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Customer First ◆ Wholeheartedly ◆ Sincerity ◆ Continuous improvement

德州三嘉机器

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服务于全球  
深孔加工领域



中国最专业的深孔加工机床制造企业之一  
One of the most professional deephole drilling & boring machine manufacturing company of China



德州三嘉机器制造有限公司  
Dezhou Sanjia machine manufacturing Co. Ltd

设计: 186 5347 7907

## 三嘉机器

中国最专业的深孔加工机床制造企业之一

通过了ISO9001:2008质量体系认证

已获得《出口质量许可证书》

被评为山东省高新技术企业

山东省科技厅设立院士工作站

Sanjia Machine

One of the most professional deephole drilling&boring machine manufacturing company of China.

We have passed the ISO 9001 quality system certification

Has obtained "Export Quality License"

ppraised as a high-tech enterprise of Shandong province

The academican workstation



## 卷首语

PREFACE

### ► 足迹印证梦想

十年前，三嘉人驾驭愿望的方舟  
执着探索苍海的深邃  
面对大海的咆哮  
出没在巅峰和波谷之间  
以坚韧不拔之信念  
以自强不息的精神  
鼓动勇敢与智慧编织的风帆  
披星戴月  
不舍昼夜  
十年后，当年的一叶轻舟  
已打造成一艘军舰  
在商海的律动中  
留下波澜壮阔的回响

Our footprint reflect our dream

Ten years ago, Sanjia person drive the ark of dream  
Devoted to explore the deep of wild ocean  
Face to the roar of sea  
Fight between peak and low ebb  
With a firm and indomitable confidence  
With a spirit to never give up  
We rise a sail of courage and intelligence  
Under stars and moon  
Day and night  
Ten years later, the ancient small boat  
Has become a strong warship  
In surge of business sea  
Leave a magnificent echo





## 总经理致辞

General manager's speech

尊敬的各位朋友：

首先，我代表三嘉机器制造有限公司全体员工向多年来关心支持我们工作的各界朋友表示由衷的感谢和崇高敬意！在各位朋友的帮助和支持下，三嘉机器全体员工励精图治、艰辛付出，才有了我公司今天的发展并将创造出明天的辉煌。

我公司自 2002 年成立以来，就一直致力于走“依托科技进步与技术创新谋求企业发展”的道路，经过公司不断的扩建，生产能力已由成立时的年产 5 台跃升至现在的 70 台，产品由当初的单一品种发展到现在的十余个种类，加工孔径从最小的 3 毫米到最大的 1600 毫米，深度最深达到 20 米。几乎覆盖了所有深孔领域的加工。

我公司一直秉承“质量第一、客户至上”的原则，产品质量在国内同行企业中一直保持领先水平，先后通过 ISO9000 和 ISO9001 质量体系认证，产品畅销全国各地，并出口到乌克兰、新加坡、尼日利亚等十余个国家，成为国内深孔行业的领头羊、排头兵。

忆往昔峥嵘岁月，看今朝任重道远，为答谢社会各界同仁对我公司的厚爱，在今后的工作中，我们将继续发扬团结奋进、开拓创新的精神，以社会发展为己任，以品牌效益为目标，为深孔加工的发展繁荣，为国家民族工业的进步而不遗余力、奋斗不息！

Dear friends:

Hello everyone! First, let me express my honest appreciation and sincere respect, in representation of all the employees of Sanjia, to all the people who have given their supports and attention to Sanjia during so many years. With your support, we attained this achievement nowadays by efforts of all Sanjia employees.

Since the establishment in 2002, our company is committed to "develop the enterprise relying on the progress of science and the creation of technology". As a result of continuously expansion, our productive capacity has been raised from 5 machines per year to 70 machines a year. We have developed a dozen different kinds of machines that we had only one kind of machine at that time but now with a diameter varying from 3 millimeter to 1600 millimeter and a depth up to 20 meters, which covers all most all deephole manufacture.

On insisting the spirit of "quality best, client first", the quality of our production stay on top among other counterparts companies, which had passed successively the ISO 9000 and ISO 9001 quality system certification and international accreditation. Our products are not only one of the best-seller in everywhere of China but also been exported to a dozen countries like Ukraine, Singapore, Iran, Nigeria. It has become the vanguard in deephole-machine manufacture.

Recall the ancient success, prospect the road in future. To acknowledge the appreciation of people of all circles, we will forge ahead in union and exploit creation, taking charge of social developing, aiming at bands benefits, to do our best for the prosperity of deephole machine manufacturing industry, for the developing of national industry.

石洪刚

# 导航

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## 走进三嘉 Introduction of Sanjia



在短短的几年间，本着永不褪色的创业精神，三嘉实现了跨越式发展，蓦然回首，所有的辛劳，所有的付出，都被喜悦、骄傲和自豪所取代，感谢所有为三嘉付出汗水、心血的同仁，以及所有关心和支持三嘉发展的朋友们，光荣属于你，属于他，属于我们大家！

Just in several years, with a never fading mind of pioneer, Sanjia have realised a leaps and bounds. When we look back, all the toil, all the pains are replaced by a sense of pride and pretension. Thanks for every partener who have gave their efforts to Sanjia and for all the friends who care and support the development of Sanjia. This pride belongs to you, belongs to us!

DEZHOU SANJIA MACHINE



## 三嘉·风采 —— 公司简介



德州三嘉机器制造有限公司成立于 2003 年 5 月，为股份制民营企业，公司现有员工 120 人，售后服务 8 人，开发设计人员 15 人，5 人具有高级职称，高级技术工人 15 人，公司骨干人员均具有十年以上设计、使用、制造深孔的丰富经验。

德州三嘉机器制造有限公司是深孔加工机床的专业制造厂家，深孔机床是三嘉公司的唯一产品，公司开发研制的十几种深孔机床系列产品，加工孔径从  $\Phi 3$ — $\Phi 1600\text{mm}$ ，加工深度从 200—20000mm，覆盖了常用的领域。因为专一，所以有更深刻的研究和关注，在三嘉公司制造的每一台机床，都将受到最高的重视，得到最优质、最完善的售后服务。

三嘉公司拥有多种先进的机械加工设备，如：有数控深孔钻镗床、卧式铣镗床、2mx13m 导轨磨床和中频感应淬火机，用于机床床体精加工；有 TXP6113 型数显卧式镗床，主要用于大型深孔钻镗床箱体孔加工；有 M4132x2m、M4150x2m 精密外圆磨床，主要用于机床主轴及各类轴件的精加工。

2002 年 5 月公司成立，在市郊租赁厂房进行生产。

2003 年 5 月公司为鞍山钢铁公司冶炼厂制造出高炉铜冷却壁专用深孔加工机床，是我公司生产的第一台专用机床。

2003 年，德州三嘉机器制造有限公司在德州经济开发区征购土地，修建了技术开发中心办公楼和车间。

2005 年，德州三嘉机器制造有限公司被认定为山东省高新技术企业。

2007 年，德州三嘉机器制造有限公司通过 ISO9000 质量管理体系认证。

2009 年 3 月，向伊朗出口 TS2150 深孔钻镗床，是我公司的第一台出口机床（临时许可证）

2009 年，山东省科技厅和德州市人民政府决定在德州三嘉机器制造有限公司设立中国工程院院士工作站。

2009 年，德州三嘉机器制造有限公司工业总产值 6000 万元，年产各种规格类型的深孔加工机床 50—70 台。

2010 年通过审核，获“出口产品质量许可证”同时公司获得机电产品的自主出口经营权。

2010 年，德州三嘉机器制造有限公司通过 ISO9001 质量管理体系认证。



Dezhou Sanjia machine manufacturing Co. Ltd was established in may in 2003 as a private joint-stock company. Now we have 120 staff among whom 8 persons for after-sell service, 15 persons for designment, 5 persons with senior professional title, 15 persons are senior techical workers, all backbone staff have a rich experience at least 10 years of design, use and manufacture deephole.

Dezhou Sanjia machine manufacturing Co. Ltd is an enterprise professional for the manufacture of deephole machine which is the only produation of Sanjia, who has designed a dozen kinds of deephole machine. The diameter varies from  $\Phi 3$  to  $\Phi 1600\text{mm}$  and the depth varies from 200 to 20000mm that it covers commonly used fields. Thanks to the specificity, our researche could be more professional. In Sanjia, every machine will receive the most highly attention and the most complex after-sell service in high quality.

Sanjia company is equiped many kinds of high-tech machine manufacturing equipments, for example: for the working of corpus, there are CNC deephole drilling machine, horizontal milling and boring machine, 2x13m slideway grinding machine and superaudio-induction hardening machine; For the working of axes, there are M4143x2m, M4150x2m cylindrical grinder.

In May 2002, our company was established and began to working in a leased-factory at suburb.

In May 2003, we made a deephole working machine specially for the blust furnace copper stave for Anshan iron and steel company which is the first professional machine we produced.

In 2003, Dezhou Sanjia machine manufacturing company bought a piece of land at economic development zone of Dezhou and built the design center building and workshop.

In 2005, Dezhou Sanjia machine manufacturing company was considered as hign-tech enterprise of Shandong Province.

In 2007, Dezhou Sanjia machine manufacturing company passed ISO 9000 quality system certification and international accreditation.

In 2009, Science and technology office of Shandong province and the government decided to set an academician workstation of chinese academy of engineer.

In 2009, Dezhou Sanjia machine manufacturing company has a gross output of 60 million RMB, produce 50 to 70 machine per year.

In 2010, we got throught the examination and obtain "export product quality license". At the same time, we got the independent export right of electromechinical product.



## 三嘉·收获——公司荣誉

我们拥有荣誉，源自我们光辉的业绩，我们拥有荣誉，是我们无私奉献的有力回报，我们拥有荣誉，意味着我们肩负更大的责任。公司的荣誉仅代表公司过去的成就，未来的荣誉才是我们三嘉人所追求的，三嘉公司时刻树立标杆，时刻激励自己，为三嘉的明天而奋斗。

### 公司荣誉

公司于 2005 年认定为山东省高新技术企业。

公司于 2007 年通过 ISO9000 质量管理体系认证，并与 2010 年通过 ISO9001 质量管理体系认证。

公司于 2009 年获市科技管理工作先进集体

山东省科技厅和德州市人民政府于 2009 年在我公司设立中国工程院院士工作站。



### Sanjia · achievement——honorary certificates

We have pride which comes from our achievement; we have pride which is the return to our contribution; we have pride, which means we are in charge of a huge responsibility. The pride of company represent only the past, the honor in future is what we truly chase. SANJIA company will set up a pacemaker and encourage ourself every minute to fight for the future.

### Honor of company

SANJIA company is considered as high-tech enterprise of Shandong province since 2005.

SANJIA company passed ISO 9000 quality system certification and international accreditation in 2007 and ISO 9001 quality system certification and international accreditation in 2010.

Sanjia company have been honored as the advanced group of technological management of Dezhou in 2009.

In 2009, Science and technology office of Shandong province and the government decided to set an academician workstation of Chinese academy of engineer.

## 三嘉·思想——企业文化

企业文化是生生不息的河流，企业拥有了文化，就如同人有了思想，前进的脚步才能勇往直前。根植于东方传统的三嘉文化和现代工业文明的三嘉文化，作为一种资源，被德州三嘉机器制造有限公司视为企业的灵魂与核心价值体系，并渗透进企业经营的方方面面。使德州三嘉机器制造有限公司日臻完善，为客户提供最满意的至诚服务，为员工提供最理想的发展平台，为社会提供最有价值的时代精神。

企业宗旨——诚实经营，健康大众，以人为本，服务大众

质量方针——客户至上 全心全意 至诚至信 持续改进

企业理念——精诚互信，服务第一，质量至上

企业愿景——成为拥有全国影响力品牌的大公司

企业使命——用我们的激情生产出大众喜爱的产品，为生活增加快乐

品牌观——专业、素养、忠诚、奉献

市场观——贴近、需求、超出、期望

环境观——绿色、健康、环保

管理观——学习、创新、绩效

服务观——文明、礼貌、热情、周到

人才观——做有竞争力的开放型雇主

道德观——爱岗敬业、诚实守信

发展观——互惠互利、合作共赢、和谐发展

The corporate culture is like a dynamically flowing river. Once an enterprise has culture, it's like human has minds, that our steps could advance. Based on traditional oriental culture and modern industry culture, SANJIA culture, as a resource, is considered by Dezhou SANJIA machine manufacturing company as the soul of enterprise and the center value system, and permeate into every aspect of company management, to improve Dezhou SANJIA machine manufacturing company, to provide the most satisfying service, to offer the most ideal platform for staff, to find to society the most valuable time spirit.

Aim of company —— honest management, public health, human centered, public service.

Project of quality —— Customer First, Wholeheartedly, Sincerity, Continuous improvement.

Idea —— mutual trust, service first, quality best.

Prospect —— to become a big enterprise with a national influence.

Responsibility —— to make public favourite production to add happiness in life.

Brand conception —— profession, attainment, sincerity, devotion.

Market conception —— closer, need, beyond, expectation.

Environment conception —— green, health, environment-protection.

Management conception —— learning, creativity, effectivity.

Service conception —— civilization, politesse, enthusiasm.

Talent conception —— to be an opening employer with concurrence.

Moral conception —— love your job, respect your duty, being honest and sincere.

Development conception —— mutual benefits, cooperation, harmonious development.



## 三嘉·基石——一流设备

“工欲善其事，必先利其器”三嘉公司拥有多种先进机械加工设备，如：数控深孔钻镗床，卧式铁镗床，2米 x13 米导轨磨床和超音频感应淬火机，用于机床床体精加工。有 TXP6113 型数显卧式镗床，主要用于大型深孔钻镗床箱体孔加工。有 M4132X2M、M4150X2M 精密外圆磨床，主要用于机床主轴及各类轴件的精加工。这些一流的设备为三嘉公司的腾飞插上了腾飞的翅膀！

To do a good job, one must first sharpen one's tools.

To do a good job, one must first sharpen one's tools. Sanjia company is equipped many kinds of high-tech machine manufacturing equipments, for example: for the working of corpus, there are CNC deephole drilling machine, horizontal milling and boring machine, 2 x 13 m slideway grinding machine and superaudio-induction hardening machine; For the working of axes, there are M4143X2M, M4150X2M cylindrical grinder. These advanced equipments prepare a pair of wings for a take-off of Sanjia company.



## 三嘉·展望——非凡业绩

德州三嘉机器制造有限公司自成立以来，不但成功为几百家大型企业提供服务，还出口新加坡、伊朗、乌克兰和尼日利亚等国家，受到客户的一致好评；2009 年度工业总产值六千万元，年产各种规格类型的深孔加工机床 50-70 台；公司制造的深孔机床，加工孔径从  $\Phi 3$ — $\Phi 1500\text{mm}$ ，加工深度从 200—20000mm。开发研制的十几种产品形成了系列，覆盖了常用的领域；公司近几年来多次承担省市科技攻关项目，并先后为多家煤矿机械厂提供深孔加工设备，完成了高炉冷却壁加工专用数控机床及应用软件，超大型油缸加工数控设备及应用软件。

与中国工程院张钟华院士和中国计量科学院合作研制开发深孔加工设备中的关键技术难题，与北京航空航天大学、首都航空航天设备公司合作研制开发深孔振动钻削数控加工设备及应用软件等。目前研制的石油钻铤专用数控深孔加工机床、风力发电机主轴专用深孔加工机床等，解决了深孔加工中的重大难题，产品性能达到国内先进水平。

在成绩面前，三嘉人仍将不断努力，开拓创新，打造更加辉煌灿烂的明天！

### 服务客户



### Sanjia · Outlook — extraordinary performance

Since being established, Dezhou Sanjia machine manufacturing company has not only provided for hundreds big enterprises the equipments, but also explored productions to Singapore, Iran, Ukraine, Nigeria and others countries, receiving good comment; In 2009, the output per year reached 60 000 000 RMB, with 50 to 70 machine in different kinds; the deephole machine produced by Sanjia have a diameter from  $\Phi 3$  to  $\Phi 1500\text{mm}$  and a depth from 200 to 20000mm. These productions cover a commonly used field. In recent years, company had taken charge of technical project of province several times and provided for many coal industry with deephole working machine, realised CNC machine and logic specially designed for the production of BF cooling wall and huge-size oil cylinder.

And the Chinese Academy of Engineering academician Zhang Zhonghua and China Institute of Metrology cooperative research and development of deep processing equipment in the key technical problems, and the Beihang University, capital Aerospace Equipment Corporation to develop cooperation in the development of deep hole vibration drilling CNC machining equipment and application software. At present the research and development of petroleum drill collar special NC machine tool spindle, wind power generator for deep hole processing machine tool, solved the difficult problem in the deep hole processing, product performance to reach the domestic advanced level.

Before achievement, Sanjia people still will continue efforts, pioneering and innovative, to create a more brilliant and splendid tomorrow!



# 深孔机床篇

## Deep hole machine articles

DEZHOU SANJIA MACHINE



随着消费大众的需求逐渐明晰化，产品规格、类型、样式的不同需求对企业进行着不断的挑战，根据市场不同消费层次的需求，三嘉机器开发了不同的产品，展现出独特的魅力，带给客户不一样的蓬勃朝气。

With the consumers' need becoming more clear, the multi-needs of format, type, style of production challenge the company continuously. According to different needs of market, Sanjia company has designed different production, present singular fascination, bring to clients a different dynamic.

