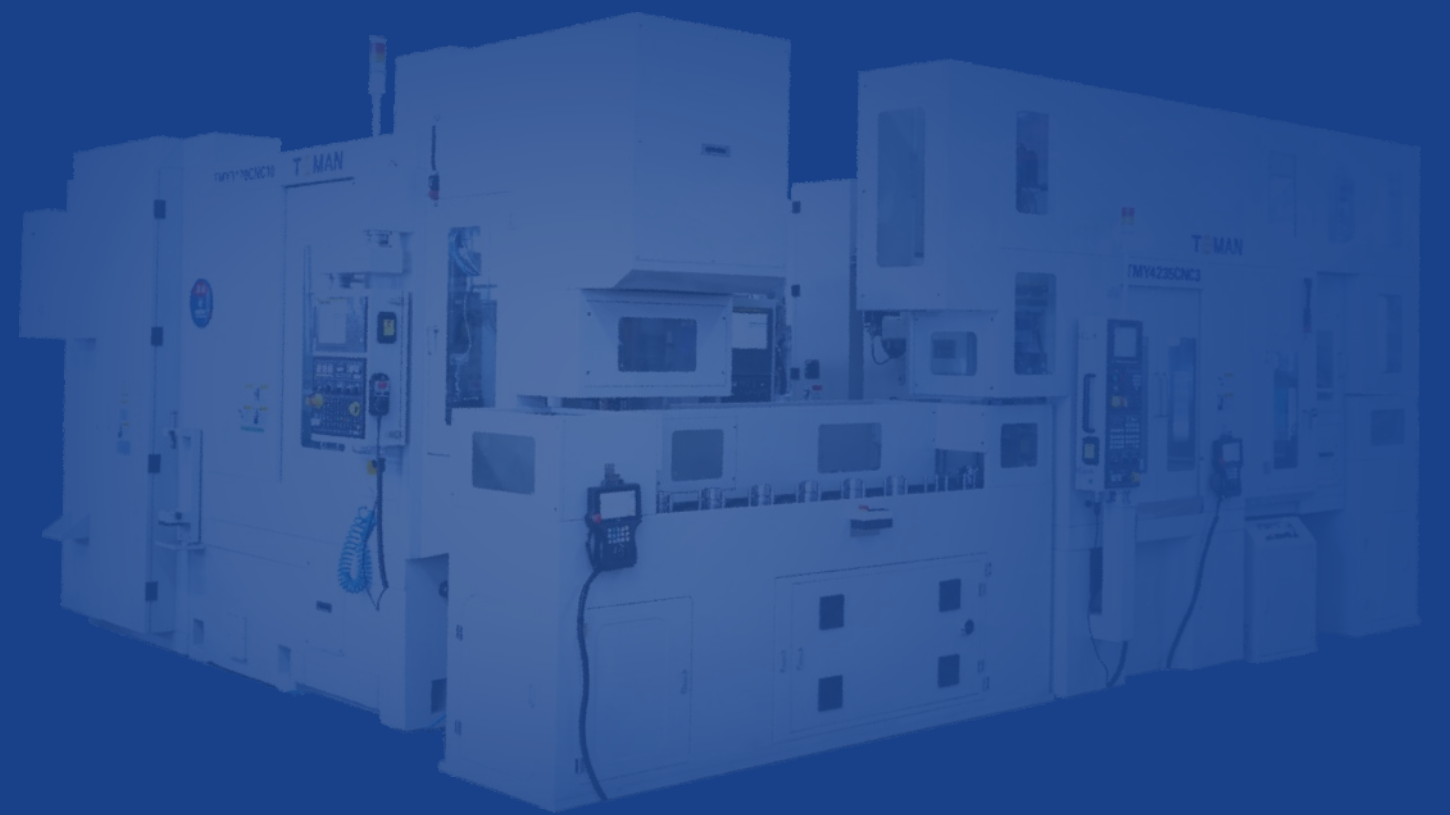


TOMAN | 浙江陀曼
智者·总是领先一步 | ZHEJIANG TOMAN
精密加工与自动化装备
PRECISE PROCESSING AND AUTOMATION EQUIPMENT



TOMAN
浙江陀曼智能科技股份有限公司
ZHEJIANG TOMAN INTELLIGENT TECHNOLOGY CO.,LTD.

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TOMAN 浙江陀曼智能科技有限公司
 智者·总是领先一步 ZHEJIANG TOMAN INTELLIGENT TECHNOLOGY CO.,LTD.

浙江陀曼智能科技有限公司创建于2006年，主要从事齿轮自动化装备、轴承自动化装备、智能部件、工业互联网应用以及基于工业4.0系统集成等产品研发、制造和服务。“陀曼”意为“宇宙运动之轴心”，象征一种“核心和领导”地位，表示公司“运动、进取、永无止境”的精神；“TOMAN”为古波斯“金币”之意，表达公司“成为专业领域的领导者”和“为客户和社会创造财富”的愿景和目标，持续为细分行业提供高性价比的自动化装备，为客户创造价值。

Zhejiang toman intelligent technology co., ltd. was founded in 2006, mainly engaged in the research and developments, manufacturing and service of gear automation equipments, bearing automation equipments, intelligent components, industrial internet application and system integration based on industry 4.0.
 Toman is committed to being a leader in the professional field and creating wealth for customers and society.

专业生产各类齿轮加工机床以及自动化生产线!

Professional production of every kinds of gear cutting machine tools and automatic production line!

为客户提供齿轮加工的高效、高精度、高性价比的综合解决方案!

To provide customers with high efficiency, high precision, cost-effective comprehensive solutions for gear cutting!

数控滚齿机系列:
CNC Hobbing Machine Series:



TMY3110



TMY3115



TMY3120



TMY3125



TMY3135



TMY3140/50

复合机系列:
Compound Machine Series



滚倒滚复合一体机
Hobbing Machine With Integrated Chamfering Unit



滚倒一体复合机
Hobbing Machine With Integrated Chamfering Station

数控剃齿机系列:
Cnc Shaving Machine Series



齿轮自动化生产线系列:
Automatic Production Line Series



齿轮关节机器人自动化生产线
Gear Joint Robot automatic production line



齿轮桁架式自动化生产线
Gear Truss type automatic production line

产品特性 Product features

在简约、紧凑之中追求高性能，全面“智能化”的数控滚齿机。

作为新一代畅销机型，实现了高效生产、高精度滚切加工。

In the simple, compact, to pursuit of high performance, comprehensive "intelligent" CNC hobbing machine.

