

# AKD

**Accuracy**  
精度，追求精准

**Kind**  
友善的，对待客户、员工、股东真诚、友善

**Design**  
设计，原创和创新

# AKD®



/PROFESSIONAL/R&D/PRODUCTION/  
NEW BENCHMARK FOR HIGH-PRECISION TRANSMISSION PRODUCTS

/专业/研发/生产/  
高精度传动产品新标杆



400-189-1896

www.szjwdcd.com



公司官网



公众号



模组寿命校验



选型网站png

深圳市金旺达机电有限公司  
Shenzhen Jinwangda Electromechanical Co., Ltd  
金旺达机电(江苏)有限公司  
Jinwangda Electromechanical(Jiangsu)Co., Ltd  
金旺达精密科技(天津)有限公司  
Jinwangda Precision Technology (Tianjin) Co., Ltd  
爱可的工业机器人(深圳)有限公司  
AKD Industrial Robot(Shenzhen)Co., Ltd

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- 东莞地址: 东莞市大朗镇石厦村金沙岗一路7号华盛智博7栋整栋(办公室5栋8楼)
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品牌 / 科技 / 服务  
Brand / Technology / Service

# COMPANY INTRODUCTION

## —— 公司简介



金旺达集团（品牌AKD）是一家专注于精密传动与高端自动化核心零部件研发制造的高新技术企业集团，以深圳金旺达机电和天津金旺达精密科技为核心，集研发、设计、生产、销售与服务为一体，致力于为全球高端自动化行业提供高可靠、高性能的核心零部件与系统解决方案。

集团南北双核协同发展：深圳公司定位于研发与高端产品创新，主营直线导轨、滚珠丝杆、模组、直线电机、DD马达等产品，广泛应用于半导体、3C电子、新能源、机器人等领域；天津公司聚焦精密传动部件的规模化制造与全球服务，主营行星减速机、摆线RV减速器、中空旋转平台、齿轮齿条及润滑系统，产品重点覆盖工业机器人、高端机床、智慧仓储、汽车产线、航空航天等高端智能装备场景。

集团坚持技术驱动，构建了从材料研发、结构设计到精密制造与性能测试的全链创新体系，已获多项专利及软件著作权，制造端引进日本、德国等国际顶尖设备，实现全流程精密管控。

秉承“零缺陷”质量理念，金旺达全面贯彻ISO9001体系，产品通过CE、ROHS等认证，以100%出厂合格率赢得海内外客户信任。产品远销全球，在半导体、机器人、新能源、医疗设备等市场树立品牌声誉。未来，集团将继续秉持“务实、创新”的价值观，信+坚持的理念，携手全球伙伴推动行业进步。

# CORPORATE CULTURE

## —— 企业文化



### 企业愿景

成为客户高性价比、长期可靠的合作伙伴！  
成为自动化核心零部件标杆品牌！

Become a cost-effective and long-term reliable partner for customers!  
Become a benchmark brand for automation core components!



### 企业使命

让工业设计更精准、操作更简单！

Make industrial design more precise and easier to operate!



### 核心价值观

务实、创新！

Practical and innovative!



### 理念

信+坚持

Believe+persist

## AKD-时刻在你身边

AKD-ALWAYS BY YOUR SIDE

我们的产品主要广泛应用于航空航天产业、工业机床产业、医疗产业、军事产业、电子产业、机械产业等，同样运用于切割、喷墨印刷、加工、CNC系统、印刷、包装、纺织、塑胶装备和自动化产业。

Our products are widely used in the aerospace industry, industrial machine tool industry, medical industry, military industry, electronics industry, machinery industry, etc. They are also used in cutting, inkjet printing, processing, CNC systems, printing, packaging, textile, plastic equipment and automation industries.



### 机床和制造系统

MACHINE TOOLS AND  
MANUFACTURING  
SYSTEM

AKD在大型龙门加工中心推出了高精密AB系列减速机,在激光切割设备推出了精密型AD系列盘式输出减速机。龙门式机床对减速机的稳定性要求非常苛刻,这两款减速机即保证了传达的极高精度又具有极强的稳定性,轻松应对各种繁杂苛刻的使用工况。

AKD has launched high-precision AB series reducers in large gantry machining centers and precision AD series disc output reducers in laser cutting equipment.



### 食品包装机械 生物制药设备 输送线

FOOD PACKAGING  
MACHINERY  
BIOPHARMACEUTICAL  
EQUIPMENT  
CONVEYOR LINE

AKD在食品包装机械、生物制药设备和物流运输线等领域提供全方位的运动控制解决方案。

AKD provides comprehensive motion control solutions in the fields of food packaging machinery, biopharmaceutical equipment, and logistics conveyor lines.



### 新能源光伏& 锂电行业自动化

NEW ENERGY PHOTO-  
VOLTAICS&  
AUTOMATION IN THE  
LITHIUM BATTERY  
INDUSTRY

创新的齿轮箱产品保证了在高速运转下的稳定性、同步精度和长久精确度-是高品质的制程及其他连续工作应用的完美解决方案。

Innovative gearbox products ensure stability, synchronization accuracy, and long-term precision under high-speed operation - the perfect solution for high-quality processes and other continuous work applications.



### 智能仓储搬运和 立体仓储领域

INTELLIGENT WARE-  
HOUSING AND  
THREE-DIMENSIONAL  
WAREHOUSING FIELD

地面执行单元AGV行走轮、顶升机构、旋转机构,四向穿梭车顶升机构和行走机构,提供全方位非标定制,提供减速机电机一体化解决方案。

Ground execution unit AGV walking wheels, lifting mechanism, rotating mechanism, four-way shuttle roof lifting mechanism and walking mechanism, providing all-round non-standard customization, and providing integrated solutions for reducer motors.



