



中国通用技术集团  
China General Technology



## T69系列落地式铣镗床

*Floor Type Milling and Boring Machine, Series T69*

## TKA69系列数控落地式铣镗床

*CNC Floor Type Milling and Boring Machine, Series TKA69*

## TK69系列数控落地式铣镗床

*CNC Floor Type Milling and Boring Machine, Series TK69*



## TH69系列数控落地式铣镗加工中心

*CNC Floor Type Milling and Boring Machine Center, Series TH69*



齐齐哈尔二机床(集团)有限责任公司

QIQIHAR NO.2 MACHINE TOOL (GROUP) CO., LTD.

## 机床的用途与特点

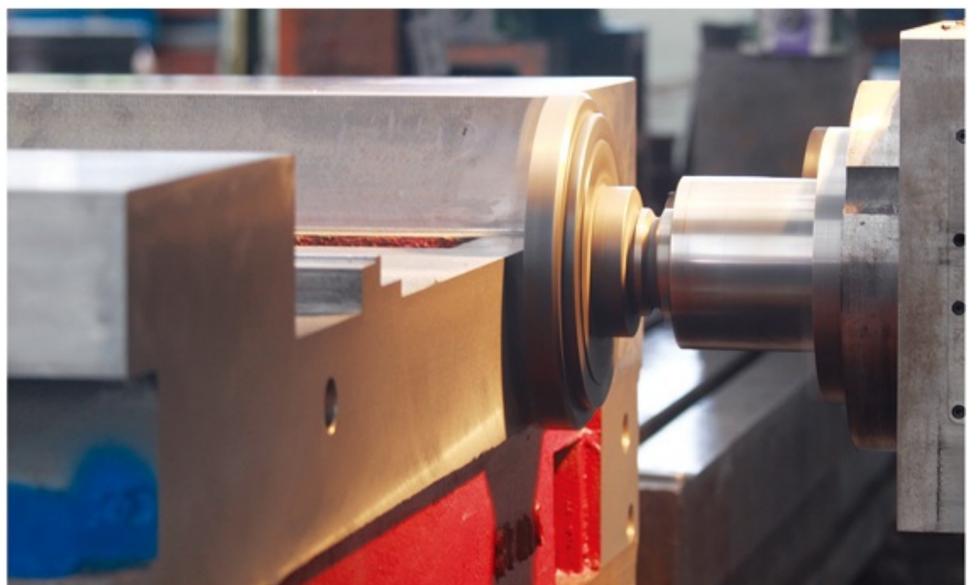
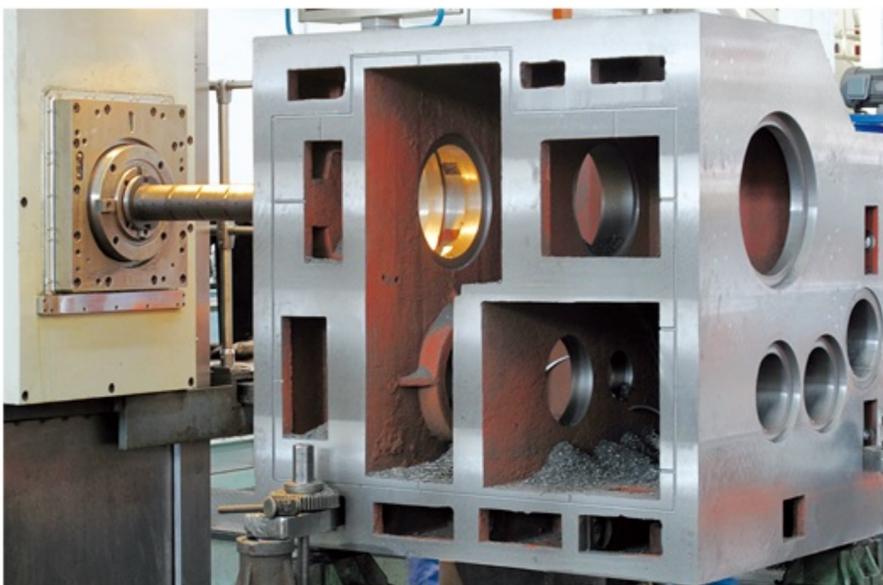
TK69型数控落地铣镗和TH69型落地铣镗加工中心均采用方滑枕移动式主轴箱结构，是我公司自主研发的具有自主知识产权的产品，是我国重大装备和国家重点行业的高精度把关设备，性价比可替代进口。该机床性能稳定可靠，采用了多项先进技术，如X轴为双齿轮一齿条消除结构或采用双电机加双减速器齿轮一齿条传动，Y、Z、W轴采用预压无间隙高精度滚珠丝杠传动结构或Y轴进给采用双丝杠驱动；X、Y、W轴导轨采用多点闭式静压导轨结构，动、静摩擦系数相当，低速无爬行；各静压油腔的压力采用毛细管螺旋阻尼器节流调整，结构简单，占用空间小，调整方便；数控系统选用国、内外名优厂家产品，可实现任意四轴联动功能，若配备两自由度的高精度摆角铣头，可以实现空间五坐标联动。该机床如配备各种铣头和数控回转工作台等附件，工件一次装夹后机床可完成铣削、镗削、攻丝加工及空间五坐标曲面和曲线等多道工序的加工（如螺旋浆叶片等）。该机床精度高，刚性好，是集高自动化、高科技机电液一体化精加工设备。

TK69/TH69系列数控落地铣镗售后服务和备件供应及时，优于国外厂商，因此它具有很强的国际市场竞争力。该机床可广泛应用于军工、能源、风电、核电、冶金、船舶、航空、航天、交通及国家重点机械制造行业超重型复杂异型工件加工。

TH69型系列数控落地铣镗加工中心除具有TK69系列功能外还具自动换刀功能，刀库容量用户可根据需求选配。

## TK69/TH69型系列技术创新点

- 1、机床主传动系统采用先进的多档机械变速—电气无级调速方式，使主轴实现较大范围无级调速，主传动电机选用国、内外名优厂家产品，电机启动扭矩大。
- 2、数控系统和进给交流伺服电机全部选用国内外名优厂家产品，可实现七轴控制，任意四轴联动功能。
- 3、机床具有主轴定向功能。
- 4、机床具有多项补偿功能，采用数字式电液比例阀控制保证机床主轴的精度要求。
- 5、主轴系统独立循环冷却功能，有效控制主轴温升，确保主轴高速旋转时的精度。
- 6、滑座、滑枕、主轴箱与移动部件导轨采用多点闭式静压导轨刚性好。动、静摩擦系数相当，保证了进给时低速无爬行。抗颠覆力矩强、耐磨损，能有效消除机床的热变形等优点。
- 7、X、Y、W轴选用国、内外名优厂家光栅尺，实现全闭环控制，Z轴为编码器半闭环控制。
- 8、主轴箱直线运动夹紧采用浮动夹紧装置，夹紧快速、可靠，夹紧时不破坏静压油膜，夹紧与松开电气互锁。
- 9、主轴刀具夹紧采用碟形弹簧组夹紧液压松开方式，安全、可靠、快捷。
- 10、机床液压系统采用闭式集中供回油系统，配备油冷却机，可分别控制主轴温升及系统温升。
- 11、机床主轴箱采用闭式结构，方滑枕采用整体铸造成型后加工而成。刚性好、不变形、长期使用精度保持性好。
- 12、主轴采用优质合金钢经多道工序加工而成。主轴轴承选用国、内外名优厂家产品，确保主轴精度。





## Machine Application and Features

It adopts headstock structure with moving ram for both CNC Floor Type Milling and Boring Machines, Series TK69 and CNC Floor Type Milling and Boring Machining Center, Series TH69. Our company independently developed those machines with independent intellectual property. Those machines have reliable performance with the application of multiple advanced technologies, such as the double pinion and rack backlash free structure or dual motor with double pinion and rack transmission provided for Axis X. There are preloaded backlash-free high precision ball-screw transmission structure provided for Axes Y, Z and W. The multi-pocket closed hydrostatic guideways structure is applied on the guideways of the Axes Y, Z and W, which has low difference between dynamic and static friction coefficients and no stick and slip at low speed. The pressure in each hydrostatic oil pocket is controlled by the damper with capillary spiral tubes, which have features of simple structure, small occupying space, and convenient adjustment. The CNC systems on those machines is capable of simultaneous motion control on any four axes and simultaneous five axes motion control, if the high precision two-axes swivel milling head is mounted. Those machines are equipped with vertical milling head, universal milling head, extended milling head and CNC rotary table, and they are especially applicable for machining super heavy-duty workpieces with complex contour shapes. Those machines can accomplish milling, boring, tapping, and machining of contour surfaces and lines in 5-D coordinate system (eg. propeller blades, etc.) with high precision and rigidity, and they are the hydro-mechatronic products integrated with high automation and technologies.