## 深孔机床工艺 ——精益求精

### 一、深孔加工工艺：

- 1、工件旋转，刀具只做进给运动；
  - 2、工件旋转，刀具旋转并进给；
  - 3、工件不转，刀具旋转并进给；
- 具体使用何种工艺，应视工件特征和工艺要求而定。

- 1、内排屑（BTA）
- 2、外排屑（枪钻）
- 3、向前排屑（适用于空心料加工）
- 4、套料加工

### I. Deep hole working technology

1. workpiece rotates, tool feed
  2. workpiece rotates, tool rotates and feed
  3. workpiece stationary, tool rotates and feed
- Which kind of technology we use depends on the feature of workpiece and the demand of technology.
1. BTA
  2. outside chip removal (gun drilling)
  3. Forward chip removal (adapted to manufacture of hollow material)
  4. Trepanning

### II. Second, the machining accuracy and efficiency:

1. deep hole gun drill machining accuracy and efficiency:

#### ◇ machining accuracy:

Drilling, reaming accuracy IT8-10; diameter.  
Surface roughness: Ra0.8-3.2.  
Processing hole straightness: <0.015/100mm.  
The processing hole skew: less than 0.05/100mm.

#### ◇ machine processing efficiency:

Cutting speed: structure, according to the tool material and workpiece material determined general 30-100m/min.  
Feed rate: determined according to the processing conditions general 5-100mm/min.

2. deep hole boring machining accuracy and efficiency:

#### ◇ machining accuracy:

Drilling: diameter accuracy IT9-10. Surface roughness: Ra6.3-12.5.  
Nesting: diameter accuracy IT9-10. Surface roughness: Ra6.3-12.5.  
Rough boring: diameter accuracy IT9-10. Surface roughness: Ra3.2-6.3.  
The fine boring: diameter accuracy IT8-9. Surface roughness: Ra1.6-3.2.  
Rolling: Aperture accuracy IT8-9. Surface roughness: Ra0.2-0.4.  
Processing hole straightness: <0.15/1000mm.  
The processing hole skew: less than 0.5/1000mm.

#### ◇ machine processing efficiency:

Cutting speed: According to the tool structure, material and workpiece material determined general 20-120m/min.  
Feed rate: determined according to the processing conditions general 10-400mm/min.

### 二、机床的加工精度和效率：

- 1、深孔枪钻加工精度和效率：

#### ◇机床的加工精度：

钻、扩孔时：孔径精度 IT8-10  
表面粗糙度：Ra0.8-3.2  
加工孔的直线度：小于 0.015/100mm  
加工孔的出口偏斜：小于 0.05/100mm

#### ◇机床的加工效率：

切削速度：根据刀具结构、材料和工件材质确定，一般在 30-100m/min

进给速度：根据加工情况确定，一般在 5-100mm/min

- 2、深孔钻镗床加工精度和效率：

#### ◇机床的加工精度：

钻孔时：孔径精度 IT9-10。表面粗糙度：Ra6.3-12.5。  
套料时：孔径精度 IT9-10。表面粗糙度：Ra6.3-12.5。  
粗镗时：孔径精度 IT9-10。表面粗糙度：Ra3.2-6.3。  
精镗时：孔径精度 IT8-9。表面粗糙度：Ra1.6-3.2。  
滚压时：孔径精度 IT8-9。表面粗糙度：Ra0.2-0.4。  
加工孔的直线度：小于 0.15/1000mm。

加工孔的出口偏斜：小于 0.5/1000mm。

#### ◇机床的加工效率：

切削速度：根据刀具结构、材料和工件材质确定，一般在 20-120m/min。

进给速度：根据加工情况确定，一般在 10-400mm/min。





## TS2116 型深孔钻镗床

TS2116 deep hole drilling-boring machine

深孔制造专家  
Deep hole manufacturing expert



### 产品介绍 Product introduction

该机床是专门加工圆柱形深孔工件的设备，如加工机床的主轴孔，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。机床床身刚性，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。授油器紧固和工件顶紧采用液压装置，仪表显示，安全可靠。

该机床为系列产品，还可按客户需要提供各种变形产品。

The machine is special equipment for machining deep cylindrical hole of workpieces. It can be perfectly suited for drilling and boring through holes, blind and step hole in workpiece: such as, spindle of various kinds of machines, many kinds of hydraulic oil cylinders and cylinders. It can perform not only drilling and boring, but also rolling pressing. The method of the internal-removal chip is adopted in drilling. The machine is strong in rigidity of the bed, high in precision, and wide in spindle speed range.

Feed system is A.C. Servo feeding motor. It is suitable for various processing methods of machining deep-holes. Fixture of the guide carriage and clamping force of the workpiece are performed by hydraulic device and indicated by meter.

Various change-model products of the series can be supplied according to users requirement.

### 主要技术规格及性能 Main Specifications and Features

|                  | 技术规格 SPECIFICATION                                       | 参数 TECHNICAL DATA   |
|------------------|--|---------------------|
| 工作范围<br>Capacity | 钻孔直径范围 Range drilling dia.                               | Φ25-Φ55mm           |
|                  | 镗孔最大直径 Max. boring dia.                                  | Φ160mm              |
|                  | 镗孔最大深度 Max. boring depth                                 | 1-12m               |
|                  | 工件夹持直径范围 Workpiece clamped dia. range                    | Φ30-Φ220mm          |
| 主轴<br>Spindle    | 主轴中心高 Height from spindle center to bed                  | 250mm               |
|                  | 床头箱主轴孔径 Spindle bore dia.                                | Φ38mm               |
|                  | 主轴转速范围 Range of spindle speed                            | 5-1250r/min 2 kinds |
| 进给<br>Feeds      | 进给速度范围 (无级) Feed speed range (infinite)                  | 5-500mm/min         |
|                  | 拖板快速移动速度 Carriage rapid-moving speed                     | 2m/min              |
| 电机<br>Motors     | 电机功率 Main motor power                                    | 15kW (变频调速)         |
|                  | 液压泵电机功率 Hydraulic motor power                            | 1.5kW, n=960r/min   |
|                  | 快速移动电机功率 Carriage rapid motor power                      | 3kW                 |
|                  | 进给电机功率 Feed motor power                                  | 3.6kW (伺服电机)        |
|                  | 冷却泵电机功率 Cool motor power                                 | 5.5kWx2+7.5kW       |
| 其他<br>Others     | 导轨宽度 Guide rail width                                    | 500mm               |
|                  | 冷却系统额定压力 Rated pressure of cooling system                | 2.5MPa / 4MPa       |
|                  | 冷却系统流量 Flow of cooling system                            | 100、200、300L/min    |
|                  | 液压系统额定压力 Rated pressure for hydraulic system             | 6.3MPa              |
|                  | 授油器承受最大轴向力 Oil cooler grant bearing max. axial force     | 68kN                |
|                  | 授油器对工件的最大顶紧力 Oil cooler grant max. preload for workpiece | 20kN                |
| 选配<br>Optional   | 钻杆箱转速范围 Range of spindle speed(drilling box)             | 5-1250r/min 2kinds  |
|                  | 电机功率 Main motor power                                    | 15kW                |

### 外形尺寸及重量 Overall dimensions and weight

| 长度 Length                               | 1000           | 2000           | 3000            |
|---|----------------|----------------|-----------------|
| 参数 Technical Data                       |                |                |                 |
| 地面空间 长 X 宽 X 高<br>Floor space LxWxH(mm) | 6600x2800x1500 | 8600x2800x1500 | 10600x2800x1500 |
| 净重 (t) Net weight                       | 8              | 10             | 12              |



## 产品介绍 Product introduction

该机床是专门加工圆柱形深孔工件的设备，如加工机床的主轴孔，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。机床床身刚性强，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。授油器紧固和工件顶紧采用液压装置，仪表显示，安全可靠。

该机床为系列产品，还可按客户需要提供各种变形产品。

The machine is special equipment for machining deep cylindrical hole of workpieces. It can be perfectly suited for boring through holes, blind and step hole in workpiece: such as, many kinds of hydraulic oil cylinders and cylinders. It can perform boring, but also rolling pressing. The machine is strong in rigidity of the bed, high in precision, and wide in spindle speed range. Feed system is A.C. Servo feeding motor. It is suitable for various processing methods of machining deep-holes. Fixture of the guide carriage and clamping force of the workpiece are performed by hydraulic device and indicated by meter.

Various change-model products of the series can be supplied according to users requirement.

## 主要技术规格及性能 Main Specifications and Features

|  | 技术规格 SPECIFICATION                                       | 参数 TECHNICAL DATA    |            |
|--|--|----------------------|------------|
|  |  | TS2120               | TS2135     |
| 工作范围<br>Capacity                         | 钻孔直径范围 Range drilling dia                                | Φ40-Φ80mm            |            |
|  | 镗孔最大直径 Max. boring dia                                   | Φ200mm               | Φ350mm     |
|  | 镗孔最大深度 Max. boring depth                                 | 1-16m                |            |
|  | 套料直径范围 Range trepanning Dia                              | Φ50-Φ120mm           |            |
|  | 工件夹持直径范围 Workpiece clamped dia. range                    | Φ60-300mm            | Φ100-400mm |
| 主轴<br>Spindle                            | 主轴中心高 Height from spindle center to bed                  | 350mm                | 450mm      |
|  | 床头箱主轴孔径 Spindle bore dia.                                | Φ75mm                |            |
|  | 主轴前端锥孔 Taper of spindle bore                             | Φ85mm, 1:20          |            |
|  | 主轴转速范围 Range of spindle speed                            | 42-670r/min 12 kinds |            |
| 进给<br>Feeds                              | 进给速度范围 (无级) Feed speed range (infinite)                  | 5-300mm/min          |            |
|  | 拖板快速移动速度 Carriage rapid-moving speed                     | 2m/min               |            |
| 电机<br>Motors                             | 主电机功率 Main motor power                                   | 30kW                 |            |
|  | 液压泵电机功率 Hydraulic motor power                            | 1.5kW, n=1440r/min   |            |
|  | 快速移动电机功率 Carriage rapid motor power                      | 3kW                  |            |
|  | 进给电机功率 Feed motor power                                  | 4.7kW (伺服电机)         |            |
|  | 冷却泵电机功率 Cool motor power                                 | 5.5kWx4group         |            |
| 其他<br>Others                             | 导轨宽度 Guide rail width                                    | 650mm                |            |
|  | 冷却系统额定压力 Rated pressure of cooling system                | 2.5MPa               |            |
|  | 冷却系统流量 Flow of cooling system                            | 100,200,300,400L/min |            |
|  | 授油器承受最大轴向力 Oil cooler grant bearing max. axial force     | 68kN                 |            |
|  | 授油器对工件的最大顶紧力 Oil cooler grant max. preload for workpiece | 20kN                 |            |
| 钻杆箱 (选配)<br>Boring bar box<br>(Optional) | 钻杆箱主轴孔径 Spindle bore dia. of drilling box                | Φ100mm               |            |
|  | 钻杆箱主轴前端锥孔 Taper of spindle bore(drilling box)            | Φ120mm、1:20          |            |
|  | 钻杆箱转速范围 Range of spindle speed(drilling box)             | 82-490r/min 6 kinds  |            |
|  | 钻杆箱电机功率 Drilling box motor power                         | 30kW                 |            |

## 外形尺寸及重量 Overall dimensions and weight

| 参数<br>Technical Data        | 长度<br>Length | 1000           | 2000           | 3000           | 4000           | 5000           | 6000           | 7000           | 8000           | 9000           | 10000          |
|-----------------------------|--------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 地面空间<br>Floor space         |              | 8000           | 10000          | 12000          | 14000          | 16000          | 18000          | 20000          | 22000          | 24000          | 26000          |
| 长 X 宽 X 高<br>L x W x H (mm) |              | x3000<br>x1600 | x3000<br>x1600 | x3000<br>x1600 | x3000<br>x1600 | x3000<br>x1600 | x3000<br>x1600 | x3000<br>x1600 | x3000<br>x1600 | x3000<br>x1600 | x3000<br>x1600 |
| 净重 (t)<br>Net weight        |              | 12             | 14             | 16             | 18             | 20             | 22             | 24             | 26             | 28             | 30             |

注：以上表格为 TS2120 型（不带钻杆箱）数据，TS2135 型可参考计算。





### 产品介绍 Product introduction

该机床是专门加工圆柱形深孔工件的设备，如加工各种机械液压油缸、汽缸圆柱形通孔、盲孔及阶梯孔等。机床可以承担镗削，而且还可以进行滚压加工。机床床身刚性强，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。授油器紧固和工件顶紧采用液压装置，仪表显示，安全可靠。

该机床为系列产品，还可按客户提供各种变形产品。

The machine is special equipment for machining deep cylindrical hole of workpieces. It can be perfectly suited for drilling and boring through holes, blind and step hole in workpiece: such as, spindle of various kinds of machines, many kinds of hydraulic oil cylinders and cylinders. It can perform not only drilling and boring, but also rolling pressing. The method of the internal-removal chip is adopted in drilling. The machine is strong in rigidity of the bed, high in precision, and wide in spindle speed range.

Feed system is A.C. Servo feeding motor. It is suitable for various processing methods of machining deep-holes. Fixture of the guide carriage and clamping force of the workpiece are performed by hydraulic device and indicated by meter.

Various change-model products of the series can be supplied according to users requirement.

### 主要技术规格及性能 Main Specifications and Features

|  | 技术规格 SPECIFICATION                                       | 参数 TECHNICAL DATA    |               |
|--|--|----------------------|---------------|
|  |  | TS2225               | TS2235        |
| 工作范围<br>Capacity                         | 镗孔最大直径 Max. boring dia                                   | Φ 250mm              | Φ 350mm       |
|  | 镗孔最大深度 Max. boring depth                                 | 1-16m                |               |
|  | 套料直径范围 Range trepanning Dia                              | Φ 50-Φ 120mm         |               |
|  | 工件夹持直径范围 Workpiece clamped dia. range                    | Φ 60-Φ 300mm         | Φ 100-Φ 400mm |
| 主轴<br>Spindle                            | 主轴中心高 Height from spindle center to bed                  | 350mm                | 450mm         |
|  | 床头箱主轴孔径 Spindle bore dia.                                | Φ 75mm               |               |
|  | 主轴前端锥孔 Taper of spindle bore                             | Φ 85mm, 1:20         |               |
|  | 主轴转速范围 Range of spindle speed                            | 42-670r/min 12 kinds |               |
| 进给<br>Feeds                              | 进给速度范围 (无级) Feed speed range ( Infinite )                | 5-500mm/min          |               |
|  | Carriage rapid-moving speed (拖板快速移动速度)                   | 2m/min               |               |
| 电机<br>Motors                             | 主电机功率 Main motor power                                   | 30kW                 |               |
|  | 液压泵电机功率 Hydraulic motor power                            | 1.5kW, n=1440r/min   |               |
|  | 快速移动电机功率 Carriage rapid motor power                      | 3kW                  |               |
|  | 进给电机功率 Feed motor power                                  | 4.7kW( 伺服电机 )        |               |
| 其他<br>Others                             | 冷却泵电机功率 Cool motor power                                 | 7.5kW                | 7.5kWx2       |
|  | 导轨宽度 Guide rail width                                    | 650mm                |               |
|  | 冷却系统额定压力 Rated pressure of cooling system                | 0.36 MPa             |               |
|  | 冷却系统流量 Flow of cooling system                            | 300L/min             | 300,600L/min  |
|  | 液压系统额定工作压力 Rated working pressure for hydraulic system   | 6.3MPa               |               |
|  | 授油器承受最大轴向力 Oil cooler grant bearing max. axial force     | 68kN                 |               |
| 镗杆箱 (选配)<br>Boring bar box<br>(Optional) | 授油器对工件的最大顶紧力 Oil cooler grant max. preload for workpiece | 20kN                 |               |
|  | 镗杆箱主轴孔径 Spindle bore dia. of boring box                  | Φ 100mm              |               |
|  | 镗杆箱主轴前端锥孔 Taper of spindle bore(boring box)              | Φ 120mm, 1:20        |               |
|  | 镗杆箱转速范围 Range of spindle speed(boring box)               | 82-490r/min 6 kinds  |               |
|  | 镗杆箱电机功率 Drilling box motor power                         | 30kW                 |               |

## TS2150/TS2250 型深孔钻镗床

TS2150/TS2250 Deep Hole Drilling&Boring Machine

深孔制造专家  
Deep hole manufacturing expert



### 产品介绍 Product introduction

该机床是专门加工圆柱形深孔工件的设备，如加工机床的主轴孔，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。机床床身刚性很强，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。授油器紧固和工件顶紧采用液压装置，仪表显示，安全可靠。

该机床为系列产品，还可按客户需要提供各种变形产品。

The machine is special equipment for machining deep cylindrical hole of workpieces. It can be perfectly suited for drilling and boring through holes, blind and step hole in workpiece: such as, spindle of various kinds of machines, many kinds of hydraulic oil cylinders and cylinders. It can perform not only drilling and boring, but also rolling pressing. The method of the internal-removal chip is adopted in drilling. The machine is strong in rigidity of the bed, high in precision, and wide in spindle speed range.

Feed system is A.C. Servo feeding motor. It is suitable for various processing methods of machining deep-holes. Fixture of the guide carriage and clamping force of the workpiece are performed by hydraulic device and indicated by meter.

Various change-model products of the series can be supplied according to users requirement.

