



FACING THE WORLD AND ENTERING THE WORLD



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Dezhou Tianrui Machinery and Equipment Co., Ltd.

Enterprise Profile 企业简介

Dezhou Tianrui Machinery and Equipment Co., Ltd. was established in 2008, with rich experience in deep hole processing, professional machine tool design and professional research and development team. The company has a special machine tool manufacturing base and a number of supporting machinery processing plants, can provide customers with a variety of processing solutions, technical training and after-sales service, mainly for the aerospace industry, coal mine, petrochemical, military enterprises, etc.

德州天瑞机械设备有限公司成立于 2008 年，拥有丰富的深孔加工经验、专业机床设计和专业的研发团队。公司拥有专门的机床制造基地和多家配套的机械加工厂，可为客户提供各种加工解决方案、技术培训和售后服务，主要服务于航空航天工业、煤矿、石化、军工企业等。

Based on the concept of "technology to help development, quality as the cornerstone", the enterprise has not only obtained the "Quality Management System Certification Certificate", "utility model Patent Certificate" and other certificates, but also won the Shandong Province "specialized and new" small and medium-sized enterprises, national enterprise integrity publicity quality / service 3A level credit unit and other honorary titles.

企业立足于“技术助发展、质量为基石”的理念，不仅取得了《质量管理体系认证证书》、《实用新型专利证书》等多个证书，同时荣获山东省“专精特新”中小企业、全国企业诚信公示质量 / 服务 3A 级诚信单位等荣誉称号。

Deep hole drilling and boring machine 深孔钻镗床

TK2120/TK2125/TK2135/TK2220/TK2225/TK2235 characteristics 特性

The machine tool is specialized in processing cylindrical deep hole workpiece equipment, such as the spindle of processing machine tool, all kinds of mechanical hydraulic cylinders, cylinder, cylindrical hole blind hole and step hole. The machine tool can not only undertake drilling, boring, but also can be rolling processing, drilling using the internal discharge method.

该机床是专门加工圆柱形深孔工件的设备，如加工机床的主轴，各种机械液压油缸、汽缸，圆柱形通孔盲孔及阶梯孔等。机床不但可以承担钻削、镗削，而且还可以进行滚压加工，钻削时采用内排屑法。

Machine tool body rigidity is strong, good precision retention. The spindle speed has a wide range, and the feed system is driven by AC servo motor, which can meet the needs of various deep hole processing processes. The illuminator (oil pressure head) and workpiece are tightened by hydraulic device, and the instrument display is safe and reliable.

机床机身刚性强，精度保持性好。主轴转速范围广，进给系统由交流伺服电机驱动，能适应各种深孔加工工艺的需要，授油器（油压头）和工件顶紧采用液压装置，仪表显示，安全可靠。

The machine tool is a series of products, but also according to the user needs to provide a variety of deformation products.

该机床为系列产品，还可按用户需要提供各种变形产品。

The machine tool mainly has bed body part, bedside box, card tray body, mop plate into the feed system, feed box, oil illuminator(oil pressure head), cooling part, dust removal device, working center frame, hydraulic system, etc. The machine tool can be flexibly selected according to the actual needs, a wide range of application.

机床主要有床体部分，床头箱，卡盘体，拖板进给系统，进给箱，授油器（油压头），冷却部分，排屑装置，工作中心架，液压系统等。本机床可根据实际需要灵活选择加工工艺方式，适用范围广泛。

According to the working situation, you can choose the following several working

forms

根据工作情况，可选择下列几种工作形式

- 1.The workpiece rotation, tool rotation, and reciprocating feed movement
- 2.The workpiece rotation, the tool does not rotate and reciprocating to the movement
- 3.The workpiece does not rotate, tool rotation and reciprocating movement.

- 1、工件旋转、刀具旋转和往复进给运动；
- 2、工件旋转、刀具不旋转和往复进给运动；
- 3、工件不旋转、刀具旋转和往复进给运动。



Machine tool use and processing case 机床用途及加工案例

Suitable for all kinds of hydraulic cylinder, main shaft hole, cylinder hole, cooling hole processing, suitable for large quantities or small batch production

适用于各种液压油缸、主轴孔、汽缸孔、冷却孔的加工，适于大批或小批生产。



Machine tool characteristics 机床特点

1. Processing accuracy ($\leq 0.03\text{mm}$) and high finish ($\leq \text{Ra}0.2-0.8$).
加工精度 ($\leq 0.03\text{mm}$) 与光洁度高 ($\leq \text{Ra}0.2-0.8$) 。
2. Can process the two ends of the small middle large inner hole.
可加工两端小中间大的内孔。
3. The inner hole processing allowance can reach 12.5mm on one side.
内孔加工余量单边可达 12.5mm。
4. Multi-step inner hole can be processed.
可加工多台阶内孔。
5. Can process long inner hole cutting process.
可加工长内孔切槽工序。

Deep hole machine tool TK2120/TK2125 Specifications and performance

深孔钻镗机床 TK2120/TK2125 的规格和性能

Technical specifications 技术规格	TK2120	TK2125
Max.boring diameter 最大镗孔直径	$\phi 200\text{mm}$	$\phi 250\text{mm}$
Max. drilling diameter 最大钻孔直径	$\phi 80\text{mm}$	$\phi 80\text{mm}$
Largest depth of boring holes 镗孔最大深度	1000-15000mm	1000-15000mm
Workpiece clamping diameter range 工件夹紧直径范围	60-300mm	60-300mm
Height from spindle center to bed 主轴中心高	350mm	350mm
Main shaft aperture of the bedside box 床头箱主轴孔径	$\phi 85\text{mm}$	$\phi 85\text{mm}$
Spindle front taper hole 主轴前端锥孔	$\phi 85\text{mm } 1:20$	$\phi 85\text{mm } 1:20$
Spindle speed range 主轴变速范围	60-1000r/min	60-1000r/min
Feed speed range (infinite) 进给速度范围 (无限)	5-3000mm/min	5-3000mm/min

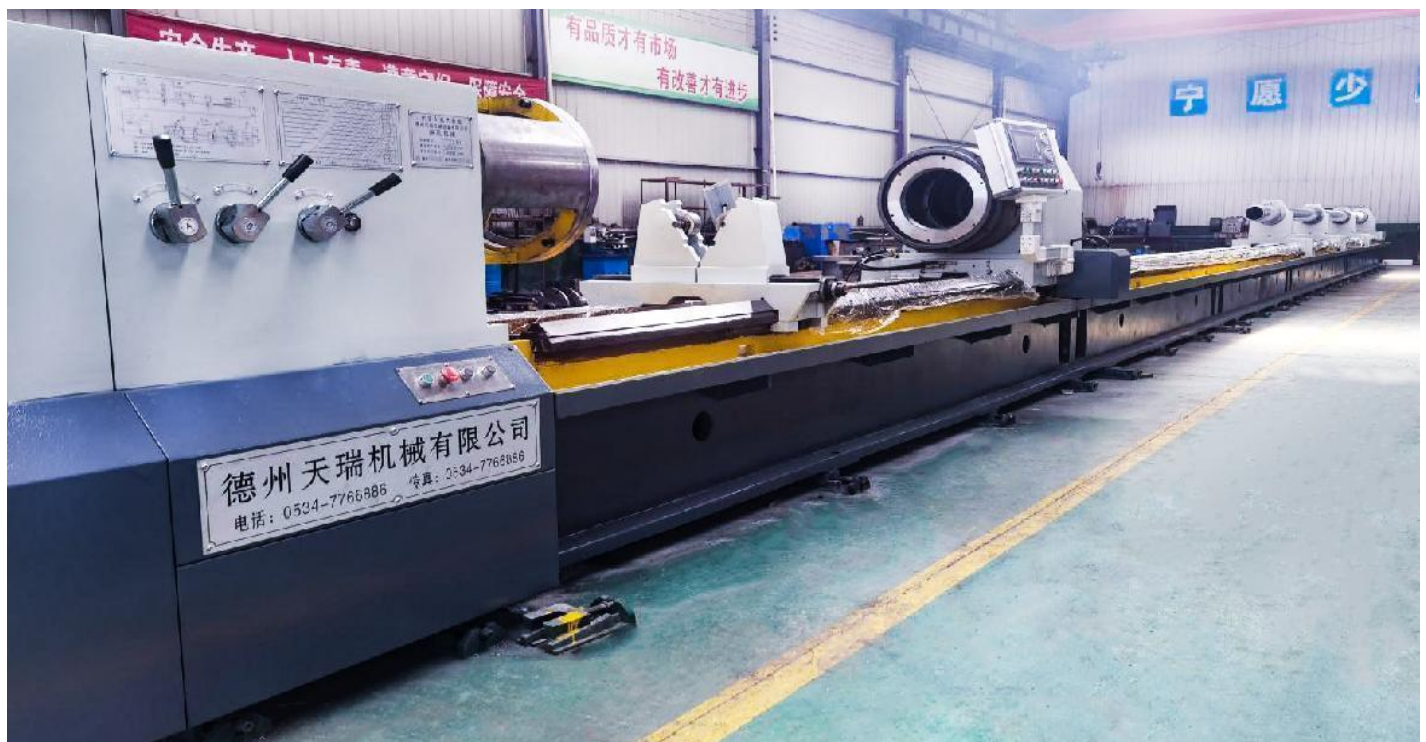
Carriage rapid-moving speed 拖板快速移动速度	3m/min	3m/min
Power of main motor 主电机功率	22KW/30KW	22KW/30KW
Hydraulic pump motor power 液压泵电机功率	1.5KW	1.5KW
Carriage rapid motor power 拖板快速电机功率	3KW	3KW
Feed motor power 进给电机功率	3.7KW	3.7KW
Cooling pump motor power 冷却泵电机功率	5.5KW/7.5KW	5.5KW/7.5KW
Cooling system rated pressure 冷却系统额定压力	0.36Mpa	0.36Mpa
Cooling system flow 冷却系统流量	300L/min	300L/min
Rated working pressure of the hydraulic system 液压系统额定工作压力	6.3Mpa	6.3Mpa
oil pressure head withstands maximum axial force 授油器承受最大轴向力	68KN	68KN
The maximum predetermined effort of the oil pressure head to the workpiece 授油器对工件的最 大预顶紧力	20KN	20KN
Length of the oil pressure head tray 授油器托板长 度	800mm	