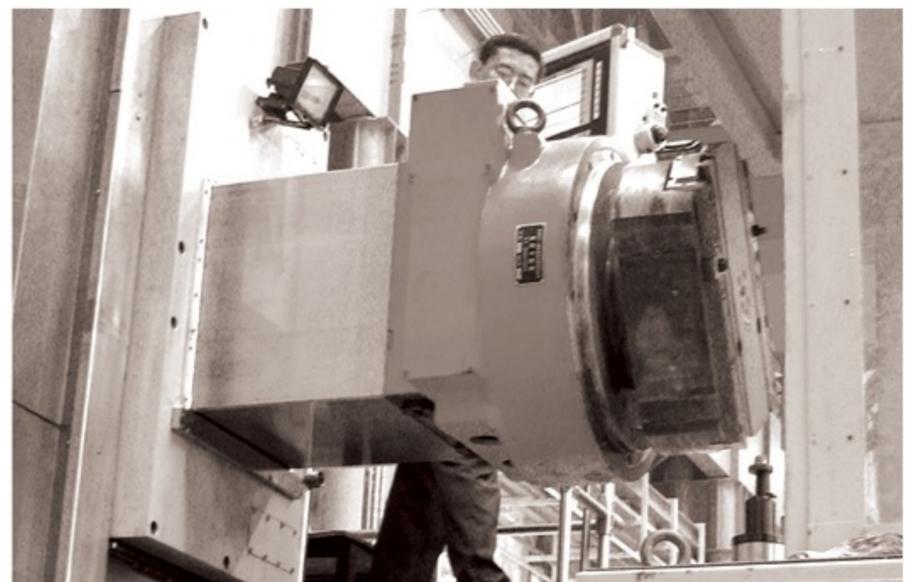
The machines of Series TK69 and TH 69 are the key equipments urgently required in domestic heavy-equipment and important industries. This series of machines are first developed and produced in the domestic market of China and they can replace the machines imported from overseas suppliers. They have reached the advanced level of similar products contemporarily around the world, with much lower market prices. Our company provide after sales services and spare parts in time after the request received and we deliver the services and parts much faster than the foreign suppliers do. Thus, this series of machines have strong competitiveness in the international market. Those machines can be widely applied in military industry, energy industry, wind power industry, nuclear power industry, metallurgy industry, shipbuilding industry, airspace and aviation industry, transportation industry and important machinery manufacturing industry of the nation.

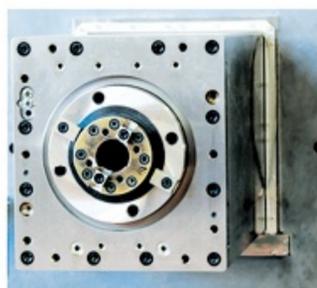
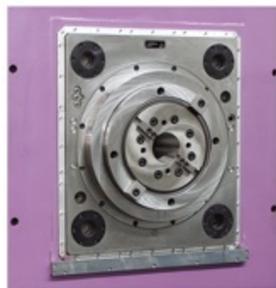
CNC Floor Type Milling and Boring Machining Center, Series TH69, are not only provided with all the functions of the machines, Series TK69, but also with automatic tool changing function, and the magazine capacity can be customized upon customer's request.



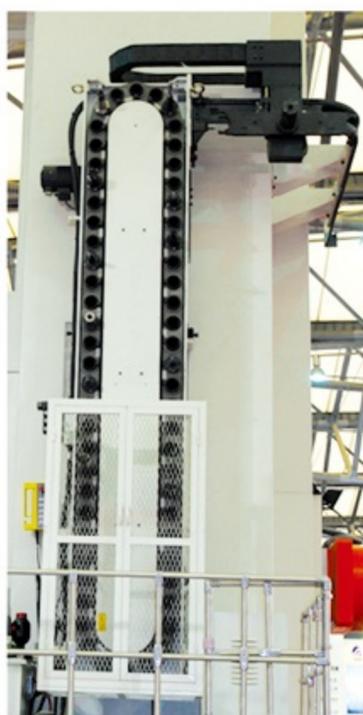
## Technical Innovations of Series TK69 and TH69

1. Main transmission system of the machine is provided with multi-shift mechanical transmission and electric infinitely variable transmission, which provides a wide range of infinitely variable transmission for the main spindle. Main transmission motor is from qualified and professional manufacturers both in China and abroad.
2. The control system and the Servo motor of the machine is from qualified and professional manufacturers both in China and abroad. The CNC system is capable of seven axes control and simultaneous control on any four of them.
3. There is the spindle orientation provided for the machine.
4. There are various compensation functions applied on the machine, and the application of the digital electro hydraulic proportional valves ensures the satisfaction of the requirements for spindle precision.
5. The spindle system is provided with independent cooling function, which can control the spindle temperature and ensure the spindle precision at high speed.
6. Guideways on slide, ram, headstock and other moving components are all provided with closed hydrostatic guideways with multi-pocket, which ensure low difference between dynamic and static friction coefficients and eliminates the stick and slip at low speed. The hydrostatic guideways also have the advantages of high anti-overturn moment and wear-resistance and elimination of thermal deformation of the machine.
7. The scales from qualified and professional manufacturers both in China and abroad are provided for the motions along the Axes X, Y and W for the full close loop control. The encoder is provided on Axis Z for the half close loop control.
8. The floating clamping device is provided for the clamping on the linear motion of column, ram and headstock with rapid and reliable clamping actions. The hydrostatic oil film will not be damaged at the clamping status, and the clamping and unclamping is interlocked with electrical control system.
9. The spindle tool is clamped by a set of disc springs and released by hydraulic pressure, which is safe, fast and reliable.
10. The hydraulic system of the machine is provided with full-closed central oil supply system, and equipped with oil cooler to control the temperature of main spindle and the system.
11. The headstock of the machine is constructed in a closed structure. The ram is made from an integrated cast part and then finely machined. The ram has high rigidity, no deformation, and high machining reliability and accuracy for a long service life.
12. The spindle is made from qualified alloy steel and has been machined through multiple processes. The main spindle is from qualified and professional manufacturers from China and abroad, which ensures the accuracy of the main spindle.