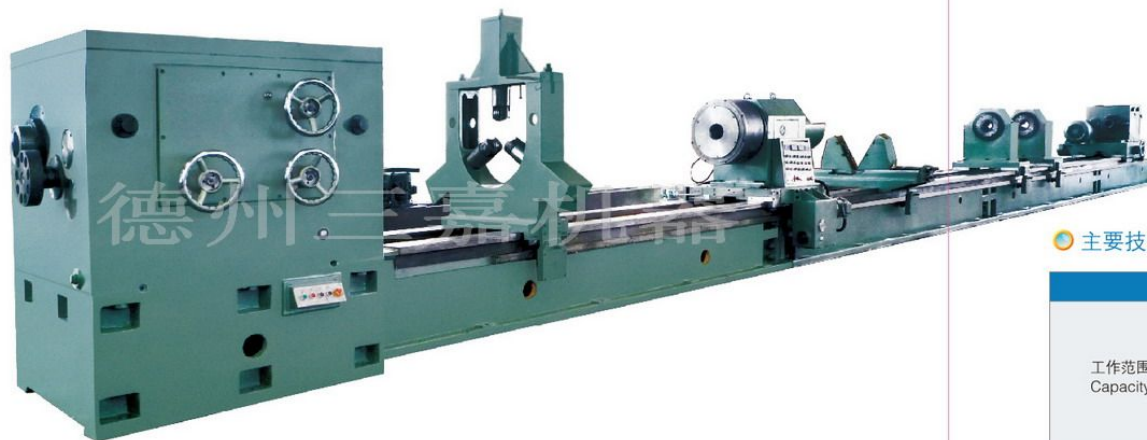
### 主要技术规格及性能 Main Specifications and Features

|                     | 技术规格 SPECIFICATION                                       | 参数 TECHNICAL DATA      |                  |
|---------------------|--|------------------------|------------------|
|                     |  | TS2150                 | TS2250           |
| 工作范围<br>Capacity    | 钻孔直径范围 Range drilling dia                                | Φ40-Φ120mm             | /                |
|                     | 镗孔最大直径 Max. boring dia                                   | Φ500mm                 |                  |
|                     | 镗孔最大深度 Max. boring depth                                 | 1-16m                  |                  |
|                     | 套料直径范围 Range trepanning Dia                              | Φ50-Φ250mm             |                  |
|                     | 工件夹持直径范围 Workpiece clamped dia. Range                    | Φ110-Φ670mm            |                  |
| 主轴<br>Spindle       | 主轴中心高 Height from spindle center to bed                  | 500mm/630mm            |                  |
|                     | 床头箱主轴孔径 Spindle bore dia.                                | Φ130mm                 |                  |
|                     | 主轴前端锥孔 Taper of spindle bore                             | Φ140mm, 1:20           |                  |
|                     | 主轴转速范围 Range of spindle speed                            | 3.15-315r/min 21 kinds |                  |
| 钻杆箱<br>Drilling Box | 钻杆箱主轴孔径 Spindle bore dia. of drilling box                | Φ100mm                 | /                |
|                     | 钻杆箱主轴前端锥孔 Taper of spindle bore(drilling box)            | Φ120mm, 1:20.          | /                |
|                     | 钻杆箱转速范围 Range of spindle speed(drilling box)             | 82-490r/min 6 kinds    | /                |
| 进给<br>Feeds         | 进给速度范围 (无级) Feed speed range ( infinite )                | 5-400mm/min            |                  |
|                     | 拖板快速移动速度 Carriage rapid-moving speed                     | 2m/min                 |                  |
| 电机<br>Motors        | 主电机功率 Main motor power                                   | 37kW                   |                  |
|                     | 钻杆箱电机功率 Drilling box motor power                         | 30kW                   | 无                |
|                     | 液压泵电机功率 Hydraulic motor power                            | 1.5kW, n=1440r/min     |                  |
|                     | 快速移动电机功率 Carriage rapid motor power                      | 5.5kW                  |                  |
|                     | 进给电机功率 Feed motor power                                  | 5.5kW ( 伺服电机 )         | 7.5kW ( 伺服电机 )   |
|                     | 冷却泵电机功率 Cool motor power                                 | 5.5kWx3+7.5kW          | 7.5kWx3group     |
| 其他<br>Others        | 导轨宽度 Guide rail width                                    | 800mm                  |                  |
|                     | 冷却系统额定压力 Rated pressure of cooling system                | 2.5MPa                 | 0.36 MPa         |
|                     | 冷却系统流量 Flow of cooling system                            | 100,200,300,600L/min   | 200,400,600L/min |
|                     | 液压系统额定工作压力 Rated working pressure for hydraulic system   | 6.3MPa                 |                  |
|                     | 授油器承受最大轴向力 Oil cooler grant bearing max. axial force     | 68kN                   |                  |
|                     | 授油器对工件的最大顶紧力 Oil cooler grant max. preload for workpiece | 20kN                   |                  |

### 外形尺寸及重量 Overall dimensions and weight

| 参数<br>Technical Data        | 长度<br>Length | 1000           | 2000           | 3000           | 4000           | 5000           | 6000           | 7000           | 8000           | 9000           | 10000          |
|-----------------------------|--------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 地面空间<br>Floor space         |              | 9500           | 11500          | 13500          | 15500          | 16000          | 19500          | 22000          | 23500          | 25500          | 27500          |
| 长 X 宽 X 高<br>L X W X H (mm) |              | x3800<br>x1900 | x3800<br>x1900 | x3800<br>x1900 | x3800<br>x1900 | x3000<br>x1600 | x3800<br>x1900 | x3800<br>x1900 | x3800<br>x1900 | x3800<br>x1900 | x3800<br>x1900 |
| 净重 (t)<br>Net weight        |              | 18             | 23             | 25             | 27             | 29             | 33             | 36             | 40             | 45             | 50             |





### 产品介绍 Product introduction

该机床是专门加工圆柱形深孔工件的设备，如加工机床的主轴孔，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。机床床身刚性强，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。授油器紧固和工件顶紧采用液压装置，仪表显示，安全可靠。

该机床为系列产品，还可按客户需要提供各种变形产品。

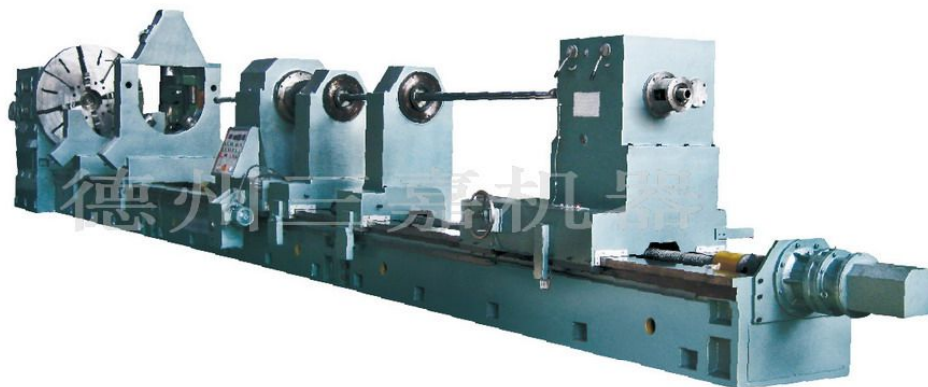
The machine is special equipment for machining deep cylindrical hole of workpieces. It can be perfectly suited for drilling and boring through holes, blind and step hole in workpiece: such as, spindle of various kinds of machines, many kinds of hydraulic oil cylinders and cylinders. It can perform not only drilling and boring, but also rolling pressing. The method of the internal-removal chip is adopted in drilling. The machine is strong in rigidity of the bed, high in precision, and wide in spindle speed range.

Feed system is A.C. Servo feeding motor. It is suitable for various processing methods of machining deep-holes. Fixture of the guide carriage and clamping force of the workpiece are performed by hydraulic device and indicated by meter.

Various change-model products of the series can be supplied according to users requirement.

### 主要技术规格及性能 Main Specifications and Features

|                     | 技术规格 SPECIFICATION                                       | 参数 TECHNICAL DATA    |
|---------------------|--|----------------------|
| 工作范围<br>Capacity    | 钻孔直径范围 Range drilling dia                                | Φ40-Φ120mm           |
|                     | 镗孔最大直径 Max. boring dia                                   | Φ630 mm              |
|                     | 镗孔最大深度 Max. boring depth                                 | 1-16m                |
|                     | 套料直径范围 Range trepanning Dia                              | Φ120-Φ340mm          |
|                     | 工件夹持直径范围 Workpiece clamped dia. range                    | Φ100-Φ800mm          |
| 主轴<br>Spindle       | 主轴中心高 Height from spindle center to bed                  | 630mm                |
|                     | 床头箱主轴孔径 Spindle bore dia                                 | Φ120mm               |
|                     | 主轴前端锥孔 Taper of spindle bore                             | Φ140mm, 1:20         |
|                     | 主轴转速范围 Range of spindle speed                            | 16-270r/min 12 kinds |
| 钻杆箱<br>Drilling Box | 钻杆箱主轴孔径 Spindle bore dia. of drilling box                | Φ100mm               |
|                     | 钻杆箱主轴前端锥孔 Taper of spindle bore(drilling box)            | Φ120mm, 1:20.        |
|                     | 钻杆箱转速范围 Range of spindle speed(drilling box)             | 82-490r/min 6 kinds  |
| 进给<br>Feeds         | 进给速度范围 (无级) Feed speed range ( infinite )                | 5-500mm/min          |
|                     | 拖板快速移动速度 Carriage rapid-moving speed                     | 2m/min               |
| 电机<br>Motors        | 主电机功率 Main motor power                                   | 45kW                 |
|                     | 钻杆箱电机功率 Drilling box motor power                         | 30kW                 |
|                     | 液压泵电机功率 Hydraulic motor power                            | 1.5kW, n=1440r/min   |
|                     | 快速移动电机功率 Carriage rapid motor power                      | 5.5kW                |
|                     | 进给电机功率 Feed motor power                                  | 7.5kW( 伺服电机 )        |
|                     | 冷却泵电机功率 Cool motor power                                 | 5.5kWx3+7.5kWx1      |
| 其他<br>Others        | 导轨宽度 Guide rail width                                    | 800mm                |
|                     | 冷却系统额定压力 Rated pressure of cooling system                | 2.5MPa               |
|                     | 冷却系统流量 Flow of cooling system                            | 100,200,300,600L/min |
|                     | 液压系统额定工作压力 Rated working pressure for hydraulic system   | 6.3MPa               |
|                     | 授油器承受最大轴向力 Oil cooler grant bearing max. axial force     | 68kN                 |
|                     | 授油器对工件的最大顶紧力 Oil cooler grant max. preload for workpiece | 20kN                 |



### 产品介绍 Product introduction

该机床为深孔加工机床，可完成大直径重型零件深孔的钻，镗和套料加工。加工时工件低速旋转，刀具高速旋转并进给。钻孔时采用 BTA 内排屑的工艺方式；镗孔时采用镗杆内供切削液向前（床头端）排切削液，排屑屑的工艺方式；套料时采用外排屑的工艺形式，需配备专用套料刀具，刀杆和专用工装夹具。根据加工的需要，机床配有钻（镗）杆箱，刀具可旋转并进给。

This machine is a deep-hole working machine, who can support the process of drilling, boring and trepanning manufacturing of big diameter workpiece. While working, the workpiece rotates slowly and the tool rotates in high-speed and feed. It use BTA during the drilling work and forward chip removal while boring. As for the trepanning process we use extra chip removal technique which demand professional trepanning tools. According to the needs of manufacturing, a boring spindle box is equipped to the machine so the boring tools could rotate and feed.

### 主要技术规格及性能 Main Specifications and Features

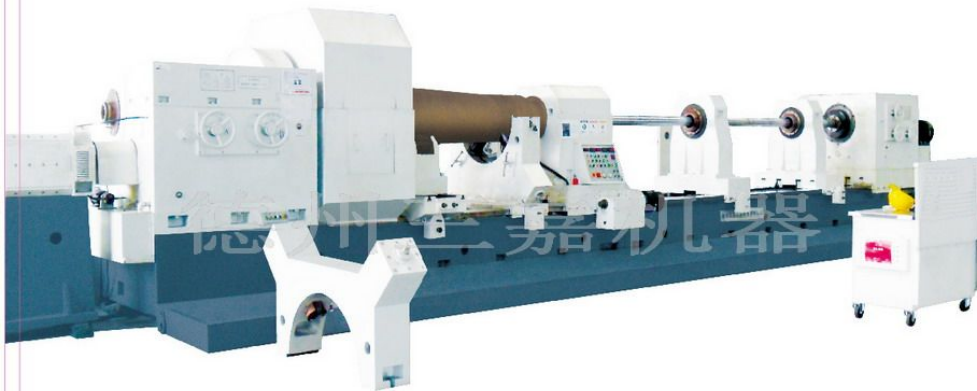
|                     | 技术规格 SPECIFICATION                                       | 参数 TECHNICAL DATA      |                  |
|---------------------|--|------------------------|------------------|
|                     |  | TSQ2180                | TSQ2280          |
| 工作范围<br>Capacity    | 钻孔直径范围 Range drilling dia                                | Φ 40-Φ 120mm           | /                |
|                     | 镗孔最大直径 Max. boring dia                                   | Φ 800mm                |                  |
|                     | 镗孔最大深度 Max. boring depth                                 | 1-16m                  |                  |
|                     | 套料直径范围 Range trepanning Dia                              | Φ 120-Φ 320mm          |                  |
|                     | 工件夹持直径范围 Workpiece clamped dia. range                    | Φ 120-Φ 1000mm         |                  |
| 主轴<br>Spindle       | 主轴中心高 Height from spindle center to bed                  | 800mm                  |                  |
|                     | 床头箱主轴孔径 Spindle bore dia                                 | Φ 120mm                |                  |
|                     | 主轴前端锥孔 Taper of spindle bore                             | Φ 140mm, 1:20          |                  |
|                     | 主轴转速范围 Range of spindle speed                            | 16-270r/min 12 kinds   |                  |
| 钻杆箱<br>Drilling Box | 钻杆箱主轴孔径 Spindle bore dia. of drilling box                | Φ 100mm                | /                |
|                     | 钻杆箱主轴前端锥孔 Taper of spindle bore(drilling box)            | Φ 120mm, 1:20          | /                |
|                     | 钻杆箱转速范围 Range of spindle speed(drilling box)             | 82-490r/min 6 kinds    | /                |
| 进给<br>Feeds         | 进给速度范围（无级） Feed speed range ( infinite )                 | 10-300mm/min           |                  |
|                     | 拖板快速移动速度 Carriage rapid-moving speed                     | 2m/min                 |                  |
| 电机<br>Motors        | 主电机功率 Main motor power                                   | 45kW                   |                  |
|                     | 钻杆箱电机功率 Drilling box motor power                         | 30kW                   | /                |
|                     | 液压泵电机功率 Hydraulic motor power                            | 1.5kW, n=1440r/min     |                  |
|                     | 快速移动电机功率 Carriage rapid motor power                      | 5.5kW                  |                  |
|                     | 进给电机功率 Feed motor power                                  | 7.5kW( 伺服电机 )          |                  |
|                     | 冷却泵电机功率 Cool motor power                                 | 11kWx2+5.5kWx2(4group) | 7.5kWx3          |
| 其他<br>Others        | 导轨宽度 Guide rail width                                    | 1000mm                 |                  |
|                     | 冷却系统额定压力 Rated pressure of cooling system                | 2.5MPa                 | 0.36MPa          |
|                     | 冷却系统流量 Flow of cooling system                            | 200,400,600,800L/min   | 300,600,900L/min |
|                     | 液压系统额定工作压力 Rated working pressure for hydraulic system   | 6.3MPa                 |                  |
|                     | 授油器承受最大轴向力 Oil cooler grant bearing max. axial force     | 68kN                   |                  |
|                     | 授油器对工件的最大顶紧力 Oil cooler grant max. preload for workpiece | 20kN                   |                  |

### 外形尺寸及重量 Overall dimensions and weight

| 参数<br>Technical Data   | 长度<br>Length | 1000           | 2000           | 3000           | 4000           | 5000           | 6000           | 7000           | 8000           | 9000           | 10000          |
|------------------------|--------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 地面空间<br>Floor space    |              | 8000           | 11500          | 14500          | 16500          | 18500          | 20500          | 22500          | 25500          | 27500          | 29500          |
| 长 X 宽 X 高<br>LxWxH(mm) |              | x3800<br>x2000 | x3800<br>x2000 | x3800<br>x2000 | x3800<br>x2000 | x3800<br>x2000 | x3800<br>x2000 | x3800<br>x2000 | x3800<br>x2000 | x3800<br>x2000 | x3800<br>x2000 |
| 净重 (t)<br>Net weight   |              | 27             | 29             | 31             | 33             | 36             | 38             | 40             | 43             | 45             | 47             |

注：以上表格为 TSQ2180 参数，TSQ2280 可以参考计算。





### 产品介绍 Product introduction

该机床为深孔加工机床，可完成大直径重型零件深孔的钻，镗和套料加工。加工时工件低速旋转，刀具高速旋转并给。钻孔时采用 BTA 内排屑的工艺方式；镗孔时采用镗杆内供切削液向前（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，刀杆和专用工装夹具。根据加工的需要，机床配有钻（镗）杆箱，刀具可旋转并给。

This machine is a deep-hole working machine, who can support the process of drilling, boring and trepanning manufacturing of big diameter workpiece. While working, the workpiece rotates slowly and the tool rotates in high-speed and feed. It use BTA during the drilling work and forward chip removal while boring. As for the trepanning process we use extra chip removal technique which demand professional trepanning tools. According to the needs of manufacturing, a boring spindle box is equipped to the machine so the boring tools could rotate and feed.