Model 型号	TK2120			TK2125		
Specific ation 规格	Ground space long*wide*high 地面空间 长×宽×高	net weight (T) 净重 (T)	rough weight (T) 毛重 (T)	Ground space long*wide*high 地面空间 长×宽×高	net weight (T) 净重 (T)	rough weight (T) 毛重 (T)
1000mm	7984*2873*15 50	11.4	12.2	7984*3150*15 50	13	14

2000mm	9984*2873*15 50	13.9	14.9	9984*3150*15 50	15.5	17
3000mm	11984*2873*1 550	15.7	16.7	11984*3150*1 550	17.5	19
4000mm	13984*2873*1 550	18.2	19.5	13984*3150*1 550	19.8	21
5000mm	15984*2873*1 550	20	21.3	15984*3150*1 550	21.6	24
6000mm	17984*2873*1 550	21.8	23.4	17984*3150*1 550	23.5	25
7000mm	19984*2873*1 550	23.6	25.2	19984*3150*1 550	25.5	27
8000mm	21984*2873*1 550	26.2	28.1	21984*3150*1 550	27.5	30

TK2135/TK2140 Series of characteristics

TK2135/TK2140 系列特点



Machine tool use case 机床案例



Deep hole boring machine TK2135/TK2140 Specifications and performance

深孔钻镗床 TK2135/TK2140 规格及性能

Technical specifications 技术规格	TK2135 parameter	TK2140 parameter
Max.boring diameter 最大镗孔直径	φ350mm	φ400mm
Max. drilling diameter 最大钻孔直径	φ80mm	φ80mm
Largest depth of boring holes 镗孔最大深度	1000-15000mm	1000-15000mm
Workpiece clamping diameter range 工件夹紧直径范围	φ100-φ500mm	φ100-φ600mm
Height from spindle center to bed 主轴中心高	450mm	450mm
Main shaft aperture of the bedside box 床头箱主轴孔径	φ85mm	φ85mm
Spindle front taper hole 主轴前端锥孔	φ85mm 1:20	φ85mm 1:20
Spindle speed range 主轴变速范围	40-500r/min	40-500r/min
Feed speed range (infinite) 进给速度范围（无限）	5-1000mm/min	5-1000mm/min

Carriage rapid-moving speed 拖板快速移动速度	3m/min	3m/min
Power of main motor 主电机功率	22KW/30KW	22KW/30KW
Hydraulic pump motor power 液压泵电机功率	1.5KW	1.5KW
Carriage rapid motor power 拖板快速电机功率	3KW	3KW
Feed motor power 进给电机功率	5KW	5KW
Cooling pump motor power 冷却泵电机功率	5.5KW	5.5KW
Cooling system rated pressure 冷却系统额定压力	0.36Mpa	0.36Mpa
Cooling system flow 冷却系统流量	300L/min	300L/min
Rated working pressure of the hydraulic system 液压系统 额定工作压力	6.3Mpa	6.3Mpa
oil pressure head withstands maximum axial force 授油器承受最大轴向力	68KN	68KN
The maximum predetermined effort of the oil pressure head to the workpiece 授油器对工件的最大预顶紧力	20KN	20KN
Length of the oil pressure head tray 授油器托板长度	1000mm	

Model 型号	TK2135			TK2140		
Specification 规格	Ground space long*wide*high 地面空间 长×宽×高	net weight 净重 (T)	rough weight 毛重 (T)	Ground space long*wide*high 地面空间 长×宽×高	net weight 净重 (T)	rough weight 毛重 (T)
1000mm	7984*2873*1550	13.4	15.2	7984*3150*1550	14	16
2000mm	9984*2873*1550	15.9	16.9	9984*3150*1550	15.5	18
3000mm	11984*2873*1550	17.7	18.7	11984*3150*1550	17.5	20
4000mm	13984*2873*1550	19.2	20.5	13984*3150*1550	19.8	22
5000mm	15984*2873*1550	22	23.3	15984*3150*1550	22.6	26
6000mm	17984*2873*1550	23.8	25.4	17984*3150*1550	23.5	27
7000mm	19984*2873*1550	25.6	27.2	19984*3150*1550	25.5	29
8000mm	21984*2873*1550	28.2	30.1	21984*3150*1550	27.5	31

Deep hole boring TK2150/TK2250/TK2180 series

深孔镗 TK2150/TK2250/TK2180 系列介绍

The machine tool can complete the boring, expansion, rolling and packing processing of large diameter heavy parts. Workpiece rotation and tool feeding during machining. Boring using the front (bedside end) discharge of cutting fluid, cutting process, the process of waste chips, need to be equipped with special set tool, knife rod and special work clip.

该机床可完成大直径重型零件深孔的镗，扩，滚压，套料加工。加工时工件旋转、刀具进给。镗孔时采用向前（床头端）排切削液、排切屑的工艺方式，套料时采用外排屑的工艺形式，需配备专用套料刀具、刀杆和专用工装夹。



TK2250 Specification of the deep-hole drilling and boring machine

TK2250 深孔钻镗床规格性能

Technical specifications 技术规格	TK2250 parameter 参数
Drilling diameter range 钻孔直径范围	φ50-φ150mm
Boring diameter range 镗孔直径范围	φ250-φ500mm
Boring depth range 钻孔深度范围	1000-20000mm
Workpiece clamping diameter range 工件夹紧直径范围	φ100-700mm
Main shaft aperture of the bedside box 床头箱主轴孔径	φ130mm
Main axis front-end cone hole 主轴前端锥孔	Metric 140 #
Range of spindle speeds progression 主轴转速范围 级数	3.15-315r/min Level 21
Boring box speed range progression 镗杆箱转速范围 级数	60-300r/min Level 6
Feed speed range 进给速度范围	5-1000mm/min
Drag board fast movement speed 拖板快速移动速度	6000mm/min
Main motor 主电机	N=37KW, n=960r/min
Boring box motor 镗杆箱电机	N=22KW, n=1460r/min
Feed motor 进给电机	N=7.5KW
Hydraulic pump motor 液压泵电机	N=505KW, n=960r/min(Three groups)
Cooling pump motor 冷却泵电机	N=5.5KW, n=960r/min(Three groups)
Cooling system at a rated pressure 冷却系统额定压力	0.36MPa
Cooling system flow 冷却系统流量	300. 600.900L/min