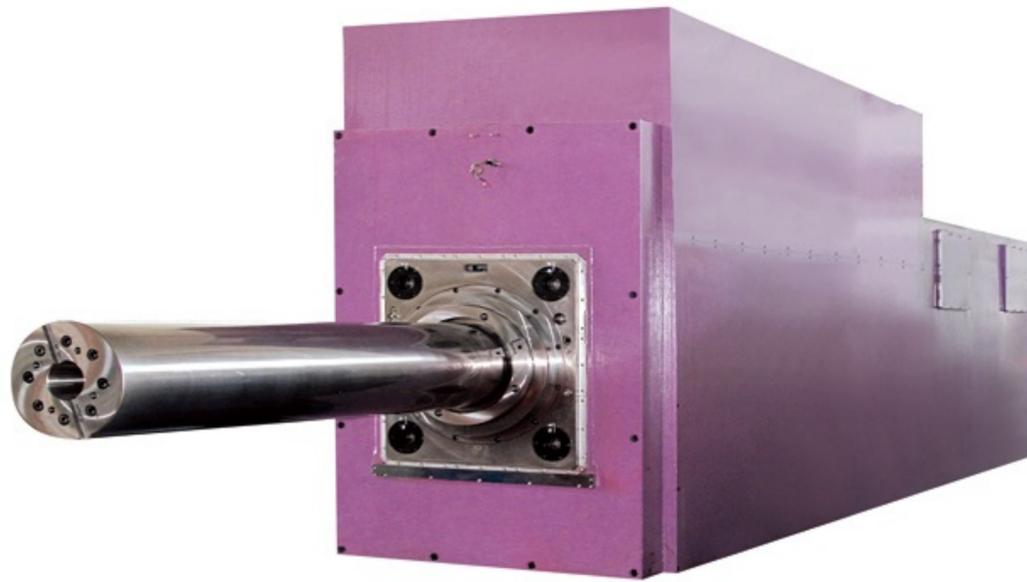
滑枕 Ram



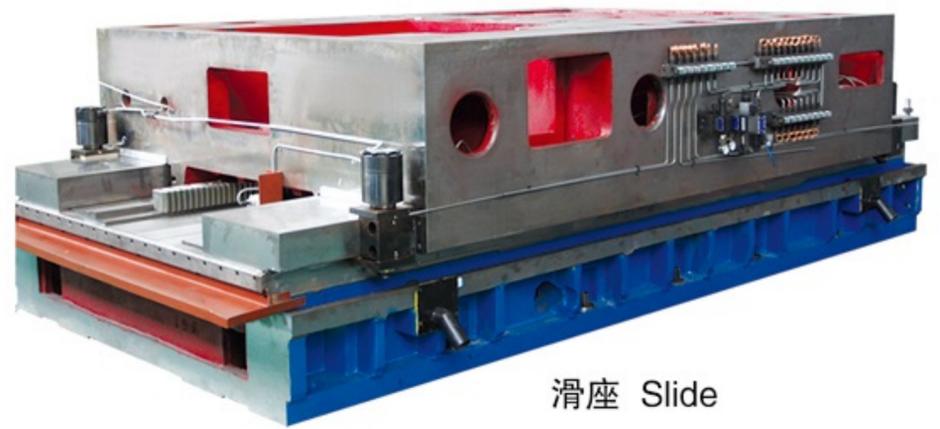
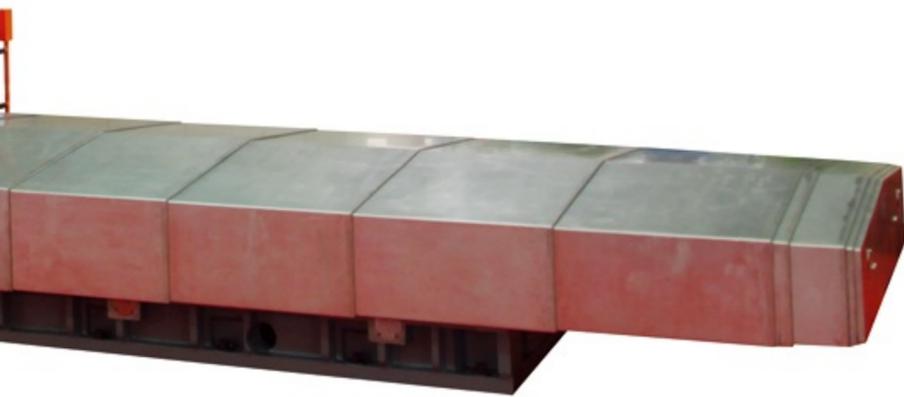
刀库 Tool Magazine