### 主要技术规格及性能 Main Specifications and Features

|                     | 技术规格 SPECIFICATION                                       | 参数 TECHNICAL DATA       |                  |
|---------------------|--|-------------------------|------------------|
|                     |  | TS2180                  | TS2280           |
| 工作范围<br>Capacity    | 钻孔直径范围 Range drilling dia.                               | Φ50-Φ150mm              | /                |
|                     | 镗孔最大直径 Max. boring dia.                                  | Φ800mm                  |                  |
|                     | 镗孔最大深度 Max. boring depth                                 | 1-16m                   |                  |
|                     | 套料直径范围 Range trepanning Dia.                             | Φ150-Φ500mm             |                  |
|                     | 工件夹持直径范围 Workpiece clamped dia. range                    | Φ270-Φ1200mm            |                  |
| 主轴<br>Spindle       | 主轴中心高 Height from spindle center to bed                  | 800mm                   |                  |
|                     | 床头箱主轴孔径 Spindle bore dia.                                | Φ120mm                  |                  |
|                     | 主轴前端锥孔 Taper of spindle bore                             | Φ140mm, 1:20            |                  |
|                     | 主轴转速范围 Range of spindle speed                            | 1-200r/min 3 档无极        |                  |
| 钻杆箱<br>Drilling Box | 钻杆箱主轴孔径 Spindle bore dia. of drilling box                | Φ120mm                  | /                |
|                     | 钻杆箱主轴前端锥孔 Taper of spindle bore(drilling box)            | Φ140mm, 1:20            | /                |
|                     | 钻杆箱转速范围 Range of spindle speed(drilling box)             | 16-270r/min 12 kinds(级) | /                |
| 进给<br>Feeds         | 进给速度范围 (无级) Feed speed range(infinite)                   | 5-500mm/min             |                  |
|                     | 拖板快速移动速度 Carriage rapid-moving speed                     | 2m/min                  |                  |
| 电机<br>Motors        | 主电机功率 Main motor power                                   | 55kW                    |                  |
|                     | 钻杆箱电机功率 Drilling box motor power                         | 45kW                    | 无                |
|                     | 液压泵电机功率 Hydraulic motor power                            | 1.5kW, n=1440r/min      |                  |
|                     | 快速移动电机功率 Carriage rapid motor power                      | 7.5kW                   |                  |
|                     | 进给电机功率 Feed motor power                                  | 7.5kW (伺服电机)            |                  |
|                     | 冷却泵电机功率 Cool motor power                                 | 11kWx2+5.5kWx2          | 7.5kWx3          |
| 其他<br>Others        | 导轨宽度 Guide rail width                                    | 1250mm                  |                  |
|                     | 冷却系统额定压力 Rated pressure of cooling system                | 2.5MPa                  | 0.36MPa          |
|                     | 冷却系统流量 Flow of cooling system                            | 200,400,600,800L/min    | 300,600,900L/min |
|                     | 液压系统额定工作压力 Rated working pressure for hydraulic system   | 6.3MPa                  |                  |
|                     | 授油器承受最大轴向力 Oil cooler grant bearing max. axial force     | 68kN                    |                  |
|                     | 授油器对工件的最大顶紧力 Oil cooler grant max. preload for workpiece | 20kN                    |                  |

### 外形尺寸及重量 Overall dimensions and weight

| 参数<br>Technical Data     | 长度<br>Length    | 1000            | 2000            | 3000            | 4000            | 5000            | 6000            | 7000            | 8000            | 9000            | 10000           |
|--------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 地面空间<br>Floor space      |                 | 13000           | 15000           | 17000           | 20000           | 22000           | 24000           | 26000           | 29000           | 31000           | 33000           |
| 长 X 宽 X 高<br>LxWxH(F mm) | x 4000<br>x2500 | x 4000<br>x2500 | x 4000<br>x2500 | x 4000<br>x2500 | x 4000<br>x2500 | x 4000<br>x2500 | x 4000<br>x2500 | x 4000<br>x2500 | x 4000<br>x2500 | x 4000<br>x2500 | x 4000<br>x2500 |
| 净重 (t)<br>Net weight     |                 | 53              | 56              | 59              | 63              | 66              | 69              | 72              | 76              | 79              | 82              |

注：以上表格为 TS2180 参数，TS2280 可以参考计算。





### 产品介绍 Product introduction

该机床为深孔加工机床，可完成大直径重型零件深孔的钻，镗和套料加工。加工时工件低速旋转，刀具高速旋转并给。钻孔时采用 BTA 内排屑的工艺方式；镗孔时采用镗杆内供切削液向前（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，刀杆和专用工装夹具。根据加工的需要，机床配有钻（镗）杆箱，刀具可旋转并给。

This machine is a deep-hole working machine, who can support the process of drilling, boring and trepanning manufacturing of big diameter workpiece. While working, the workpiece rotates slowly and the tool rotates in high-speed and feed. It use BTA during the drilling work and forward chip removal while boring. As for the trepanning process we use extra chip removal technique which demand professional trepanning tools. According to the needs of manufacturing, a boring spindle box is equipped to the machine so the boring tools could rotate and feed.

### 主要技术规格及性能 Main Specifications and Features

|                     | 技术规格 SPECIFICATION                                       | 参数 TECHNICAL DATA        |                   |
|---------------------|--|--------------------------|-------------------|
|                     |  | TS21100                  | TS21160           |
| 工作范围<br>Capacity    | 钻孔直径范围 Range drilling dia.                               | Φ60-Φ180mm               |                   |
|                     | 镗孔最大直径 Max. boring dia.                                  | Φ1000mm                  | Φ1600mm           |
|                     | 镗孔最大深度 Max. boring depth                                 | 1-16m                    |                   |
|                     | 套料直径范围 Range trepanning Dia.                             | Φ140-Φ500mm              |                   |
|                     | 工件夹持直径范围 Workpiece clamped dia. Range                    | Φ270-Φ2000mm             |                   |
| 主轴<br>Spindle       | 主轴中心高 Height from spindle center to bed                  | 1250mm                   | 1450mm            |
|                     | 床头箱主轴孔径 Spindle bore dia.                                | Φ100mm                   | /                 |
|                     | 主轴前端锥孔 Taper of spindle bore                             | Φ140mm, 1:20             | /                 |
|                     | 主轴转速范围 Range of spindle speed                            | 1-190r/min 3kinds        | 1-100r/min 2kinds |
| 钻杆箱<br>Drilling Box | 钻杆箱主轴孔径 Spindle bore dia. of drilling box                | Φ120mm                   |                   |
|                     | 钻杆箱主轴前端锥孔 Taper of spindle bore(drilling box)            | Φ140mm, 1:20.            |                   |
|                     | 钻杆箱转速范围 Range of spindle speed(drilling box)             | 16-270r/min 12 kinds     |                   |
| 进给<br>Feeds         | 进给速度范围（无级） Feed speed range ( infinite )                 | 5-500mm/min              |                   |
|                     | 拖板快速移动速度 Carriage rapid-moving speed                     | 4m/min                   |                   |
| 电机<br>Motors        | 主电机功率 Main motor power                                   | 75kW                     | 100kW             |
|                     | 钻杆箱电机功率 Drilling box motor power                         | 45kW                     |                   |
|                     | 液压泵电机功率 Hydraulic motor power                            | 1.5kW, n=1440r/min       |                   |
|                     | 快速移动电机功率 Carriage rapid motor power                      | 7.5kW                    |                   |
|                     | 进给电机功率 Feed motor power                                  | 11kW ( 伺服电机 )            |                   |
|                     | 冷却泵电机功率 Cool motor power                                 | 5.5kWx4+11kW(5group)     |                   |
| 其他<br>Others        | 导轨宽度 Guide rail width                                    | 1600mm                   |                   |
|                     | 冷却系统额定压力 Rated pressure of cooling system                | 2.5MPa                   |                   |
|                     | 冷却系统流量 Flow of cooling system                            | 100,200,300,400,700L/min |                   |
|                     | 液压系统额定工作压力 Rated working pressure for hydraulic system   | 6.3MPa                   |                   |
|                     | 授油器承受最大轴向力 Oil cooler grant bearing max. axial force     | 68kN                     |                   |
|                     | 授油器对工件的最大顶紧力 Oil cooler grant max. preload for workpiece | 20kN                     |                   |

### 外形尺寸及重量 Overall dimensions and weight

| 参数<br>Technical Data                          | 长度<br>Length | 4000  | 5000  | 6000  | 7000  | 8000  | 9000  | 10000 | 12000  | 15000 |
|---|--------------|-------|-------|-------|-------|-------|-------|-------|--------|-------|
| 地面空间<br>Floor space<br>长 X 宽 X 高<br>LxWxH(mm) | 21000        | 23000 | 25000 | 28000 | 30000 | 30000 | 34000 | 38000 | 450000 |       |
|   | x4500        | x4500 | x4500 | x4500 | x4500 | x4500 | x4500 | x4500 | x4500  | x4500 |
| 净重 ( t )<br>Net weight                        | x3000        | x3000 | x3000 | x3000 | x3000 | x3000 | x3000 | x3000 | x3000  | x3000 |
|   | 113          | 115   | 117   | 120   | 122   | 125   | 130   | 135   | 150    |       |

注：以上表格为 TS21100 参数，TS1160 可以参考计算。



## ZS2110B 型数控深孔钻床 ZS2110B CNC deep-hole drilling machine



### 产品介绍 Product introduction

ZSK2110B 深孔钻机床是专门加工深孔类工件的设备，主要用于采用 BTA 方式加工小直径深孔零件，特别适用于加工石油钻铤。该机床机构上最大的特点是：工件前侧即靠近授油器端采用双卡盘夹紧，后侧采用环形中心架夹持。工件的顶紧和授油器的夹紧易采用液压控制，安全可靠、操作方便。该机床配备钻杆箱，以适应不同的加工工艺要求。

ZSK2110B deep-hole drilling machine, as a professional equipment for deep-hole workpiece manufacture, adopting principally the BTA to produce small diameter deep-hole workpiece, is very suitable for oil drill collar. The biggest feature of this machine is that: the forward part of workpiece which near to the sealing head is fixed by double chucks and the backward part by center supporter. The top locking of workpiece and the fixation of sealing head are controlled by hydraulic-pressure, safe and practical. This machine is equipped with a boring spindle box to suit different needs.

## TS21 系列石油钻铤专用机床 TS21 series petroleum drill collar special drilling machine



|   | 技术规格 SPECIFICATION                                     | 参数 TECHNICAL DATA    |                       |
|---|--|----------------------|-----------------------|
|   |  | ZS2110B              | TS21 系列               |
| 工作范围<br>Capacity                                | 钻孔直径范围 Range drilling dia                              | Φ30-Φ100mm           |                       |
|   | 钻孔最大深度 Max. drilling depth                             | 6-20m                |                       |
|   | 工件夹持直径范围 Workpiece clamped dia. range                  | Φ60-Φ300mm           |                       |
| 主轴<br>Spindle                                   | 主轴中心高 Height from spindle center to bed                | 600mm                | 350mm                 |
|   | 主轴转速范围 Range of spindle speed                          | 18-290r/min 9 kinds  | 42-670 r/min 12 kinds |
| 钻杆箱<br>Drilling Box                             | 钻杆箱主轴孔径 Spindle bore dia. of drilling box              | Φ120mm               | Φ100mm                |
|   | 钻杆箱主轴前端锥孔 Taper of spindle bore(drilling box)          | Φ140mm, 1:20         | Φ120mm, 1:20          |
|   | 钻杆箱转速范围 Range of spindle speed(drilling box)           | 25-410r/min 12 kinds | 82-490r/min 6kinds    |
| 进给<br>Feeds                                     | 进给速度范围 (无级) Feed speed range ( infinite )              | 0.5-450mm/min        |                       |
|   | 拖板快速移动速度 Carriage rapid-moving speed                   | 2m/min               |                       |
| 电机<br>Motors                                    | 主电机功率 Main motor power                                 | 45kW                 | 30kW                  |
|   | 钻杆箱电机功率 Drilling box motor power                       | 45kW                 | 30kW                  |
|   | 液压泵电机功率 Hydraulic motor power                          | 1.5kW, n=1440r/min   |                       |
|   | 快速移动电机功率 Carriage rapid motor power                    | 5.5kW / 4kW          |                       |
|   | 进给电机功率 Feed motor power                                | 7.5kW ( 伺服电机 )       |                       |
| 其他<br>Others                                    | 冷却泵电机功率 Cool motor power                               | 5.5kW X4group        |                       |
|   | 导轨宽度 Guide rail width                                  | 1000mm               | 650mm                 |
|   | 冷却系统额定压力 Rated pressure of cooling system              | 2.5MPa               |                       |
|   | 冷却系统流量 Flow of cooling system                          | 100,200,300,400L/min |                       |
|   | 液压系统额定工作压力 Rated working pressure for hydraulic system | 6.3MPa               |                       |
| 选配<br>环形中心架<br>Optional the ring<br>steady rest | Φ60-330 mm ( ZS2110B )                                 |                      |                       |
|   | Φ60-260 mm ( TS2120 型 )                                |                      |                       |
|   | Φ60-320 mm ( TS2135 型 )                                |                      |                       |

石油钻铤类加工机床还有 TS2120 和 TS2135 变形产品，用户可以根据需要订购。





### 产品介绍 Product introduction

该机床是专门加工圆柱形工件内孔和外圆的专用设备。是在深孔钻镗床的基础上增加了车削外圆的功能。

该机床为系列产品，还可按客户需要提供各种变形产品。

This machine is special for the inner hole and excircle manufacture of cylindrical deep-hole workpieces. The excircle lathing function is added to this machine on base of deep-hole drilling-boring machine.

This machining tool is a series products, we can offer all kinds of other products according to the needs of clients.



### 主要技术规格及性能 Main Specifications and Features

| 技术规格 SPECIFICATION  |   | 参数 TECHNICAL DATA        |
|---------------------|---|--------------------------|
| 工作范围<br>Capacity    | 钻孔直径范围 Range drilling dia                     | Φ40-Φ120mm               |
|                     | 镗孔最大直径 Range drilling dia                     | Φ500mm                   |
|                     | 镗孔最大深度 Max. drilling depth                    | 1-16m                    |
|                     | 车削最大外圆 Turning                                | Φ600mm                   |
|                     | 工件夹持直径范围 Workpiece clamped dia. range         | Φ100-Φ660mm              |
| 主轴<br>Spindle       | 主轴中心高 Height from spindle center to bed       | 630mm                    |
|                     | 床头箱主轴孔径 Range drilling dia                    | Φ120mm                   |
|                     | 主轴前端锥孔 Range drilling dia                     | Φ140mm, 1:20             |
|                     | 主轴转速范围 Range of spindle speed                 | 16-270r/min 12 kinds     |
| 钻杆箱<br>Drilling Box | 钻杆箱主轴孔径 Spindle bore dia. of drilling box     | Φ100mm                   |
|                     | 钻杆箱主轴前端锥孔 Taper of spindle bore(drilling box) | Φ120mm, 1:20.            |
|                     | 钻杆箱转速范围 Range of spindle speed(drilling box)  | 82-490r/min 6 kinds      |
| 进给<br>Feeds         | 进给速度范围 (无级) Feed speed range (infinite)       | 0.5-450mm/min            |
|                     | 拖板快速移动速度 Carriage rapid-moving speed          | 2m/min                   |
| 电机<br>Motors        | 主电机功率 Main motor power                        | 45kW                     |
|                     | 钻杆箱电机功率 Drilling box motor power              | 30kW                     |
|                     | 液压泵电机功率 Hydraulic motor power                 | 1.5kW, n=1440r/min       |
|                     | 快速移动电机功率 Carriage rapid motor power           | 5.5kW                    |
|                     | 进给电机功率 Feed motor power                       | 7.5kW (伺服电机)             |
|                     | 冷却泵电机功率 Cool motor power                      | 5.5kWx3+7.5kWx1 (4group) |
|                     | Z轴电机 Z Axle motor                             | 4kW                      |
| 其他<br>Others        | X轴电机 X Axle motor                             | 23N·m(无级调速)              |
|                     | 冷却系统额定压力 Rated pressure of cooling system     | 2.5MPa                   |
|                     | 冷却系统流量 Flow of cooling system                 | 100,200,300,600L/min     |

## TS2120E 型深孔钻镗床 TS2120E type deep hole boring machine



### 产品介绍 Product introduction

该机床是专门加工异型深孔工件的设备，如加工各种板材、塑料模具、盲孔及阶梯孔等等。机床可以承担钻削、镗削加工，钻削时采用内排屑法。机床床身刚性强，精度保持性好。该机床为系列产品，还可按客户提供各种变形产品。

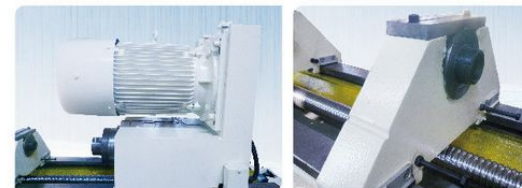
The machine is profiled deep hole workpiece specialized processing equipment, such as the processing of variety of sheet metal, plastic mold, blind hole and step hole. The machine can undertake drilling, boring, drilling of BTA. The rigidity of machine bed, to maintain good accuracy. The machine series of products, but also offers a variety of customer needs deformation products.