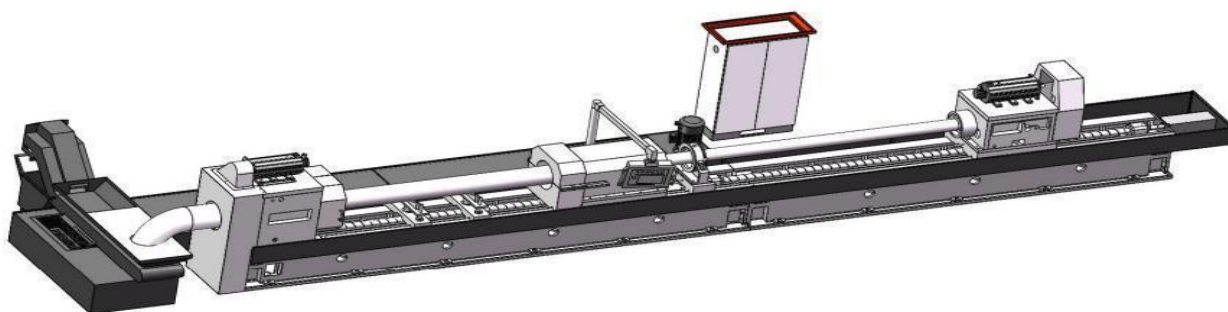
Machine tool specifications 机床规格	Net machine weight (ton) 机床重量 (吨)	Machine tool shape size (Long * width * height)
1m	18	9500*3800*1900
2m	20	11500*3800*1900
3m	22	13500*3800*1900
4m	24	15500*3800*1900
5m	26	17500*3800*1900
6m	28	19500*3800*1900
7m	30	23500*3800*1900
8m	32	25500*3800*1900
9m	34	27500*3800*1900
10m	36	31500*3800*1900
11m	38	33500*3800*1900
12m	40	35000*3800*1900

Intelligent high-end deep-hole composite machine 智能高端深孔复合机床

TFK25/TFK50 Machine tool display 系列机床展示

Deep hole composite machine tool is a high efficiency special machine tool developed by Tianrui. The spindle of the machine tool adopts large aperture front cutting spindle to ensure the smooth cutting of iron chips in high speed and fast processing. The machine tool adopts the front and rear double power rotary processing mode, processing materials whether hot rolled pipe or cold pull pipe, can be carried out with high efficiency boring processing. Its processing efficiency is more than 5 times that of the traditional machine tool, is 20 times that of the honing machine, processing precision, roundness size, surface finish can be met, intelligent composite machine tool is the most ideal processing equipment for the production of coal mine cylinder and engineering cylinder.

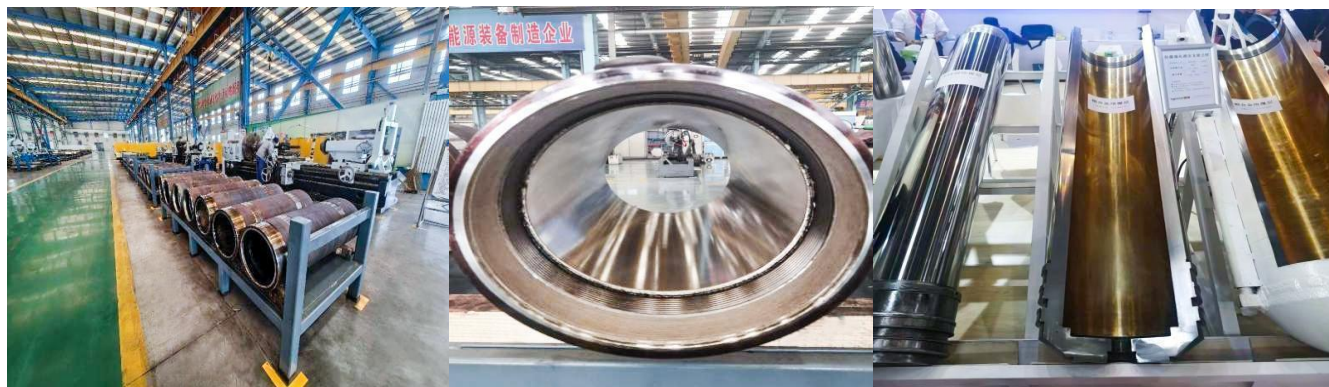
深孔复合机床是天瑞研发的一台高效专用机床。机床主轴采用大孔径前排削主轴，以便于保证在高速和快速加工中，铁屑的排削顺畅。机床采用前后双动力旋转加工方式，加工材料不论是热轧管还是冷拔管，都可以进行高效率镗孔加工。其加工效率是传统机床的 5 倍以上，是珩磨机的 20 倍，加工精度、圆度尺寸、表面光洁度等都能满足，智能复合机床是生产煤矿油缸与工程油缸最理想的加工设备。



Machine tool use and product cases 机床用途及案例

Used for processing coal oil cylinder, small digging oil cylinder, baler oil cylinder, pump oil cylinder and other kinds of oil cylinder processing.

用于加工煤炭油缸、小挖油缸、打包机油缸、泵油缸等各类油缸的加工。



1.The machining accuracy is ≤ 0.03 , and the high finish is $Ra \leq Ra0.2-0.8$;

加工精度 ≤ 0.03 , 光洁度高 $\leq Ra0.2-0.8$;

2.The processing efficiency is more than 5 times that of the traditional machine tools;

加工效率是传统机床的 5 倍以上;

3.Using the spindle large aperture front row cutting;

采用主轴大孔径前排削;

4.The internal hole processing margin of unilateral 10mm;

内孔加工余量单边 10mm;

5.Can be processed cold pull pipe, hot rolling pipe, drilling, sleeve, material, blind hole repair.

可加工冷拔管、热轧管、钻孔、套料、盲孔修复等。

Technical parameter 技术参数

	Project name 项目名称	TFK25 parameter 参数	TFK50 parameter 参数
Working range 工作范围	Boring diameter range 镗孔直径范围	$\phi 40-\phi 250\text{mm}$	$\phi 160-\phi 500\text{mm}$
	Artifact length 工件长度	500-10000mm	500-10000mm
	Maximum processing volume 最大加工量	0.4-10mm	0.4-10mm
Parameter parameters of grinding shaft box 磨杆箱主轴 参数	center height 中心高度	$> 350\text{mm}$	$> 500\text{mm}$
	Main axis front-end cone hole 主轴前端锥孔	$\phi 250\text{mm}$	$\phi 400$
	Spindle variable speed range 主轴变速范围	3-1000r/min 3 (Non-pole speed control in the	3-1000r/min 2 (Non-pole speed control in the

		gear) (档内无极调速)	gear) (档内无极调速)
	Boring torque 镗杆扭矩	$\geq 3500\text{N.m}$	$\geq 6500\text{N.m}$
Feed parameter 进料参数	Feed speed range 进料速度范围	5-1000mm/min	5-1500mm/min
	The drag board moves quickly 拖板快速移动	3m/min	1.5m/min
	Boring rod feed torque 镗杆进给扭矩	$\geq 1000\text{N.m}$	$\geq 1500\text{N.m}$
	Positioning length 定位长度	0-10000mm	0-4000mm
Working accuracy 加工精度	Bface roughness of workpiece 工件镗削表面粗糙度	$\leq \text{Ra}3.2\mu\text{m}$	$\leq \text{Ra}3.2\mu\text{m}$
	Rolling surface roughness of the workpiece 工件滚压表面 粗糙度	$\leq \text{Ra}0.4\mu\text{m}$	$\leq \text{Ra}0.4\mu\text{m}$
	Cylindricity of workpiece machining 工件加工圆柱度	$\leq 0.036/500\text{mm}$	$\leq 0.036/500\text{mm}$
	Workpiece processing roundness 工件加工圆度	$\leq 0.03/100\text{mm}$	$\leq 0.03/200\text{mm}$
Motor capacity 电机容量	Boring motor power 镗杆电机功率	30KW	45KW
	Spindle box motor power 主轴箱电机功率	45KW	55KW
	Hydraulic pump motor power	2.2KW	2.2KW