As a new generation of best-selling machine, it realizes high efficient production, high-precision hobbing process.



采用全数控系统7轴4轴联动，采用展成法原理，通过数控系统电子齿轮箱功能，实现分度和差动补偿运动，可完成圆柱直齿轮、斜齿轮、小锥度齿、鼓形齿、花键、蜗轮、链轮等齿部的加工。

The full CNC system 7 axis 4 axis linkage, using the principle of development method, through the numerical control system electronic gear box function, the realization of indexing and differential compensation movement, can complete the cylindrical spur gear, helical gear, small tcone tooth, drum tooth, spline, worm gear, sprocket and other tooth processing.

整机采取模块化设计，各功能组件可以根据客户需求快速组合成具备不同功能的机型，满足客户个性化、快速交货的要求。

The machine adopts modular design, each functional component can be quickly combined into models with different functions according to customer needs, to meet customer's personalized, fast delivery requirements;

便于接近和维护的组件，将机床的液压、润滑与气动装置组合到机床上。

Components for easy access and maintenance that combine the hydraulic, lubricating and pneumatic components of the machine tool onto the machine tool;

具备故障自诊断、主轴过载自动监测及报警等保护功能；

Has fault self-diagnosis, spindle overload protection functions such as automatic monitoring and alarm;

客户可以根据加工需要选购自动上下料装置、自动化料仓、去毛刺装置和粗定位等装置。

Customers can need according to the processing of choose and buy automatic up-down material device, automatic bin, deburring device and positioning device.

加工位与更换位的双工位上下料机械手设计，结构精巧可靠，最大限度地节约上下料时间，实现少人与无人化加工，提高机床的加工效率。

The dual-station loading and unloading manipulator design of the processing position and the replacement position has a sophisticated and reliable structure, which saves the loading and unloading time to the greatest extent, realizes less humanized and unmanned processing, and improves the processing efficiency of the machine tool.

设计理念 The design concept

一流的研发手段

The first-class research and development way

采用一流的美国参数技术公司（PTC）旗下的CAD/CAM/CAE一体化的Pro/Engineer三维设计软件。结合了零件设计、产品装配、逆向工程、自动测量、机构分析、有限元分析、产品数据库管理等功能，极大提高产品研发的质量。

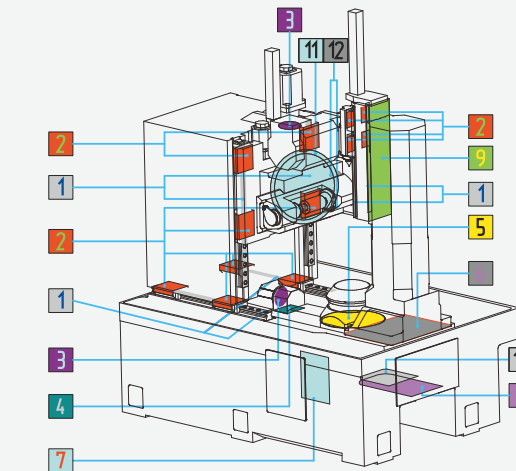
Using first-class parameter technology companies in the United States (PTC), CAD/CAM/CAE integration of Pro/Engineer 3 d design software. Combining parts design, product assembly, reverse engineering, automatic measurement, mechanism analysis, finite element analysis, product database management and other functions, greatly improve the quality of product research and development.

刮削工艺

The scraping process

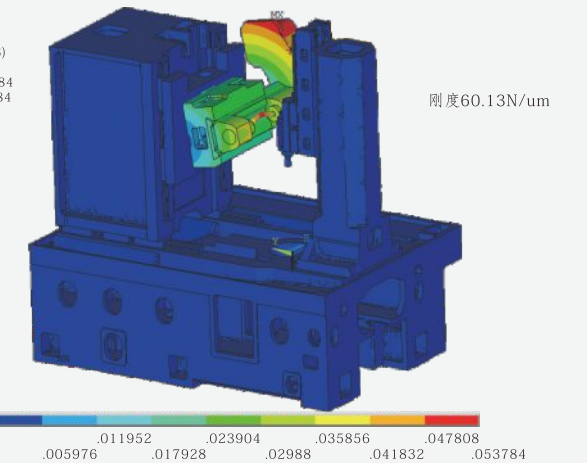
通过熟练技工对所有重要接触面进行铲刮，为整机的高刚度和高精度提供可靠保证。

By skilled workers to shovel scraping all the important contact area, to provide reliable guarantee for high rigidity and high precision of the machine.



- 1 直线导轨装配面
- 2 滑块装配面
- 3 丝杆螺母装配面
- 4 丝杆支撑座装配面
- 5 工作台装配面
- 6 小立柱装配面
- 7 消除机构装配面
- 8 C轴电机底座装配面
- 9 小立柱导轨座装配面
- 10 C轴电机安装座装配面
- 11 A轴锥套接触面
- 12 Y轴燕尾装配面

NODAL SOLUTION
STEP=1
SUB =1
TIME=1
USUM (AVG)
RSYS=0
DMX=.053784
SMX=.053784



静态与动态刚性分析

Static and dynamic rigidity analysis

整机使用FEA（有限元解析）设计手段，根据机床受力分析情况进行优化设计，机床质量得到极大的提高，从而使机床无刚性薄弱点且刚性均匀分布，大大减小机床受力变形，具有卓越性能。

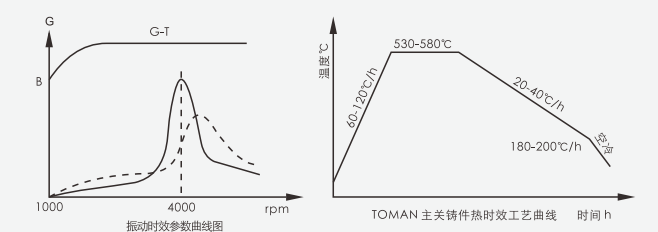
Machine using FEA (finite element analysis) design method, optimized design according to the status of force bearing analysis on the machine tools, machine tool quality greatly improved, so as to make the machine without rigid vulnerabilities and rigid uniform distribution, greatly reduce the forced deformation of machine tool, has excellent performance.