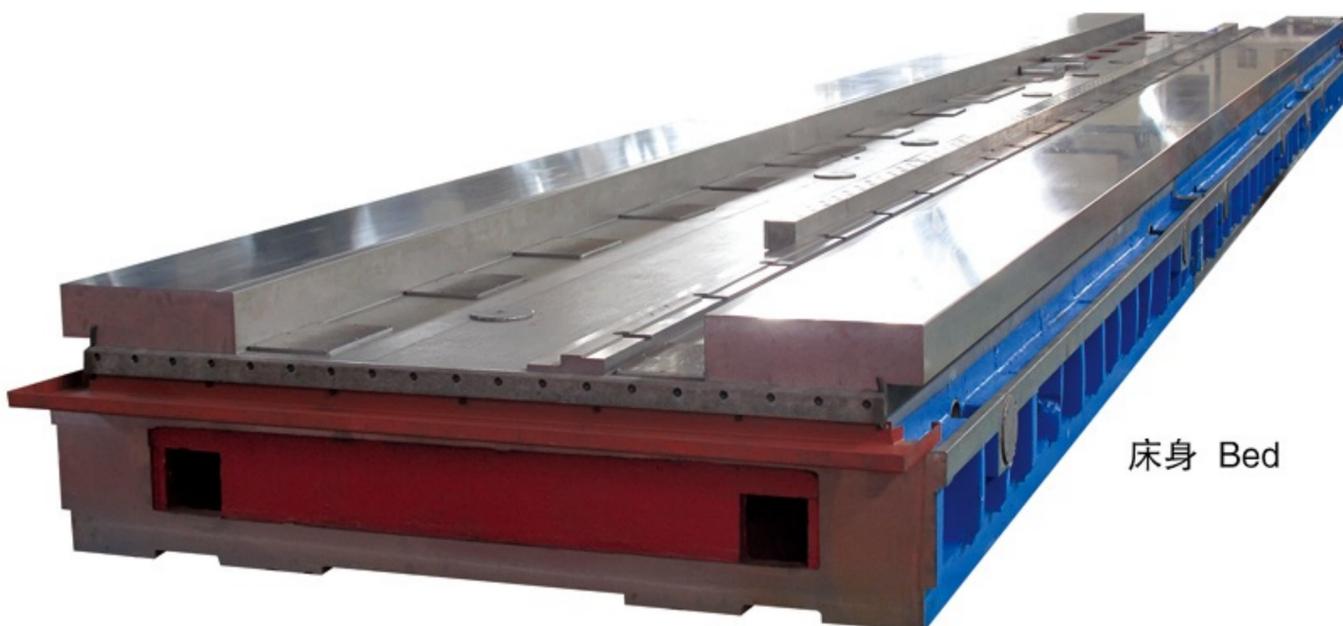
立柱 Column



主轴箱 Headstock



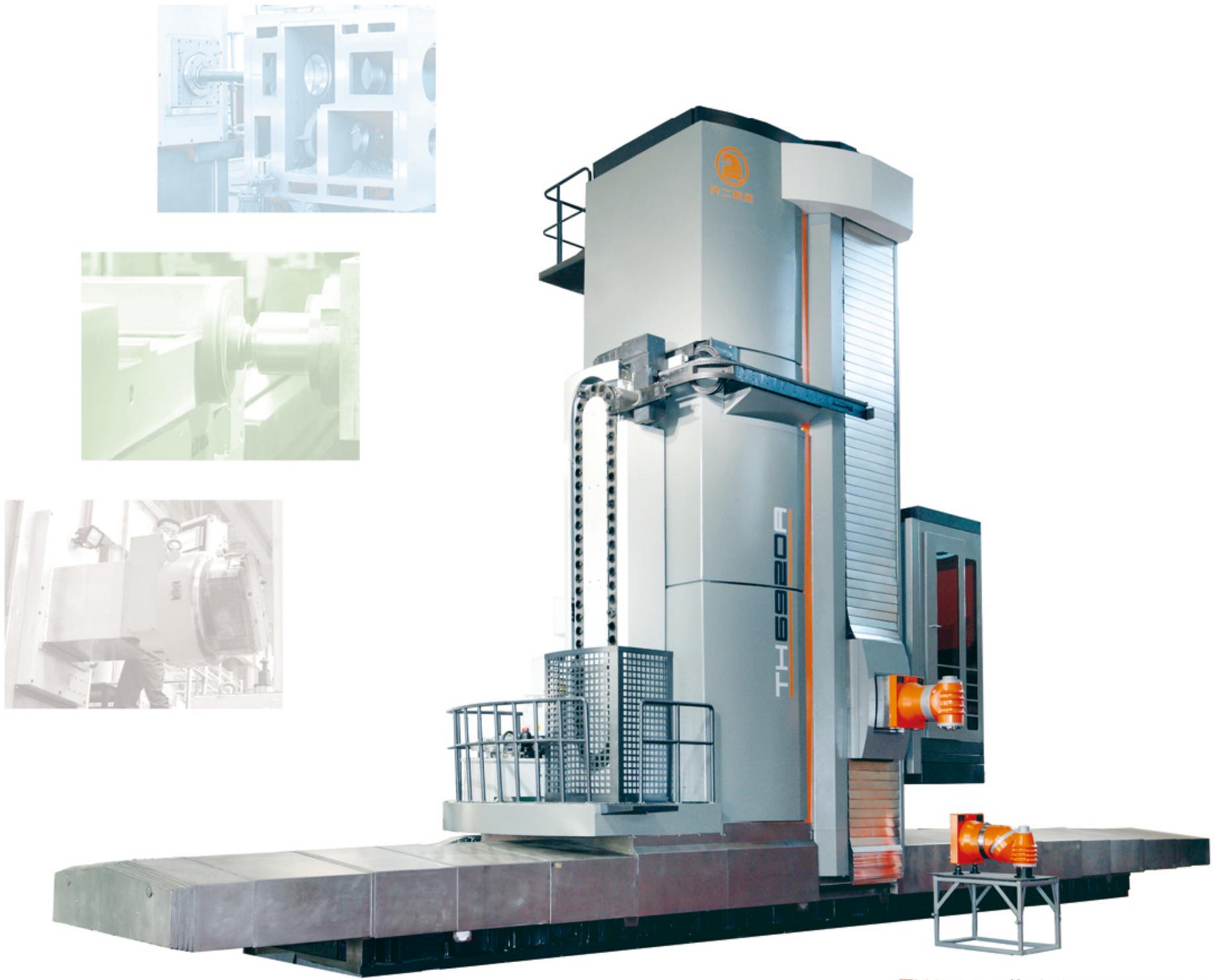
滑座 Slide



床身 Bed

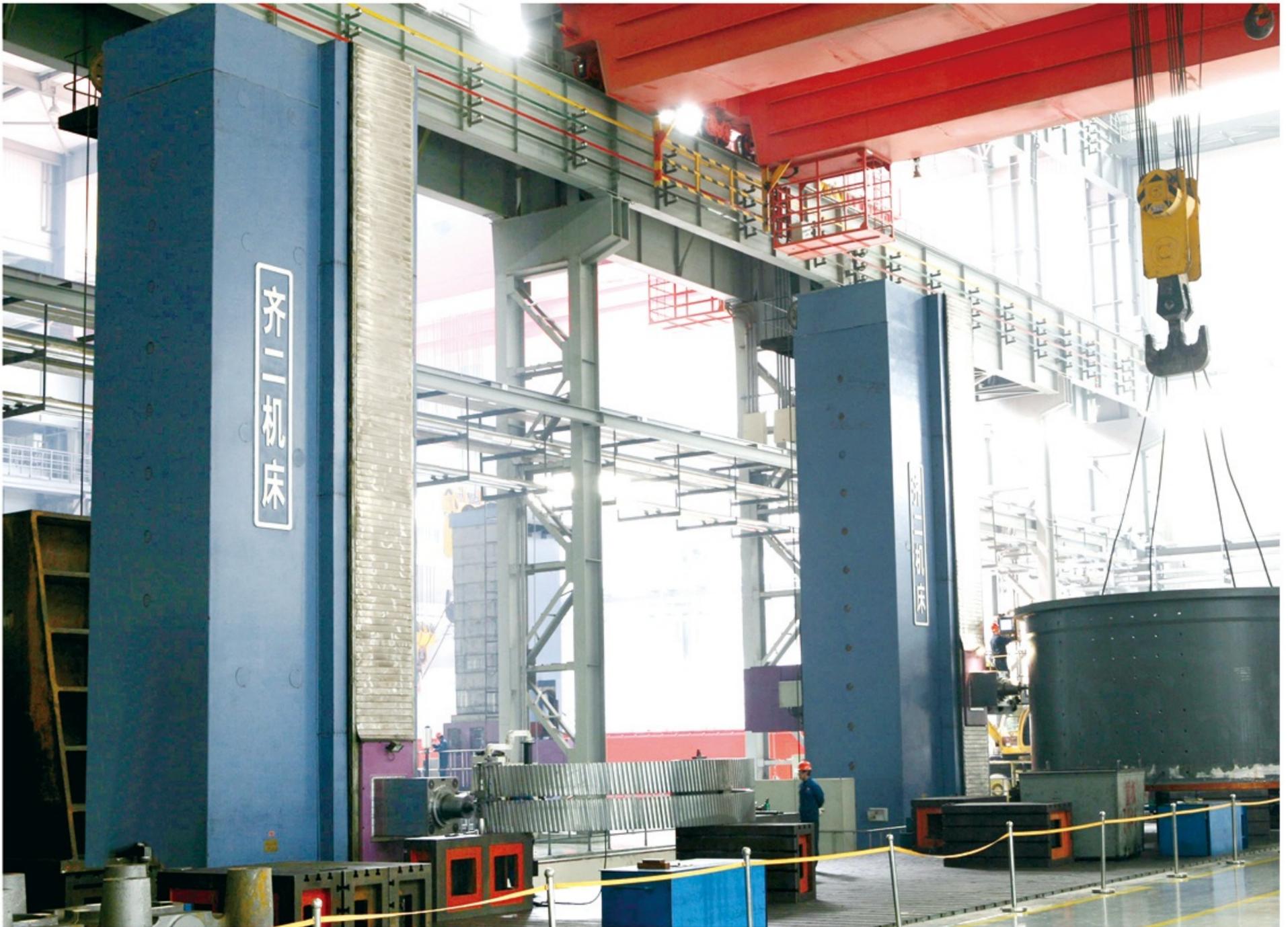






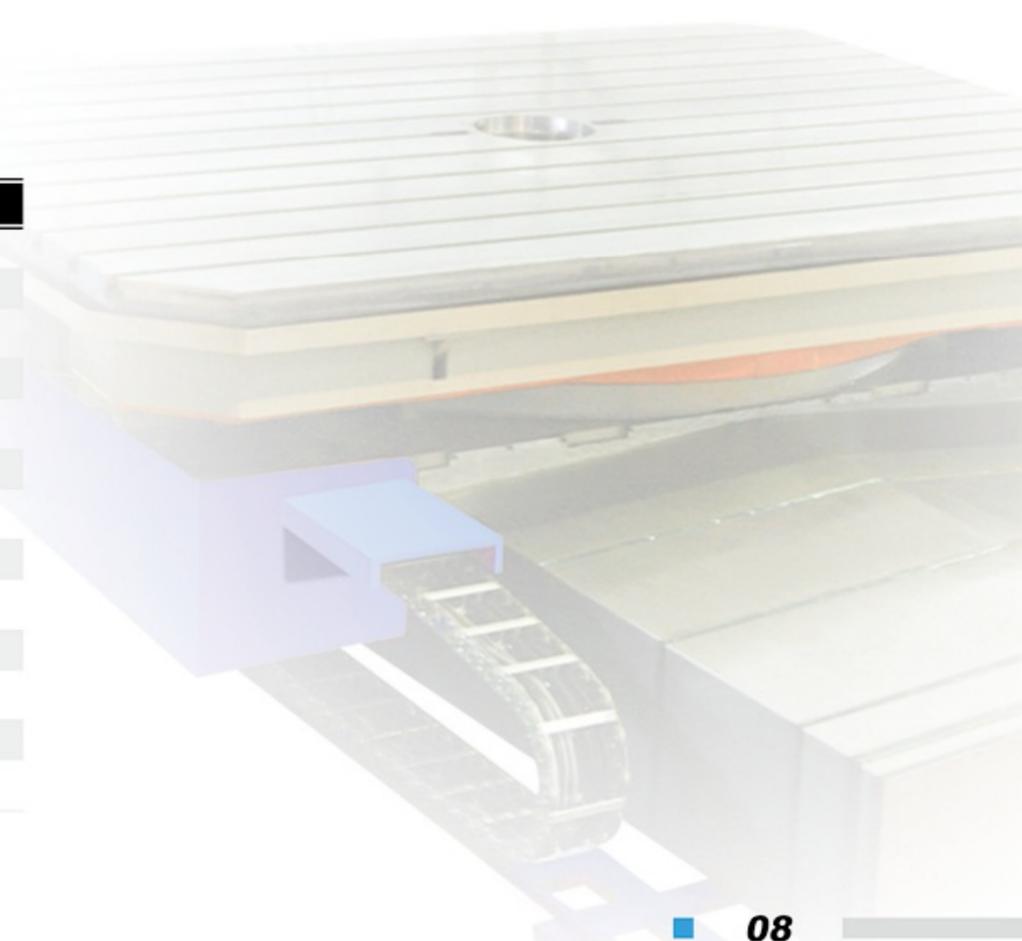
TH6920A 落地式铣镗加工中心

参数名称\型号	Specification/Model	单位(Unit)	TK6913B/TH6913B	TK6916B/TH6916B	TK6916/TH6916
镗轴直径	Boring Spindle Diameter	mm	φ 130	φ 160	φ 160
镗轴锥孔 (7: 24)	Boring Spindle Taper (7:24)		ISO50	ISO50	ISO50
铣轴端部直径	Milling Spindle End Diameter	mm	φ 254	φ 280	φ 320
滑枕截面尺寸	Ram Section	mm	380 × 400	440 × 480	480 × 520
立柱行程 (可加长)X	Column Travel ( can be extended)Axis X	mm	4000	6000	6000
主轴箱行程 (可加高)Y	Headstock Travel (can be extended)Axis Y	mm	2000	3000	3000
镗轴行程W	Boring Spindle Travel (Axis W)	mm	700	1000	1200
滑枕行程Z	Ram Travel (Axis Z)	mm	800	1000	1200
主轴转速范围 III档	Headstock Speed Range, III Shifts	rpm	2-1500/3.2-2500	2-1500	2-1000
镗轴及滑枕进给范围 无级	Feed Rate of Boring Spindle and Ram, Infinitely Variable	mm/min	3000	0.6-4000	1-3000
立柱, 主轴箱进给范围 无级	Feed Rate of Column and Headstock, Infinitely Variable	mm/min	1-6000	1-6000	1-6000
主电机功率	Main Motor Power	kw	41	58	57
刀库容量	Tool Magazine Capacity	Pc.	40 (加工中心用)	60 (加工中心)	60 (加工中心)



TK6932 双立柱数控落地式铣镗床

TK6920/TH6920	TK6920A/TH6920A	TK6926B/TH6926B	TK6932/TH6932
φ 200	φ 200	φ 260	φ 320
ISO60	ISO50	ISO60	ISO60
φ 320	φ 320	φ 400	φ 450
480 × 520	480 × 520	600 × 650	680 × 780
8000	8000	10000	18000
4000	4000	5000	8000
1200	1200	1700	1800
1200	1200	1700	2000
2-1000	2-2000	2-800	2-800
1-3000	1-10000	1-3000	1-3000
1-6000	1-15000	1-6000	1-6000
81	81	110	129
60 (加工中心)	60-100	60(加工中心)	80 (加工中心)





