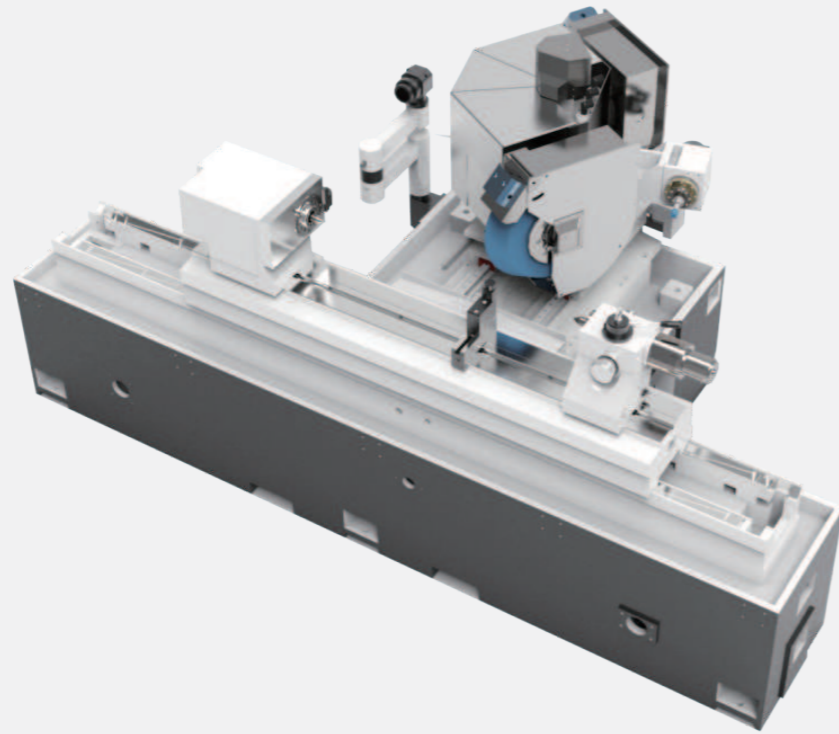


注：图片为常规配置尾座，仅供参考。也可根据应用的需要配置其他形式的尾座。  
Note: Variant tailstocks are possible for applications.

## WHEEL DRESSING 砂轮修整

### 砂轮修整

机床上可以配置多种形式的修整方案，常规状态下配置了两个金刚笔座，分别位于头架及尾架后侧。用于修整内圆砂轮的金刚笔座安装在工作台面上。根据应用的不同还可以选择动力驱动的修整器。如修整 CBN 砂轮等。