时效处理

The Aging treatment

所有床身、大立柱、后立柱等铸件均经过二次时效处理，充分地消除铸件的内应力，提高铸件尺寸精度的稳定性，机床精度长期稳定性得以保证。

All the castings, such as bed, large column and rear column, have undergone secondary aging treatment, which can fully eliminate the internal stress of the castings, improve the stability of the dimensional accuracy of the castings, and ensure the long-term stability of the precision of the machine tool.



TM01平台系列

TM01 platform series



标准配置

Standard configuration

滚刀刀杆组件 Hob arbor assembly ($\phi 32$)	液压系统 hydraulic system
刀杆自动夹紧装置 Hob arbor automatic clamping device	NC控制系统 NC controller system
工件自动夹紧装置 Workpiece automatic clamping device	NC数据存储卡 NC data memory card
主轴定位 Spindle positioning	操作软件 Operational software
全密封护罩 Fully-enclosed safeguards	漏电断路器 Residual-current circuit breaker
机床照明灯 working light	双手操作按钮 Hands action button
机床状态显示三色灯 Three colour lights indicate machine status	RS232C接口 RS232C connector
工件计数器 Workpiece counter	电气柜用空调 Air conditioner for electric cabinet
主轴电流表 Main spindle ampere meter	排屑机 Chip conveyor
铁屑小车 Chip cart	自动润滑系统 Automatic lubrication system
切削油箱 Cutting oil tank (湿切用 Wet hobbing uses)	集雾器 Mist collector
冷却喷枪 Cold spray gun (湿切用 Wet hobbing uses)	机床调整垫铁 The sizing block for machine adjustment

主要技术参数

Main technology parameter

TM01系列数控滚齿机 TM01 series CNC hobbing machine	单位 Unit	TMY3110	TMY3115	TMY3120	TMY3125
		干切 Dry hobbing	湿切/干切 Wet hobbing/dry hobbing		
最大工件直径 Maximum workpiece diameter	mm	$\phi 100$	$\phi 150$	$\phi 200$	$\phi 250$
最大工件模数 Maximum module	mm	3	4	6	6
工作台台面直径 worktable surface diameter	mm	$\phi 150$	$\phi 150$	$\phi 200$	$\phi 250$
滚刀最大安装直径x长度 Hob maximum assemble diameter x length	mm	$\phi 110 \times 150$	$\phi 110 \times 180$	$\phi 130 \times 230$	$\phi 130 \times 230$
滚刀中心至工作台中心水平距离 Horizontal distance between hob center and worktable center	mm	5-145	15-155	30-230	40-260
滚刀最大轴向移动量 Maximum hob axial movement amount	mm	130	150	180	180
滑板行程 (Z轴移动量) Hob head slide travel (Z axis displacement)	mm	190-400	190-490	200-500	200-550
刀具最大回转角 Max. swiveling angle of the hob head	Deg	$\pm 45^\circ$	$\pm 45^\circ$	$\pm 45^\circ$	$\pm 45^\circ$
主电机功率 Hob spindle motor power	KW	7.5	7.5	11	18.5
滚刀主轴最高转速 (B轴) Maximum hob spindle rotate speed (B axis)	rpm	3000	1500/2000	1200/1500	1200/1500
工作台最高转速 (C轴) Maximum worktable rotate speed (C axis)	rpm	400	250/300	200/250	120/150
径向进给速度 (X轴) (无级) Radial feed speed (X axis) (stepless)	mm/min	1-2000	1-2000	1-2000	1-2000
径向最大快速移动速度 (X) Radial maximum rapid moving speed (X axis)	mm/min	8000	8000	8000	8000
轴向进给速度 (Z轴) (无级) Axial feed speed (Z axis) (stepless)	mm/min	1-2000	1-2000	1-2000	1-2000
轴向最大快速移动速度 (Z) Axial maximum rapid moving speed (Z axis)	mm/min	8000	8000	8000	8000
切向进给速度 (Y轴) (无级) Tangential travel feed speed (Y axis) (stepless)	mm/min	1-1000	1-1000	1-1000	1-1000
切向最大快速移动速度 (Y轴) Tangential maximum rapid travel speed (Y axis)	mm/min	3000	3000	3000	3000

可选配置

Optional configuration

自动上下料装置 Automatic loading/unloading material device	工件夹具 Workpiece clamping
自动储料装置 Automatic material storage	工件粗定位装置 Workpiece rough locator device
去毛刺装置 Deburring device	自动对齿装置 Automatic tooth align device
机外调刀装置 Independent hob adjustment device	切削油冷却装置 oil cooling device
滚刀刀杆组件 Hob arbor assembly (公制 metric system: $\phi 10$ 、 $\phi 13$ 、 $\phi 22$ 、 $\phi 27$ 、 $\phi 40$)、(英制 inch system: $\phi 16$ 、 $\phi 22.225$ 、 $\phi 26.988$ 、 $\phi 38.1$)	

TM02平台系列

TM02 platform series



标准配置

Standard configuration

滚刀刀杆组件 Hob arbor assembly (φ40)	液压系统 hydraulic system
刀杆自动夹紧装置 Hob arbor automatic clamping device	NC控制系统 NC controller system
工件自动夹紧装置 Workpiece automatic clamping device	NC数据存储卡 NC data memory card
主轴定位 Spindle positioning	操作软件 Operational software
全密封护罩 Fully-enclosed safeguards	漏电断路器 Residual-current circuit breaker
机床照明灯 working light	双手操作按钮 Hands action button
机床状态显示三色灯 Three colour lights indicate machine status	RS232C接口 RS232C connector
工件计数器 Workpiece counter	电气柜用空调 Air conditioner for electric cabinet
主轴电流表 Main spindle ampere meter	排屑机 Chip conveyor
铁屑小车 Chip cart	自动润滑系统 Automatic lubrication system
切削油箱 Cutting oil tank	集雾器 Mist collector
冷却喷枪 Cold spray gun	机床调整垫铁 The sizing block for machine adjustment

