

CNC 万能外圆及内圆磨床

CNC UNIVERSAL GRINDING MACHINES FOR EXTERNAL AND INTERNAL DIAMETERS

RU



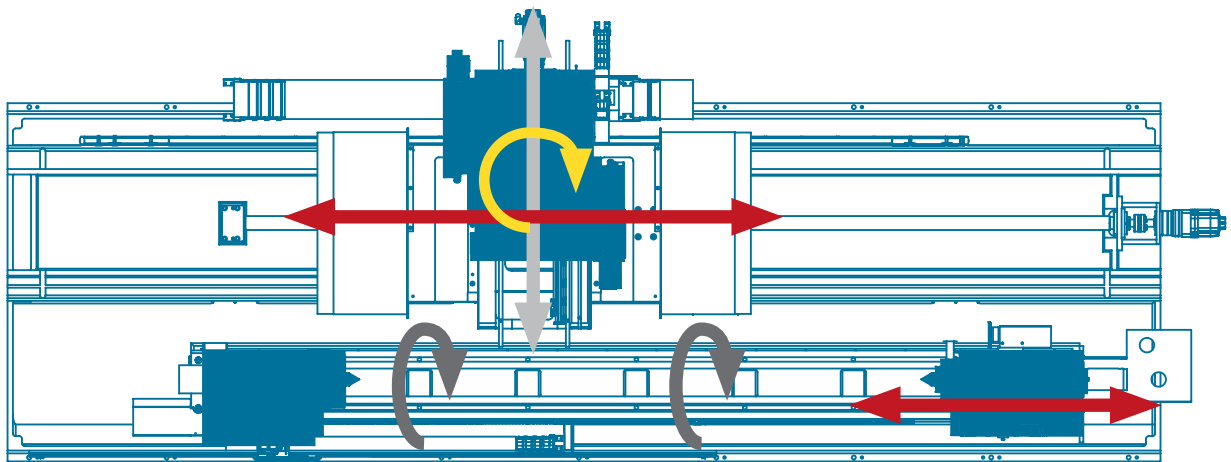


AZ Universal grinding machines range has been designed to fulfil the requirements of a wide range of applications that combine external, internal, face and taper grinding of components such as: transmission shafts, electric motor shaft, gas turbine shafts, railway shafts, machine tools shafts, landing gear components, etc.