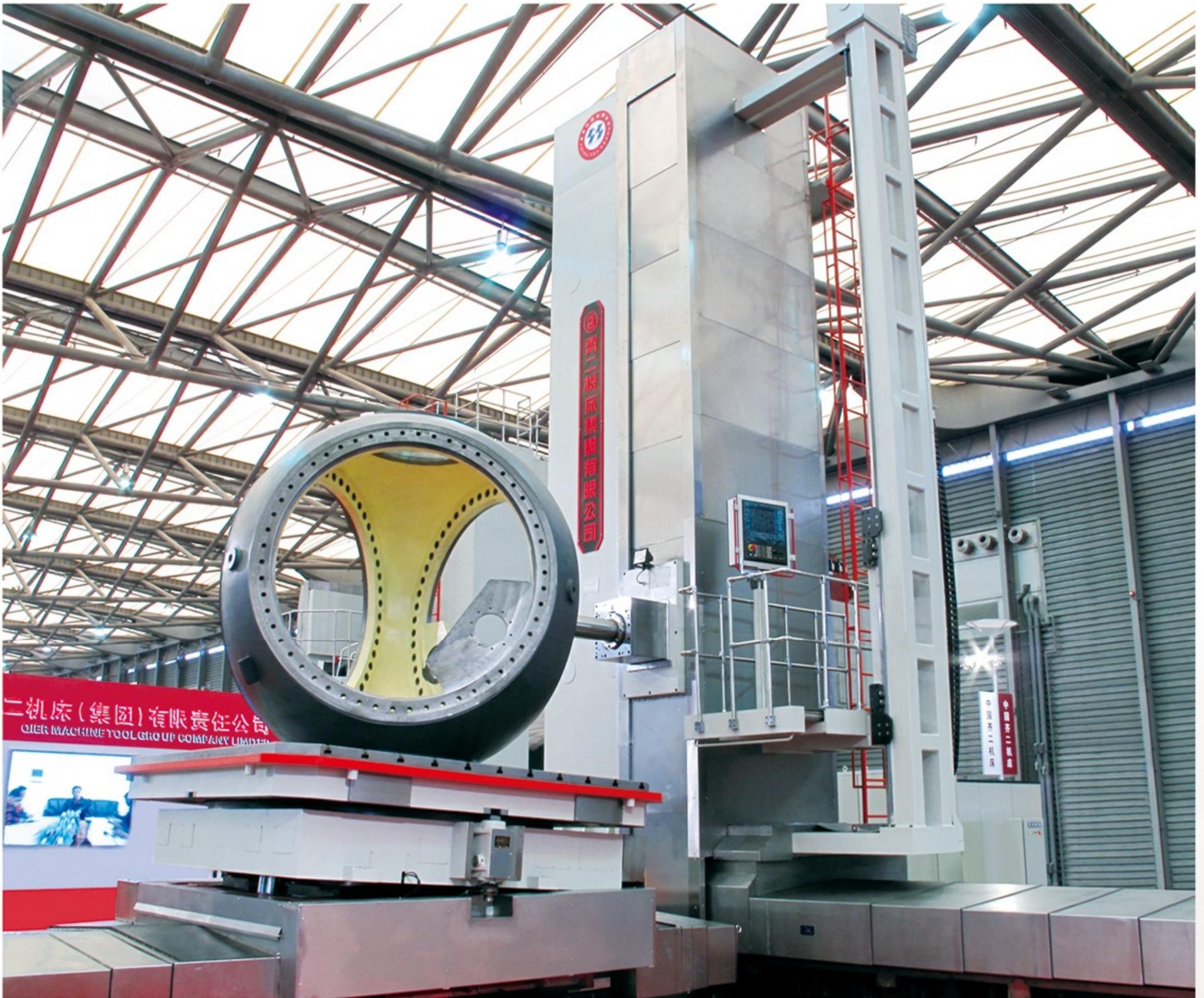
**TK6920 双立柱数控落地式铣镗床正在加工核电零部件**  
 CNC Floor Type Milling and Boring Machine with Double Column  
 while machining Parts of nuclear Power equipment