### 机器人技术 自动化技术

ROBOT TECHNOLOGY  
AUTOMATION TECH-  
NOLOGY

机械手技术多种多样的伺服齿轮箱和机械传动系统,从经济型到高端型应有尽有、可应用于各种机器人及其辅助轴上、例如传动轴和工位控制装置。

The robotic arm technology offers a wide range of gear boxes and mechanical transmission systems, ranging from economical to high-end models, and can be applied to various robots and their auxiliary shafts, such as transmission shafts and workstation control devices.



### 航空航天 军工船舶

AEROSPACE  
MILITARY SHIP

AKD在军工领域推出方位控制齿轮箱、俯仰角控制齿轮箱、推进器、高精度回转平台、电推缸精密减速机。

AKD has launched azimuth control gearboxes, pitch angle control gearboxes, thrusters, high-precision rotary platforms, and precision electric cylinder reducers in the military industry.



## 我们的标准, 您的优势 / Our standard, your advantage

激情与专业相结合-使我们成为传动装置领域的先锋和技术领导者  
无与伦比的服务范围-我们凭借自己的团队为每一种应用开发最理想的产品  
创新启发灵感-AKD员工每天都面对的挑战  
可靠性、精度和质量-客户需求推动我们进步  
永远可靠的合作伙伴-我们与客 户共同开发合适的解决方案  
始终领先一步-凭借我们的生产深度、灵活性和交货可靠性  
国际领先-AKD无所不在

Combining passion and expertise - making us pioneers and technological leaders in the field of transmission devices  
Unparalleled service scope - we develop the most ideal products for every application with our own team  
Innovation inspires inspiration - the challenges that AKD employees face every day  
Reliability, accuracy, and quality - customer demands drive our progress  
Forever reliable partners - we work together with customers to develop suitable solutions  
Always one step ahead - with our production depth, flexibility, and delivery reliability  
International Leading - AKD Everywhere



# 产品汇总

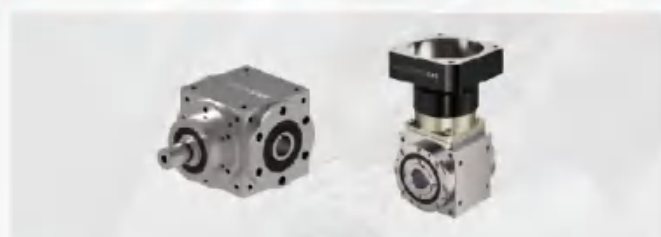
## 高精度行星减速机



## 高精度行星减速机



## 高精度伺服直交轴减速机



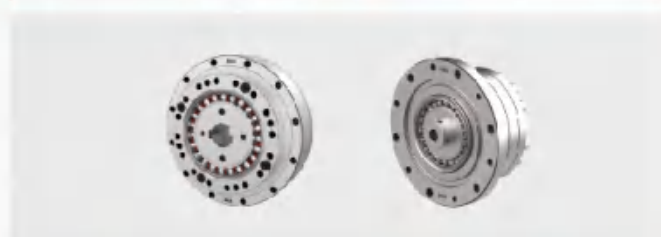
## 高精度中空旋转平台



## 高精度摆线针轮减速器



## 高精度谐波系列



## 精密直角减速器



## 精密齿轮齿条及智慧润滑系统



## AB-ABR系列 高精度行星减速机

AB-ABR Series  
High Precision Planetary Gearboxes



### 产品优势

我们可为客户定制高精度、高刚性、高扭矩的精密行星减速机，AB系列在技术方面为您提供创新和先进的解决方案以达到效率最大化。

ABR系列效率更高，运行更佳，更低的运行噪音；该系列新型产品以低运行噪音，坚实的结构及其更为简单易行的安装方式更加值得信赖。

We can customize high-precision, high rigidity, and high torque precision planetary reducers for our customers. The AB series provides innovative and advanced solutions in technology to achieve maximum efficiency.

The ABR series has higher efficiency, better operation, and lower operating noise; This new series of products is more trustworthy due to its low operating noise, solid structure, and simpler and more feasible installation method.



输出双支撑，大跨距，高稳定性。  
Output double support, large span, high stability.



斜齿设计，高咬合率，运转平滑，低噪音，低背隙。  
Oblique tooth design, high occlusion rate, even rotation, low noise, low back clearance.



出力轴为研磨光面处理，与油封搭配确保最低摩擦系数和启动负载。  
The output shaft is treated with abrasive finish and matched with oil seal to ensure minimum friction coefficient and starting load.



用螺旋伞齿轮，高精度咬合，低背隙，低噪音。  
With spiral bevel gear, high precision occlusion, low back clearance, low noise.

### 技术参数

回程间隙 Return clearance	arcmin	1-9
速比 Speed ratio	i	3-100
额定输出力矩 Rated output torque	Nm	14-2000
使用温度 Cusing temperature	℃	-10-90
噪音 The noise	dB(A)	56-70
工作效率 The work efficiency	%	97
工作寿命 The working life	h	20000

### 产品型号

<b>AB系列</b>	- AB042	- AB142	- AB285
	- AB060	- AB180	- AB330
	- AB090	- AB220	
	- AB115	- AB240	
<b>ABR系列</b>	- ABR042	- ABR142	- ABR285
	- ABR060	- ABR180	- ABR330
	- ABR090	- ABR220	
	- ABR115	- ABR240	

## AD-ADR系列 高精行星减速机

AD-ADR Series  
High Precision Planetary Gearboxes



### 产品优势

AD系列能够在设计、装配和应用上提供最大的灵活性。其突出特点是功率密度高且回程间隙低，特别适合需要高效率 and 扭转刚度的高精度应用。

ADR系列能够在设计、装配和应用上提供最大的灵活性。其突出特点是功率密度高且回程间隙低，特别适合需要高效率 and 扭转刚度的高精度应用。

The AD series provides maximum flexibility in design, assembly, and application. Its prominent features are high power density and low return clearance, making it particularly suitable for high-precision applications that require high efficiency and torsional stiffness.