GENERAL STRUCTURE

一般结构



■ **X AXIS** is on radial direction of workpiece

■ **X AXIS** 轴在工件径向方向上

■ **Z AXIS** is on the same direction of workpiece rotation axis

■ **Z AXIS** 轴是工件轴线的同一方向

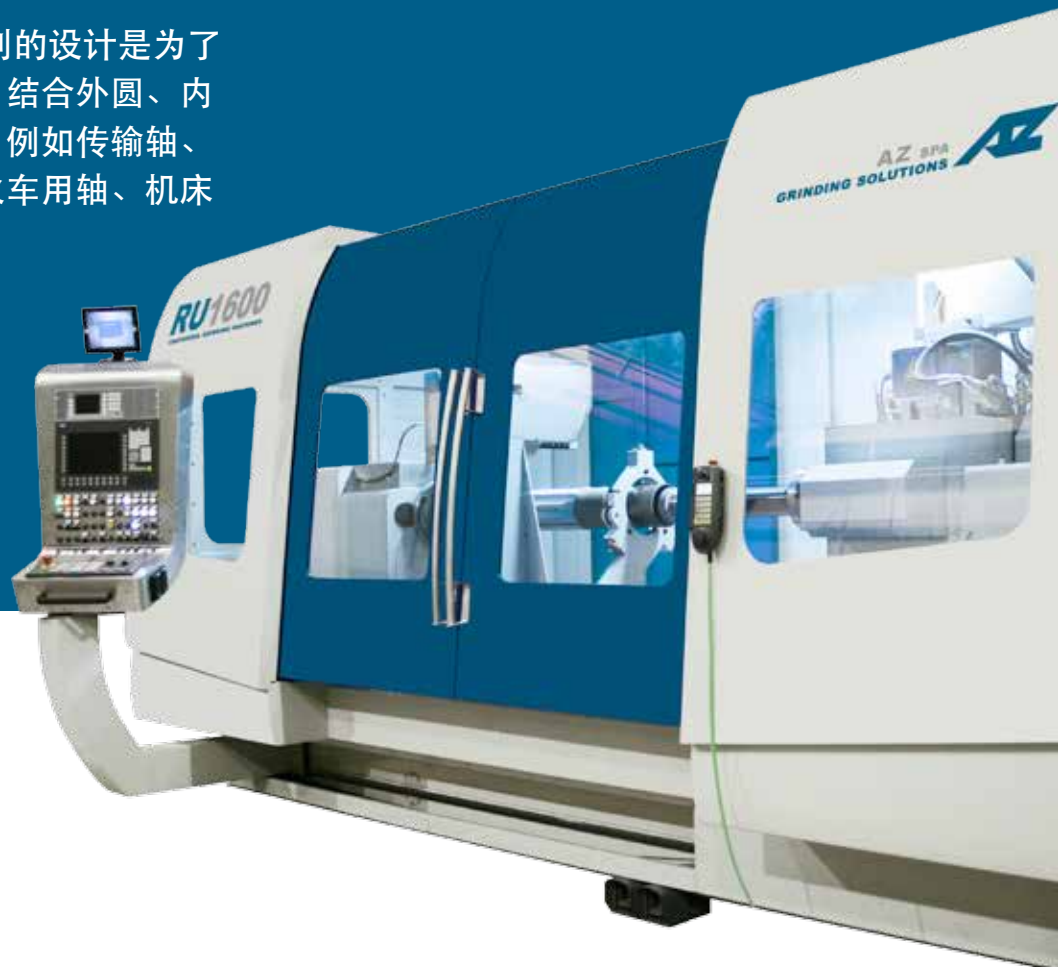
■ **B AXIS** is the wheelhead rotation

■ **B AXIS** 轴为旋转的磨头

■ **C AXIS** is the headstock rotation axis

■ **C AXIS** 轴是主轴箱的旋转轴

AZ公司的万能磨床系列的设计是为了满足广泛的应用范围，结合外圆、内圆表面和锥形的磨削。例如传输轴、电机轴、汽轮机轴、火车用轴、机床用轴、起落架等



MACHINE BED

床身

- + Base made of COMPOSITAL® with temperature control
- + X and Z axis movement on linear guideways
- + **FEM** base analysis

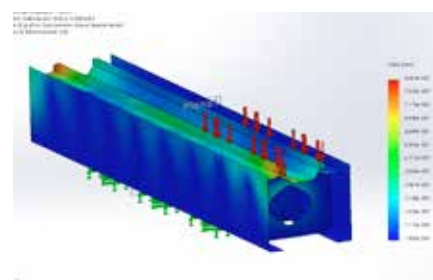
床身由 COMPOSITAL® 与温度控制的基础
X轴和Z轴直线导轨运动

■ The COMPOSITAL® (composite material) has these characteristics:

- reduced machine vibration
- better surface quality
- less tool wear
- lower noise emission

■ 有限元素的分析的 COMPOSITAL® (复合材料) 具有以下特点:

- 减少机器振动
- 更好的表面质量
- 减少刀具磨损
- 低噪音
- 头架



HEADSTOCK

由数控控制速度



- + Variable speed controlled by CNC
- + High precision rotation
- + The headstock can swivel (optional)
- + It's designed to use different clamping systems in accordance with the specific workpiece

高精度旋转
主轴箱可旋转（选配）
根据特定工件设计不同的夹紧系统



WORKPIECE CLAMPING

工件夹紧

- + The workpiece clamping system is customized on workpiece features

工件夹紧系统根据工件特征而定制



1. 3 Jaws chuck 2-3. Driving dogs

TAILSTOCK

尾座

- + Cylindricity correction
- + Tailstock on air suspension with footer pedal
- + Hydraulic constant pressure controlled by load cell