主要技术参数

Main technology parameter

TM02系列数控滚齿机 TM02 series CNC hobbing machine	单位 Unit	TMY3135	TMY3140	TMY3150
		湿切 Wet hobbing	湿切 Wet hobbing	湿切 Wet hobbing
最大工件直径mm Max. workpiece diameter mm	mm	φ350	φ400	φ500
最大工件模数mm Maximum module mm	mm	8	12	16
工作台台面直径 Worktable surface diameter	mm	φ320	φ320	φ450
滚刀最大安装直径×长度 Hob Maximum Assemble Diameter X Length	mm	φ160×230	φ200×230	φ240×300
滚刀中心至工作台中心水平距离 Horizontal distance between hob center and worktable center	mm	40-360	45-375	50-345
滚刀最大轴向移动量 Maximum hob axial movement amount	mm	180	200	250
滑板行程（Z轴移动量） Hob head slide travel (Z axis movement amount)	mm	200-600	200-600	200-600
刀具最大回转角 Maximum swiveling angle of the hob head	Deg	±45°	±45°	±45°
主电机功率 Hob spindle motor power	KW	15	15	18.5
滚刀主轴最高转速（B轴） Maximum hob spindle rotate speed(B axis)	rpm	750/1200	500/750	300
工作台最高转速（C轴） Maximum worktable rotate speed(C axis)	rpm	75	75	50
径向进给速度（X轴）（无级） Radial feed speed(X axis)(stepless)	mm/min	1-2000	1-2000	1-2000
径向最大快速移动速度（X） Radial maximum rapid move speed(X axis)	mm/min	5000	5000	5000
轴向进给速度（Z轴）（无级） Axial feed speed(Z axis)(stepless)	mm/min	1-2000	1-2000	1-2000
轴向最大快速移动速度（Z） Axial maximum rapid moving speed(Z axis)	mm/min	6000	6000	6000
切向进给速度（Y轴）（无级） Tangential feed speed(Y axis) (stepless)	mm/min	1-1000	1-1000	1-1000
切向最大快速移动速度（Y轴） Radial maximum rapid travel speed(Y axis)	mm/min	2500	2500	2500

可选配置

Optional configuration

自动上下料装置（仅针对Y3135/40） Automatic loading/unloading material device(only to Y3135/40)	工件夹具 Workpiece clamping
自动储料装置（仅针对Y3135/40） Automatic workpiece storage(only to Y3135/40)	工件粗定位装置 Workpiece rough locator device
去毛刺装置 Deburring device	自动对齿装置 Automatic tooth align device
机外调刀装置 Independent hob adjustment device	切削油冷却装置 oil cooling device
滚刀刀杆组件Hob arbor assembly (公制metric system: φ22、φ27、φ32、φ50、φ60)、(英制inch system: φ26.988、φ31.75、φ38.1、φ50.8)	

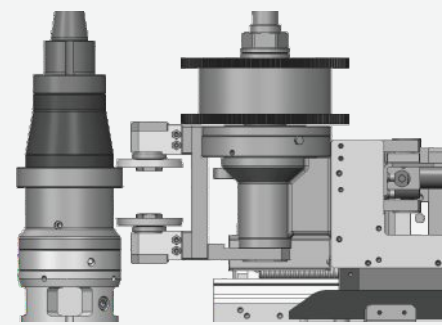
滚倒复合一体机 Hobbing machine with integrated chamfering station



齿轮复合机系列产品可满足齿轮行业各类客户的个性化需求，可供客户随意选型，满足乘用车、新能源汽车、中小模数工程机械行业等中小模数齿轮的加工需要。

Gear compound machine series products to meet the personalized needs of all kinds of customers in the gear industry, are available for customers to choose at will, to meet the machining needs of middle and small modulus gears in passenger cars, new energy vehicles, middle and small modulus engineering machinery industry and so on.

机型Type	功能Function	倒棱加工范围 Chamfering range of edge extrusion				
		最大模数 Maximum modulus (mm)	最大直径 Maximum diameter (mm)	最小直径 Minimum diameter (mm)	最大长度 Maximum length (mm)	齿宽 Tooth width (mm)
TMY3115CNC10	滚倒一体	4	150	20	300	5-60
TMY3120CNC10	滚倒一体	5	200	20	300	5-60
TMY3125CNC10	滚倒一体	5	250	20	300	5-60



采取模块化设计，各功能组件如倒棱部装、液压站、气动部装、电气柜和排屑机可以根据客户需求快速组合，整体布局紧凑，占地面积小，满足客户个性化、快速交货的要求。

Modular design is adopted, for every functional components, for example: chamfering assembly, hydraulic station, pneumatic assembly, electrical cabinet and chip conveyor, which can be quickly combined according to customers' needs, with compact overall layout, small floor area, meeting customers' personalized, fast delivery requirements.

采用两套独立的控制系统分别控制滚齿工位与倒棱工位加工，相对于传统的双通道控制方式，人机工程友好，操作更便利。

To use two sets of independent control systems to control the hobbing station and chamfering station respectively, compared with the traditional double channels control mode, ergonomics friendly, more convenient operation.

专用控制软件，专用的操作界面，无需编程，只需要输入被加工齿轮、刀具以及相关切削参数就可以实现滚齿与倒棱工位的自动加工，运行稳定可靠。

Special control software, special operation interface, without programming, only need to input the gear, tool and related cutting parameters to realize the automatic machining of hobbing and chamfering station, operation is stable and reliable.

内置倒棱机构，采用4工位旋转上下料装置，在滚齿作业时同时进行倒棱，实现高效生产。

Inner built-in chamfering structure, 4-position rotating loading and unloading device, chamfering at the same time in gear hobbing operation, to realize efficient production.

挤棱工位可任意调整挤棱和去毛刺高度，倒棱工位可实现快速换产，同时通过采用特殊设计，允许选配车削去毛刺功能。

The edging squeezing station can adjust edging squeezing and the height of deburring at will, and the chamfering station can realize rapid production change, at the same time, to use the special design, allows the optional turning deburring function.

滚倒滚复合一体机系列 Hobbing machine with integrated chamfering unit



设备适用于乘用车变速齿轮、工程机械等行业中小模数齿轮的滚齿和倒棱加工。

The equipment is suitable for hobbing and chamfering machining of middle and small modulus gears in the industries of speed change gears for passenger cars, engineer machinery.