### 主要技术规格及性能 Main Specifications and Features

|                     | 技术规格 SPECIFICATION                            | 参数 TECHNICAL DATA   |
|---------------------|---|---|
| 工作范围<br>Capacity    | 钻孔直径范围 Drilling diameter range                | Φ40-Φ80mm   |
|                     | 镗孔最大直径 The maximum diameter of the bore       | Φ200mm  |
|                     | 镗孔最大深度 The maximum depth of the boring        | 1-5m  |
|                     | 套料直径范围 Nesting diameter range                 | Φ50-Φ140mm  |
| 主轴 Spindle          | 主轴中心高 Spindle center height                   | 350mm / 450mm   |
| 钻杆箱<br>Drilling Box | 钻杆箱主轴孔径 Spindle bore dia. of drilling box     | Φ100mm  |
|                     | 钻杆箱主轴前端锥孔 Taper of spindle bore(drilling box) | Φ120mm, 1:20  |
|                     | 钻杆箱转速范围 Range of spindle speed(drilling box)  | 82-490r/min 6 kinds   |
| 进给<br>Feeds         | 进给速度范围 (无级) Feed speed range (infinite)       | 5-500mm/min   |
|                     | 拖板快速移动速度 Carriage rapid-moving speed          | 2m/min  |
| 电机<br>Motors        | 钻杆箱电机功率 Drilling box motor power              | 30kW  |
|                     | 快速移动电机功率 Carriage rapid motor power           | 4kW   |
|                     | 进给电机功率 Feed motor power                       | 4.7kW   |
| 其他<br>Others        | 导轨宽度 Width of guide rails                     | 650mm   |
|                     | 冷却泵电机功率 Cooling pump motor power              | 5.5kWx2group  |
|                     | 冷却系统额定压力 Cooling system rated pressure        | 2.5MPa  |
|                     | 冷却系统流量 Cooling system flow                    | 100,200L/min  |
|                     | 工作台尺寸 Table size                              | 根据工件尺寸确定<br>Determined according to the size of the workpiece |

## ZSK2104C 型板材加工深孔钻床

### ZSK2104C type sheet metal processing Deep Hole Drilling Machine



### 主要技术规格及性能 Main Specifications and Features

|                  | 技术规格 SPECIFICATION                             | 参数 TECHNICAL DATA   |
|------------------|--|---|
| 工作范围<br>Capacity | 钻孔直径范围 Drilling diameter range                 | Φ20-Φ40mm   |
|                  | 最大钻孔深度 Maximum drilling depth                  | 100-2500mm  |
| 主轴 Spindle       | 主轴中心高 Spindle center height                    | 120mm   |
| 钻杆箱 Drilling Box | 钻杆箱主轴转速范围 Drilling box spindle speed range     | 400-1500r/min(无级调速 Stepless speed)                            |
| 进给<br>Feeds      | 拖板进给速度范围 The carriage feed speed range         | 10-500mm/min(无级调速 Stepless speed)                             |
|                  | 拖板快速移动速度 The extension units fast moving speed | 3m/min  |
| 电机<br>Motors     | 进给电机扭矩 Feeding motor torque                    | 14N·m   |
|                  | 钻杆箱电机功率 Drill pipe box motor power             | 11kW  |
| 其他<br>Others     | 切削冷却液最大压力 The cutting coolant largest pressure | 1-6MPa(可调 Adjustable)   |
|                  | 切削冷却液流量 Cutting coolant flow                   | 1-200L/min(可调 Adjustable)                                     |
|                  | 工作台尺寸 Table size                               | 根据工件尺寸确定<br>Determined according to the size of the workpiece |



**TLS2210A 型深孔拉镗床** TLS2210A type deep hole pull boring machine

**产品介绍** Product introduction

该机床为细长管镗孔加工的专用机床,采用工件旋转(穿过床头箱主轴孔),刀具刀杆固定只做进给运动的加工方式。镗孔时采用授油器供切削液的形式,向前排切屑加工工艺。刀具进给采用交流伺服驱动系统实现无级调速。床头箱主轴采用多级齿轮换速,转速范围广。授油器紧固及工件装夹采用机械锁紧装置。

The machine is the slender tube Boring dedicated machine, using workpiece rotation (through the the headstock spindle hole) the tool shank fixed only feed motion processing.

Boring grant oil for cutting fluid form, the swarf machining process to the front row. Tool feed achieve variable speed AC servo drive system. Headstock spindle using multi-stage gear change speed, wide speed range. Grant oil fastening and workpiece clamping with mechanical locking device.

**主要技术规格及性能** Main Specifications and Features

|                  | 技术规格 SPECIFICATION   | 参数 TECHNICAL DATA |
|------------------|--|-------------------|
| 工作范围<br>Capacity | 镗孔直径范围 The scope of the diameter of the bore                     | Φ40-Φ100mm        |
|                  | 拉镗孔最大深度 Maximum depth of pull boring                             | 1-12m             |
|                  | 最大夹持工件直径 Maximum clamping workpiece diameter                     | Φ127mm            |
| 主轴<br>Spindle    | 中心高度(从平导轨至主轴中心) Center height (from flat rail to spindle center) | 250mm             |
|                  | 主轴过孔 Spindle hole  | Φ130mm            |
|                  | 主轴转速范围、级数 Spindle speed range, series                            | 40-670r/min 12 级  |
| 进给<br>Feeds      | 进给速度范围 Feed speed range  | 5-200mm/min       |
|                  | 拖板快速移动速度 The carriage  | 2m/min            |
| 电机<br>Motors     | 床头箱主电机 The main motor of the headstock                           | 15kW              |
|                  | 进给电机功率 Feed motor  | 4.7kW             |
|                  | 冷却泵电机 Cooling pump motor   | 5.5kW             |
| 其他<br>Others     | 机床床身宽度 The width of the machine bed                              | 500mm             |
|                  | 冷却系统额定压力 Cooling system rated pressure                           | 0.36MPa           |
|                  | 冷却系统流量 Cooling system flow                                       | 300L/min          |

**TLS2220B 型深孔拉镗床** TLS2220B type deep hole pull boring machine

**产品介绍** Product introduction

该机床为细长管镗孔加工的专用机床,采用工件固定,刀具刀杆旋转并做进给运动的加工方式。

镗孔时采用授油器供切削液的形式,向前排切屑加工工艺。刀具进给采用交流伺服驱动系统实现无级调速。拉杆箱主轴采用多级齿轮换速,转速范围广。授油器紧固及工件装夹采用机械锁紧装置。

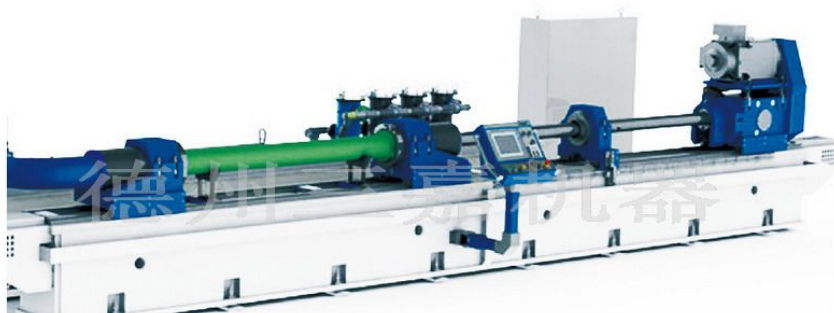
The machine is slender tube Boring dedicated machine, using a fixed workpiece, tool shank rotate and do feed motion processing. Boring grant oil for cutting fluid form, the swarf machining process to the front row. Tool feed achieve variable speed AC servo drive system. Trolley Case spindle using multi-stage gear change speed, wide speed range. Grant oil fastening and workpiece clamping with mechanical locking device.

**主要技术规格及性能** Main Specifications and Features

|                  | 技术规格 SPECIFICATION   | 参数 TECHNICAL DATA |
|------------------|--|-------------------|
| 工作范围<br>Capacity | 镗孔直径范围 The scope of the diameter of the bore                     | Φ40-Φ200mm        |
|                  | 拉镗孔最大深度 Maximum depth of pull boring                             | 1-12m             |
| 主轴 Spindle       | 中心高度(从平导轨至主轴中心) Center height (from flat rail to spindle center) | 350mm             |
| 钻杆箱 Drilling Box | 主轴转速范围、级数 Spindle speed range, series                            | 80-350r/min 6 级   |
| 进给<br>Feeds      | 进给速度范围 Feed speed range  | 5-200mm / min     |
|                  | 拖板快速移动速度 The extension units fast moving speed                   | 2m/min            |
| 电机<br>Motors     | 拉杆箱主电机 Main Motor Trolley Case                                   | 22kW(4 级)         |
|                  | 进给电机 Feed motor  | 4.7kW( 交流伺服电机 )   |
|                  | 拖板快速电机 The carriage  | 4kW               |
| 其他<br>Others     | 冷却泵电机 Cooling pump motor   | 5.5kW             |
|                  | 机床床身宽度 The width of the machine bed                              | 650mm             |
|                  | 冷却系统额定压力 Cooling system rated pressure                           | 0.36MPa           |
|                  | 冷却系统流量 Cooling system flow                                       | 300L/min          |

## TGK25 / TGK35 型数控深孔镗刮滚机床

TGK25 / TGK35 CNC deep hole skiving and roller burnishing machine



德国 Wenaroll



德国 Wenaroll

### 产品介绍 Product introduction

数控深孔镗刮滚机床，效率比普通深孔和珩磨高 5-8 倍。它是专业制造液压缸的加工设备。他把粗镗与精镗溶于一体，利用推镗一次完成粗精镗，在镗完后利用退刀的时机同时完成滚压这道工序。滚压加工，使工件粗糙度达 Ra0.4。

深孔加工滚压技术是一种无切削加工，通过塑性变形使内孔表面达到工件要求的表面粗糙度。

Deep Hole Boring roll the machine efficiency is 5-8 times higher than ordinary deep hole and honing. It is the professional processing equipment for the manufacture of hydraulic cylinders. His rough boring and fine boring soluble one, push boring at once coarse and fine boring, boring after the use of the timing of the retraction finished rolling process. Rolling process, the the workpiece roughness of Ra0.4.

Deep processing rolling technology is a non-cutting processing, to achieve the the workpiece required surface roughness so that the surface of the inner space by plastic deformation.

### 滚压的几大优势:

- 1、提高表面粗糙度，粗糙度基本能达到 $Ra \leq 0.4 \mu m$ 左右。
- 2、修正圆度，椭圆度可 $\leq 0.03mm$ 。同轴度 $\leq 0.06mm/m$
- 3、提高表面硬度，使受力变形消除，硬度提高 $HV \geq 4^\circ$
- 4、加工后有残余应力层，提高疲劳强度提高30%。
- 5、提高配合质量，减少磨损，延长零件使用寿命，但零件的加工费用反而降低。

### Rolling several advantages:

Improve the surface roughness, roughness  $Ra \leq 0.4 \mu m$  so basically to achieve.  
Amend roundness, ovality  $\leq 0.03mm$ . Concentricity  $\leq 0.06mm/m$   
3, to improve the surface hardness, the force deformation eliminate higher hardness  $HV \geq 4^\circ$   
4, after processing residual stress layer, to improve the fatigue strength is improved by 30%.  
5 to improve the matching quality, reduce wear and extend the life of parts, but the parts of the processing cost was reduced.

### 加工精度:

工件镗削表面粗糙度 $\leq Ra3.2um$   
工件滚压表面粗糙度 $\leq Ra0.4um$   
工件加工圆柱度 $\leq 0.027/500mm$   
工件加工圆度 $\leq 0.02/100mm$

### Machining accuracy:

Boring workpiece surface roughness  $\leq Ra3.2um$   
The workpiece Rolling surface roughness  $\leq Ra0.4um$   
Workpiece cylindricity  $\leq 0.027/500mm$   
Workpiece roundness  $\leq 0.02/100mm$

### 主要技术规格及性能 Main Specifications and Features

|                     | 技术规格 SPECIFICATION                             | 参数 TECHNICAL DATA      |                        |
|---------------------|--|------------------------|------------------------|
|                     |  | TGK25                  | TGK35                  |
| 工作范围<br>Capacity    | 镗孔直径范围 The scope of the diameter of the bore   | $\Phi 40 - \Phi 250mm$ | $\Phi 40 - \Phi 350mm$ |
|                     | 最大工件长度 The maximum length of the workpiece     | 1-9m                   |                        |
|                     | 工件夹持范围 Workpiece clamping range                | $\Phi 60 - \Phi 300mm$ | $\Phi 60 - \Phi 450mm$ |
| 主轴 Spindle          | 中心高度 Center height                             | 350mm                  | 450mm                  |
| 钻杆箱<br>Drilling Box | 主轴前端锥孔 Front spindle taper hole                | 100mm1:20              |                        |
|                     | 主轴变速范围 Spindle speed range                     | 30-1000r/min (无级调速)    |                        |
| 进给<br>Feeds         | 进给速度范围 Feed speed range                        | 5-1000mm/min (无级)      |                        |
|                     | 拖板快速移动 Pallet fast-moving                      | 3m/min                 |                        |
| 电机<br>Motors        | 镗杆箱电机功率 Motor power of the boring bar          | 30kW(交流伺服电机)           | 60kW(交流伺服电机)           |
|                     | 液压泵电机功率 Hydraulic pump motor power             | 1.5kW                  |                        |
|                     | 进给电机 Feed motor                                | 11kW(交流伺服电机)           |                        |
|                     | 顶紧架快速移动电机 The top tight Rack fast-moving motor | 4kW                    |                        |
|                     | 输出冷却泵电机功率 The output cooling pump motor power  | 7.5kWx2                | 7.5kWx3                |
|                     | 自动排屑电机功率 Automatically Paixie motor power      | 4kW                    |                        |
|                     | 磁性分离器电机功率 Magnetic separator motor power       | 3kW                    |                        |
| 其他<br>Others        | 冷却系统额定压力 Cooling system rated pressure         | 2.5MPa                 |                        |
|                     | 液压系统额定压力 Rated pressure of hydraulic system    | 6.3 MPa                |                        |
|                     | 授油器的最大预紧力 Maximum grant oil preload            | 60KN                   |                        |
|                     | 冷却系统流量 Cooling system flow                     | 200、400L/min           | 200、400、600L/min       |
|                     | 磁性分离器流量 Magnetic separator flow                | 800L/min               |                        |
|                     | 压力布袋过滤器流量 Pressure bag filter traffic          | 800L/min               |                        |
|                     | 过滤精度 Filtration precision                      | 5 微米                   |                        |



## ZSK21 系列型数控深孔钻床 ZSK21 series CNC Deep Hole Drilling Machine

本机床是用于钻削圆柱形棒料的深孔加工设备，它是一种高效、高精度、高自动化的采用外排屑法（枪钻法）钻削小孔的机床。通过一次连续钻削即可达到一般需要钻、扩、铰工序才能保证的加工质量。孔径精度为 IT7-IT10，表面粗糙度 Ra3.2-0.04 μm，孔中心线直线度每 100mm 长度上 ≤0.05mm。



This machine is used for deep-hole drilling cylindrical bar processing equipment, it is a highly efficient, high-precision, high automation outside chip method machine drilling holes (gun drill Law). Generally require drilling, expansion hinges process in order to ensure processing quality can be achieved through a continuous drilling. Aperture accuracy of IT7-IT10, surface roughness Ra3.2-0.04 μm, the straightness of the bore centerline on each 100mm length ≤ 0.05mm.