圆柱度误差校正
尾座在空气悬架上
负载单元控制的液压恒压



WORKPIECE SUPPORT

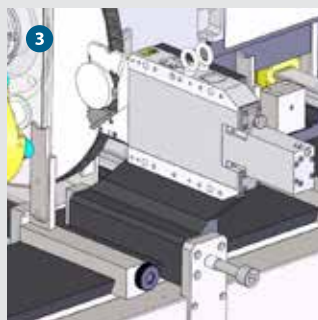
工件支撑

The machine can be equipped with different workpiece supports:

- + 2 points steady rests for external grinding
- + 3 points steady rests for internal grinding
- + High precision centering steady rests < 1 micron
- + Prism support steady rests

机床可以装配不同的工件支撑

外圆磨削2点中心架
内圆磨削3点中心架
高精度定心中心架 < 1 μ
棱镜支撑中心架



1. 2 points steady rests

2. 3 points steady rests

3. High precision steady rests

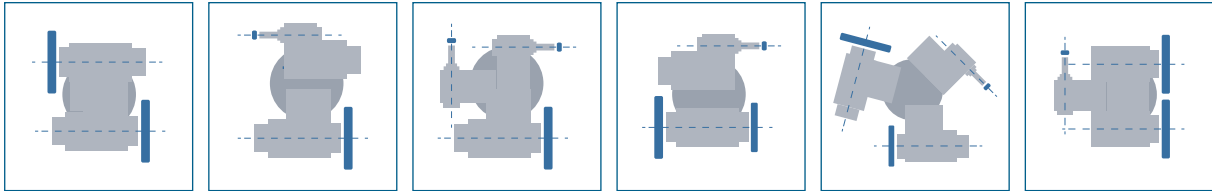
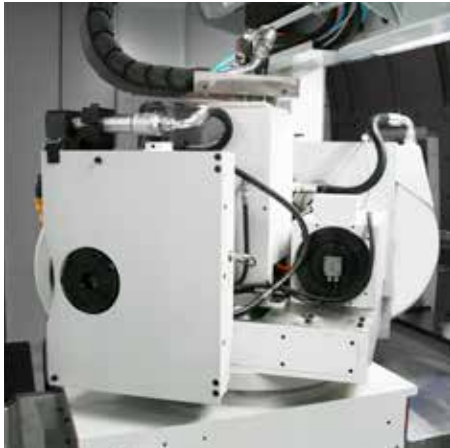
4. Prism support

GRINDING

磨削

- + The wheelhead can rotate controlled by circular encoder and can have 4 different grinding spindles for external and internal grinding
- + Use of straight or angular grinding wheels
- + High precision grinding wheel spindle run-out < 1 micron

磨头可旋转控制循环，编码器和可有4个不同的磨削主轴的外径和内径磨削
使用直线和角砂轮
高精度磨削砂轮主轴 变形量 < 1μ



The figures used are only indicative. Other wheelhead configurations are possible.
Le immagini sono puramente indicative. Sono possibili altre configurazioni della testa portamolca.



GRINDING WHEELS 砂轮

- + Traditional grinding wheels: Corundum e silicon oxide
- + Grinding wheel with 120 m/s grinding speed
- + Diamond grinding wheels
- + Encoding chip for wheel recognition
- + Grinding wheel cleaning with high-pressure water jet 70 Atm
- + Automatic wheel balancing system

传统砂轮：刚玉砂轮
砂轮磨削速度：120米/秒
金刚石砂轮
用于砂轮识别的编码芯片
砂轮带有高压水清洗 70Atm
自动砂轮平衡系统

MATERIAL TO BE GROUND	GRINDING WHEEL TYPOLOGY	PERIPHERAL SPEED
ALLOY STEEL	< 52 HRC ALUMINIUM OXIDE > 52 HRC SILICON CARBIDE	45 m/s 120 m/s
HEAT TREATED STEEL	CBN CORUNDUM	120 m/s 45 m/s
CHROMIUM PLATED	CORUNDUM	45 m/s
HVOF PLATED	DIAMOND RESINOID DIAMOND VETRIFIED	40 m/s
STAINLESS STEEL	CORUNDUM	45 m/s

DRESSING

修整器

- + Dressing triple support with diamond disc, with single diamond or more diamonds.
- + Automatic dressing cycle
- + Touch probe for grinding wheel diameter measuring