The ADR series provides maximum flexibility in design, assembly, and application. Its prominent features are high power density and low return clearance, making it particularly suitable for high-precision applications that require high efficiency and torsional stiffness.



将太阳齿轮输出轴承直接设置臂架内，确保精度和同心度。  
The sun gear output bearing is directly set inside the arm frame to ensure accuracy and concentricity.



太阳齿一体式设计，确保同心度和扭转刚度。  
Integrated solar tooth design ensures concentricity and torsional rigidity.



锁紧环经动平衡分析，确保连续运转中，同心度和零滑差传递。  
The dynamic balance analysis of the locking ring ensures the concentricity and zero slip transfer in the continuous rotation.



锁紧环经动平衡分析，确保连续运转中，同心度和零滑差传递。  
The dynamic balance analysis of the locking ring ensures the concentricity and zero slip transfer in the continuous rotation.

### 技术参数

回程间隙 Return clearance	arcmin	1-9
速比 Speed ratio	i	4-100
额定输出力矩 Rated output torque	Nm	14-2000
使用温度 Cusing temperature	℃	-10-90
噪音 The noise	dB(A)	56-70
工作效率 The work efficiency	%	97
工作寿命 The working life	h	20000

### 产品型号

<b>AD系列</b>	-AD047	-AD142
	-AD064	-AD200
	-AD090	-AD255
	-AD110	
<b>ADR系列</b>	-ADR047	-ADR142
	-ADR064	-ADR200
	-ADR090	-ADR255
	-ADR110	

## AG-AGR系列 高精行星减速机

AG-AGR Series  
High Precision Planetary Gearboxes



### 产品优势

与其他斜齿减速机相比，AG系列斜齿减速机性价比更高，不仅具有高精密款的回程间隙和稳定性，还更加的经济适用。它在很多领域都能提供满足需求的最经济解决方案。

AGR系列凭借低摩擦损耗轴承的设计和经过优化的润滑功能，使其运行更佳，更低的运行噪音，坚实的结构及其更为简单易安装的方式更加值得信赖。

Compared with other helical gear reducers, AG series helical gear reducers have higher cost-effectiveness, not only with high-precision backlash and stability, but also more economical and applicable. It can provide the most economical solutions that meet the needs in many fields.

The AGR series, with its low friction loss bearing design and optimized lubrication function, operates better, with lower operating noise, solid structure, and a simpler and easier installation method, making it more reliable.



输出法兰通孔设计，容易安装。  
Output flange through hole design, easy to install.



输出轴一体化设计，确保精度和同心度。  
Output shaft integrated design to ensure accuracy and concentricity.



出力轴为研磨光面处理，与油封搭配确保最低摩擦系数和启动负载。  
The output shaft is treated with abrasive finish and matched with oil seal to ensure minimum friction coefficient and starting load.



用螺旋伞齿轮，高精度咬合，低背隙，低噪音。  
With spiral bevel gear, high precision occlusion, low back clearance, low noise.

### 技术参数

回程间隙 Return clearance	arcmin	1-9
速比 Speed ratio	i	3-100
额定输出力矩 Rated output torque	Nm	40-2000
使用温度 Cusing temperature	℃	-10-90
噪音 The noise	dB(A)	56-70
工作效率 The work efficiency	%	97
工作寿命 The working life	h	20000

### 产品型号

<b>AG系列</b>	-AG060	-AG142
	-AG090	-AG180
	-AG115	-AG220
<b>AGR系列</b>	-AGR060	-AGR142
	-AGR090	-AGR180
	-AGR115	-AGR220

## AE-AER系列 高精度行星减速机

AE-AER Series  
High Precision Planetary Gearboxes



### 产品优势

与其他斜齿减速机相比，AE系列斜齿减速机性价比更高，不仅具有高精密款的回程间隙和稳定性，还更加的经济适用。它在很多领域都能提供满足需求的最经济解决方案。

AER系列凭借低摩擦损耗轴承的设计和经过优化的润滑功能，使其运行更佳，更低的运行噪音，坚实的结构及其更为简单易安装的方式更加值得信赖。

Compared with other helical gear reducers, AE series helical gear reducers have higher cost-effectiveness, not only with high-precision backlash and stability, but also more economical and applicable. It can provide the most economical solutions that meet the needs in many fields.

The AER series, with its low friction loss bearing design and optimized lubrication function, operates better, with lower operating noise, solid structure, and a simpler and easier installation method, making it more reliable.



输出法兰通孔设计，容易安装。  
Output flange through hole design, easy to install.



输出轴一体化设计，确保精度和同心度。  
Output shaft integrated design to ensure accuracy and concentricity.



出力轴为研磨光面处理，与油封搭配确保最低摩擦系数和启动负载。  
The output shaft is treated with abrasive finish and matched with oil seal to ensure minimum friction coefficient and starting load.



用螺旋伞齿轮，高精度咬合，低背隙，低噪音。  
With spiral bevel gear, high precision occlusion, low back clearance, low noise.

### 技术参数

回程间隙 Return clearance	arcmin	1-9
速比 Speed ratio	i	3-100
额定输出力矩 Rated output torque	Nm	40-2000
使用温度 Cusing temperature	°C	-10-90
噪音 The noise	dB(A)	56-70
工作效率 The work efficiency	%	97
工作寿命 The working life	h	20000

### 产品型号

AE系列	- AE070	- AE155
	- AE090	- AE205
	- AE115	- AE235
AER系列	- AER070	- AER120
	- AER090	- AER155

## AFH-AFHR系列 高精度行星减速机

AFH-AFHR Series  
High Precision Planetary Gearboxes



### 产品优势

#### 精度特性

·背隙小于3弧分、定位精准。  
Back clearance less than 3 arc minutes, precise positioning.