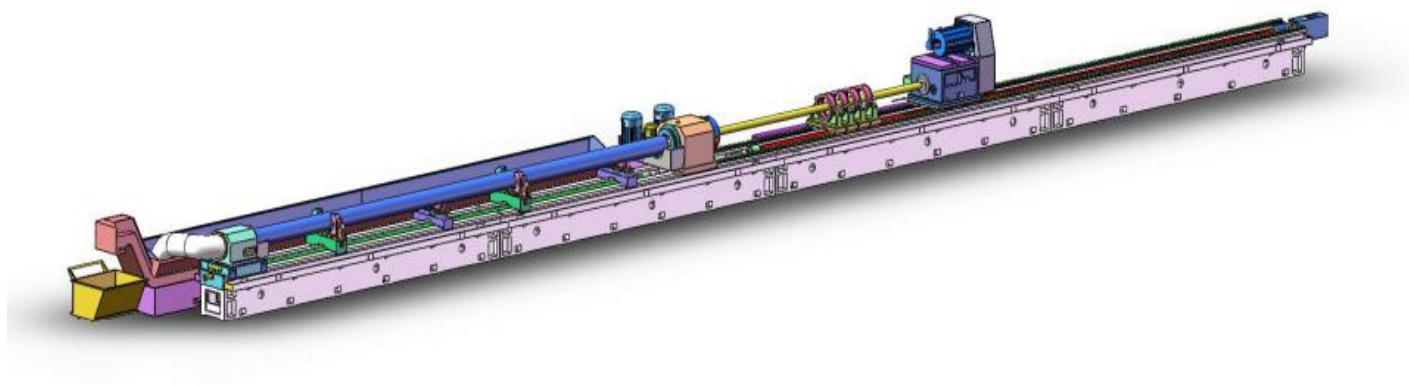
	液压泵电机功率		
	Feed motor 进给电机	5KW	5KW
	Resolution motor power 分辨率电机功率	5.5KW	5.5KW
	Cooling motor power 冷却电机功率	7.5KW Group 2	7.5KW Group 2
	Oil pressure head quickly moving motor 授油器快速移动电机	2.2KW	2KW
	Magnetic separator motor 磁性分离器电机	2.8KW	2.8KW
Other 其他	Cooling system quota pressure 冷却系统定额压力	0.36Mpa	0.36Mpa
	Rated pressure of the extraction system 提液系统额定压力	0.36Mpa	0.36Mpa
	Hydraulic system rated pressure 液压系统额定压力	6.3Mpa	6.3Mpa
	Maximum jacking force of Oil pressure head 授油器的最大顶紧力	20KN	30KN
	Cooling system flow 冷却系统流量	300L/min *Group 2	400L/min *Group 2
	Strip the filter flow rate 布带过滤器流量	600L/min	800L/min

CNC scraping and rolling machine 数控刮削滚光机床

TGK 16 / TGK 25 series machine tool display TGK16/TGK25 系列机床展示

TGK series CNC scraping rolling machine is an efficient deep hole processing machine tool developed by Tianrui on the basis of similar equipment of well-known foreign manufacturers. Its efficiency of processing cold pull pipe (unilateral processing allowance 0.5mm) is more than 5 times that of traditional machine tool, 40 times that of honing machine tool, and it is the most ideal processing equipment for the production of coal mine cylinder.

TGK 系列数控刮削滚光机是天瑞在国外知名厂家同类设备基础上研发的一款高效深孔加工机床，其加工冷拔管（单边加工余量 0.5mm）效率是传统机床的 5 倍以上，是珩磨机床的 40 倍，是生产煤矿油缸最理想的加工设备。



Machine tool characteristics 机床特点

1.Machining accuracy of ≤ 0.033 , high finish ($\leq Ra0.2-0.8$);

加工精度 ≤ 0.03 ，光洁度高 ($\leq Ra0.2-0.8$) ；

2.The processing efficiency is more than 5 times that of the traditional machine tools;

加工效率是传统机床的 5 倍以上；

3.The size accuracy (IT8) adjustment is convenient and accurate, the fine boring tool through the boring head end surface of the screw control of the internal spindle cone surface length to fine-tune the diameter precision;

尺寸精度 (IT8) 调整方便准确，精镗刀通过镗头端面的螺钉控制内部心轴锥面长度来微调直径精度；

4.The boring head adopts numerical control program (through the cylinder) automatic control, suitable for mass production;镗头采用数控程序（通过气缸）自动控制，适于大批量生产；

5. The unilateral margin of the inner hole processing is 0.5mm;内孔加工单边余量 0.5mm;

6. The machine tool can automatically identify the length of the workpiece, without repeated programming according to different lengths of the workpiece;

机床能自动识别工件长度，无须根据不同长度工件重复编程；

7.Unique structure, more stable processing.(The actuator fixed tool can be rotated because the guide is more stable).结构独特，加工更稳定。（可采用授油器固定，刀具旋转并进给的方式，因导向不动所以更稳定）。

Machine tool processing efficiency comparison 机床加工效能对比

Machine tool name 机床名称	Deep-hole drilling and boring machine 深孔镗床	Deep-hole drilling and boring machine 深孔镗床	Tianrui scraping and rolling machine 天瑞刮削滚光机
Machine tool model 机床型号	T2120	TG2120	TGK2120

Artificial quantity 人工数量	One person / class 一人/班	One person / class 一人/班	One person / class 一人/班
Workpiece specifications 工件规格	$\phi 150 * 6 \text{ m}$	$\phi 150 * 6 \text{ m}$	$\phi 150 * 6 \text{ m}$
Finish allowance 加工余量	One-side of 0.5mm 单边 0.5mm	One-side of 0.5mm 单边 0.5mm	One-side of 0.5mm 单边 0.5mm
Material 材料	45#	45#	45#
Class production 班产量	Five pieces 5 件	Five pieces 5 件	30

Technical parameters of TGK series scraper TGK 系列刮滚机技术参数

Project name 项目名称	The TGK 16 parameters 参数	The TGK 25 parameters 参数
Boring diameter range 镗孔直径范围	$\phi 40\text{-}\phi 160\text{mm}$	$\phi 40\text{-}\phi 250\text{mm}$
Artifact length 工件长度	500-12000mm	500-15000mm
Maximum processing volume 最大加工量	0.4-1mm	0.4-1mm
center height 中心高度	$>300\text{mm}$	$>350\text{mm}$
Main axis front-end cone hole 主轴前端锥孔	$\phi 80\text{mm } 1:20$	$\phi 100\text{mm } 1:20$
Spindle variable speed range	3-1000 r/min	3-1000 r/min

主轴变速范围		
Boring torque 镗杆扭矩	$\geq 3500\text{N.m}$	4500N.m
Feed speed range 进料速度范围	5-1000mm/min	5-1000mm/min
The drag board moves quickly 拖板快速移动	2m/min	1.5m/min
Boring rod feed torque 镗杆进给扭矩	$\geq 1000\text{N.m}$	$\geq 1500\text{N.m}$
Positioning length 定位长度	0-12000mm	0-15000mm
Bface roughness of workpiece 工件镗削表面粗糙度	$\leq \text{Ra}3.2\mu\text{m}$	$\leq \text{Ra}3.2\mu\text{m}$
Rolling surface roughness of the workpiece 工件滚压表面粗糙度	$\leq \text{Ra}0.4\mu\text{m}$	$\leq \text{Ra}0.4\mu\text{m}$
Cylindricity of workpiece machining 工件加工圆柱度	$\leq 0.036/500\text{mm}$	$\leq 0.036/500\text{mm}$
Workpiece processing roundness 工件加工圆度	$\leq 0.03/100\text{mm}$	$\leq 0.03/100\text{mm}$
Boring motor power 镗杆电机 功率	The 22KW AC servo motor 交流伺服电机	A 30KW AC servo motor 交流伺服电机
Spindle box motor power 主轴箱电机功率	1.8KW	1.8KW
Hydraulic pump motor power 液压泵电机功率	3.7KW AC servo motor 交流伺服电机	3.7KW AC servo motor 交流伺服电机
Feed motor 进给电机	3KW	3KW
Resolution motor power	The 5.5KW 2 group	The 5.5KW 2 group

分辨率电机功率		
Cooling motor power 冷却电机功率	2KW	2KW
Oil pressure head quickly moving motor 授油器快速移 动电机	2.8KW	2.8KW
Magnetic separator motor 磁性分离器电机	0.36Mpa	0.36Mpa
Cooling system quota pressure 冷却系统定额压力	0.36Mpa	0.36Mpa
Rated pressure of the extraction system 提液系统额定压力	6.3Mpa	6.3Mpa
Hydraulic system rated pressure 液压系统额定压力	15KN	30KN
Maximum jacking force of Oil pressure head 授油器的最大顶 紧力	300 L/min * 2 group	400 L/min * 2 group
Cooling system flow 冷却系统流量	600L/min	800L/min
SIEMENS KND Or the user selection SIEMENS KND 或用户选配		

Deep hole honing machine 深孔珩磨机

MK 350 / MK 500 series machine tool display MK350/MK500 系列机床展示

MK series tianrui CNC deep hole honing machine is equipped with numerical control system, linear rolling rail, AC servo motor, grinding rod adopts infinite speed regulation, smooth change, convenient speed regulation, easy to ensure the accuracy of aperture size and reduce labor intensity.