### 主要技术规格及性能 Main Specifications and Features

| 技术规格 SPECIFICATION  |  | 参数 TECHNICAL DATA |               |               |               |
|---------------------|--|-------------------|---------------|---------------|---------------|
|                     |  | ZSK21008          | ZSK2102       | ZSK2103       | ZSK2104       |
| 工作范围<br>Capacity    | 加工孔径范围 Technology specification                  | Φ1-Φ8mm           | Φ3-Φ20mm      | Φ5-Φ40mm      | Φ5-Φ40mm      |
|                     | 最大加工深度 Range drilling dia.                       | 10-300mm          | 30-3000mm     |               |               |
| 主轴<br>Spindle       | 主轴数 Spindle quantity                             | 1                 | 1,2,3,4       | 1,2           | 1             |
|                     | 主轴转速 Spindle rotation speed range                | 350r/min          | 350 r/min     | 150r/min      | 150r/min      |
| 钻杆箱<br>Drilling Box | 钻杆箱转速范围 Drilling box speed range                 | 3000-20000r/min   | 500-8000r/min | 600-6000r/min | 200-7000r/min |
|                     | 进给速度范围 Feeding speed range                       | 10-500mm/min      | 10-350mm/min  |               |               |
| 进给<br>Feeds         | 刀具快速移动速度 Tools rapid move speed                  | 5000mm/min        | 3000mm/min    |               |               |
|                     | 钻杆箱电机功率 Drilling box motor power                 | 2.5kW             | 4kW           | 5.5kW         | 7.5kW         |
| 电机<br>Motors        | 主轴箱电机功率 Drilling box motor power                 | 1.1kW             | 2.2kW         | 2.2kW         | 3kW           |
|                     | 进给电机（伺服电机）Torque of feed motor                   | 4.7N·M            | 7N·M          | 8.34N·M       | 11N·M         |
| 其他<br>Others        | 冷却油过滤精度 Coolant filtering precision              | 8μm               | 30 μm         |               |               |
|                     | 冷却液压力范围 Rated pressure of cooling system         | 1-18MPa           | 1-10MPa       |               |               |
|                     | 冷却液最大流量 Flow rate of cooling system              | 20L/min           | 100L/min      | 100L/min      | 150L/min      |
| 数控 CNC              | 北京 KND（标配）SIEMENS 802 系列、FANUC 等为选配，可根据工件情况制作专机。 |                   |               |               |               |

## ZSK2302 系列三坐标数控深孔钻床 ZSK2302 Series 3D CNC Deep Hole Drilling Machine



ZSK2302 三坐标数控深孔钻床是用于钻削三坐标的深孔加工设备，它是一种高效、高精度、高自动化的采用外排屑法（枪钻法）钻削小孔的机床。通过一次连续钻削即可达到一般需要钻、扩、铰工序才能保证的加工质量。孔径精度为 IT7-IT10，表面粗糙度 Ra3.2-0.04 μm，孔中心线直线度每 100mm 长度上 ≤0.05mm。它广泛地用于塑橡模具工业的水孔、射销孔、电热孔；液压机械工业的阀、分配器、泵体；汽车、拖拉机工业的发动机缸体、供油系统零件、传动系统零件、转向机构壳体和转向轴；航天工业的推进器、着陆架；发电机工业的热交换板等零件深孔的加工。

ZSK2103 is CNC Deep-hole drilling machine suited for drilling 3-D hole system. It is adopting chip moved outer, with high efficiency, high accuracy, drill small-holes by "gun-drilling" method. It can instead of drilling, expanding, reaming by one drilling process obtain sourcing accuracy. Bore accuracy is IT7-IT10, roughness Ra3.2-0.04 μm, linearity ≤0.05mm in 100mm length. It is used widely in plastic and rubber industry, hydraulic mechanism, automobile and tractor, generator and aviation industry for machining deep-hole perforation; such as cooling hole, elecheating hole, valve distributor, pump steering shaft, spindle heat-exchanger, plate, etc.

### 主要技术规格及性能 Main Specifications and Features

| 技术规格 SPECIFICATION  |  | 参数 TECHNICAL DATA |
|---------------------|--|-------------------|
| 工作范围<br>Capacity    | 加工孔径范围 Technology specification                    | Φ4-Φ20mm          |
|                     | 最大加工深度 Range drilling dia                          | 300-1000 mm       |
| 主轴 Spindle          | 工作台最大横向移动 Max. cross travel of table               | 600mm             |
|                     | 升降滑台最大垂直方向行程 Max. vertical travel of elevate table | 300mm             |
| 钻杆箱<br>Drilling Box | 中心高度 Center height                                 | 60mm              |
|                     | 钻杆箱电机功率 Drilling box motor power                   | 4kW (变频电机)        |
| 进给<br>Feeds         | 进给速度范围 Feeding speed range                         | 10-500mm/min      |
|                     | 快速移动速度 Tools rapid move speed                      | 3000mm/min        |
| 电机<br>Motors        | 进给电机 Torque of feed motor                          | 1.5kW             |
|                     | 冷却油过滤精度 Coolant filtering precision                | 30 μm             |
| 其他<br>Others        | 冷却液压力范围 Rated pressure of cooling system           | 1-10MPa           |
|                     | 冷却液流量 Flow rate of cooling system                  | 100L/min          |
| 数控 CNC              | 北京 KND（标配）SIEMENS 802 系列、FANUC 等为选配 可根据工件情况制作专机    |                   |

## ZSK2303 系列三坐标数控深孔钻床

ZSK2303 Series 3D CNC Deep Hole Drilling Machine



### 产品介绍 Product introduction

ZSK2303 三坐标数控深孔钻机床是用于钻削三坐标的深孔加工设备，它是一种高效、高精度、高自动化的采用外排屑法（枪钻法）钻削小孔的机床。通过一次连续钻削即可达到一般需要钻、扩、铰工序才能保证的加工质量。孔径精度为 IT7-IT10，表面粗糙度 Ra3.2-0.04 μm，孔中心线直线度每 100mm 长度上 ≤0.05mm。它广泛地用于塑料模具工业的水孔、射销孔、电热孔；液压机械工业的阀、分配器、泵体；汽车、拖拉机工业的发动机缸体、供油系统零件、传动系统零件、转向机构壳体 and 转向轴；航空工业的推进器、着陆架；发电机工业的热交换板等零件深孔的加工。



ZSK2303 is CNC Deep-hole drilling machine suited for drilling 3-D hole system. It is adopting chip moved outer, with high efficiency, high accuracy, drill small-holes by "gun-drilling" method. It can instead of drilling, expanding, reaming by one drilling process obtain sourcing accuracy. Bore accuracy is IT7-IT10, roughness Ra3.2-0.04 μm, linearity ≤0.05mm in 100mm length. It is used widely in plastic and rubber industry, hydraulic mechanism, automobile and tractor, generator and aviation industry for machining deep-hole perforation; such as cooling hole, elecheating hole, valve distributor, pump steering shaft, spindle heat-exchanger, plate, etc.



### 主要技术规格及性能 Main Specifications and Features

|                  | 技术规格 SPECIFICATION                                   | 参数 TECHNICAL DATA |
|------------------|--|-------------------|
| 工作范围<br>Capacity | 加工孔径范围 Technology specification                      | Φ5-Φ30mm          |
|                  | 最大加工深度 Range drilling dia                            | 300-2000mm        |
|                  | 工作台最大横向移动 Max. cross travel of table                 | 1000mm            |
| 主轴 Spindle       | 钻杆箱转速范围 Spindle rotation speed range                 | 800-7000r/min     |
| 进给<br>Feeds      | 进给速度范围 Feeding speed range                           | 10-500mm/min      |
|                  | 刀具快速移动速度 Tools rapid move speed                      | 3000mm/min        |
| 电机<br>Motors     | 钻杆箱电机功率 Drilling box motor power                     | 4kW( 伺服电机 )       |
|                  | 进给电机 Power feed motor                                | 1.6kW             |
| 其他<br>Others     | 冷却油过滤精度 Coolant filtering precision                  | 30 μm             |
|                  | 冷却液压力范围 Rated pressure of cooling system             | 1-10MPa           |
|                  | 冷却液流量 Flow rate of cooling system                    | 6-100L/min        |
| 数控 CNC           | 北京 KND ( 标配 ) SIEMENS 802 系列、FANUC 等为选配 可根据工件情况制作专机。 |                   |

注：工作台尺寸、钻杆箱升降范围，可根据客户工作情况而定。



## 2MSK2125 / 2MSK2135 型数控深孔强力珩磨机床

### 2MSK2125/ 2MSK2135 CNC deep-hole honing machine



#### 产品介绍 Product introduction

2MSK2125 2MSK2135 数控深孔强力珩磨机床适用于圆柱形深孔工件的珩磨及抛光加工，例如：各种液压油缸、汽缸等精密管件。对带有台阶孔的工件进行珩磨及抛光加工。其加工孔径精度可达 IT8 ~ IT9 级或以上，表面粗糙度可达到 Ra0.2~0.4 μm。采用局部珩磨，可修整被加工件的锥度、椭圆度及局部孔径误差。对于一些冷拔钢管，可以直接进行强力珩磨。2MSK2125 2MSK2135 珩磨机是一种高精度、高效率的理想设备。

该数控深孔强力珩磨机床配备 KND 数控系统，交流伺服电机，磨杆箱采用无级调速。采用链轮、链条实现磨头往复运动，可以精确的控制珩磨的位置。同时采用双直线导轨，具有较高的使用寿命和较高的精度。珩磨头采用液压定压扩张，砂条的珩磨力稳定不变，以保证工件的圆度和圆柱度。珩磨压力可以根据需要调整，并设置高低压控制，在操纵台上就可以轻松实现粗、精珩的转换。机床的其他配置如：液压阀、自动润滑站等采用名牌产品。

另外，该数控深孔强力珩磨机床的数控系统、直线导轨、液压阀等配置都可以根据用户要求选配或指定。

2MSK2125 2MSK2135 CNC high efficiency deep-hole honing machine is equipment suitable for honing and burnishing cylindrical deep-hole parts such as various cylinders. This machine is specially for honing and burnishing step holes and the hole diameter accuracy of machined workpiece can be up to and over IT8-IT9, and the surface roughness reach Ra 0.2~0.4 μm. It can also repair and maintain taper and ellipticity of machined workpiece with the help of partial honing. It can directly perform high efficiency honing of cold drawing steel pipes. 2MSK2125 2MSK2135 is an ideal equipment for deep-hole machining with high accuracy and high efficiency.

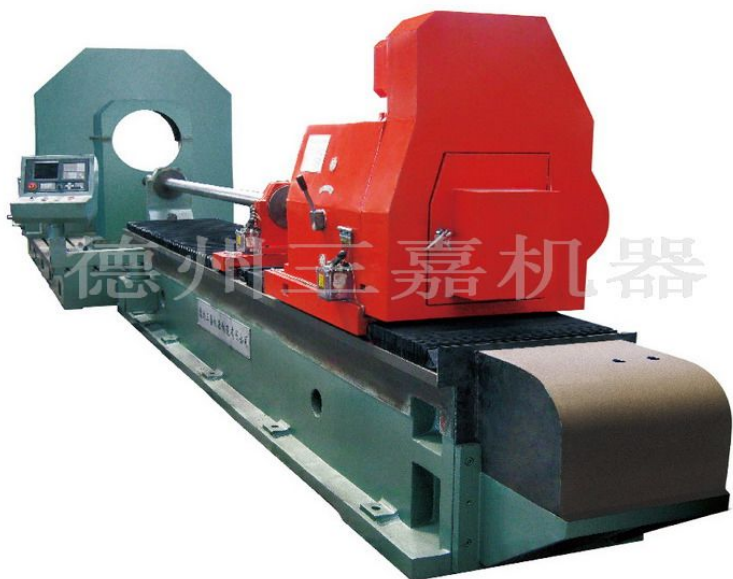
This machine is mated with KND CNC system, AC servo motor, honing box adopts stepless speed. It mated with high accuracy racks and gears to realize the reciprocating of honing head and it can control the honing position too. This machine is mated with double linear guide way, so it has long life and high accuracy. The honing head adopt hydraulic constant pressure expanding, sand blades always maintain constant pressure to be sure the roundness and cylinder of the workpiece. The honing pressure can be adjusted according to requires and it is device high and low pressure control to realize the rough and finish honing on the operate station. The machine's other equipments such as hydraulic valve, automatic lubricate station are use the well-known brand products. Otherwise, the CNC system, linear guide way and hydraulic valve can be chosen by customer.

#### 主要技术规格及性能 Main Specifications and Features

| 技术规格 SPECIFICATION |  | 参数 TECHNICAL DATA |            |
|--------------------|--|-------------------|------------|
|                    |  | 2MSK2125          | 2MSK2135   |
| 工作范围<br>Capacity   | 加工孔径范围 Range of honing diameter                          | Φ35-Φ250mm        | Φ60-Φ350mm |
|                    | 加工最大深度 Max honing depth                                  | 1-12m             |            |
|                    | 工件夹持直径范围 Workpiece clamped diameter range                | Φ50-Φ300mm        | Φ75-Φ400mm |
| 主轴 Spindle         | 中心高 Spindle center height                                | 350mm             |            |
| 珩磨杆箱 Honing Box    | 磨杆箱主轴转速范围 Speed range of spindle                         | 25-250r/min 2 档无级 |            |
| 进给 Feeds           | 拖板往复速度范围 Range of carriage rapid-moving speed            | 4-18m/min         |            |
| 电机<br>Motors       | 磨杆箱主电机功率 Main motor of honing box                        | 11kW( 变频电机 )      |            |
|                    | 往复运动电机功率 Motor of honing box reciprocating speed         | 5.5kW ( 伺服电机 )    |            |
| 其他<br>Others       | 冷却泵流量 Flow of coolant pump                               | 100L/min          |            |
|                    | 磨头扩张液压泵工作压力 Max pressure of honing head expanding system | 4MPa              |            |
| 数控系统 CNC           | 北京 KND ( 标配 ) SIEMENS 802 系列、FANUC 等为选配 可根据工件情况制作专机。     |                   |            |

## 2MSK2150 型数控深孔强力珩磨机

### 2MSK2150 CNC Deep-hole honing machine



### 产品介绍 Product introduction

2MSK2150 数控深孔强力珩磨机床适用于圆柱形深孔工件的珩磨及抛光加工，例如：各种液压油缸、汽缸等精密管件。对带有台阶孔的工件进行珩磨及抛光加工。其加工孔径精度可达 IT8 ~ IT9 级以上，表面粗糙度可达到 Ra0.2~0.4  $\mu\text{m}$ 。采用局部珩磨，可修整被加工件的锥度、椭圆度及局部孔径误差。对于一些冷拔钢管，可以直接进行强力珩磨。2MSK2150 珩磨机是一种高精度、高效率的理想设备。

2MSK2150 数控深孔强力珩磨机床配备 KND 数控系统，交流伺服电机，磨杆箱采用无级调速。采用链轮、链条实现磨头往复运动，可以精确的控制珩磨的位置。同时采用双直线导轨，具有较高的使用寿命和较高的精度。珩磨头采用液压定压扩张，砂条的珩磨力稳定不变，以保证工件的圆度和圆柱度。珩磨压力可以根据需要调整，并设置高低压控制，在操纵台上就可以轻松实现粗、精珩的转换。机床的其他配置如：液压阀、自动润滑站等采用名牌产品。

另外，2MSK2150 数控深孔强力珩磨机床的数控系统、直线导轨、液压阀等配置都可以根据用户要求选配或指定。

2MSK2150 CNC high efficiency deep-hole honing machine is equipment suitable for honing and burnishing cylindrical deep-hole parts such as various cylinders. This machine is specially for honing and burnishing step holes and the hole diameter accuracy of machined workpiece can be up to and over IT8~IT9, and the surface roughness reach Ra 0.2~0.4  $\mu\text{m}$ . It can also repair and maintain taper and ellipticity of machined workpiece with the help of partial honing. It can directly perform high efficiency honing of cold drawing steel pipes. 2MSK2150 is an ideal equipment for deep-hole machining with high accuracy and high efficiency.

This machine is mated with KND CNC system, AC servo motor, honing box adopts stepless speed. It mated with high accuracy racks and gears to realize the reciprocating of honing head and it can control the honing position too. This machine is mated with double linear guide way, so it has long life and high accuracy. The honing head adopt hydraulic constant pressure expanding, sand blades always maintain constant pressure to be sure the roundness and cylinder of the workpiece. The honing pressure can be adjusted according to requires and it is device high and low pressure control to realize the rough and finish honing on the operate station. The machine's other equipments such as hydraulic valve, automatic lubricate station are use the well-known brand products. Otherwise, the CNC system, linear guide way and hydraulic valve can be chosen by customer.