#### 刚性、扭矩、负载特性

·使用整体式交叉滚子轴承，大大提高了刚性和扭矩实现高负载容量。  
The use of integral cross roller bearings greatly improves rigidity and torque to achieve high load capacity.

#### 轴向力特性

·两列圆锥滚子轴承，能提供更大的轴向力，使用于冲击力比较大的行业。  
Two row tapered roller bearings can provide greater axial force and are used in industries with high impact forces.

#### 行星轮特性

·行星轮齿面宽，模数大，实现高强度。  
The planetary gear teeth have a wide surface and a large modulus, achieving high strength.



两列圆锥滚子轴承，能提供更大的轴向力，使用于冲击力比较大的行业。  
Two rows of tapered roller bearings, which provide greater axial force, are used in high-impact industries.



优化的一体式齿圈设计保证最合理刚性。  
Optimized one-piece gear design ensures optimum rigidity.



出力轴为研磨光面处理，与油封搭配确保最低摩擦系数和启动负载。  
The output shaft is treated with abrasive finish and matched with oil seal to ensure minimum friction coefficient and starting load.



用螺旋伞齿轮，高精度咬合，低背隙，低噪音。  
With spiral bevel gear, high precision occlusion, low back clearance, low noise.

### 技术参数

回程间隙 Return clearance	arcmin	1-7
速比 Speed ratio	i	3-100
额定输出力矩 Rated output torque	Nm	40-2000
使用温度 Cusing temperature	°C	-10-90
噪音 The noise	dB(A)	56-70
工作效率 The work efficiency	%	97
工作寿命 The working life	h	20000

### 产品型号

AFH系列	- AFH060	- AFH142
	- AFH075	- AFH180
	- AFH100	- AFH210

## AL直齿系列行星减速机 ALR直齿转角系列行星减速机

AL Straight tooth series planetary reducer  
ALR Straight tooth Angle series planetary reducer



### 产品优势

采用直齿齿轮传动，经渗碳淬火处理，齿向齿廓修形处理，确保运行平稳，噪音小；

结构简单，可大批量生产，且交货期快性价比高；

减速机种类齐全，可以满足市场上绝大多数减速机的替换配合；

维护方便：在产品寿命期内无需更换润滑脂，安装更便捷。

Adopting spur gear transmission, after carburizing and quenching treatment, the tooth profile is modified to ensure smooth operation and low noise;

Simple structure, capable of mass production, fast delivery time, and high cost-effectiveness;

The variety of reducers is complete, which can meet the replacement and matching needs of the vast majority of reducers in the market;

Easy maintenance: No need to replace lubricating grease during the product's lifespan, making installation more convenient.

### 产品型号

AL系列 - AL042 - AL120  
- AL060 - AL160  
- AL080  
- AL090

ALR系列 - ALR060 - ALR120  
- ALR090 - ALR160

### 技术参数

回程间隙 Return clearance	arcmin	8-15
速比Speed ratio	i	3-100
额定输出力矩 Rated output torque	Nm	20-250
使用温度Cusing temperaturec	℃	-10-90
噪音The noise	dB(A)	58-68
工作效率The work efficiency	%	97
工作寿命The working life	h	20000

## ALE直齿系列行星减速机 ALER直齿转角系列行星减速机

ALE Straight tooth series planetary reducer  
ALER Straight tooth Angle series planetary reducer



### 产品优势

采用直齿齿轮传动，经渗碳淬火处理，齿向齿廓修形处理，确保运行平稳，噪音小；

结构简单，可大批量生产，且交货期快性价比高；

减速机种类齐全，可以满足市场上绝大多数减速机的替换配合；

维护方便：在产品寿命期内无需更换润滑脂，安装更便捷。

Adopting spur gear transmission, after carburizing and quenching treatment, the tooth profile is modified to ensure smooth operation and low noise;

Simple structure, capable of mass production, fast delivery time, and high cost-effectiveness;

The variety of reducers is complete, which can meet the replacement and matching needs of the vast majority of reducers in the market;

Easy maintenance: No need to replace lubricating grease during the product's lifespan, making installation more convenient.

### 产品型号

ALE系列 - ALE060  
- ALE090  
- ALE120

ALER系列 - ALER060  
- ALER090  
- ALER120

### 技术参数

回程间隙 Return clearance	arcmin	8-15
速比Speed ratio	i	3-100
额定输出力矩 Rated output torque	Nm	20-250
使用温度Cusing temperaturec	℃	-10-90
噪音The noise	dB(A)	58-68
工作效率The work efficiency	%	97
工作寿命The working life	h	20000

## 高精度伺服 直交轴减速机

High precision servo  
Direct axis reducer



### 产品优势

#### ■ 高强度、高精度螺旋伞齿轮

· 齿轮采用强力渗碳合金钢，研磨精密符合AGMA12级标准以内。  
The gears are made of strong carburizing carbon alloy steel, and the grinding precision meets the AGMA12 level standard.

#### ■ 低背隙

· 使用Gleason参数齿轮加工设备，加工研磨等级的螺旋伞齿轮，确保低背隙、低噪音，背隙最小可达6弧分以内。  
Using Gleason parameter gear machining equipment, process spiral bevel gears of grinding grade to ensure low backlash and low noise, with a minimum backlash of up to 6 arc minutes.

#### ■ 高扭矩密度

· 一体式齿箱体确保最大刚性与耐蚀性，结构紧凑，富有刚性的设计保证了在小体积、重量轻的情况下能够达到最高扭矩。  
The integrated gearbox body ensures maximum rigidity and corrosion resistance, with a compact structure and a rigid design that ensures the ability to operate in a small volume and light weight Achieve maximum torque.