可选机型 Optional type	功能Function	加工范围Machining range				
		最大模数 Maximum modulus (mm)	最大直径 Maximum diameter (mm)	最小直径 Minimum diameter (mm)	最大加工长度 Maximum machining length (mm)	齿宽 Tooth width (mm)
TMY3115CNC11	滚倒滚	4	150	20	250	5-60
TMY3120CNC11	滚倒滚	5	200	20	250	5-60

实现了中小模数齿轮一次装夹完成粗滚+挤棱去毛刺+精滚的加工，彻底解决了齿面翻边毛刺和凸起的问题，在显著提升齿轮的加工精度的同时，避免了热处理后的后道工序因翻边毛刺或凸起导致刀具寿命或加工精度的降低。

To realize the process: rough rolling+edging squeezing and deburring+finish rolling, only one clamping of middle and small modular gear, the problems of flanging burr and bulge on the tooth surface are completely solved, the machining accuracy of the gear is significantly improved, and the reduction of tool life or machining accuracy caused by burr or bulge in the subsequent process after heat treatment is avoided.

挤棱工位可任意调整挤棱和去毛刺高度，倒棱工位可实现快速换产，同时通过采用特殊设计，允许选配车削去毛刺功能。

The edging squeezing station can adjust the edging squeezing and the height of deburring at will, the chamfering station can realize rapid product change, at the same time, to use the special design, allows the optional turning deburring function.

内置桁架机械手运行速度快，定位精确可靠，调整方便，操作便利。采用多工位循环码垛式自动料仓，可以快速换产、调整方便，提升高度达400mm，一次装料可以满足长时间加工需要。

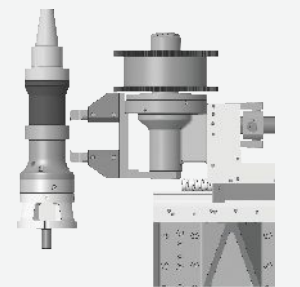
The inner built-in truss mechanical arm has the advantages of fast running speed, accurate and reliable positioning, convenient adjustment and operation. It adopts multi position cycle palletizing automatic bin, which can change product quickly, adjust conveniently, the lifting height is up to 400mm, the one-time loading can meet the needs of long-time machining.

整机采用全封闭不锈钢内防护满足干切防护要求，将加工区和非加工区彻底隔开，大倾角内防护使铁屑能够快速排出机外。

The whole machine uses fully enclosed stainless steel inner protection to meet the requirement of dry cutting protection, the processing area and non processing area are completely separated, the large angle inner protection enables the chip to be quickly discharged out of the machine.

机床采取模块化设计各功能组件可以根据客户需求快速组合，满足客户个性化需求。

Modular design is used for the machine, the functional components can be quickly combined according to the needs of customers, to meet the personalized needs of customers.

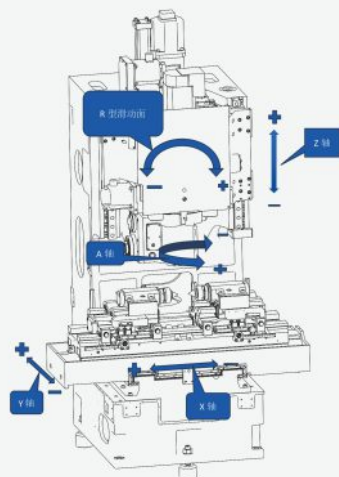


数控剃齿机

CNC shaving machine

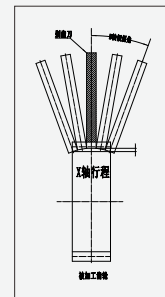
高效数控剃齿机广泛用于各类直齿圆柱齿轮，斜齿轮及轴齿轮的精密加工。本机床自动化程度高、刚性好、效率高、性能齐全、操作方便，特别适合于汽车、摩托车、拖拉机、工程机械、减速机等行业成批大量齿轮剃齿生产，并可根据用户的需求选配相应的盘齿或轴齿自动上下料装置，满足客户各类需求。

High efficiency CNC shaving machine is widely used in finishing of every kind of spur gear, helical gear and shaft gear. The machine has high degree of automation, good rigidity, high efficiency, complete performance, convenient operation, it is especially suitable for mass gear shaving production in automobile, motorcycle, tractor, engineering machinery, reducer and so on industries, and according to the needs of users, the corresponding automatic loading and unloading device of disc gear or shaft gear can be selected to meet the needs of every kind of customers.

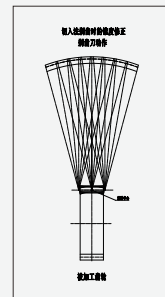


NC控制轴 NC control axis

- A:** 刀架回转运动
Rotation movement of tool holder
- B:** R滑动面摆动
R sliding surface swing
- X:** 工作台轴向进给运动
Axial feed movement of worktable
- Y:** 工作台切向进给运动
Tangential feed movement of worktable
- Z:** 滑板径向进给运动
Radial feed movement of slide
- S:** 剃刀旋转运动
Rotation movement of razor



轴向剃齿形
Axial shaving drum



径向剃齿形
Radial shaving

一、R型滑动面配置在刀架头上部，以刀架的啮合点为中心摆动，可以加工出更加理想的锥度及鼓形齿，大大缩短了剃齿机的换型的辅助时间以及提高了使用方便性。

The R-shaped sliding surface is arranged on the upper part of the tool holder head, swings around the center of the meshing point of the tool holder, which can machining more ideal taper and drum shaped teeth, greatly reducing the auxiliary time of the shaving tooth machine and improving the convenience of use.

二、操作者可方便地在滑板正面调整刀架回角以达到合适的工件和刀具轴交角；主轴允许朝向正面，剃齿刀锁紧采用了快换装置，刀具更换省时省力。

The operator can easily adjust the return angle of the tool holder on the front of the slide to achieve the appropriate axis intersection angle between the workpiece and tool; the spindle is allowed to face the front, the shaving tooth cutter is locked with a quick change device, which saves time and labor when changing the tool.

三、采用特殊弹簧设计，完全消除了刀具安装的间隙，使刀具的旋转精度和装夹刚性大幅提升，降低了切削时刀具的振动，提升了加工的精度。

The use of special spring design, completely eliminates the tool installation clearance, make the rotation precision and clamping rigidity of the tool substantial increase, reduce the vibration of the tool when cuts, improve the precision of machining.