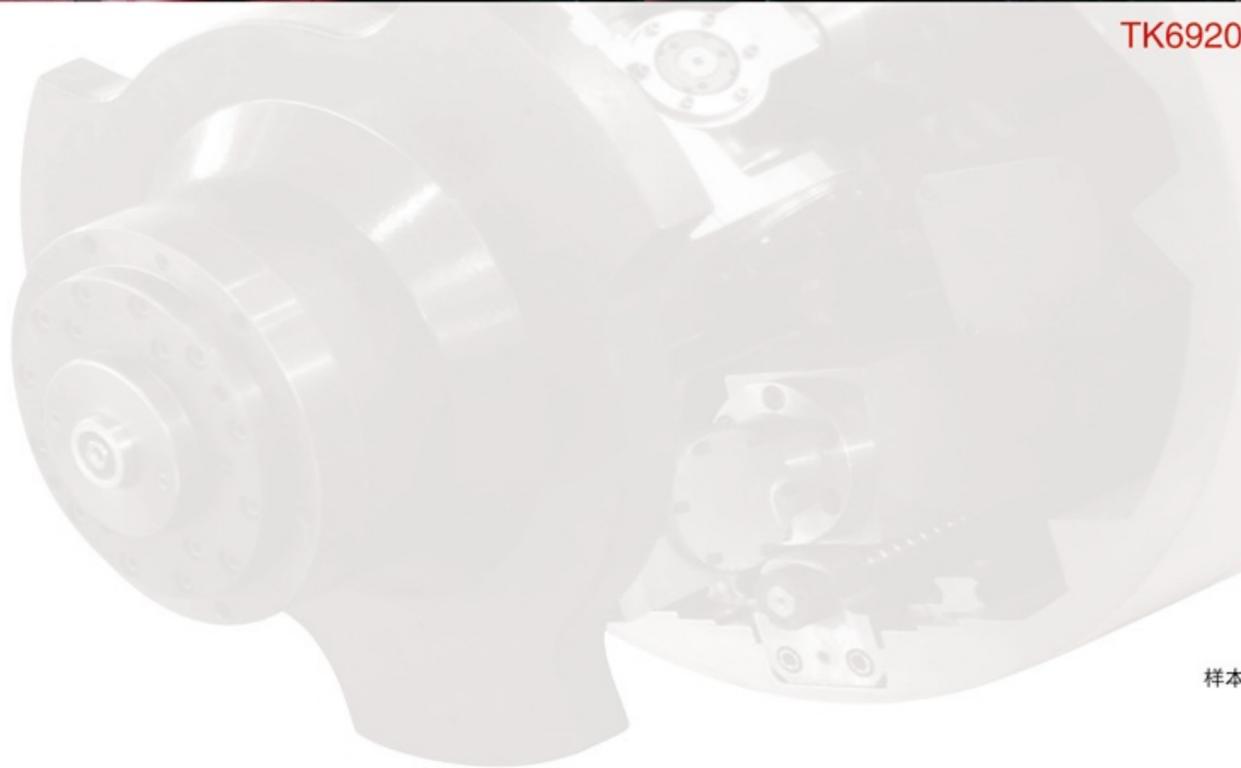


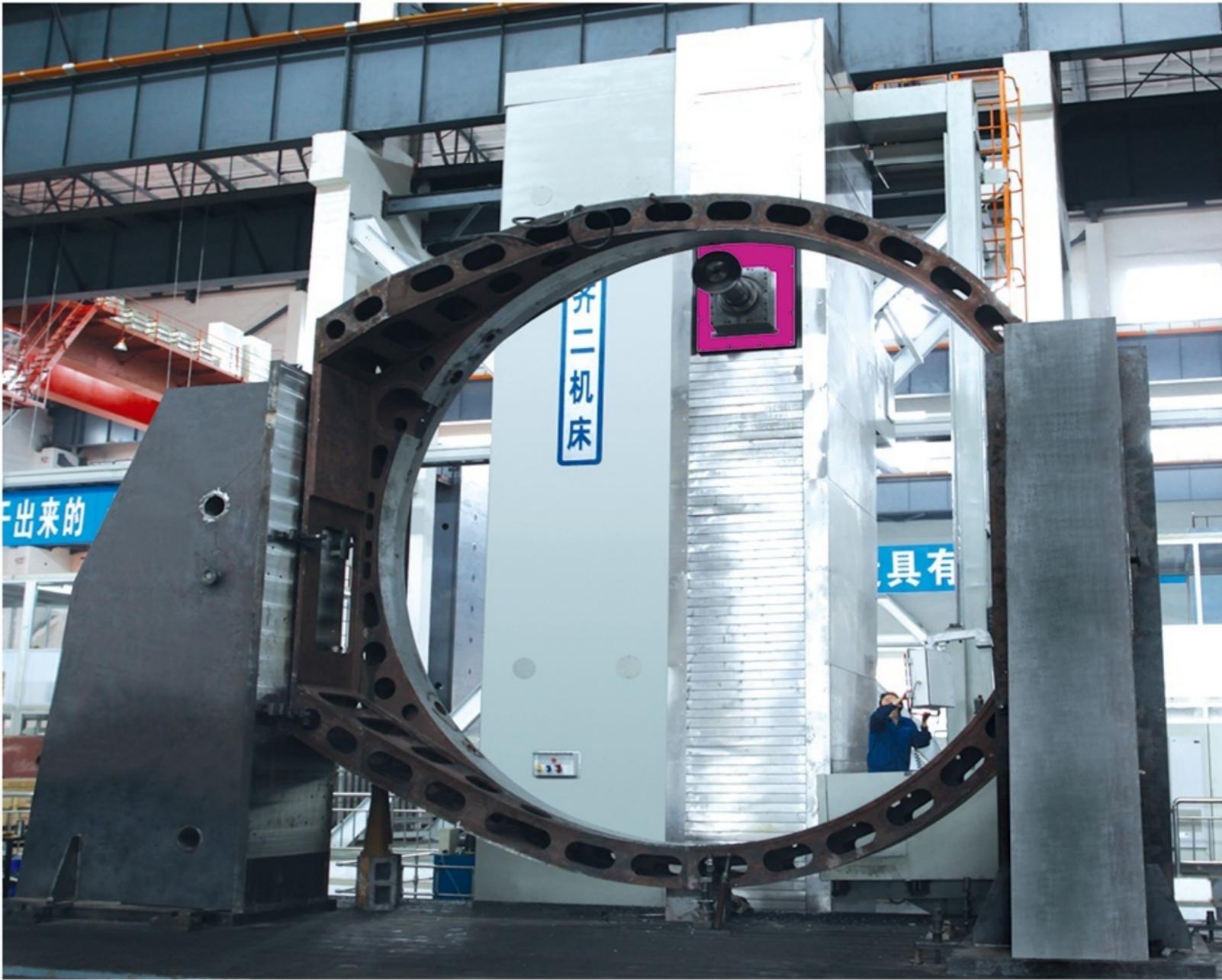
TK6916 数控落地式铣镗床



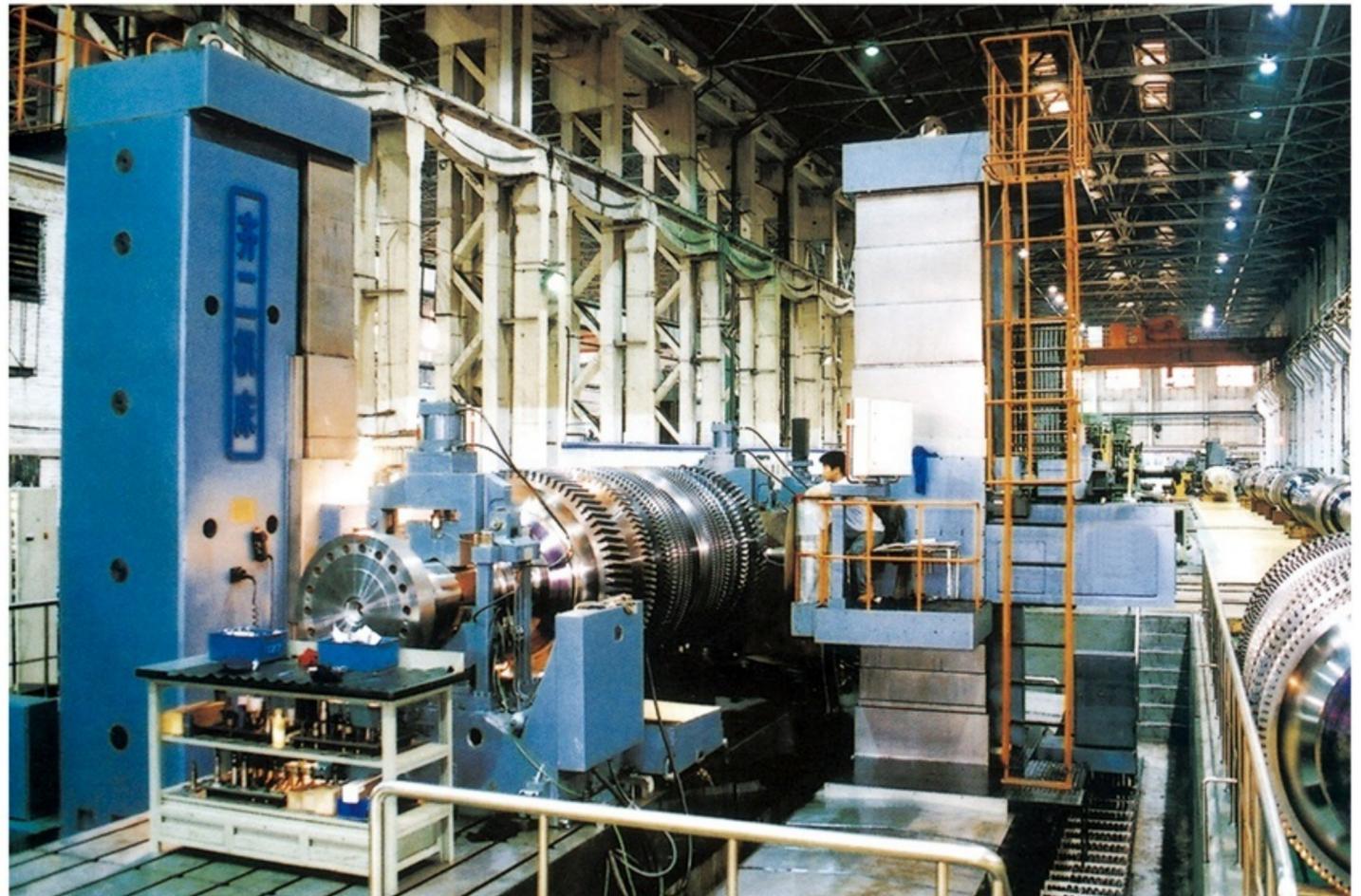
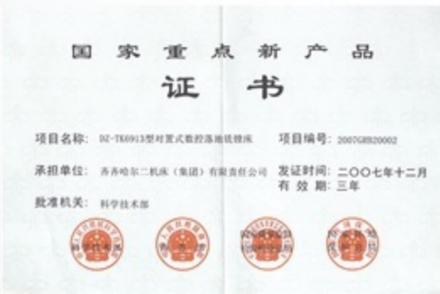


TK6920 数控落地式铣镗床





TK6926 数控落地式铣镗床



DZ-TK6913型 对置式数控铣镗床

CNC Floor Type Milling and Boring Machine with Two opposed Spindle, Model DZ-TK6913



本机床具有七轴控制，任意四轴联动；高速度，高精度，高效率等优点。有较大的功率和刚性，即能满足大扭矩铣削加工的要求，又可以用于高速，高精度的轻合金加工，安装各种附件可以扩大机床加工范围。

This Series of machines are provided with seven axes control and simultaneous control on any four of them. They have the features of high speed, high precision and high efficiency, as well as much larger power and rigidity, which satisfy the requirements not only for high torque milling operation, but also for high speed and high precision machining operation on light alloy. The machine application range can be extended with the installation of various accessories.



FA-160 数控落地式铣镗床

参数名称\型号	Specification /Model	单位(Unit)	FA-130	FA-160
镗轴直径	Boring Spindle Diameter	mm	130	160
铣轴直径	Milling Spindle End Diameter	mm	221.44	254
滑枕截面尺寸	Ram Section(W × H)	mm	380 × 450	420 × 450
主轴锥孔	Spindle Taper		ISO50	ISO50
立柱行程 X	Column Travel(Axis X)	mm	4000	6000
主轴箱行程 Y	Headstock Travel(Axis Y)	mm	2000	3000
镗轴行程 W	Boring Spindle Travel(Axis W)	mm	700	1000
滑枕行程 Z	Ram Travel(Axis Z)	mm	800	1000
主轴转速	Spindle Speed	r/min	2-2000	2-2500



T6920 落地式铣镗床

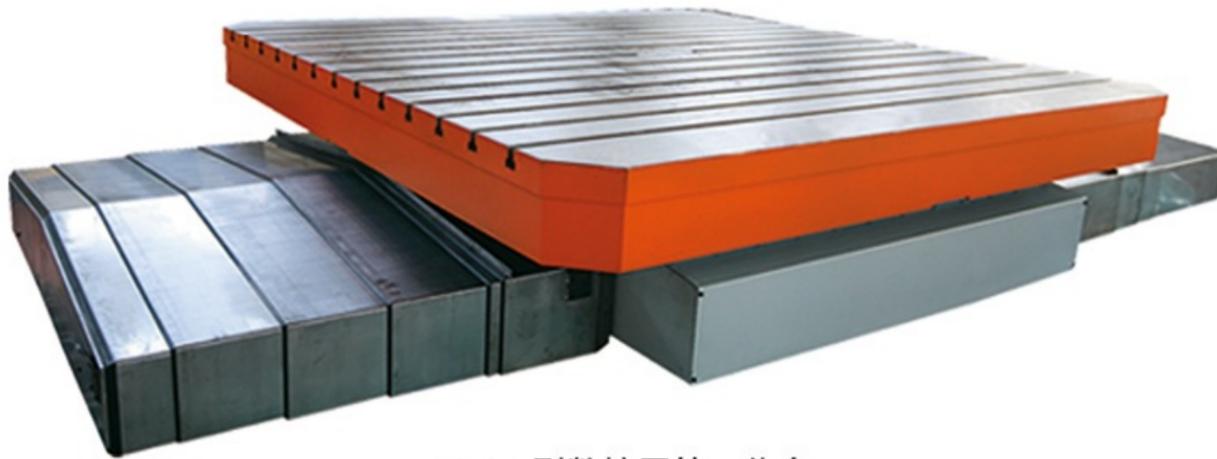
落地铣镗床是一种加工范围广、生产率高的先进设备，工件一次性装夹后可完成各种铣、镗、钻削多道工序加工，具有刚性好、精度高、万能性强等特点。