#### ■ 多方位安装

· 多重精密加工表面易于安装，适用于任意安装方向。  
Multiple precision machined surfaces are easy to install and suitable for any installation direction.

### 产品型号

AT065L	AT075L	AT090L	AT110L	AT140L	AT170L	AT210L	AT240L	AT280L
AT065 L1	AT075 L1	AT090 L1	AT110 L1	AT140 L1	AT170 L1	AT210 L1	AT240 L1	AT280 L1
AT065H	AT075H	AT090H	AT110H	AT140H	AT170H	AT210H	AT240H	AT280H
AT065C	AT075C	AT090C	AT110C	AT140C	AT170C	AT210C	AT240C	AT280C
AT065 R1	AT075 R1	AT090 R1	AT110 R1	AT140 R1	AT170 R1	AT210 R1	AT240 R1	AT280 R1

### 技术参数

回程间隙 Return clearance	arcmin	3-6
速比Speed ratio	i	1/2
额定输出力矩 Rated output torque	Nm	12-3200
使用温度Cusing temperaturec	℃	-10-90
噪音The noise	dB(A)	68-83
工作效率The work efficiency	%	97
工作寿命The working life	h	20000

#### ■ AT轴输入转向器 减速比1/1



## AT-F 输入法兰型系列

AT-F Input Flange series



### 产品优势

#### ■ 高强度、高精度螺旋伞齿轮

· 齿轮采用强力渗碳合金钢，研磨精密符合AGMA12级标准以内。  
The gears are made of strong carburizing carbon alloy steel, and the grinding precision meets the AGMA12 level standard.

#### ■ 低背隙

· 使用Gleason参数齿轮加工设备，加工研磨等级的螺旋伞齿轮，确保低背隙、低噪音，背隙最小可达6弧分以内。  
Using Gleason parameter gear machining equipment, process spiral bevel gears of grinding grade to ensure low backlash and low noise, with a minimum backlash of up to 6 arc minutes.

#### ■ 高扭矩密度

· 一体式齿箱体确保最大刚性与耐蚀性，结构紧凑，富有刚性的设计保证了在小体积、重量轻的情况下能够达到最高扭矩。  
The integrated gearbox body ensures maximum rigidity and corrosion resistance, with a compact structure and a rigid design that ensures the ability to operate in a small volume and light weight Achieve maximum torque.

#### ■ 多方位安装

· 多重精密加工表面易于安装，适用于任意安装方向。  
Multiple precision machined surfaces are easy to install and suitable for any installation direction.

### 产品型号

AT065FL	AT075FL	AT090FL	AT110FL	AT140FL	AT170FL	AT210FL	AT240FL	AT280FL
AT065FL1	AT075FL1	AT090FL1	AT110FL1	AT140FL1	AT170FL1	AT210FL1	AT240FL1	AT280FL1
AT065FH	AT075FH	AT090FH	AT110FH	AT140FH	AT170FH	AT210FH	AT240FH	AT280FH
AT065FC	AT075FC	AT090FC	AT110FC	AT140FC	AT170FC	AT210FC	AT240FC	AT280FC
AT065FR1	AT075FR1	AT090FR1	AT110FR1	AT140FR1	AT170FR1	AT210FR1	AT240FR1	AT280FR1

### 技术参数

回程间隙 Return clearance	arcmin	6-10
速比Speed ratio	i	1-200
额定输出力矩 Rated output torque	Nm	12-3200
使用温度Cusing temperaturec	℃	-10-90
噪音The noise	dB(A)	71-84
工作效率The work efficiency	%	97
工作寿命The working life	h	20000

#### ■ AT轴输入转向器 减速比1/1



## ATX-AS精密型 输入带行星直角减速器

ATX-AS precision  
input with planetary right Angle reducer



### 产品优势

#### ■ 高强度、高精密螺旋伞齿轮

· 齿轮采用强力渗碳合金钢，研磨精度符合AGMA12级标准以内。  
The gears are made of strong carburizing carbon alloy steel, and the grinding precision meets the AGMA12 level standard.

#### ■ 低背隙

· 使用Gleason参数齿轮加工设备，加工研磨等级的螺旋伞齿轮，确保低背隙、低噪音，背隙最小可达6弧分以内。  
Using Gleason parameter gear machining equipment, process spiral bevel gears of grinding grade to ensure low backlash and low noise, with a minimum backlash of up to 6 arc minutes.

#### ■ 高扭矩密度

· 一体式箱体确保最大刚性与耐蚀性，结构紧凑，富有刚性的设计保证了在小体积、重量轻的情况下能够达到最高扭矩。  
The integrated gearbox body ensures maximum rigidity and corrosion resistance, with a compact structure and a rigid design that ensures the ability to operate in a small volume and light weight. Achieve maximum torque.

#### ■ 多方位安装

· 多重精密加工表面易于安装，适用于任意安装方向。  
Multiple precision machined surfaces are easy to install and suitable for any installation direction.