帶有單鑽石和多鑽石的金剛石修整器滾輪
自動修整循環
砂輪直徑測量的接觸探針



WORKPIECE POSITIONING

工件定位

- + Gap control with ultrasonic sensor
- + Grinding wheel contact screen display
- + Touch probe for workpiece positioning

間隙控制與超聲波傳感器
砂輪接觸屏顯示
工件定位用接觸探針

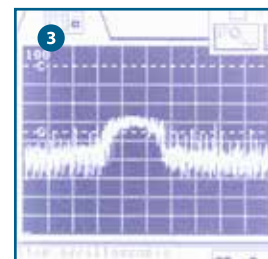


ROBOTICS

機器手

- + The machine can be equipped with Anthropomorphic or cartesian robot for loading and unloading of workpiece

機床可配備工件上下料可用的機械手



1-2. Touch probe

3. View of grinding wheel-workpiece contact

MEASUREMENT

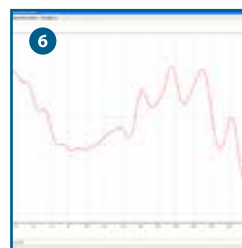
测量

The machine can be supplied with different measurement systems:

- + Absolute in-process measuring
- + In-process diameter measuring with fork
- + External measuring with double touch
- + Automatic shape control
- + Taper correction
- + Probe for different position measuring
- + External balancing heads flange type
- + Internal balancing heads spindle type

机床可以配备不同的测量系统：

- 绝对在线测量
- 带有量仪在线直径测量
- 双接触外径测量
- 形状自动控制
- 锥度校正
- 不同位置的测量探针
- 主轴型外平衡头



1-2. Absolute in-process measuring device
5. External measuring with double touch

3. Balancing system for grinding wheel
6. Cartesian shape control diagram

4. Linear encoders
7. Polar shape control diagram

CNC CONTROL SYSTEM

CNC控制系统

Security SoftwareMemory
Color screen 18 inc
USB port
Network output
Graphic interface
Remote control handset

安全软件
保存
18英寸彩色显示屏
USB端口
网络输出
图形界面
手动远程控制



COMMUNICATION

通信

- + Webcam inside the grinding zone control by external joystick
- + External monitor for grinding monitoring
- + Software for remote control

摄像头内的磨削区域控制
用于磨削显示的外部显示屏
远程控制软件



PLANTS

装置

- + Electric system conforming to CE or UL standards
- + Paper or magnetic coolant cleaner
- + Protection cabin with viewer
- + Guarding with temperature control
- + Flue gas cleaning

电气系统负荷CE或UL标准
过滤纸或磁性冷却液清洁剂
防护带有温度控制
烟雾净化器

MOVING WHEELHEAD / MOVING TABLE

		RU1000	RU1600	RU2000	RU2500	RU3000	RU4000	RU5000	RU6000
Height centers 顶尖高度	[mm]	400	400	400	440	450	450	550	600
Swing over table 回转直径	[mm]	780	780	780	820	880	880	1080	1200
Max lenght of external grinding 大磨削长度	[mm]	1000	1600	2000	2500	3000	4000	5000	6000
Max diameter of grinding wheel 最大磨削直径	[mm]	660	660	660	710	710	915	915	915
Width of grinding wheel 磨削宽度	[mm]	18÷50	18÷50	22÷80	22÷80	30÷120	30÷120	30÷120	30÷120
Maximum weight between centers 顶尖最大支撑重量	[kg]	80	150	300	800	3000	4000	5000	6000
Min. distance between centers 最小顶尖距离	[mm]	30	30	30	50	80	80	80	80
Max. distance between centers 最大顶尖距离	[mm]	1060	1550	2050	2550	3050	4050	5050	6050
Grinding wheel spindle power 砂轮主轴功率	[kW]	11	11	11	16	24.2	24.2	24.2	24.2
Headstock spindle power 头架主轴功率	[kW]	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
Maximum headstock speed 头架最大角速度	[rpm]	1000	1000	1000	1000	500	500	500	500

*Based on specific customer requirements. The different application possibilities of our machines depend on the technical equipment specifically requested by our customers and workpiece drawing.



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