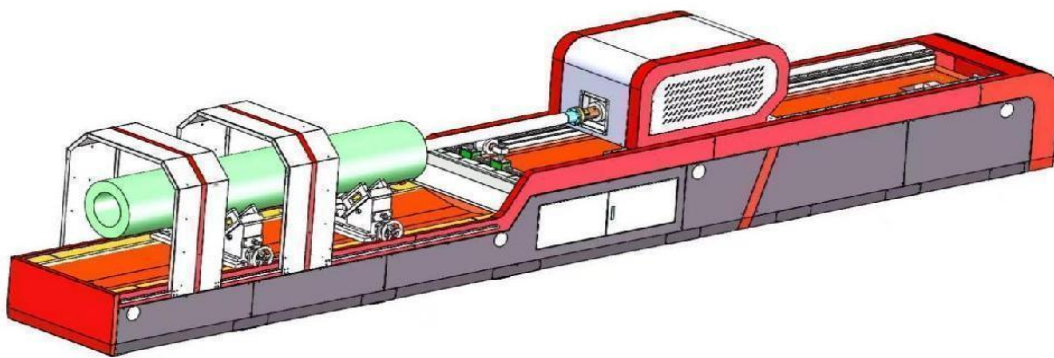
In the process of honing, the sand bar and workpiece always maintain constant pressure, so that the sand bar for strong grinding, to ensure the high efficiency of deep hole processing, for the general cylindrical deep hole parts, after rough boring, if the use of cold pull steel pipe, strong honing can be directly used to change the deep hole processing.

The traditional process of multiple processes effectively improves the productivity. The honing parts are cast iron and all kinds of steel, including hardened workpieces. When the honing diameter is greater than 1000mm, it needs to be customized, which can reduce the center force of the honing head and improve the honing roundness.

MK 系列天瑞数控深孔珩磨机配备数控系统、直线滚动导轨、交流伺服电机，磨杆采用无极调速，换向平稳、调速方便，容易保证孔径尺寸精度和减轻劳动强度。

在珩磨过程中，砂条和工件始终保持恒压，使砂条进行强力磨削，保证了深孔加工的高效率，对一般圆柱形深孔零件，粗镗后进行粗精珩磨，若使用冷拔钢管，可直接进行强力珩磨改变了深孔加工。

多工序的传统工艺方法，有效地提高了生产率。被珩磨零件质为铸铁和各类钢材，包括淬硬后的工件。珩磨直径大于 1000mm 时，需定制，也可双动力旋转珩磨，能够减少珩磨头中心力，提高珩磨圆度。

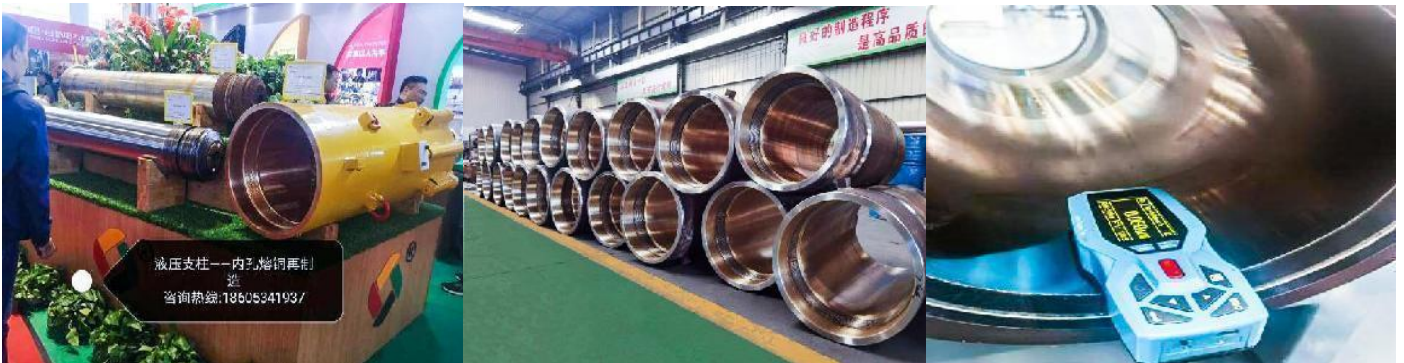




Machine tool use and case study 机床使用案例

Tianrui CNC deep hole honing machine is suitable for coarse fine honing processing of cylindrical deep hole parts, such as coal cylinder, small digging cylinder, baler cylinder, pump cylinder and other kinds of oil cylinder wall, especially good at processing step oil cylinder.

天瑞数控深孔珩磨机适合圆柱形深孔零件的粗精珩磨加工，如煤炭油缸、小挖油缸、打包机油缸、泵车油缸等各类油缸内壁，尤其擅长加工台阶式油缸。



Machine tool characteristics 机床特点

1. High machining precision (≤ 0.02), high finish ($\leq Ra0.2-0.8$).

加工精度高 (≤ 0.02)，光洁度高 ($\leq Ra0.2-0.8$)。

2. Size accuracy (IT6) adjustment is convenient and accurate, honing head through the cylinder head tight rise open honing (hydraulic or servo).

尺寸精度 (IT6) 调整方便准确，珩磨头通过油缸顶紧涨开珩磨 (液压或伺服)。

3. The machine tool through the numerical control program, through the hanging to control the processing size.

机床通过数控程序控制长短，通过珩磨往复次数控制加工尺寸。

4. Precision oblique rack drive, repeated positioning accuracy of 0.01mm.

精密斜齿条传动，重复定位精度 0.01mm.

5.Assembled heavy duty support, V-type adjustment bracket (customer optional).

拼装式重型支架、V 型调整支架（客户可选）。

6.360 degrees joint joints, free adjustment, easy and convenient (company patent).

360 度关节万向节，自由调整，轻松方便（公司专利）。

7.Large torque input and output power, compared to the peer can improve 2 times the processing efficiency.