注：图片仅供参考，不同机型有不同配置。

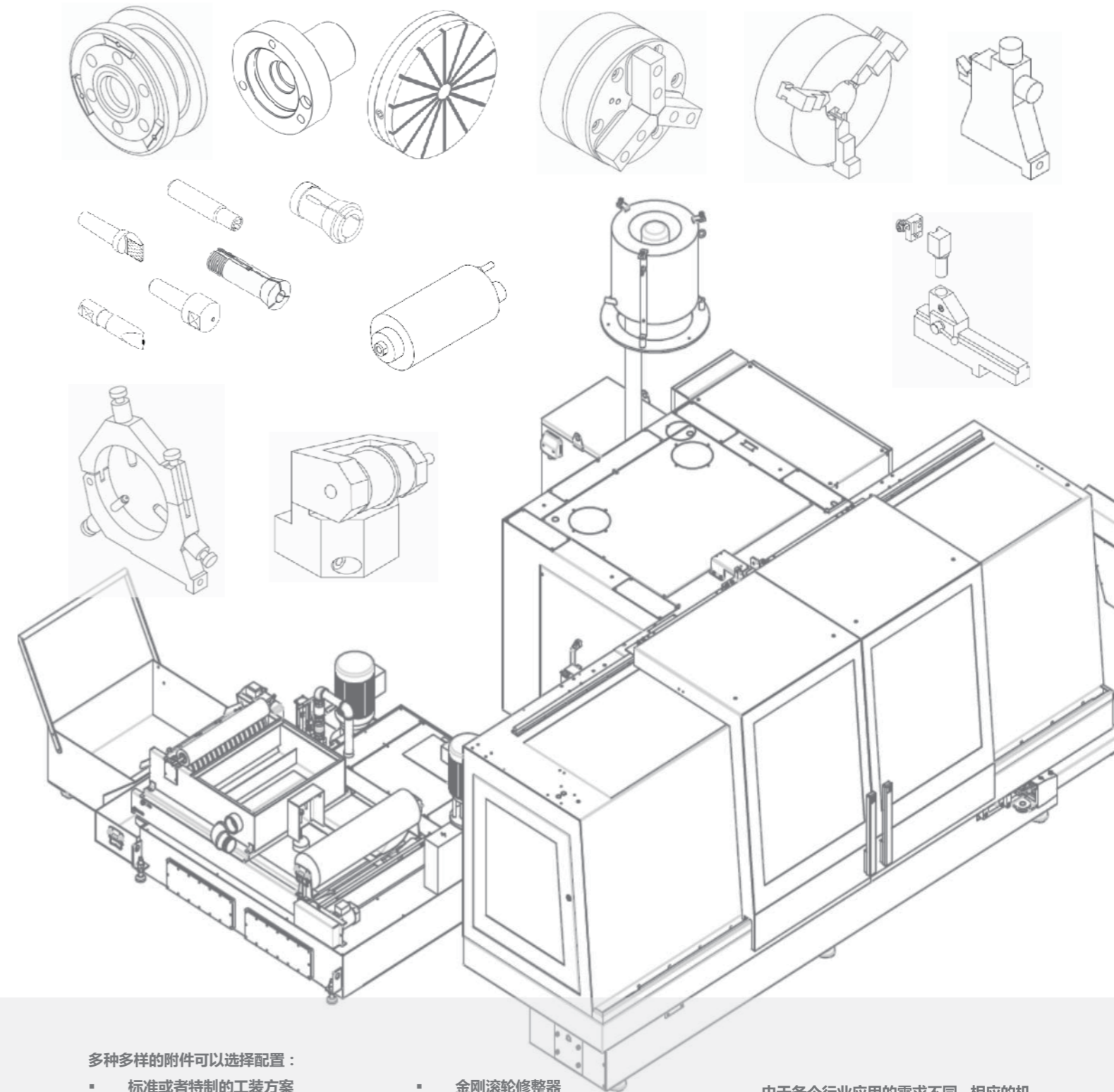
Note: Picture for reference only. Configurations are different depends on machine models

### Wheel dressing

A multitude of dressing solutions are available, from Diamond disc or roll dressers, to special programmable articulating dressers for complex or internal forms. Normally equipped two diamond dresser holder behind of workhead and tailstock.

Even the smallest of details are considered by offering features such as coolant feed directly to the wheel dressing diamonds to minimize diamond wear, optimizing precision and reducing set ups and consumable costs.

## ACCESSORIES 功能附件



多种多样的附件可以选择配置：

- 标准或者特制的工装方案
- 冷却过滤系统/油雾吸收器
- 在线量仪系统
- 间隙消除器
- 轴向定位测头 - 安装在头架上
- 砂轮平衡仪 - 自动或半自动
- 卡盘、夹头及中心架等
- 金刚滚轮修整器
- 自动门、尾座和动力工装
- 工件自动上下料方案
- 交钥匙工程
- CAD/CAM 软件

由于各个行业应用的需求不同，相应的机床配置也不尽相同。具体的机床应用和配置方案请联系哈挺公司工程师。

# CONTROL SYSTEM 控制系统

- 图形化软件简单易学  
Graphical User Interface
- 快捷方便的设置  
Quickly and efficiently set-up
- 彩色显示屏  
Color screen
- 多砂轮数据管理  
Multi wheel datum
- 以太网  
Ethernet
- 后台编辑功能  
Background editing