四、整机设计紧凑，配备单独的液压站和磁性排屑器，独立的电气柜置于机床后面，机床调整和维护空间集中在机床的前面和后面，两侧面不需要进行维护而有利于排线生产，同时采用了的热平衡设计和补偿技术。

The whole machine is compact in design, equipped with a separate hydraulic station and magnetic chip conveyor, the independent electrical cabinet is placed at the back of the machine, the adjustment and the maintenance space of the machine are concentrated at the front and back of the machine, there is no need for maintenance on both sides, which is conducive to the production of wire laying, at the same time, the heat balance design and compensation technology of the machine are used.

主要技术参数

Main technology parameter

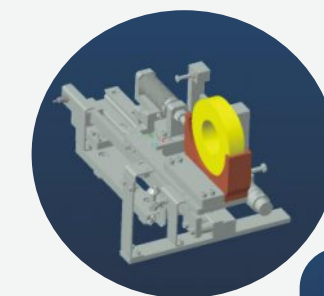
名称 Name	Y4235CNC5	Y4235CNC3	Y4235CNC2
最大工件直径 (mm) Maximum workpiece diameter(mm)	350		
最大工件模数 (mm) Maximum workpiece modulus(mm)	8 (径剃5) 8(diameter shaving 5)		
标准压力角 (°) Standard pressure angle(°)	0-30		
最大工件齿宽(mm) Maximum work piece tooth width(mm)	150	40	
剃刀最大宽度(mm) Maximum width of razor(mm)	50		
剃刀最大外径(mm) Maximum outer diameter of razor(mm)	250		
剃刀安装孔径(mm) Assemble hole diameter of razor	63.5		
剃刀最大转速 (r/min) Maximum rotation speed of razor	500		
主轴功率 (Kw) Spindle power (Kw)	3.7/5.5		
A轴旋转角度 A axis rotation angle degree	+20° 到 -90° +20° to -90°		
A轴最大旋转速度 Maximum rotation speed of A axis	240° /s		
Z轴行程 (mm) Z-axis range(mm)	117-300		
Z轴快移速度 (mm/min) Z-axis fast moving speed(mm/min)	8000		
Z轴进给速度 (mm/min) Z-axis feed speed(mm/min)	1-2000		
X轴行程 (mm) X-axis range(mm)	±75	/	
X轴进给速度 (mm/min) X-axis feed speed(mm/min)	1-3000	/	
Y轴行程 (mm) Y-axis range(mm)	±10	/	
Y轴进给速度 (mm/min) Y-axis feed speed(mm/min)	1-600	/	
B轴摆动角度 (锥度鼓形用) B-axis swing angle(for taper drum)	±2°	±2°	±2°
B轴控制方式 B-axis control way	伺服控制 Servo control	伺服控制 Servo control	手动调整 Manual adjustment
左右顶尖最大间距 (mm) (从左锁紧螺母端面算起) Maximum distance between left top and right top(mm)(from the face of the left lock nut and right lock nut counting)	490 (选配700) 490(optional 700)	265 (选配300) 265(optional 300)	
顶尖中心高 (mm) Top center height(mm)	180		

标准配置

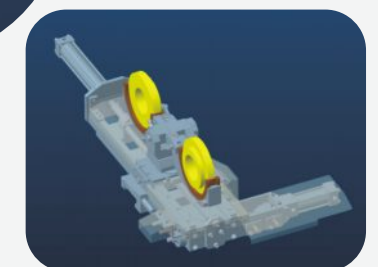
Standard configuration

剃刀垫片 Razor gasket (10、12.5、15)
磁性分离器 Magnetic separator
集屑盒 Chip collecting box
切削油箱 Cutting oil tank
机床状态显示三色灯 Three color light for machine status display
机床调整垫铁 Machine adjustment parallels
电气柜空调 Electric cabinet air conditioner
液压系统 Hydraulic system
润滑系统 Lubrication system
操作软件 Operation software
温补系统 Temperature compensation system
漏电断路器 Leakage power circuit breaker
双手操作按钮 Two hand operation button
NC控制系统 NC control system

可根据自动化需要选配上料装置：
The loading and unloading device can be selected according to the needs of automation:



直立式上料机构



双工位旋转式上料机构

为了进一步提高加工效率与精度，降低人工需求与劳动强度，满足齿轮行业的转型升级需求；陀曼依靠多年的齿轮机床自动化经验，可以根据客户不同需求提供热前制齿工序的个性化综合解决方案，满足客户对齿轮制齿工序的自动化、智能化、个性化的需求！

In order to further improve the processing efficiency and precision, reduce the labor demand and labor intensity, to meet the transformation and upgrading needs of the gear industry; Based on many years of experience in gear cutting automation, Toman can provide personalized comprehensive solutions for the hot front gear cutting process according to the different needs of customers, to meet customers' needs for automation, intelligence and personalized gear cutting process!

滚倒剃自动化生产线--关节机器人组线

gear hobbing / chamfering / shaving Automatic Production Line-joint Robot Assembly Line

自动线由滚齿机/倒棱机/剃齿机、关节机器人、甩油机、多工位装盘堆垛式料仓、外防护和安装装置组成，根据客户需求进行自由组合能完成所有的齿轮热前制齿加工工序。

The automatic line is composed of hobbing machine、chamfering machine、shaving machine、joint robot、oil slitter、multi position palletizing and stacking bin、outer protection and installation device, according to customer demand for free combination can complete all gear making process of the gear before the hot machining.

智能化、柔性化 Intelligent、Flexibility

具备高度的智能化以及柔性化，可以与中央处理器交换数据，实现集中管理。数据可以实时在线采集和统计分析，自动报警、自动抽检等功能。

With a high degree of intelligence and flexibility, it can exchange data with the center processor to achieve centralized management. Data can be real-time online collection and statistical analysis, automatic alarm、automatic sampling and so on functions.

自动化料仓客户根据客户产品进行灵活设计定制

Automatic bin, customer can design and custom made flexibly according to their products



布局紧凑，设计合理

Compact layout, reasonable design



滚倒剃自动化生产线--桁架式机器人组线

gear hobbing / chamfering / shaving Automatic Production Line-truss Robot Assembly Line

该自动生产线适用于汽车变速箱、摩托车等中小模数齿轮的批量生产需要。

The automatic production line is suitable for the mass production of middle and small modulus gears, it is suitable to automobile gearbox、motorcycle and so on.