### 产品型号

ATX070AS-FL	ATX080AS-FL	ATX110AS-FL	ATX135AS-FL	ATX165AS-FL	ATX200AS-FL
ATX070AS-FL1	ATX080AS-FL1	ATX110AS-FL1	ATX135AS-FL1	ATX165AS-FL1	ATX200AS-FL1
ATX070AS-FH	ATX080AS-FH	ATX110AS-FH	ATX135AS-FH	ATX165AS-FH	ATX200AS-FH
ATX070AS-FC	ATX080AS-FC	ATX110AS-FC	ATX135AS-FC	ATX165AS-FC	ATX200AS-FC
ATX070AS-CR	ATX080AS-CR	ATX110AS-CR	ATX135AS-CR	ATX165AS-CR	ATX200AS-CR

### 技术参数

回程间隙 Return clearance	arcmin	3-8
速比Speed ratio	i	6-200
额定输出转矩 Rated output torque	Nm	49-2150
使用温度Cusing temperaturec	℃	-10-90
噪音The noise	dB(A)	62-76
工作效率The work efficiency	%	97
工作寿命The working life	h	20000

#### ■ AT轴输入转向器 减速比1/1



## ARG 系列 中空旋转平台

ARG Series  
Hollow rotatingplatform



### 产品优势

重复定位精度高；

采用高精度交叉斜角滚柱轴承，体积小、结构紧凑，可同时承载径向及轴向负荷；

中空旋转平台减速机采用硬齿面磨齿结构，具有运转平稳，高输出扭矩低噪音等特点；

旋转盘本体使用铝合金材料，全闭环高精度五轴CNC加工，及检测设备，确保各部之精密精度；

齿轮经渗碳热处理及齿轮研磨，精密精度达DIN6级以内，齿面硬度达HRC58-60度。

High precision in repeated positioning;

Adopting high-precision cross angled roller bearings, with small volume and compact structure, it can simultaneously bear radial and axial loads;

The hollow rotating platform reducer adopts a hard tooth surface grinding structure, which has the characteristics of smooth operation, high output torque, and low noise;

The rotating disc body is made of aluminum alloy material, fully closed-loop high-precision five axis CNC machining, and testing equipment to ensure the precision of each part;

The gears undergo carburizing heat treatment and gear grinding, with a precision of up to DIN6 level and a tooth surface hardness of HRC58-60 degrees.

### 技术参数

回程间隙 Return clearance	arcsec	15
速比Speed ratio	i	5-100
额定输出转矩 Rated output torque	Nm	5.2-120
使用温度Cusing temperaturec	℃	-10-90

中空旋转平台	型号	齿槽 (mm)	中空直径 (mm)	减速比
	ARG60-05k	60	28	5
	ARG60-10k			10
	ARG85-05k	85	33	5
	ARG85-10k			10
	ARG110-05k	110	35	5
	ARG110-10k			10
	ARG130-06k	130	62	6
	ARG130-10k			10
	ARG130-18k	170	72	18
	ARG170-10k			10
ARG170-18k	200	100	18	
ARG200-10k			10	
ARG200-18k	280	150	18	
ARG280-10k			10	

一体机(中空+行星)	一体机型号	中空型号	行星型号	中空行星总速比
	ARG85A	ARG85	AG060	25,35,50,70,100
	ARG110A	ARG110	AG060	25,50,70,100
	ARG130A	ARG130	AG060	30,50,70,100
	ARG170A	ARG170	AG090	30,50,70,100
	ARG200A	ARG200	AG090	30,50,70,100
	ARG280A	ARG280	AG115	30,50,70,100

一体机(中空+直角)	一体机型号	中空型号	行星型号	中空行星总速比
	ARG60Z	ARG60	AR042	10,15
	ARG85Z	ARG85	AR060	10,15,20,30
	ARG130Z	ARG130	AR060	20,30
	ARG170Z	ARG170	AR090	20,30,50
	ARG200Z	ARG200	AR090	20,30,50
	ARG280Z	ARG280	AR120	20,30,50

## 摆线针轮 ARV减速器系列

Cycloid Needle Wheel  
ARV Reducer Series



### 产品优势

具有体积小、重量轻、传动比范围大、效率高、抗冲击力强、扭矩大等优点。

啮合齿数多、间隙小、振动和惯性小等特性，能够保证平稳运转并能达到很高的传动和定位精度。

应用场景：主要应用于工业机器人、数控机床、变位机、非标自动化等行业。

It has the advantages of small size, light weight, wide transmission ratio range, high efficiency, strong impact resistance, and high torque.

The characteristics of multiple meshing teeth, small clearance, low vibration and inertia can ensure smooth operation and achieve high transmission and positioning accuracy.

Application scenarios: Mainly used in industries such as industrial robots, CNC machine tools, positioners, and non-standard automation.



### 使用环境

环境空气最高温度随季节而变化，但不超过40℃

环境空气最低温度为-10℃

The maximum temperature of the ambient air varies with the seasons, but does not exceed 40 °C

The minimum temperature of ambient air is -10 °C

## 技术参数表

ARV-E系列 减速器技术参数表

项目 Model 型号	速比值 Speed Ratio		容许力矩 Allowable Moment Nm	Torsional Rigidity 扭转刚度 N.m (Arc.min)	瞬时容许 最大转矩 Instantaneous Maximum Torque	转动精度(空转) Transmission Accuracy (Arc.min)	齿隙回差 Backlash (Arc.min)	寿命 Life h	重量 Weight kg
	轴输出	壳输出							
20E	81	80	870	48	820	0.6	1	6000	4.7
	105	104							
	121	120							
	141	140							
	161	160							
40E	81	80	1590	99	2010	0.6	1	6000	9.3
	105	104							
	121	120							
	153	152							
80E	81	80	1900	196	3600	0.6	1	6000	13.1
	101	100							
	121	120							
	153	152							
110E	81	80	2900	291	5380	0.6	1	6000	17.4
	111	110							
	161	160							
	175.28	174.28							
160E	81	80	3900	382	7800	0.6	1	6000	26.4
	101	100							
	129	128							
	145	144							
	171	170							
320E	81	80	6800	481	15600	0.6	1	6000	44.3
	101	100							
	118.5	117.5							
	129	128							
	141	140							
	171	170							
450E	81	80	8620	1076	22000	0.6	1	6000	66.4
	101	100							
	118.5	117.5							
	129	128							
	154.8	153.8							
	171	170							
	192.4	191.4							
550E	101	100	10214	1231	29400	0.6	1	6000	104.5
	121	120							
	151	150							
	181	180							
	221	220							
	277	276							