### 主要技术规格及性能 Main Specifications and Features

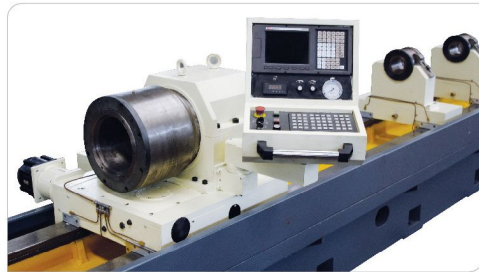
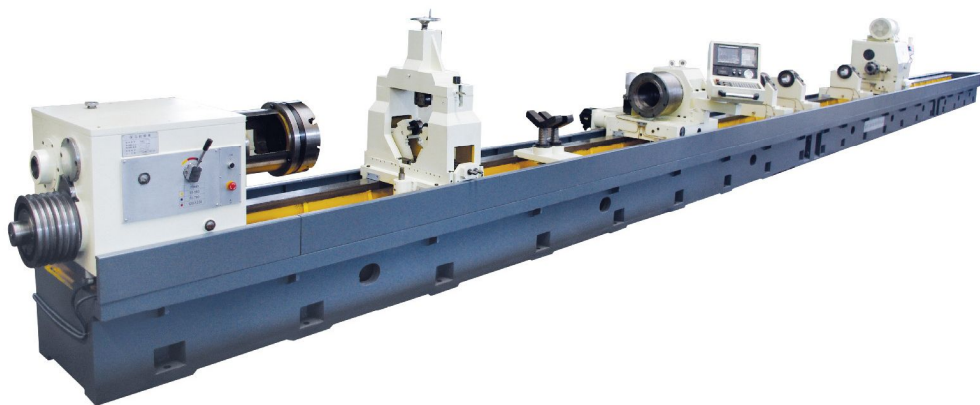
|                  | 技术规格 SPECIFICATION  | 参数 TECHNICAL DATA               |
|------------------|---|---------------------------------|
| 工作范围<br>Capacity | 加工孔径范围 Range of honing diameter                             | $\Phi 60 - \Phi 500\text{mm}$   |
|                  | 加工最大深度 Max honing depth                                     | 1~12m                           |
|                  | 工件夹持直径范围 Workpiece clamped diameter range                   | $\Phi 150 - \Phi 1400\text{mm}$ |
| 主轴<br>Spindle    | 中心高 (工件侧) Spindle center height(main spindle)               | 1000mm                          |
|                  | 中心高 (磨杆箱侧) Spindle center height(honing box)                | 350mm                           |
| 珩磨杆箱 Honing Box  | 磨杆箱主轴转速范围 Speed range of spindle                            | 25~250r/min 2 档无级               |
| 进给 Feeds         | 拖板往复速度范围 Range of carriage rapid-moving speed               | 4~18m/min                       |
|                  | 磨杆箱主电机功率 Main motor of honing box                           | 15kW (变频电机)                     |
| 电机 Motors        | 往复运动电机功率 Motor of honing box reciprocating speed            | 11kW (伺服电机)                     |
|                  | 冷却泵流量 Flow of coolant pump                                  | 100L/min                        |
| 其他 Others        | 磨头扩张液压力 Max pressure of honing head expanding system        | 4MPa                            |
|                  | 数控系统 CNC 北京 KND (标配) SIEMENS 802 系列、FANUC 等为选配 可根据工件情况制作专机。 |                                 |





## TSK2120G型数控深孔钻镗床

TSK2120G Deep-hole Drilling&Boring machine



### 产品介绍 Product introduction

该机床是专门加工圆柱形深孔工件的带有防护的数控设备，如加工机床的主轴孔，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。机床床身刚性强，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。授油器紧固和工件顶紧采用伺服顶紧装置，仪表显示，安全可靠。

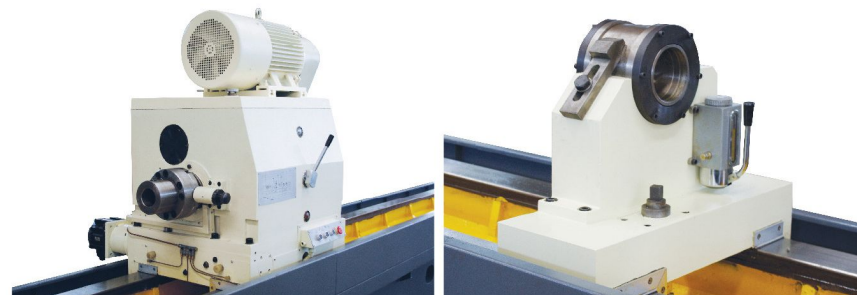
该机床为系列产品，还可按客户需要提供各种变形产品。

The machine is special equipment for machining deep cylindrical hole of workpieces. It can be perfectly suited for drilling and boring through holes, blind and step hole in workpiece: such as, spindle of various kinds of machines, many kinds of hydraulic oil cylinders and cylinders. It can perform not only drilling and boring, but also rolling pressing. The method of the internal-removal chip is adopted in drilling. The machine is strong in rigidity of the bed, high in precision, and wide in spindle speed range.

Feed system is A.C. Servo feeding motor. It is suitable for various processing methods of machining deep-holes. Fixture of the guide carriage and clamping force of the workpiece are performed by hydraulic device and indicated by meter.

Various change-model products of the series can be supplied according to users requirement.

TSK2120G 型数控深孔钻镗床 TSK2120G Deep-hole Drilling&Boring machine



### 主要技术规格及性能 Main Specifications and Features

|                           | 技术规格 SPECIFICATION                                       | 参数 TECHNICAL DATA    |
|---------------------------|--|----------------------|
| 工作范围<br>Capacity          | 钻孔直径范围 Range drilling dia.                               | Φ40-Φ80mm            |
|                           | 镗孔最大直径 Max. boring dia.                                  | Φ200mm               |
|                           | 镗孔最大深度 Max. boring depth                                 | 1-6m                 |
|                           | 工件夹持直径范围 Workpiece clamped dia. Rang                     | Φ50-Φ400mm           |
| 主轴<br>Spindle             | 主轴中心高 Height from spindle center to bed                  | 400mm                |
|                           | 床头箱主轴孔径 Spindle bore dia.                                | Φ70mm                |
|                           | 主轴前端锥孔 Taper of spindle bore                             | Φ85mm,1:20           |
|                           | 主轴转速范围 Range of spindle speed                            | 40-1200 r/min 无级     |
| 进给 Feeds                  | 进给速度范围 (无级) Feed speed range ( infinite )                | 5-3200mm/min         |
| 电机<br>Motors              | 主电机功率 Main motor power                                   | 37kW 变频电机            |
|                           | 进给电机功率 Feed motor power                                  | 4.4kW                |
|                           | 授油器电机功率 Oil cooler motor power                           | 4.4kW                |
|                           | 冷却泵电机功率 Cool motor power                                 | 5.5kWx4group         |
| 其他<br>Others              | 导轨宽度 Track width   | 600mm                |
|                           | 冷却系统额定压力 Rated pressure of cooling system                | 2.5MPa               |
|                           | 冷却系统流量 Flow of cooling system                            | 100,200,300,400L/min |
|                           | 授油器承受最大轴向力 Oil cooler grant bearing max. axial force     | 6.3KN                |
|                           | 授油器对工件的最大顶紧力 Oil cooler grant max. preload for workpiece | 20KN                 |
|                           | 数控系统: CNC  | 北京 KND               |
| 钻杆箱<br>Drilling Box<br>选配 | 钻杆箱主轴孔径 Spindle bore dia. of drilling box                | Φ70mm                |
|                           | 钻杆箱主轴前端锥孔 Taper of spindle bore(drilling box)            | Φ85mm,1:20.          |
|                           | 钻杆箱转速范围 Range of spindle speed(drilling box)             | 60--1200r/min 无级     |
|                           | 钻杆箱电机功率 Drilling box motor power                         | 22kW 变频电机            |

### 德州三嘉机器制造有限公司

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传真: 0534-2752878 邮箱: sanjiaqiye@163.com 网址: http://www.sjmachine.cn

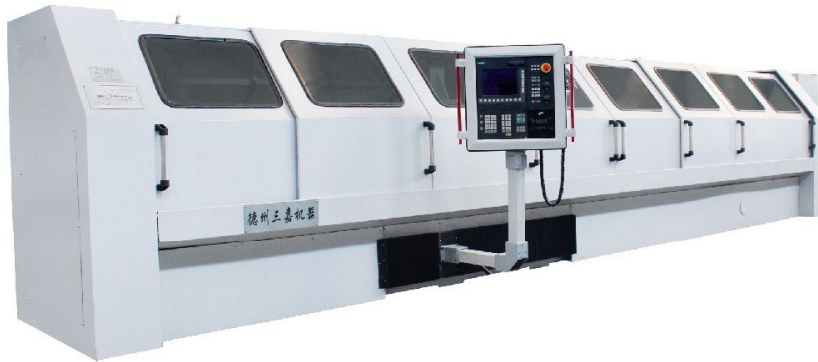
### Dezhou Sanjia machine manufacturing Co. Ltd

North of Lepu Road economic developed zone, Dezhou, Shandong Province( 2 bus terminal north of 2 kilometers road east )  
Tel: 0534-2758303 / 13583411128 Fax: 0534-2752878 E-mail: sanjiaqiye@163.com Website: http://www.sjmachine.cn



## TSK2120G型数控深孔钻镗床

TSK2120G Deep-hole Drilling&Boring machine



### 产品介绍 Product introduction

该机床是专门加工圆柱形深孔工件的带**安全防护**的数控设备，如加工机床的主轴孔，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。机床床身刚性很强，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。授油器紧固和工件顶紧采用伺服顶紧装置，仪表显示，安全可靠。

该机床为系列产品，还可按客户需要提供各种变形产品。

The machine is special equipment for machining deep cylindrical hole of workpieces. It can be perfectly suited for drilling and boring through holes, blind and step hole in workpiece: such as, spindle of various kinds of machines, many kinds of hydraulic oil cylinders and cylinders. It can perform not only drilling and boring, but also rolling pressing. The method of the internal-removal chip is adopted in drilling. The machine is strong in rigidity of the bed, high in precision, and wide in spindle speed range.

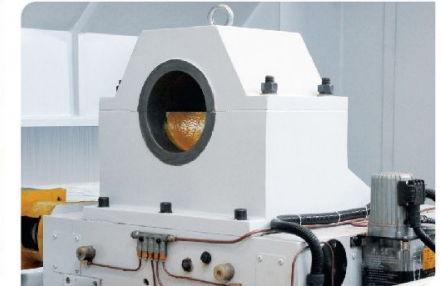
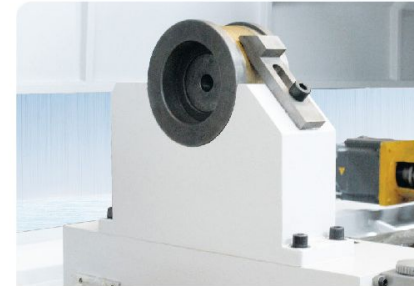
Feed system is A.C. Servo feeding motor. It is suitable for various processing methods of machining deep-holes. Fixture of the guide carriage and clamping force of the workpiece are performed by hydraulic device and indicated by meter.

Various change-model products of the series can be supplied according to users requirement.

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TSK2120G 型数控深孔钻镗床  
TSK2120G Deep-hole Drilling&Boring machine



### 主要技术规格及性能 Main Specifications and Features

|                           | 技术规格 SPECIFICATION                                       | 参数 TECHNICAL DATA    |
|---------------------------|--|----------------------|
| 工作范围<br>Capacity          | 钻孔直径范围 Range drilling dia.                               | Φ40 ~ Φ80mm          |
|                           | 镗孔最大直径 Max. boring dia.                                  | Φ200mm               |
|                           | 镗孔最大深度 Max. boring depth                                 | 1 ~ 16m              |
|                           | 工件夹持直径范围 Workpiece clamped dia. Rang                     | Φ50 ~ Φ400mm         |
| 主轴<br>Spindle             | 主轴中心高 Height from spindle center to bed                  | 400mm                |
|                           | 床头箱主轴孔径 Spindle bore dia.                                | Φ70mm                |
|                           | 主轴前端锥孔 Taper of spindle bore                             | Φ85mm, 1:20          |
|                           | 主轴转速范围 Range of spindle speed                            | 40 ~ 1200 r/min 无级   |
| 进给 Feeds                  | 进给速度范围 (无级) Feed speed range ( infinite )                | 5 ~ 3200mm/min       |
|                           | 主电机功率 Main motor power                                   | 37kW 变频电机            |
| 电机<br>Motors              | 进给电机功率 Feed motor power                                  | 4.4kW                |
|                           | 授油器电机功率 Oil cooler motor power                           | 4.4kW                |
|                           | 冷却泵电机功率 Cool motor power                                 | 5.5kWx4group         |
| 其他<br>Others              | 导轨宽度 Track width   | 600mm                |
|                           | 冷却系统额定压力 Rated pressure of cooling system                | 2.5MPa               |
|                           | 冷却系统流量 Flow of cooling system                            | 100、200、300、400L/min |
|                           | 授油器承受最大轴向力 Oil cooler grant bearing max. axial force     | 6.3KN                |
|                           | 授油器对工件的最大顶紧力 Oil cooler grant max. preload for workpiece | 20KN                 |
| 钻杆箱<br>Drilling Box<br>选配 | 钻杆箱主轴孔径 Spindle bore dia. of drilling box                | Φ70mm                |
|                           | 钻杆箱主轴前端锥孔 Taper of spindle bore(drilling box)            | Φ85mm, 1:20.         |
|                           | 钻杆箱转速范围 Range of spindle speed(drilling box)             | 60 ~ 1200r/min 无级    |
|                           | 钻杆箱电机功率 Drilling box motor power                         | 22kW变频电机             |
| 数控系统 ( 选配 )               | 北京 KND、德国西门子、FANVC 或客户指定                                 |                      |

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## ZSK2104E型数控深孔钻床

ZSK2104E-Series Cvc Deep Hole Drilling Machine

ZSK2104E 型数控深孔钻床  
ZSK2104E-Series Cvc Deep Hole Drilling Machine



### 产品介绍 Product introduction

本机床是用于钻削圆柱形棒料的深孔加工设备，它是一种高效、高精度、高自动化的采用内内外组合排屑法(枪钻法和BTA)钻削小孔的机床。通过一次连续钻削即可达到一般需要钻、扩、铰工序才能保证的加工质量。孔径精度为 IT7-IT10，表面粗糙度 Ra3.2-0.04 μm，孔中心线直线度每 100mm 长度上 ≤0.05mm。

This machine is a kind of special deep hole drilling machine with high Efficiency, high accuracy and high automation and with gun drilling process. This machine is CNC control and workpiece will be fixed on platform when drill. Workpiece is fixed on platform. There are two position setting blocks at left side of workpiece ( looks from operator side ) to catch the workpiece with no Longitudinal movement. At front side there is a position setting block to set workpiece position. The workpiece is manually clamped by a pressing pad. Drilling accuracy H7 ~ H10, roughness Ra≤3.2 μm, Alignment less than 1/1000mm

### 主要技术规格及性能 Main Specifications and Features

|                       | 技术规格 SPECIFICATION                           | 参数 TECHNICAL DATA             |
|-----------------------|--|-------------------------------|
|                       |  | ZSK2104E                      |
| 工作范围<br>Capacity      | 钻孔直径范围 Range drilling dia                    | Φ5-Φ25 ( 枪钻 ) Φ20-Φ40 ( BTA ) |
|                       | 钻孔最大深度 Max. boring depth                     | 1500mm                        |
|                       | 工件夹持直径范围 Workpiece clamped dia. range        | Φ20 - 80mm                    |
| 主轴<br>Spindle         | 主轴中心高 Height from spindle center to bed      | 120mm                         |
|                       | 主轴转速范围 Range of spindle speed                | 60r/min                       |
| 进给<br>Feeds           | 进给速度范围 ( 无级 ) Feed speed range ( infinite )  | 5 ~ 200mm/min                 |
|                       | 拖板快速移动速度 Carriage rapid-moving speed         | 2m/min                        |
| 电机<br>Motors          | 主电机功率 Main motor power                       | 5.5kW                         |
|                       | 液压泵电机功率 Hydraulic motor power                | 1.5kW, n=1440r/min            |
|                       | 进给电机功率 Feed motor power                      | 3kW ( 伺服电机 )                  |
|                       | 冷却泵电机功率 Cool motor power                     | 7.5kWx2group                  |
| 其他<br>Others          | 冷却系统额定压力 Rated pressure of cooling system    | 1-10MPa                       |
|                       | 冷却系统流量 Flow of cooling system                | 100、200、300、400L/min          |
| 钻杆箱<br>Boring bar box | 钻杆箱转速范围 Range of spindle speed(drilling box) | 100 ~ 3000r/min 6 kinds       |
|                       | 钻杆箱电机功率 Drilling box motor power             | 15kW                          |

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## 2MSK2180/2MSK21100型数控深孔强力珩磨机床

MSK2180/2MSK21100 CNC deep hole strong honing machine



### 产品介绍 Product introduction

2MSK2180/2MSK21100 数控深孔强力珩磨机床适用于圆柱形深孔工件的珩磨及抛光加工，例如：各种液压油缸、汽缸等精密管件。对带有台阶孔的工件进行珩磨及抛光加工。其加工孔径精度可达 IT8 ~ IT9 级或以上，表面粗糙度可达到 Ra0.2 ~ 0.4  $\mu\text{m}$ 。采用局部珩磨，可修整被加工件的锥度、椭圆度及局部孔径误差。对于一些冷拔钢管，可以直接进行强力珩磨。2MSK2180/2MSK21100 数控深孔强力珩磨机床是一种高精度、高效率的理想设备。

2MSK2180/2MSK21100 数控深孔强力珩磨机床配备 KND 数控系统，交流伺服电机，磨杆箱采用 2 档无级调速；采用齿轮齿条实现珩磨头的往复运动，可以精确的控制珩磨的位置。同时采用双直线导轨，具有较高的使用寿命和较高的精度。珩磨头采用液压定压扩张，砂条的珩磨力稳定不变，以保证工件的圆度和圆柱度。珩磨压力可以根据需要调整，并设置高低压控制，在操纵台上就可以轻松实现粗、精珩的转换。机床的其他配置如：液压阀、自动润滑站等采用名牌产品。

另外，2MSK2180/2MSK21100 数控深孔强力珩磨机床的数控系统、直线导轨、液压阀等配置都可以根据用户要求选配或指定。

2MSK2180/2MSK21100 CNC high efficiency deep-hole honing machine is equipment suitable for honing and burnishing cylindrical deep-hole parts such as various cylinders. This machine is specially for honing and burnishing step holes and the hole diameter accuracy of machined workpiece can be up to and over IT8~IT9, and the surface roughness reach Ra 0.2~0.4  $\mu\text{m}$ . It can also repair and maintain taper and ellipticity of machined workpiece with the help of partial honing. It can directly perform high efficiency honing of cold drawing steel pipes. 2MSK2180/2MSK21100 is an ideal equipment for deep-hole machining with high accuracy and high efficiency.

This machine is mated with KND CNC system, AC servo motor, honing box adopts stepless speed. It mated with high accuracy racks and gears to realize the reciprocating of honing head and it can control the honing position too. This machine is mated with double linear guide way, so it has long life and high accuracy. The honing head adopt hydraulic constant pressure expanding, sand blades always maintain constant pressure to be sure the roundness and cylinder of the workpiece. The honing pressure can be adjusted according to requires and it is device high and low pressure control to realize the rough and finish honing on the operate station. The machine's other equipments such as hydraulic valve, automatic lubricate station are use the well-known brand products. Otherwise, the CNC system, linear guide way and hydraulic valve can be chosen by customer.