## 简单易用的操作系统

机床配备了 Fanuc 主流产品 Oi CNC 控制器, 10.4 寸 TFT 彩色显示器, 手持控制器让操作更加方便。通过软键输入令工作快捷和有效。

软件的设计将设置时间最小化, 从而最大化制造的产出来降低产品的成本。

简单跟随设置页面的指导, 操作人员可以通过图形交互画面输入金刚笔和砂轮位置。图形化的编程方式让编程变得非常简单, 无需操作人员输入复杂的程序代码, 从而降低设置时间, 同时也减少了对操作人员培训的成本。

## Easy used control system

The machine incorporates Fanuc Oi CNC control system. The 10.4 inch TFT color screen display is designed with a remote pendant for convenience and flexibility. Soft keys enable the operator to type quickly and efficiently avoiding the slowness commonly associated with a virtual keyboard.

The software is designed to minimize set-up times, which is fundamental in reducing machined component costs whilst maximizing manufacturing output.

Easy to follow set-up pages allow the operator to digitize diamond and wheel positions by means of a simple user-friendly interface. This graphical programming removes the requirement for operators to input complex code, subsequently reducing set-up and operator training costs.



# DRESSING & GRINDING CYCLES 修整及磨削循环

修整 Dressing	说明 Description	磨削 Grinding	说明 Description
	G901 直砂轮修整循环 Straight dress		G810 切入磨削循环 Plunge grind
	G903 端面砂轮修整循环 Face dress		G811 走刀磨削循环 Traverse grind
	G905 斜切砂轮修整循环 Angle face dress		G812 切入及轴肩磨削循环 Plunge & shoulder grind
	G906 斜面修整循环 Taper dress		G815 复合切入走刀循环 Multi-plunge & traverse grind
	G907 ISO 轮廓修整循环 ISO profile dress		G816 锥度走刀磨削循环 Taper traverse grind
	G911 单斜面及圆角修整循环 Single Radius/Angle dress		G818 ISO 轮廓编程循环 ISO Contour grind
	G913 左端面修整 LH face dress		G821 端面走刀磨削循环 Face traverse grind

注：更多的循环及其详细信息请参见机床编程手册。

Note: Please refer to programming manual for more details of cycles

## SPECIFICATION 技术规格

项目 Items	参数 Data	项目 Items	参数 Data
<b>工作范围 Capability</b>		<b>工作台 Z 轴 Working table Z axis</b>	
中心高 Center height	200 mm	最大行程(650 型) Max. travel	800 mm
最大回转直径 Max. swiveling diameter	Ø399 mm	最大行程(1000 型) Max. travel	1150 mm
最大磨削直径 Max. grinding diameter	Ø380 mm	电子手轮最小增量 HPG min. increment	0,0001 mm
两顶之间长度(650 型) Distance between	650 mm	可编程最小进给量 Programable min infeed	0.0001 mm
两顶之间长度(1000 型) Distance between	1000 mm	海德汉光栅尺分辨率 Glass scale resolution	0,00005 mm
两顶之间承重 Workpiece load between centers	100 kg	<b>控制系统 Control system</b>	
<b>万能砂轮头架 Universal</b>		数控系统 Control	Fanuc CNC 0i
最高转速 Max. speed	5000 rpm	软件 Software	图形交互式界面 GUI
砂轮尺寸(ØxWxB) Wheel size left	Ø500x80x203.2mm	显示屏 Display	10.4 寸 TFT
砂轮架回转分辨率	0.0001°	可存储程序数 Program	20
砂轮头架回转范围 Rotary range	-30° / +235°	控制轴数 Max. controlled axes	5
内磨电主轴安装孔 ID spindle diameter	Ø120mm	接口 Interface	USB/Ethernet
外磨电主轴功率 OD wheel motor drive power	9 kW	<b>机床电气 Electrical supply</b>	
外磨砂轮最高线速度 Max. OD wheel surface	63 m/s	标准 3 相电源 3 phase electrical supply	380v 3ph 50Hz
内磨电主轴速度 ID spindle speed	30000~60000 rpm	控制回路电压 Control circuit voltage	24vDC.
<b>工件主轴 Workhead</b>		输入电压偏差范围 Tolerance of input	+/- 5%.
转速范围, 无级调速 Speed range	0-1000 rpm	满负载功率消耗 (主机) Power consumption	32 KVA
主轴内锥 Inner taper	MT 5	<b>气动供应 Pneumatical supply</b>	
主轴外锥 Outer taper	A2-5	输入气压 Input pressure	5.5 bar
最大承载(两顶) Max. load (Between centers)	100 kg	要求流量 Required flow	40-50 l/min
<b>尾座 Tailstock</b>		气源标准 Air supply quality	ISO 8573-1 : 2001
套筒直径 Poppet diameter	Ø50 mm	<b>环境参数 Environment</b>	
套筒行程 Poppet travel	49 mm	标准机床噪音 Machine noise	<75 dB(A)
莫氏锥度 Morse taper	MT 4	环境温度 Ambient	0 – 40 °C
锥度微调范围 Range of taper	60 µm	环境湿度 Ambient humidity	≤75%
<b>砂轮架进给 - X 轴 Wheel infeed X axis</b>		<b>其他 Miscellaneous</b>	
最大行程 Max. travel	350 mm	机床颜色 Color on enclosure	RAL 7035 浅灰
最高进给速度 Max. slide velocity	10 m/min	床身颜色 Color on bed	RAL 7012 深灰
电子手轮最小增量 HPG min.	0,0001 mm	占地尺寸(650 型) Floor space	3060 x 2290 mm
可编程最小进给量 Programable min.	0.0001 mm	占地尺寸(1000 型) Floor space	3660 x 2290 mm
海德汉光栅尺分辨率 Glass scale resolution	0,00005 mm	高度 Height	2720 mm
		毛重 Gross weight	6500/7500 kg