大扭矩进给输出功率，相对同行可提高 2 倍加工效率。

8. Simple operation is easy to use, improve the auxiliary time by 2 times.

操作简单易上手，提高 2 倍辅助时间。

MK350/MK500/MK1000 technical parameter

MK350/MK500/MK1000 技术参数

	Project name 项目名称	The MK 350 parameters 参数	The MK 500 parameters 参数	MK1000 Parameter 参数
Working range 工作范围	Honing diameter range 珩磨直径范围	φ30-φ350mm	φ50-φ500mm	φ200-φ1000mm
	Workpiece length 工件长度	500-20000mm	500-20000mm	500-20000mm
	Maximum processing volume 最大加工量	0.4-1mm	0.4-1mm	0.4-1mm
Parameter parameters of grinding shaft box 磨杆箱 主轴参数	Center height 中心高度	300mm	>500mm	>800mm
	Spindle variable speed range 主轴变速范围	0-300/min(Infinite speed regulation)	0-300/min(Infinite speed regulation)	0-200/min(Infinite speed regulation)
	Boring torque	≥1000N.m	≥1500N.m	≥2200N.m

	镗杆扭矩			
Feed parameter 进给参数	Feed speed range 进给速度范围	0-30m/min	0-40m/min	0-40m/min
	The tray moves quickly 托板快速移动	$\geq 10\text{m/min}$	$\geq 10\text{m/min}$	$\geq 10\text{m/min}$
	Boring rod feed torque 镗杆进给扭矩	$\geq 200\text{N.m}$	$\geq 300\text{N.m}$	$\geq 600\text{N.m}$
	Positioning length 定位长度	0-20000mm	0-20000mm	0-20000mm
Working accuracy 加工精度	The face roughness of working 工件珩磨表面粗糙度	$\leq \text{Ra}0.8\mu\text{m}$	$\leq \text{Ra}0.8\mu\text{m}$	$\leq \text{Ra}0.8\mu\text{m}$
	Workpiece polished surface roughness 工件抛光表面粗糙度	$\leq \text{Ra}0.4\mu\text{m}$	$\leq \text{Ra}0.4\mu\text{m}$	$\leq \text{Ra}0.4\mu\text{m}$
	Workpiece processing cylindrical degree 工件加工圆柱度	$\leq 0.02/500\text{mm}$	$\leq 0.02/500\text{mm}$	$\leq 0.02/500\text{mm}$
	Workpiece processing roundness 工件加工圆度	$\leq 0.02/100\text{mm}$	$\leq 0.02/100\text{mm}$	$\leq 0.02/100\text{mm}$
Motor capacity	Boring motor power 镗杆电机功率	15KW	22KW	30KW

电机容量	Hydraulic pump motor power 液压泵电机功率	1.5KW	1.5KW	1.5KW
	Feed motor 进给电机	3.7KW	5KW	5KW
	Cooling motor power 冷却电机功率	0.75KW	0.75KW	1.5KW
KND or user optional KND 或用户选配				

Three coordinate gun drill 三坐标枪钻

Machine tool display 机床展示

Tianrui three coordinate gun drilling machine tool (ZKS2102 / ZKS2108) is a porous special machine tool, using the tool rotary feed, workpiece fixed processing technology, can process a variety of special-shaped parts, can be drilled in the end of the workpiece, especially suitable for through the rotating workbench drill with an Angle of eccentric hole. The workbench can be rotated at 360 degrees.

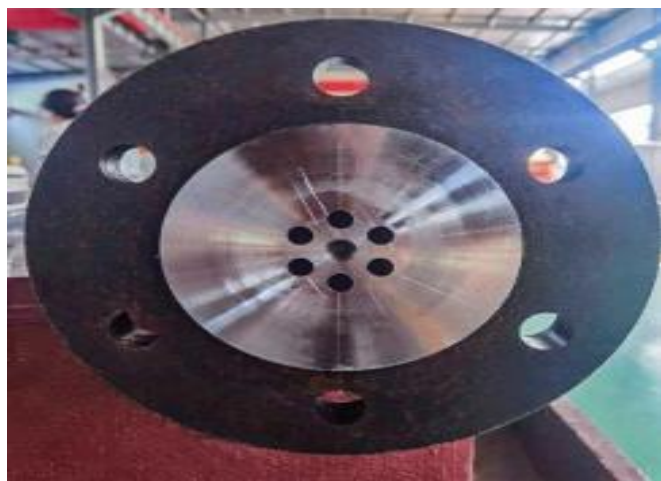
天瑞三坐标枪钻机床（ZKS2102/ZKS2108）是加工多孔的专用机床，采用刀具旋转进给，工件固定的加工工艺，可加工各种异形零件，可在工件端面钻孔，特别适合于通过转动工作台钻带有角度的偏心孔。工作台可 360 度旋转。



Suitable for all kinds of special-shaped parts deep hole machining, with an Angle of deep hole machining. 适合各种异形零件深孔加工，带有角度的深孔加工。

Machine tool characteristics 机床特点

- 1.Machessed honeycomb deep holes with angled holes.可加工蜂窝式深孔与带有角度的孔。
- 2.The bench can rotate 360 degrees with a dial (customizable).工作台可 360 度旋转，工作台带有刻度盘（可定制）。
- 3.Convenient clip, low tooling cost.装夹方便，工装费用低。
- 4.The guide sleeve adopts the linear bearing structure with the positioning precision of 0.005mm.导向套采用直线轴承结构定位精度 $\leq 0.005\text{mm}$ 。
- 5.The positioning accuracy between the holes is 0.1mm.孔与孔之间的定位精度 $\leq 0.1\text{mm}$ 。



Machine tool name 机床名称	Deep hole gun drill 深孔枪钻床	Double gun drill 双轴枪钻	Three coordinate gun drill 三坐标枪钻
Model 机床型号	ZK2103	ZK2103×2	ZKS2103
Artificial quantity 人 工数量	One person / class 1 人/班	One person / class 1 人/班	One person / class 1 人/班
Workpiece specifications	$\phi 10\text{mm}$	$\phi 10\text{mm}$	$\phi 10\text{mm}$

工件规格			
Material 材料	45#	45#	45#
Class production 班 产量	15M	30M	≥20M

ZKS tricoordinate series technical parameters ZKS 三坐标系列技术参数

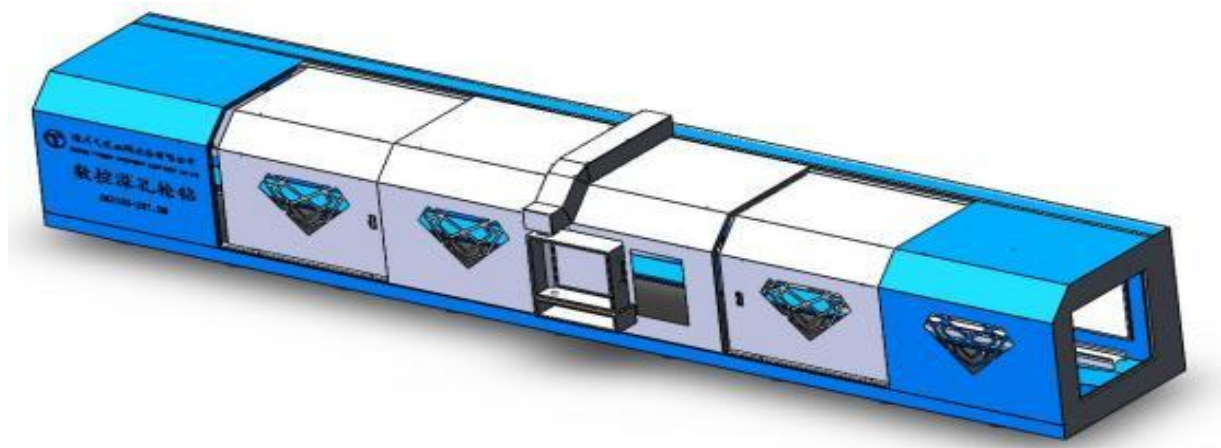
	Project name 项目名称	ZKS2103	ZKS2108
Working range 工作范围	Drilling diameter range 钻孔直径范围	φ3-φ20mm	φ10-φ80mm
	Processing length 加工 长度	100-2000mm	100-5000mm
	Z axis itinerary Z 轴行程	2000mm	2000mm
	Y axis itineraryY 轴行程	500mm	500mm
	X axis itinerary X 轴行程	1000mm	1000mm
Drill pipe box spindle parameters 钻杆箱主轴 参数	Center height 中心高度	150mm	150mm
	Spindle front taper hole 主轴前端锥孔	φ40mm 1:20	φ40mm 1:20
	Spindle speed range 主 轴变速范围	60-4000r/min	60-4000r/min
	Drill rod torque 钻杆扭矩	≥35N.m	≥50N.m