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2MSK2180/2MSK21100 型数控深孔强力珩磨机床  
MSK2180/2MSK21100 CNC deep hole strong honing machine



### 主要技术规格及性能 Main Specifications and Features

|                    | 技术规格 SPECIFICATION                                   | 参数 TECHNICAL DATA                  |                                    |
|--------------------|--|------------------------------------|------------------------------------|
|                    |  | 2MSK2180                           | 2MSK21100                          |
| 工作范围<br>Capacity   | 珩磨孔直径范围 Range of honing diameter                     | $\Phi 100 \sim \Phi 800\text{mm}$  | $\Phi 100 \sim \Phi 1000\text{mm}$ |
|                    | 珩磨孔最大深度 Max honing depth                             | 1 ~ 20m                            |                                    |
|                    | 工件固定托架夹持直径范围 Workpiece clamped diameter range        | $\Phi 100 \sim \Phi 1000\text{mm}$ | $\Phi 100 \sim \Phi 1200\text{mm}$ |
| 主轴<br>Spindle      | 主轴中心高（高低床身）Spindle center height                     |                                    |                                    |
|                    | 珩磨杆至床体导轨 Honing box to Guide                         | 350mm                              |                                    |
|                    | 工件中心线至床体导轨 Workpiece to Guid                         | 1000mm                             |                                    |
| 珩磨杆箱<br>Honing Box | 珩磨杆箱主轴转速范围 Speed range of honing box                 | 20 ~ 125r/min; 2档 档内无级             |                                    |
| 进给 Feeds           | 进给速度范围（无级）Feed speed range ( infinite )              | 1 ~ 10m/min; 无级调速                  |                                    |
| 电机<br>Motors       | 珩磨杆箱电机功率 Main motor of honing box                    | 22kW变频调速                           | 30kW变频调速                           |
|                    | 液压泵电机功率 Hydraulic motor power                        | 1.5kW                              |                                    |
|                    | 往复电机功率 Motor of honing box reciprocating speed       | 11kW                               | 15kW                               |
|                    | 冷却泵电机功率 Cool motor power                             | 750W x 2                           |                                    |
|                    | 磨头扩张油泵电机 Motor power of honing head expanding system | 1.5kW                              |                                    |
| 其他<br>Others       | 导轨宽度 Guide rail width                                |                                    |                                    |
|                    | 珩磨杆支撑导轨面 Guide of Honing box                         | 650mm                              |                                    |
|                    | 工件支撑导轨面 Guide of Workpiece                           | 1200mm                             |                                    |
| 数控系统 CNC           | 冷却系统流量 Flow of coolant pump                          | 100x2L/min                         |                                    |
|                    | 北京 KND( 标配 ) 或用户指定                                   |                                    |                                    |

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## TS21100G/TS21160G重型深孔钻镗床

TS21100G/TS21160G Deep Hole Drilling & Boring Machine



### 产品介绍 Product introduction

该机床为深孔加工机床，可完成大直径重型零件深孔的钻，镗和套料加工。加工时工件低速旋转，刀具高速旋转并给。钻孔时采用 BTA 内排屑的工艺方式；镗孔时采用镗杆内供切削液向前（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，刀杆和专用工装夹具。根据加工的需要，机床配有钻（镗）杆箱，刀具可旋转并给。

This machine is a deep-hole working machine, who can support the process of drilling, boring and trepanning manufacturing of big diameter workpiece. While working, the workpiece rotates slowly and the tool rotates in high-speed and feed. It use BTA during the drilling work and forward chip removal while boring. As for the trepanning process we use extra chip removal technique which demand professional trepanning tools. According to the needs of manufacturing, a boring spindle box is equipped to the machine so the boring tools could rotate and feed.

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TS21100G/TS21160G 重型深孔钻镗床  
TS21100G/TS21160G Deep Hole Drilling & Boring Machine



### 主要技术规格及性能 Main Specifications and Features

|                     | 技术规格 SPECIFICATION                                       | 参数 TECHNICAL DATA         |          |
|---------------------|--|---------------------------|----------|
|                     |  | TS21100G                  | TS21160G |
| 工作范围<br>Capacity    | 钻孔直径范围 Range drilling dia                                | Φ60 ~ Φ160mm              |          |
|                     | 镗孔直径范围 Max. drilling dia                                 | Φ80 ~ Φ1600mm             |          |
|                     | 镗孔最大深度 Max. boring depth                                 | 1 ~ 20m                   |          |
|                     | 套料直径范围 Range trepanning Dia                              | Φ140 ~ Φ700mm             |          |
|                     | 工件夹持直径范围 Workpiece clamped dia. Range                    | Φ270 ~ Φ2000              |          |
|                     | 机床最大承重 Max.Weight  | 90t                       |          |
| 主轴<br>Spindle       | 主轴中心高 Height from spindle center to bed                  | 1250mm                    | 1450mm   |
|                     | 床头箱主轴孔径 Spindle bore dia.                                | Φ70mm                     |          |
|                     | 床头箱主轴前端锥孔 Taper of spindle bore                          | Φ140mm 1:20               |          |
|                     | 床头箱主轴转速范围 Range of spindle speed                         | 3 ~ 115r/min; 无级          |          |
| 钻杆箱<br>Drilling Box | 钻杆箱主轴孔径 Spindle bore dia. of drilling box                | Φ120mm                    |          |
|                     | 钻杆箱主轴前端锥孔 Taper of spindle bore(drilling box)            | Φ140mm 1:20               |          |
|                     | 钻杆箱主轴转速范围 Range of spindle speed(drilling box)           | 16 ~ 270r/min ;12级        |          |
| 进给<br>Feeds         | 进给速度范围 Feed speed range                                  | 0.5 ~ 500mm/min; 无级       |          |
|                     | 拖板快速移动速度 Carriage rapid-moving speed                     | 4m/mi                     |          |
| 电机<br>Motors        | 主电机功率 Main motor power                                   | 110kW                     |          |
|                     | 钻杆箱电机功率 Drilling box motor power                         | 45kW                      |          |
|                     | 液压泵电机功率 Hydraulic motor power                            | 1.5kW                     |          |
|                     | 授油器移动电机功率 Oil cooler rapid motor power                   | 5.5kW                     |          |
|                     | 进给电机功率 Feed motor power                                  | 11kW                      |          |
|                     | 冷却泵电机功率 Cool motor power                                 | 5.5kWx2+11kWx3            |          |
|                     | 机床电机总功率（约） Total power                                   | 210kW                     |          |
|                     | 导轨宽度 Guide rail width                                    | 1600mm                    |          |
| 其它<br>Others        | 冷却系统额定压力 Rated pressure of cooling system                | 2.5MPa                    |          |
|                     | 冷却系统最大流量 Flow of cooling system                          | 200、400、600、800、1100L/min |          |
|                     | 液压系统额定工作压力 Rated working pressure for hydraulic system   | 6.3MPa                    |          |
|                     | 授油器承受最大轴向力 Oil cooler grant bearing max. axial force     | 68kN                      |          |
|                     | 授油器对工件的最大顶紧力 Oil cooler grant max. preload for workpiece | 20kN                      |          |

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# 刀具和辅具篇

## Tool aids articles

### ZJ 型机夹可转位 BTA 深孔钻头 ZJ Indexable BTA deep-hole drill head

该钻头选用优质进口可转位涂层刀片，具有加工效率高，转换刀片方便，刀体可长期使用，刀具消耗费用低等多种特点，可加工碳素钢、高强度合金钢、不锈钢等多种材料。

This kind of drill head use imported indexable coated insert. It is characterized by its efficiency. It is practical to change insert which could be used for a long time to reduce the consumption. This drill head can manufacture the material like carbon steel, high strength alloy steel, stainless steel etc.

| 钻头规格 (mm) | 配用钻杆 (mm) | 钻头规格 (mm) | 配用钻杆 (mm) |
|-----------|-----------|-----------|-----------|
| Φ28-29.9  | Φ25       | Φ60-69.9  | Φ56       |
| Φ30-34.9  | Φ27       | Φ70-74.9  | Φ65       |
| Φ35-39.9  | Φ30       | Φ75-84.9  | Φ70       |
| Φ40-44.9  | Φ35       | Φ85-104.9 | Φ80       |
| Φ45-49.9  | Φ40       | Φ105-150  | Φ100      |
| Φ50-59.9  | Φ43       |           |           |



### TJ 型机夹可转位深孔粗 (半精) 镗头 TJ Indexable deep-hole rough boring head (semi-fine)

该刀具为单刃可转位刀片结构，适用于深孔的粗、半精加工。  
This boring head is single blade indexable construction, suitable to rough or semi-fine machining of deep-hole.

| 镗头规格 (mm) | 配用镗杆 (mm) | 镗头规格 (mm)  | 配用镗杆 (mm) |
|-----------|-----------|------------|-----------|
| Φ38-42.9  | Φ35       | Φ88-107.9  | Φ80       |
| Φ43-47.9  | Φ40       | Φ108-137.9 | Φ100      |
| Φ48-60.9  | Φ43       | Φ138-177.9 | Φ130      |
| Φ61-72.9  | Φ56       | Φ178-249.9 | Φ160      |
| Φ73-77.9  | Φ65       | Φ250-499.9 | Φ220      |
| Φ78-87.9  | Φ70       | Φ500-1000  | Φ360      |



### JT 型深孔精镗头 JT Deep-hole fine boring head

该镗头采用矩形浮动镗刀块结构，适用于深孔的精镗削加工。  
This boring head use rectangular floating boring blade construction, suitable to the fine boring machining.

| 镗头规格 (mm) | 配用镗杆 (mm) | 镗头规格 (mm)  | 配用镗杆 (mm) |
|-----------|-----------|------------|-----------|
| Φ38-42.9  | Φ35       | Φ88-107.9  | Φ80       |
| Φ43-47.9  | Φ40       | Φ108-137.9 | Φ100      |
| Φ48-60.9  | Φ43       | Φ138-177.9 | Φ130      |
| Φ61-72.9  | Φ56       | Φ178-249.9 | Φ160      |
| Φ73-77.9  | Φ65       | Φ250-499.9 | Φ220      |
| Φ78-87.9  | Φ70       | Φ500-1000  | Φ360      |



### JT 型深孔精镗头专用刀块 JT Professional block of deep-hole fine boring head

该刀块采用硬质合金焊接结构，长度方向可微量调整，刀块与精镗刀体之间采用浮动联接，适用于深孔的精加工。  
This block use hard alloy welding construction, its length could be adjusted lightly, we use floating connection between the block and the cutters to adapt to the fine deep-hole machining.

| 刀方尺寸 (mm) | 适用镗头规格 (mm) |
|-----------|-------------|
| 12X25     | Φ40-59.9    |
| 16X30     | Φ60-74.9    |
| 16X40     | Φ75-89.9    |
| 20X50     | Φ90-139.5   |
| 25X50     | Φ140-199.9  |
| 50X80     | Φ200-600    |



### ZT 型深孔套料钻 ZT Deep-hole trepanning head

套料钻，又称环形钻，它是一种可以在实心棒料端面上加工出一个孔，并且留下一根芯棒的切削刀具。套料加工，可以节约材料，减少机床的动力消耗。

Trepanning head, namely circle driller, is a kind of cutter which can produce a hole at an end face of solid bar and leave a core bar. Trepanning process can economize material and reduce the consumption of power.



### G 型深孔滚压头 G Deep-hole roller burnishing head

该滚压头采用圆锥滚子，直径可微调，适用于深孔的光整加工，具有操作使用方便，加工效率高等特点。  
This roller burnishing head use tapered roller, the diameter can be adjusted lightly, suitable to the finishing process of deep-hole. It benefits of some characteristic like easy to control and very efficiency.

| 镗头规格 (mm) | 配用镗杆 (mm) | 镗头规格 (mm)  | 配用镗杆 (mm) |
|-----------|-----------|------------|-----------|
| Φ40-42.9  | Φ35       | Φ88-107.9  | Φ80       |
| Φ43-47.9  | Φ40       | Φ108-137.9 | Φ100      |
| Φ48-60.9  | Φ43       | Φ138-177.9 | Φ130      |
| Φ61-72.9  | Φ56       | Φ178-249.9 | Φ160      |
| Φ73-77.9  | Φ65       | Φ250-500   | Φ220      |
| Φ78-87.9  | Φ70       |            |           |



### TGG 型组合镗滚头 TGG Combined boring & roller burnishing head

该组合头采用一镗、两次滚压的加工方式，将镗削和滚压合为一次走刀完成，既可保证加工质量，大大提高了效率。

In manner of one boring two rolling, this modular machine combine the boring and rolling process to finish the work in one time. This can not only guarantee the quality but also promote the efficiency.

| 镗头规格 (mm) | 配用镗杆 (mm) | 镗头规格 (mm)  | 配用镗杆 (mm) |
|-----------|-----------|------------|-----------|
| Φ63-72.9  | Φ56       | Φ108-137.9 | Φ100      |
| Φ73-77.9  | Φ65       | Φ138-177.9 | Φ130      |
| Φ78-87.9  | Φ70       | Φ178-249.9 | Φ160      |
| Φ88-107.9 | Φ80       | Φ250-500   | Φ220      |





## MS 型深孔珩磨头 MS Deep-hole honing head

该珩磨头适用于深孔的精密及光整加工。

This honing head is suitable for finishing working of deep-hole.

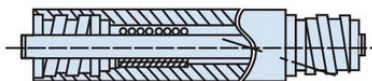
| 珩磨头规格 (mm) | 珩磨杆 (mm) | 珩磨头规格 (mm) | 珩磨杆 (mm) |
|------------|----------|------------|----------|
| Φ38-49.9   | Φ35      | Φ200-349.9 | Φ100     |
| Φ50-79.9   | Φ45      | Φ350-499.5 | Φ130     |
| Φ80-119.9  | Φ70      | Φ500-1000  | Φ230     |
| Φ120-200   | Φ85      |            |          |



## 珩磨杆 Honing bar

该珩磨杆由外管与芯杆等零件组成，芯杆可调节珩磨头的胀缩，杆长分为 1 米、1.2 米、1.5 米、2 米等多种规格，以适应不同机床不同加工深度的需要，珩磨杆与磨头的规格对应情况见磨头部分。

This honing bar is consisted of extermal bar and core pole which can adjust the length of honing bar varying from 1m, 1.2m, 1.5m, 2m to adapt to different machine and different needs. The match of honing bar and honing head is noted in the part of honing head.



## 钻镗杆 Boring bar

该钻杆可与相应的钻头、镗头、滚压头联接，规格对应情况见本网站中相应的刀具部分。杆长有 0.5 米、1.2 米、1.5 米、1.7 米、2 米等，以适应不同机床，不同加工深度的需要。

This boring bar could be joint to homologize bit, boring head and rolling head. For the standard, please search related part of our site. The length of boring bar could be 0.5m, 1.2m, 1.5m, 1.7m, 2m etc, to adapt to different machine and different needs.



## 锥套 Taper sleeve



## 辅具 Accessories



还可以根据用户要求设计制作专用深孔刀具，如胀刀、成型刀等。

We can make professional deep-hole tool according to clients demand, like rose cutter, profiled cutter etc.

注：以上各表所列标准品种、规格，客户如有特殊要求，可特殊订货。

Note: the above table for standard varieties, specifications, for the special requirements of customers, available on special order.

## 服务篇 Service Articles

一流的品牌，一流的品质，更有一流的服务，德州三嘉机器制造有限公司坚持以用户为中心，市场为导向，建立了贯穿产品售前、售中到售后的服务网络，优秀的专业研发团队、强大的生产制造能力、严格的质量保证体系、快捷的市场响应机制、完善的售后服务网络，为客户提供高品质的市场服务，用户的满意就是我们工作的新起点。

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在我公司制造的每一台机床，无论是从售前、售中还是售后，都将受到最严格的监督、最优质、最完善的售后服务，我们一直坚持“客户至上、全心全意、至诚至信、顾客满意”的质量方针，为您打造最优质的产品！

1. 购买我公司的产品，享有免费安装调试的服务，（合同有其他规定的除外）。
2. 在保修期内机床出现故障，先请您按“使用说明书”的有关注意事项中的有关条款对照处理，如果故障排除不了，请来入、来电、来函或传真与我们联系，接到通知我们将在 48 小时之内做出答复或派出服务人员，并保证故障及时排除，机床运转正常。
3. 保修期满后，我公司将以最优惠的价格为您修理或更换备件，但无论何种情况，您将享受我们终生的服务。
4. 对于重型机床或专机产品，我们将严格执行用户监督制和公司内验收制度。

## promise

Every machine we made, no matter before-selling, selling or after-selling, will receive the most strict surveillance, the best, the most complex after-selling service. We always insist our quality project "Sincerity Genuiness Faith Satisfaction", to provide the best production.

1. You benefit the serviec of free installation,(except the other provision in contrat)
2. If the machine has malfunction during warranty, please firtly solve the problem according to the related provision in the "operation manual". If the problem could not be repaired, please connect us by telephone, letter fax or coming personally, we will give you an answer or send you a servcie staff in 48 hours after the receive of information, and promise that the problem could be solved in time.
3. After the warranty, our company will repair or change the component with preferential price. But no matter what kind of situation, you will benefit our service whole life.
4. As for the heavy machine tools or private machine production, we will adapt strictly the client supervision system and intern check and acception system.





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progress, take-off, Dezhou Sanjia machine manufacturing  
company has already sounded the most loudly horn and scaled  
the heights, with the fascination of forging a splendid dream, to  
advance for a new prospect of market!

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