ARV-C系列减速器技术参数表

项目 Model 型号	减速机单体 减速比 Retarder Monomer Life Reduction Ratio	容许力矩 Allowable Moment Nm	Torsional Rigidity 扭转刚度 N.m (Arc.min)	瞬时容许 最大转矩 Instantaneous Maximum Torque	转动精度(空转) Transmission Accuracy (Arc.min)	齿隙回差 Backlash (Arc.min)	寿命 Life h	重量 Weigh kg t
10C	27	684	39	470	0.6	1	6000	4.6
27C	36.57	960	129	1223	0.6	1	6000	8.5
50C	32.54	1694	234	2370	0.6	1	6000	14.6
100C	36.75	2540	498	5000	0.6	1	6000	19.5
200C	34.86	8890	947	9900	0.6	1	6000	55.6
320C	35.61	20910	1870	15980	0.6	1	6000	79.5
500C	37.34	33400	3130	25000	0.6	1	6000	154
650C	38.24	45790	5263	31850	0.6	1	6000	368
800C	38.41	61005	6978	39200	0.6	1	6000	563

## AC 谐波系列

AC Harmonic series



### 产品优势

承载能力高 谐波传动中，齿与齿的啮合是面接触，加上同时啮合齿数（重叠系数）比较多，因而单位面积载荷小，承载能力较其他传动形式高；

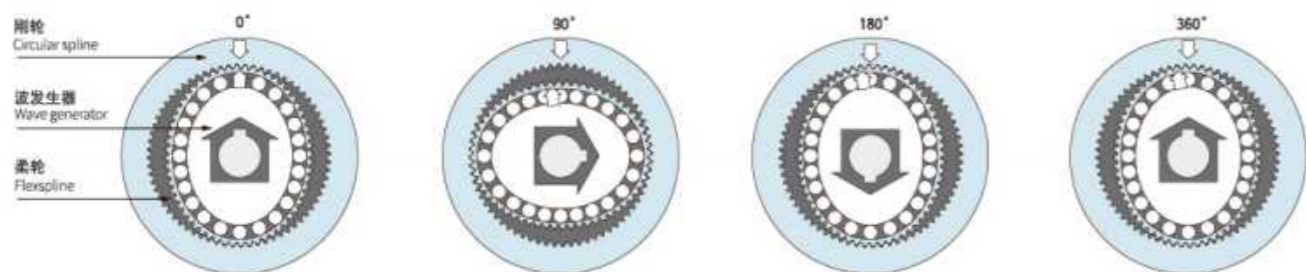
体积小、重量轻、传动效率高、寿命长、传动平稳、无冲击，无噪音，运动精度高；

广泛应用于电子、航空航天、机器人等行业，由于它的独特优点，在化工行业的应用也逐渐增多。

In high harmonic transmission with load-bearing capacity, the meshing between teeth is surface contact, and the number of simultaneously meshing teeth (overlap coefficient) is relatively high, resulting in a small load per unit area and higher load-bearing capacity compared to other transmission forms;

Small size, light weight, high transmission efficiency, long service life, smooth transmission, no impact, no noise, high motion accuracy;

Widely used in industries such as electronics, aerospace, robotics, etc., due to its unique advantages, its application in the chemical industry is gradually increasing.



柔轮被波发生器弯曲成椭圆状，因此在长轴部分刚轮和齿啮合，在短轴部分则完全与齿轮呈脱离状态。

固定刚轮，使波发生器按顺时针方向旋转后，柔轮发生弹性形变，与刚轮啮合的齿轮位置顺次移动。

波发生器向顺时针方向旋转180度后，柔轮仅向逆时针方向移动一齿。

波发生器旋转一周(360度)后，由于比刚轮减少2齿，因此柔轮向逆时针方向移动2齿，一般将该动作作为输出执行。

## ACS系列规格表

每个产品都组装有精密交叉滚子轴承用于直接支撑外部负载(输出法兰部)。

型号 Type	基本额定负载 Basic rated load				容许静力矩Mc Allowable static moment Mc		重量 Weight
	基本额定动负载Cr Basic rated dynamic load Cr		基本额定静负载Cr Basic rated static load Cr		Nm	kgfm	
	KN	kgf	KN	kgf			kg
14	4.7	480	6.07	620	41	4.2	0.22
17	5.3	540	7.55	770	64	6.5	0.3
20	5.8	590	9.0	920	91	9.3	0.38
25	9.6	980	15.1	1540	156	16	0.6
32	15	1530	25.0	2550	313	32	1.1
40	21	2170	36.5	3720	450	46	1.4

## ACD系列规格表

型号 Type	基本额定负载 Basic rated load				容许静力矩Mc Allowable static moment Mc		重量 Weight
	基本额定动负载Cr Basic rated dynamic load Cr		基本额定静负载Cr Basic rated static load Cr		Nm	kgfm	
	KN	kgf	KN	kgf			kg
14	4.7	480	6.07	620	41	4.2	0.23
17	5.3	540	7.55	770	64	6.5	0.28
20	5.8	590	9.0	920	91	9.3	0.39
25	9.6	980	15.1	1540	156	16	0.73
32	15	1530	25	2550	313	32	1.4

## AHD系列规格表

型号 Type	基本额定负载 Basic rated load				容许静力矩Mc Allowable static moment Mc		重量 Weight
	基本额定动负载Cr Basic rated dynamic load Cr		基本额定静负载Cr Basic rated static load Cr		Nm	kgfm	
	KN	kgf	KN	kgf			kg
14	2.9	296	4.3	438	37	3.8	0.2
17	5.2	530	8.1	826	62	6.3	0.24
20	7.3	744	11	1122	93	9.5	0.29
25	10.9	1111	17.9	1825	129	13.2	0.55
32	19.1	1948	32.7	3334	290	29.6	1.2