选配多种附件（万能铣头、垂直铣头、伸长铣头、高速铣头、摆角铣头、后立柱、平旋盘、回转工作台等），能够进一步扩大加工范围。

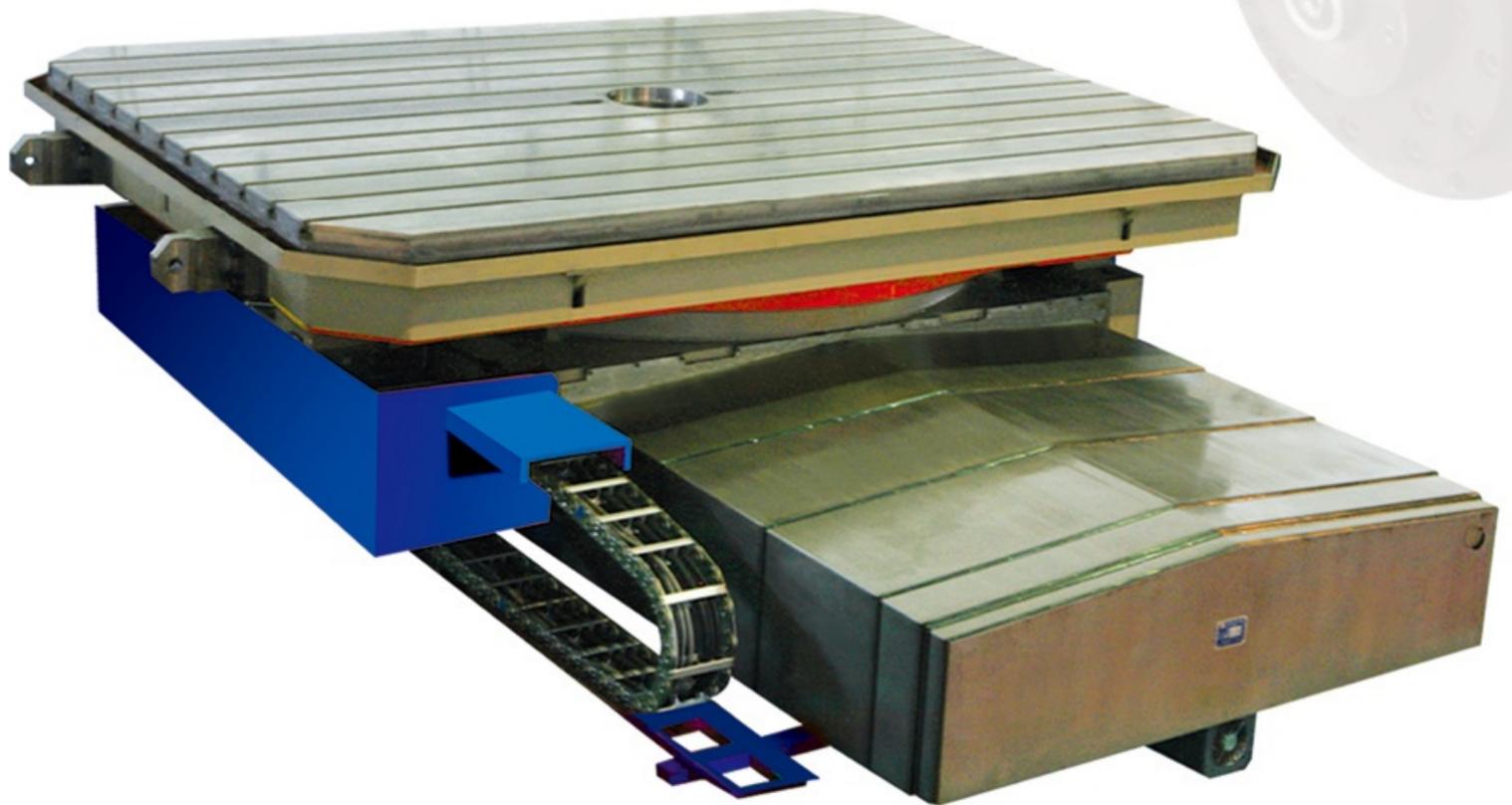
Floor Type Milling and Boring Machine is the advanced equipments with wide application range and high production efficiency. After the completion of one-time workpiece setup, various operation, such as milling, boring and drilling, can be completed on the machine. The machine has the features of high efficiency, high precision and high versatility.

The application of the machine can be increased with the installation of the optional accessories, such as universal milling head, vertical milling head, extended milling head, high speed milling head, swivel milling head, rear column, facing plate, rotary table.

参数名称/型号	Specification/Model	单位/Unit	T6913D	T6916D	T6920D	T6926
镗轴直径	Boring Spindle Diameter	mm	130	160	200	260
铣轴端部直径	Milling Spindle End Diameter	mm	221.44	320	320	400
滑枕尺寸（宽×高）	Ram Section(W×H)	mm	350×380	480×520	480×520	600×650
镗轴锥孔	Boring Spindle Taper		ISO-50	ISO-50	ISO-60	ISO-60
镗轴行程	Boring Spindle Travel	mm	800	1200	1200	1500
滑枕行程	Ram Travel	mm	700	1200	1200	1500
主轴箱行程（可加高）	Headstock Travel (can be extended)	mm	2000	3000	4000	5000
立柱行程（可加长）	Column Travel (Can be Extended)	mm	4000	6000	8000	10000
主轴转速范围（无级）	Spindle Speed Range (Infinitely Variable)	r/min	3.15-750	2.3-485	2.3-485	1.6-500



ZTK30型数控回转工作台  
CNC Rotary Table, Model ZTK30



ZTK60型数控回转工作台  
CNC Rotary Table, Model ZTK60

参数名称\型号	Specification/Model	单位/Unit	ZTK20	ZTK30	ZTK40	ZTK60	ZTK80	ZTK100
工作台台面尺寸	Table Size	mm	2000 × 2000	2500 × 3000	3000 × 3000	3000 × 3500	3000 × 4000	4000 × 4000
工作台承载重量	Table Load	t	20	30	40	60	80	100
工作台直线行程	Table Linear Travel	mm	1500	2000	2000	3000	3000	3000
工作台直线运动速度	Table Linear Travel Speed	mm/min	1-3000	1-3000	1-3000	1-3000	1-3000	
工作台回转运动速度	Table Rotating Speed	r/min	0.001-1	0.001-1	0.01-1	0.001-1	0.001-1	0.001-0.95



## 附件:

### 数控平旋盘 CNC Facing Head

型号	单位	XPK60A	XPK80	XPK100
平旋盘直径	mm	600	800	1000
滑板行程	mm	200	200	200
转数	r.p.m	1-110	1-110	0.98-110
附件重量	kg	600	800	1000



### 数控万能铣头 CNC Universal Milling Head

型号 Model 锥孔 Taper  
WXK25/20 II ISO50  
分度单位: 25°  
分度精度 ± 3  
自动分度  
自动类刀具  
自动安装