Feed parameters 进给参数	Feed speed range 进给速度范围	5-1000mm/min	5-1000mm/min
	Rapid movement of pallet 托板快速移动	2m/min	2m/min
	Boring bar feed torque 镗杆进给扭矩	$\geq 10\text{N.m}$	$\geq 10\text{N.m}$
	Positioning length 定位长度	0-2000mm	0-5000mm
Processing accuracy 加工精度	Workpiece surface roughness 工件表面粗糙度	$\leq \text{Ra}1.6\mu\text{m}$	$\leq \text{Ra}1.6\mu\text{m}$
	Workpiece machining cylindricity 工件加工圆柱度	$\leq 0.02/500\text{mm}$	$\leq 0.02/500\text{mm}$
	Workpiece processing roundness 工件加工圆度	$\leq 0.03/100\text{mm}$	$\leq 0.03/100\text{mm}$
Motor capacity 电机容量	Drill pipe motor power 钻杆电机功率	15KW 交流伺服电机 AC servo motor	30KW 交流伺服电机 AC servo motor
	Hydraulic pump motor power 液压泵电机功率	1.8KW	1.8KW
	Feed motor 进给电机	3.7KW 交流伺服电机 AC servo motor	5KW 交流伺服电机 AC servo motor

	Lubrication motor power 润滑电机功率	0.25KW	0.25KW
	Cooling motor power 冷却电机功率	7.5KW 2	7.5KW 3
Other 其他	Cooling system quota pressure 冷却系统定额压力	16Mpa (可调) adjustable	16Mpa (可调) adjustable
	Working pressure 工作压力	7Mpa	7Mpa
	Cooling system flow 冷却系统流量	10L/min*1 20L/min*1	10L/min*1 20L/min*1

Double shaft gun drill 双轴枪钻

Tianrui double-axis gun drilling machine (ZK2102-2/ZK2108-2) is a special machine tool for processing multiple holes at the same time. It adopts the processing technology of tool rotation feeding and workpiece fixed. It can also be processed by dual power methods such as workpiece and tool simultaneous rotation and tool feeding. It can also drill holes on the end face of the workpiece and is particularly suitable for drilling center holes with angles by rotating the worktable.



天瑞双轴枪钻机床（ZK2102-2/ZK2108-2）是同时加工多孔的专用机床，采用刀具旋转进给，工件固定的加工工艺，也可采用工件和刀具同时旋转，刀具进给等双动力方式进行加工，还可在工件端面钻孔，特别适合于通过转动工作台钻带有角度的中心孔。



Suitable for all kinds of parts of the high-efficiency deep hole processing

适合各类零件的高效深孔加工



Machine tool characteristics 机床特点

- 1.The bed and box are cast by high quality cast iron with good rigidity and stability.
床体及箱体均采用优质铸铁铸造，具有良好的刚性和稳定性。
- 2.There is no need to return the tool during drilling the deep hole.
在钻削深孔过程中刀具中途无需退刀。
- 3.CNC control system control, high degree of automation.
采用数控系统控制，自动化程度高。
- 4.The feed movement is driven by AC servo motor, ball screw auxiliary drive, but no pole speed regulation.

进给运动由交流伺服电机驱动，滚珠丝杠副传动，可无极调速。

5.Using the sliding guide rail, smooth running at low speed, no crawling

采用滑动导轨，低速运行平稳，无爬行

6.Drilling pipe box spindle can have no polar variable speed.

钻杆箱主轴可无极变速。

7.Spindle bearing and guide rail surface, etc.主轴轴承及导轨面等。

8.The high voltage cooling system adopts motor driven gear pump and immersion oil temperature controller.高压冷却系统采用电机驱动齿轮泵，并采用浸入式油温控制器。

9Automatic dust removal level was used to eliminate the chips.采用自动排屑级排除切屑。

10.The machine tool adopts the fully enclosed protection form, convenient observation, the overall beautiful.机床采用全封闭防护形式，观察便捷，整体美观。

11.With a variety of automatic monitoring devices.具有多种自动监控装置。

ZK2103/ZK2105/ZK2108 technical parameters 技术参数

	Project name 项目名称	ZK2103-2	ZK2105-2	ZK2108-2
Working range 工作范围	Drilling diameter range 钻孔直径范围	φ3-φ30mm	φ10-φ50mm	φ3-φ30mm
	Processing length 加工长度	500-2000mm	500-3000mm	500-2000mm
Drpipe box spindle	Center height 中心高度	200mm	200mm	200mm
	Spindle front taper hole 主轴前端锥孔	φ40mm 1:20	φ40mm 1:20	φ40mm 1:20

parameters 钻杆箱 主轴参数	Spindle speed range 主轴变速范围	30-4000r/min	30-4000r/min	30-4000r/min
	Drill torque 钻杆扭矩	$\geq 35\text{N.m}$	$\geq 50\text{N.m}$	$\geq 50\text{N.m}$
Feed parameter 进给参数	Feed speed range 进给速度范围	5-1000mm/min	5-1000mm/min	5-1000mm/min
	Rapid movement of pallet 托板快速移动	2m/min	2m/min	2m/min
	Boring bar feed torque 镗杆进给扭矩	$\geq 10\text{N.m}$	$\geq 10\text{N.m}$	$\geq 10\text{N.m}$
	Positioning length 定位长度	0-2000mm	0-2000mm	0-2000mm
	Workpiece machining cylindricity 工件加工圆柱度	$\leq 0.016/500\text{mm}$	$\leq 0.016/500\text{mm}$	$\leq 0.016/500\text{mm}$
	Workpiece processing roundness 工件加工圆度	$\leq 0.01/100\text{mm}$	$\leq 0.02/200\text{mm}$	$\leq 0.02/200\text{mm}$
Motor capacity	Drill pipe motor power 钻杆电机功率	7.5KW 交流 伺服电机 AC servo motor	15KW 交流伺 服电机 AC servo motor	30KW 交流伺 服电机 AC servo motor

电机容量	Hydraulic pump motor power 液压泵电机功率	1.8KW	1.8KW	1.8KW
	Feed motor 进给电机	3KW 交流伺服电机 AC servo motor	3KW 交流伺服电机 AC servo motor	5KW 交流伺服电机 AC servo motor
SIEMNS KND 或用户选配 SIEMNS KND Or the user selection				

Single shaft gun drill 单轴枪钻

Tianrui single axis CNC deep hole drill (ZK2103) is a kind of high efficiency, high precision and high automation. Using the discharge chip drilling method (gun drilling method), it can replace the machining accuracy and surface roughness that generally requires drilling, expansion and hinge process to be achieved by drilling through a continuous drilling. Tianrui single-axis CNC deep hole gun drill using digital control system control, not only has the single movement function, it also has the function of automatic circulation. Therefore, not only suitable for small batch processing, especially suitable for the processing requirements of mass production. It can not only drill through holes, but also process blind holes or step holes, and can also process eccentric holes and inclined oil holes with special tooling.



天瑞单轴数控深孔枪钻（ZK2103）是一种高效、高精度、高自动化的专用深孔枪床。采用外排屑钻削法（枪钻法），通过一次连续钻削即可代替一般需要钻、扩、铰工序才能达到的加工精度和表面粗糙度。天瑞单轴数控深孔枪钻采用数字控制系统控制，不但有单动功能，它还具有自动循环的功能。因此，不但适合于小批量的加工，特别适合大批量生产的加工要求。既能钻削通孔，也能加工盲孔或阶梯孔，配合专用工装时也可加工偏心孔及斜油孔。

Machine tool characteristics 机床特点

1.High machining accuracy (0.02), high finish (Ra0.8-1.6).

加工精度高 (≤ 0.02)，光洁度高 ($\leq Ra0.8-1.6$)。

2.The machining efficiency is 20 times that of traditional machine tools.