由滚倒复合一体机、全自动数控剃齿机、自动上下料仓、自动甩油机、自动抽检台和桁架机械手等自动化设备组成，根据客户需求进行自由组合能完成所有的齿轮热前制齿加工工序。

It is composed of hobbing machine with chamfering station、shaving machine、automatic loading and unloading、automatic oil slitter、automatic sampling table and truss mechanical arm and so on automatic equipments, it can finish complete all the gear making process before hot treatment by free combination according to customer requirements.

自动线一字排开的布局形式，巧妙地将齿轮热前滚齿-倒棱-剃齿三道工序与自动上下料系统完美融合，整线布局紧凑、占地面积小、生产效率高、调试维护简单、人机操作友好和造型美观等特点。

Automatic line, line layout form, ably to integrate gear hobbing before hot - chamfering - shaving tooth three processes and automatic loading and unloading system, the whole line layout is compact、cover an small area、high production efficiency、adjustment and maintenance are simple、man-machine operating friendly and aesthetically pleasing and so on.



可以根据齿轮不同的热前制齿工艺，任意选择执行部分或全部加工工序，如可以跳过倒棱工序只选择滚齿与剃齿加工，或者跳过滚齿与倒棱工序，也可以对滚齿后的产品集中只进行剃齿加工，更佳柔性化，可以适应未来市场变化进行多品种生产的要求。

Users can choose to perform part or all of the machining processes according to the different gear cutting processes before hot treatment of the gear, for example: they can skip the chamfering process and only choose hobbing and shaving machining, or skip the hobbing and chamfering process, they also can concentrate on shaving the products after hobbing, which is more flexible, can meet the requirement of multi varieties production in the future market.

数控车床系列产品

CNC turning machines

在简约、紧凑之中追求高性能。
持续改进是陀曼的发展之道，一直以来我们都在不断寻求各种方式来改进陀曼的数控车床产品，力求为您——尊敬的客户——带来更多的价值；
新一代陀曼数控车床对产品进行了多方面的提升和强化因而性能较以往更胜一筹；我们研究和改进了机床的各个方面，包括运动控制，冷却液箱，排屑，操作及维修便捷性，实现高精度、高生产率、高可靠性，成就了TOMAN高性价比的数控车床系列。
以操作的易用性为前提，提升操作性与日常维护性；整机使用FEA有限元分析并结合Pro/E三维仿真设计，使机床刚性均匀分布而无薄弱点；
机床设计采用热对称结构，使运转过程中各部件变形均匀，保证机床长时间运转热变形最小；
在所有环节采用专用设备、工具和标准化工作及管理流程保证的同时，坚持以工匠的技术进行刮研作业；预留自动化接口，便于组线生产。



		CKPP16	CKP16	CKPP20	CKP20	CKP26	CKZ20	CKZ26/600	CKZ26/1050	CKP40	CKZ40
加工能力 The processing ability	最大回转直径 Maximum rotating diameter		Φ380	Φ460		Φ500		Φ500	Φ540	Φ680	Φ680
	滑鞍上最大回转直径 Maximum turning diameter on the saddle	/	Φ160	/		Φ260		Φ260	Φ280	Φ400	Φ400
	最大加工直径 Maximum processing diameter		Φ160	Φ200	Φ200	Φ260	Φ200	Φ260	Φ370	Φ420	Φ420
	最大加工长度 Maximum processing length		/	/	/	/	320	630	1050	660	1250
行程 The range	X轴行程 X-axis range	320	90+25	360	140+25	155+25	140+25	155+25	185+30	215+35	215+35
	Z轴行程 Z-axis range	280	280	300	320	320	320	650	1100	710	1300
主轴 The spindle	卡盘尺寸(标配) The chuck dimension (standard)		6"	8"	8"	10"	8"	10"	10"	12"	12"
	最高转速 Maximum speed of revolution		5000rpm	4000rpm		4000rpm		4000rpm	3500rpm	3000rpm	3000rpm
	变速级数 The number of steps		无级变速 Stepless speed change	无级变速 Stepless speed change		无级变速 Stepless speed change		无级变速 Stepless speed change	无级变速 Stepless speed change	无级变速 Stepless speed change	无级变速 Stepless speed change
	主轴端形式 The spindle end form		A2-5	A2-6		A2-6		A2-6	A2-6	A2-8	A2-8
刀塔 The knife tower	主轴通孔尺寸 The spindle hole dimension		Φ45	Φ45		Φ62		Φ62	Φ72	Φ87	Φ87
	刀塔形式(标配) The knife tower form (standard)	/	液压刀塔 Hydraulic knife tower	/		液压刀塔 Hydraulic knife tower		液压刀塔 Hydraulic knife tower	液压刀塔 Hydraulic knife tower	液压刀塔 Hydraulic knife tower	液压刀塔 Hydraulic knife tower
	刀具数量 The tool quantity		4	8	4	8		8	12	12	12
	车刀杆尺寸 The turning tool dimension		20X20	25X25		25X25		25X25	25X25	32X25	32X25
进给速度 The feed speed	镗刀杆直径 Boring blade diameter		Φ25			Φ32		Φ32	Φ40	Φ40	Φ40
	X轴快速进给速度 The X axis speed of fast forward		24m/min	24m/min		24m/min		24m/min	24m/min	20m/min	20m/min
尾座 The tailstock	Z轴快速进给速度 The Z axis speed of fast forward		30m/min	30m/min		30m/min		30m/min	30m/min	24m/min	24m/min
	尾座套筒行程 Tailstock quill travel	/	/	/	/	/	80	85	100	/	100
	液压尾座套筒直径 Hydraulic tailstock sleeve diameter						Φ65	Φ80	Φ110	/	Φ110
电机 The motor	尾座锥孔 Tailstock Quill taper hole	/	/	/	/	/	MT 4(内置活顶尖) M4 (Outer live center)	MT 5(内置活顶尖) M5 (Outer live center)	MT 4(内置死顶尖) M4 (Inner back dead center)	/	MT 4(内置死顶尖) M4 (Inner back dead center)
	主轴电机 The spindle motor		5.5/7.5KW	7.5/11KW	7.5/11KW	11/15KW	7.5/11KW	11/15KW	15/18.5KW	22/30KW	22/30KW
电/气源 The Electric/gas source	冷却泵电机 The cooling bump motor		0.37KW	0.55KW		0.55KW		0.55KW	0.55KW	0.55KW	0.55KW
	电源容量 The power capacity		12KVA	12KVA	15KVA	15KVA	15KVA	20KVA	25KVA	35KVA	35KVA
冷却 The cooling	气源 Air source		0.5-0.6mpa	0.5-0.6mpa		0.5-0.6mpa		0.5-0.6mpa	0.5-0.6mpa	0.5-0.6mpa	0.5-0.6mpa
	水箱容量 Water tank capacity		100L	100L	110L	110L	110L	130L	160L	150L	200L
尺寸/重量 Dimensions/Weight	机床高度 The highth of the lathe		1700	1700	1750	1750	1700	1700	1700	1900	1900
	占地面积(LxW) Floor area (LxW)		1850X1870	1850X1870	2300X2100	2300X2100	2300X2100	2950x1600	4000X1600	4233X1846	5488X1846
	机床重量 The heavy of the lathe		2500	2500	3200	3200	3500	3500	4500	5600	7000
											10000