### 万能铣头 Universal Milling Head

型号 Model 锥孔 Taper  
WX 15/13C ISO50  
WX 25B/20 I ISO50



### 垂直铣头 Vertical Milling Head

型号 Model 锥孔 Taper  
CX 15/13C ISO50  
CX 25A/20 I ISO50



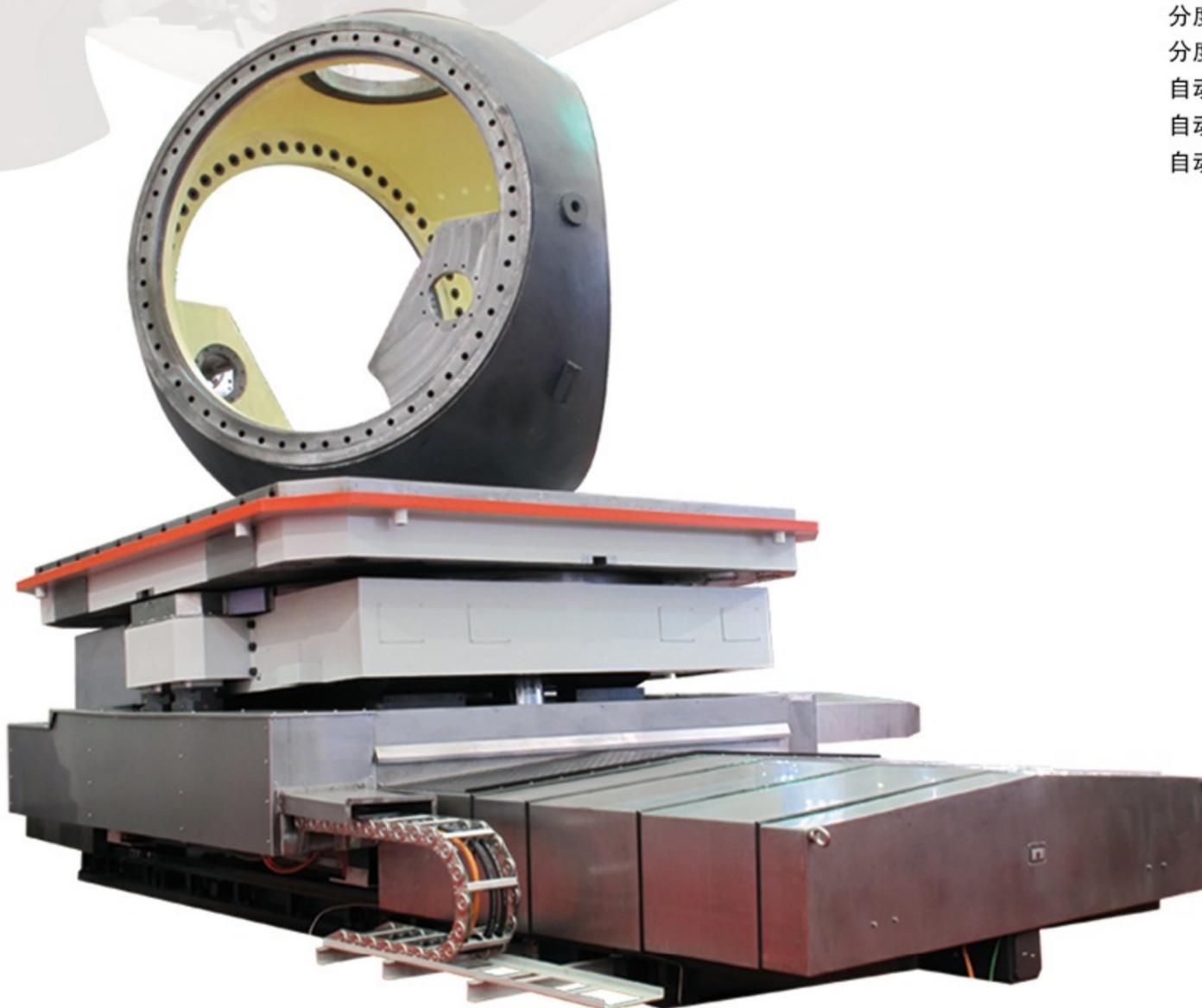
### 伸长铣头 Extended Milling Head

型号 Model 锥孔 Taper  
SX 10/13C ISO40  
SX 15 ISO40



### 数控垂直铣头 CNC Vertical Milling Head

型号 Model 锥孔 Taper  
CXK25/20 II ISO50  
分度单位: 25°  
分度精度 ± 3  
自动分度  
自动类刀具  
自动安装



可翻转的回转工作台 Turnable Table





TK6813/16系列 数控刨台式铣镗床

TK6513、TH6513、TK6813、TH6813、TK6516、TH6516、TK6816、TH6816型数控刨台式铣镗床系列是新开发的一种大扭矩、高效率、高刚性、功能先进的机床。

该机床适用于大、中型箱体类、机架类、模具类零件的加工，工件在一次装夹后，自动完成铣、镗、钻、铰、铤、攻丝等工序。可实现七轴控制，四轴联动，进行圆弧插补和三维曲面的加工。配合铣头、平旋盘等附件，从而扩大机床的加工能力。

TK65系列(不带滑枕)的结构——X轴、W轴采用直线导轨，Y轴采用矩形导轨，B轴强力润滑导轨。

TK68系列(带滑枕)的结构——X轴采用直线导轨，X、V、W轴采用静压导轨，B轴强力润滑导轨，Z轴采用导向杆导向。

CNC Planer Type Milling and Boring Machines, Model TK6513, TH6513, TK6813, TH6813, TK6516, TH6516, TK6816, TH6816 are the advanced machine tools with large torque, high efficiency and high rigidity.

This series of machines are applicable to machine large or middle size housing components, frames and moulds. After the completion of one-time workpiece setup, the machine can automatically complete multiple operations, such as milling, boring, drilling, reaming, counterboring, tapping, etc. The machine is capable of seven axes control and simultaneous control on any four of them, it is also capable of circular interpolation and 3-D contoured surface machining. With the installation of accessories, such as milling heads and facing plates, the machine operation capability can be increased.

The Structure features of Series TK65 (without ram) Linear Guideways for Axes X and W and rectangular guideways along Axes Y, forced lubrication guideways for Axis B.

The Structure features of Series TK68 (with ram) – Linear Guideways for Axis X, Hydrostatic Guideways for Axes Y, V and W, forced lubrication guideways for Axis B, guiding bar for Axis Z.

参数名称\型号	Specification/Model	单位(Unit)	TK6513/TH6513	TK6813/TH6813	TK6516/TH6516	TK6816/TH6816
镗轴直径	Boring Spindle Diameter	mm	φ130	φ130	φ160	φ160
镗轴端部直径	Milling Spindle End Diameter	mm	φ221.44	φ254	φ280	φ280
工作台行程	Table Travel	mm	2500	2500	2500	2500
镗轴行程	Boring Spindle Travel	mm	800	800	900	1000
滑枕行程	Ram Travel	mm	无;NA	800	无;NA	1000
主轴箱行程	Headstock Travel	mm	2000	2000	3000	3000
立柱行程	Column Travel	mm	1000	1500	2000	2000
镗轴锥孔号	Boring Spindle Taper		ISO 50	ISO 50	ISO 50	ISO 50
主轴转速	Spindle Speed	r/min	2-2000	2-2000	2-1500	2-1500
工作台、主轴箱、立柱进给速度	Feed Rate of Table, Headstock and Column	m/min	5-6000	5-6000	5-6000	5-6000



TK6111 数控卧式镗床

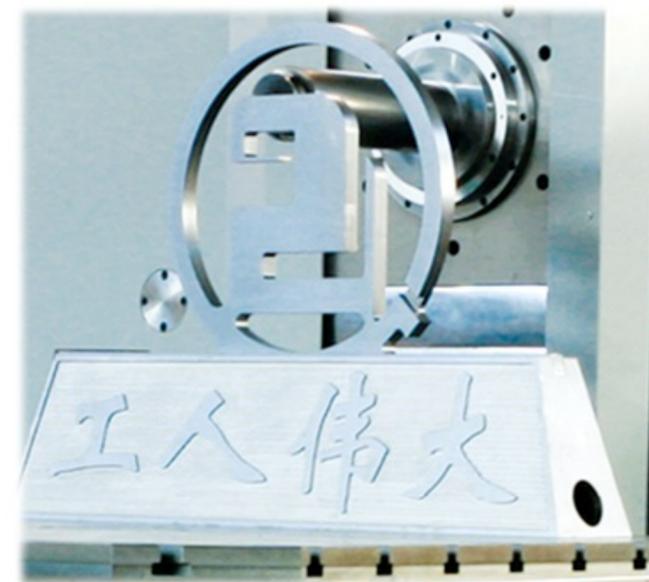
TK6111/6113型卧式铣镗加工中心，主机带有回转工作台，呈十字滑台结构。机床五轴控制，工件一次装夹可完成多工序多侧面的加工。机床配有铣头附件，刀库及机械手，可有效地扩大机床加工范围。

CNC Table Type Milling and Boring Machine, Model TK6111/6113, is provided with rotary table, which can slide parallel and perpendicular to the column. The machine is provided with five axes control and capable of completion of multiple machining operations on multiple surfaces after one time workpiece setup. The machine is equipped with milling heads, tool magazine and tool changer, which effectively increase the machine application range.



TK6113 数控卧式镗床

参数名称\型号	Specification/Model	单位(Unit)	TK6111	TK6113
主轴直径	Spindle Diameter	mm	110	130
主轴锥孔	Spindle Taper		ISO 50	ISO 50
主轴转速	Spindle Speed	rpm	5-2000	5-2000
工作台横向行程(X)	Table Transversal Travel (Axis X)	mm	2000	2500
工作台回转行程(B)	Table Rotating (Axis B)		360°	360°
主轴行程(Z)	Spindle Travel	mm	700	800
回转工作台最大承重	Max. Load of Table	kg	6000	10000
进给速度X,Y,Z轴	Feed Rate of Axes X, Y and Z	mm/min	2-6000	2-6000
刀库容量	Tool Magazine Capacity	pics	20	20-40





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