注：表格中数据仅基于样本印刷时期水平。任何技术和参数的改变不再另行通知。

Note: All specifications and designs are subject to alterations without notice.

## CONFIGURATION 机床配置

### ☑ 主机 Main machine:

No.	名称
1	铸铁床身及工作台 Cast iron machine bed and working table
2	自动回转砂轮架 Automatic rotary wheel head
3	X 轴 Z 轴光栅尺 Glass scales on X and Z axis
4	锥度微调的工件头架 Workhead with taper adjustment
5	手动尾座, 带锥度微调 Manual operated tailstock, with taper adjustment
6	金刚笔夹持座 Diamond dresser holder
7	电气柜, 配空调 Cabinet with air conditioner
8	润滑系统 Lubrication system
9	气动系统 Pneumatic system
10	液压系统 Hydraulic system
11	CNC 系统, 带手持控制器 CNC Control system with HPG
12	全封闭机床外罩 Full closed enclosure
13	工作灯 Work light

### ☑ 附件 Accessories:

编号	名称
1	轴向定位量仪 Axial positioning probe
2	外圆砂轮, Ø500mm OD grinding wheel, Ø500mm
3	外圆砂轮法兰, Ø203.2 Flange for OD grinding wheel, Ø203.2
4	莫氏 4 号转接套及全顶尖半顶尖 Morse taper 4 carbide centers
5	工件驱动拨盘 (鸡心夹头) Driving dog
6	标准金钢笔 Diamond dresser
7	标准磨削和修整循环 Grinding and dressing cycles
8	Ø150mm 三爪卡盘 Ø150mm 3 jaw chuck
9	平衡芯轴 Wheel balancing mandrel
10	标准手动工具及工具车 Operator tools
11	纸带式冷却液过滤系统及油雾吸收器 Coolant filter and oil mist
12	第一次加入的润滑油品 Coolant and lubrication oil for the first fill
13	用户手册 User manual

注：机床实际配置以合同中供货范围为准。

Note: The actual machine configuration is subject to the scope of supply in contract.

### 平面布局 Layout:

650/1000

	A	B	C	D
650	3060	2290	1030	1270
1000	3660	2290	1030	1270
H	mm			

注：出于安全和操作方便的需要，机床四周至少应留出 1 米以上的操作空间

Note: For safety and convenience of operation, at least one meter space needed around the machine.



Service hotline:  
400 006 8690