轴承装备系列产品

The bearing equipment series product

经过多年的沉淀、发展和创新，轴承生产自动化装备已成为行业领导者。产品系列覆盖了各种小、中、大型轴承的套圈全自动车削设备，并针对客户批量等不同需求推出定制服务，同时还推出全自动计数系统、漏工序检测系统、全自动上下料系统等系列辅助装置，进一步提高轴承生产企业自动化生产能力。

After years of precipitation, development and innovation, bearing production equipment industry has become the leader of the industry which include variety of small, medium and large bearing rings covers of automatic turning equipment, services for the different customers requirement, and also introduced Automatic counting systems, leakage process detection system, automatic loading and unloading systems and other auxiliary device, further improve bearing production enterprise automation production capacity.



主要技术参数 Main technology parameter

规格型号	自动线名称 Name of automatic line	加工范围	适合产品 Suitable for products
TM-ZC9203	微型轴承套圈车削自动线 Miniature bearing ring turning automatic line	D≤32mm	钢管、棒料、冷镦等各类轴承套圈 Steel pipe, bar, cold heading and other kinds of bearing rings
TM-ZC9206	全自动轴承套圈车削生产线 Automatic bearing ring turning production line	D≤62mm	钢管、棒料、冷镦等各类轴承套圈 Steel pipe, bar, cold heading and other kinds of bearing rings
TM-ZC9208	全自动轴承套圈车削生产线 Automatic bearing ring turning production line	D≤80mm	投资成本最省的轴承车削自动线 The most cost-effective bearing turning automatic line
TM-ZC9210	中大型轴承重切数控自动线 CNC automatic line for medium and large bearing recutting	D≤100mm	钢管、棒料、冷镦等各类轴承套圈 Steel pipe, bar, cold heading and other kinds of bearing rings
TM-ZC9213	中大型轴承重切数控自动线 CNC automatic line for medium and large bearing recutting	D≤130mm	钢管、棒料、冷镦等各类轴承套圈 Steel pipe, bar, cold heading and other kinds of bearing rings
TM-ZC9218	精密车铣复合数控机床柔性自动线 Precision turning and milling complex CNC machine flexible automatic line	D≤180mm	钢管、棒料、冷镦等各类轴承套圈 Steel pipe, bar, cold heading and other kinds of bearing rings
TM-ZCK20	CNC车削自动线 CNC turning automatic line	D≤260mm	各种盘类、短轴类、套类零件 All kinds of disk, short shaft, sleeve parts
TM-CKG5825	高精度高刚性数控车磨钻复合加工中心 High precision and high rigidity CNC grinding and drilling compound machining center	D≤2500mm	可提供车铣、车钻、车磨等复合加工中心 Can provide milling, drilling, grinding and other complex machining center
TM-CD-JQR-1000-3	锻造机器人 Forging robot	90mm≤D≤150mm	重量不大于5KG的轴承套圈及坯料 Bearing rings and billets with weight not more than 5KG
TM-ZC9206D TM-ZC9210D	轴承套圈锻件粗车自动线 Automatic line for bearing ring forging	D≤110mm	各类轴承锻件、钢管件、冷镦件的粗车 All kinds of bearing forgings, steel pipe parts, cold rolled rough cars
TM-ZC9206Q TM-ZC9210Q	UC轴承套圈车削自动线 UC bearing ring turning automatic line	D≤110mm	UC轴承、水泵轴承等长轴类套圈 UC bearing, pump bearing and other long shaft rings
TM-ZC9206YT TM-ZC9210YT	圆锥(塔件)车削自动线 Taper (tower) turning automatic line	D≤110mm	冷挤压圆锥联体套圈、精锻件圆锥联体套圈 Cold extrusion conical coupling ring, fine forging conical coupling ring
TM-ZC9206Y TM-ZC9210Y	圆锥套圈车削自动线 Taper ring turning automatic line	D≤110mm	圆锥轴承套圈 Taper bearing ring
TM-ZC9206L TM-ZC9210L	轮毂轴承套圈车削自动线 Automatic turning line for hub bearing ring	D≤110mm	轮毂轴承 Wheel hub bearing
TM-ZC9206Z TM-ZC9210Z	短圆柱(滚针)轴承套圈车削自动线 Automatic turning line for short cylindrical (needle rolling) bearing rings	D≤110mm	短圆柱、滚针轴承 Short cylindrical needle roller bearings
TM-ZC9206G TM-ZC9210G	关节轴承套圈车削自动线 Automatic turning line for knuckle bearing rings	D≤110mm	关节轴承、外球面轴承 Joint bearings, outer spherical bearings



轮毂单元数控产品延伸平台

CNC product extension platform for wheel hub unit

该平台专攻汽车轮毂单元的全自动化车削、钻孔、攻丝加工，坚持“智者，总是领先一步”的理念，逐步向汽摩零部件、齿轮、液压件等细分行业领域进军，旨在为客户提供专用数控车削自动线以及专用数控车床，破解当前招工难、劳动力成本逐年攀升之难题，为客户量身定做最合适的全自动化车铣钻复合加工解决方案。

This platform specialize in automation turning, drilling, tapping for auto wheel hub unit manufacturing. We insist on "wise, always keeps one step ahead" philosophy and now is coming into subdivided industries of auto parts, gears and hydraulic parts etc. It is aimed to supply the professional CNC automatic turning machine line and the professional CNC lathe, at solving recruitment difficulties and rising labour costs and providing a finest solution for full-automatic turning, milling and drilling combined working.

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