加工效率是传统机床的 20 倍。

3.The machine tool is automatically controlled by the CNC program and is suitable for mass production.机床采用数控程序自动控制，适于大批量生产。

4.The clip workpiece is simple, using two cone plate compact structure, high positioning accuracy, coaxial 0.02, can also use V-type iron clip.装夹工件简单，采用两锥盘顶紧结构，定位精度高，同轴度 ≤ 0.02 ，也可采用 V 型铁装夹。

Processing efficiency comparison 加工效能对比

Machine tool name 机床名称	Single shaft gun drill 数控单轴枪钻	Lathe 普通车床	Radial drilling machine 摇臂钻床
Model 机床型号	ZK2103	CD6140	Z3050
Artificial quantity 人工数量	One person / class 一 人/班	One person / class 一人/班	One person / class 一 人/班
Workpiece specifications 工 件规格	$\phi 10 \times 2$ 米	$\phi 10 \times 2$ 米	$\phi 10 \times 2$ 米
Material 材料	45#	45#	45#

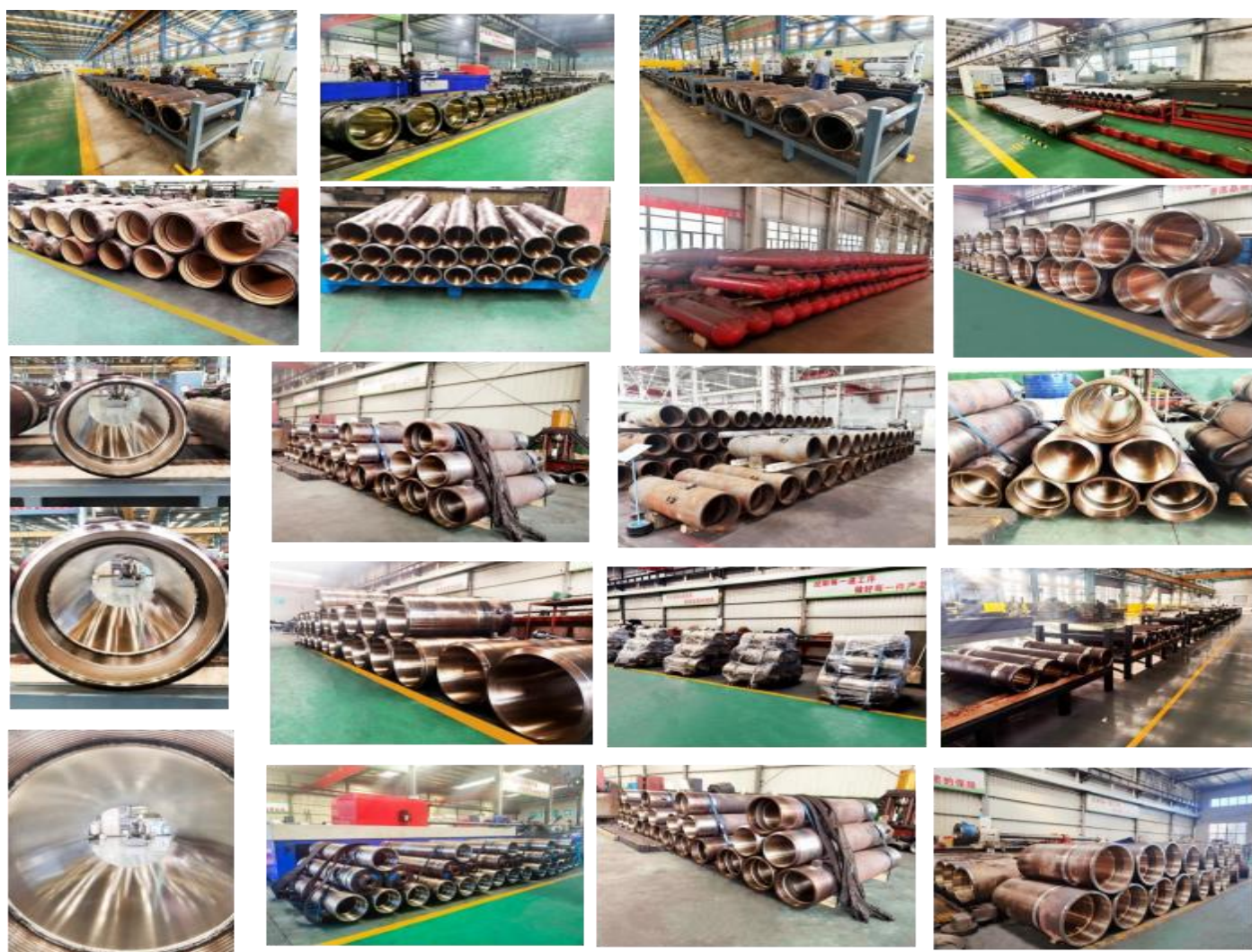
Class production 班产量	20	1	Unable to process 无法加工
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Technical parameters of ZK single-axis gun drilling series ZK 单轴枪钻系列技术参数

	Project name 项目名称	ZK2102	ZK2103
Working range 工作范围	Drilling diameter range 钻孔直径范围	φ3-φ20mm	φ3-φ20mm
	Processing length 加工长度	500-2000mm	500-2500mm
Drpipe box spindle parameters 钻杆箱 主轴参数	Center height 中心高度	200mm	200mm
	Spindle front taper hole 主轴前端锥孔	φ40mm 1:20	φ40mm 1:20
	Spindle speed range 主轴变速范围	30-4000r/min	30-4000r/min
	Drill torque 钻杆扭矩	≥35N.m	≥50N.m
Feed parameter	Feed speed range 进给速度范围	5-1000mm/min	5-1000mm/min
	Rapid movement of pallet 托板快速移动	2m/min	2m/min

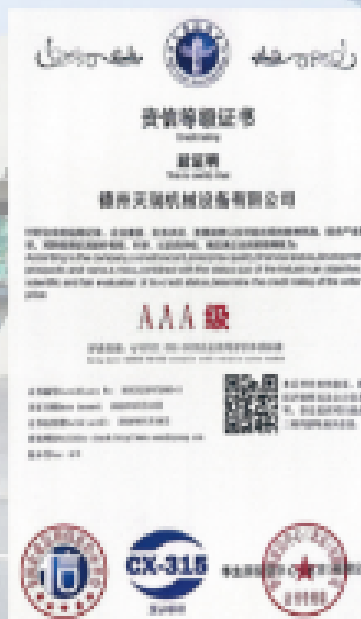
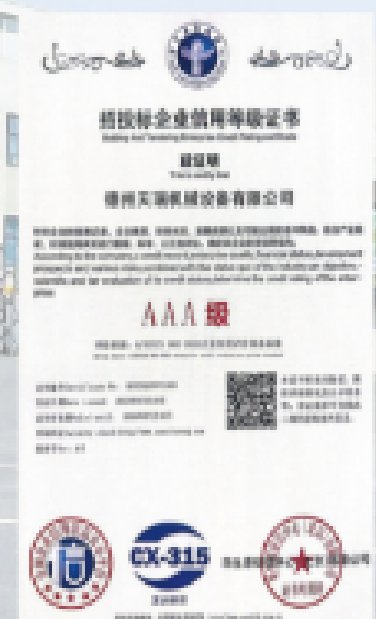
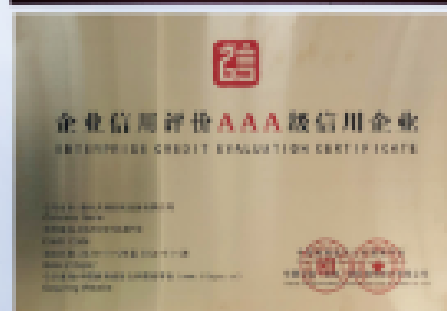
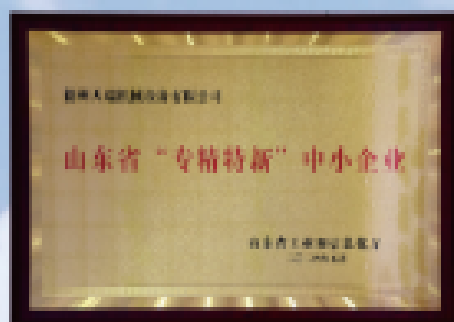
进给参数	Boring bar feed torque 镗杆进给扭矩	$\geq 10\text{N.m}$	$\geq 10\text{N.m}$
	Positioning length 定位长度	0-2500mm	0-2500mm
	Workpiece machining cylindricity 工件加工圆柱度	$\leq 0.016/500\text{mm}$	$\leq 0.016/500\text{mm}$
	Workpiece processing roundness 工件加工圆度	$\leq 0.01/100\text{mm}$	$\leq 0.02/100\text{mm}$
Motor capacity 电机容量	Drill pipe motor power 钻杆电机功率	5KW 交流伺服电机 AC servo motor	7.5KW 交流伺服电机 AC servo motor
	Hydraulic pump motor power 液压泵电机功率	5.5KW	5.5KW
	Feed motor 进给电机	0.75KW 交流伺服电机 AC servo motor	1.6KW 交流伺服电机 AC servo motor
SIEMNS KND 或用户选配 SIEMNS KND Or the user selection			

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Good machine tool, Tianrui made