※基本额定动负载是指，使轴承的基本动态额定寿命达到100万转的一定的静止径向负载。

※基本额定静负载是指，在承受最大负载的转动体和轨道的接触部中央位置，施加一定水平的接触应力(4kN/mm<sup>2</sup>)的静态负载。

※容许静力矩是指，对输出轴承可能施加最大的力矩载荷，如在此范围内，能够保持基本性能并可工作的数值。

## AR 精密直角 减速器系列

AR Precision Right  
Angle Reducer Series



### 产品优势

-采用先进六轴精密机械加工,一次装夹同时加工完成确保最佳几何精度。

-传动齿轮经精密研制,运转低背隙、高精度。

-精密传动、寂静、稳定、顺畅、流程;连到精密传动,低噪音、高刚性等高品质要求。

-本体结构扎实、体积小,有效节省安装空间。

-虽然体积小、重量轻。但具有高扭矩输出及低背隙的优异特性。

-订购时请告知马达法兰及心轴尺寸。

-Adopting advanced six axis precision machining, the machining is completed simultaneously with one clamping to ensure optimal geometric accuracy.

-The transmission gear has been precisely developed to operate with low backlash and high precision.

-Precision transmission, silence, stability, smoothness, and process; Connected to precision transmission, high quality requirements such as low noise and high rigidity.

-The body structure is solid and the volume is small, effectively saving installation space.

-Although small in size and lightweight. But it has excellent characteristics of high torque output and low backlash.

-Please inform the size of the motor flange and spindle when placing an order.

### 规格表

说明 Description 型号 Model No.	减速比 Ratio	容许最大扭矩 Allowable Max Torque (kgf.m/N.m)	破坏力矩值 Breaking Torque (kgf.m/N.m)	容许马达转速 Allowable Max Speed (rpm/min)	背隙 Backlash (min-arc)	重量 Weight (kg)
AR042	3	1.5/15	4/40	2500	0.5	0.5
AR042S	9.12.15.21.30	1.5/15	4/40	2500	2	0.9

说明 Description 型号 Model No.	减速比 Ratio	容许最大扭矩 Allowable Max Torque (kgf.m/N.m)	破坏力矩值 Breaking Torque (kgf.m/N.m)	容许马达转速 Allowable Max Speed (rpm/min)	背隙 Backlash (min-arc)	重量 Weight (kg)
AR060	2.3.5	4.5/45	12/120	2500	0.5	1.2
AR060S	6.8.10.14.20	4.5/45	12/120	2500	2	2

说明 Description 型号 Model No.	减速比 Ratio	容许最大扭矩 Allowable Max Torque (kgf.m/N.m)	破坏力矩值 Breaking Torque (kgf.m/N.m)	容许马达转速 Allowable Max Speed (rpm/min)	背隙 Backlash (min-arc)	重量 Weight (kg)
AR090	2.3.5	12/120	32/320	2500	0.5	3.6
AR090S	6.8.10.14.20	12/120	32/320	2500	2	6.5

说明 Description 型号 Model No.	减速比 Ratio	容许最大扭矩 Allowable Max Torque (kgf.m/N.m)	破坏力矩值 Breaking Torque (kgf.m/N.m)	容许马达转速 Allowable Max Speed (rpm/min)	背隙 Backlash (min-arc)	重量 Weight (kg)
AR120	2.3.5	16/160	45/450	2500	0.5	8
AR120S	6.8.10.14.20	16/160	45/450	2500	2	15.5

## 齿条 RACKS



### 齿条订购代码

Rack ordering code

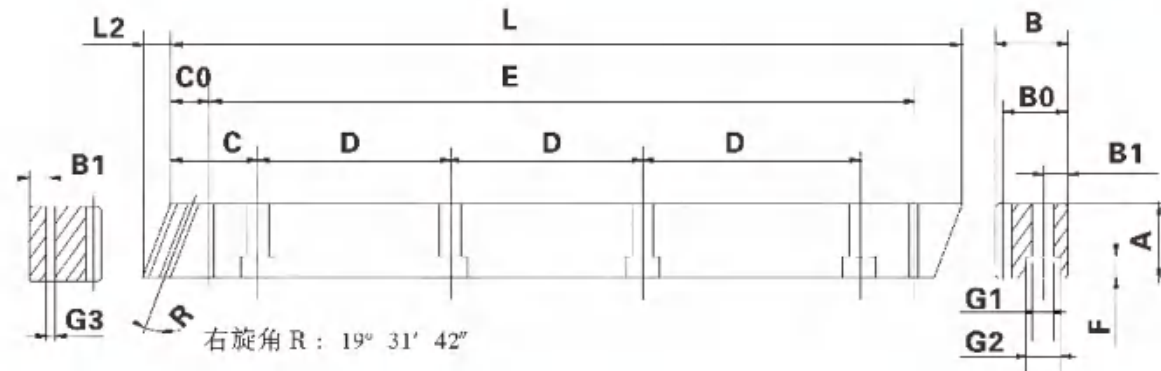
模数	材料	热处理方式	齿的角度方向	齿条长度	齿条精度等级	表面处理方式
<b>02</b>	<b>C</b>	<b>H</b>	<b>R</b>	<b>10</b>	<b>06</b>	<b>**</b>
M1.5~M12	C S45C M 42CrMo	H 齿面高周波 Q 调质	I 直齿 R 右旋 L 左旋	10 1000mm 05 500mm	06 DIN6 07 DIN7	P 喷砂 F 发黑 空白 无

## CHR 斜齿齿条

CHR Helical rack

- 精度等级 DIN6/碳钢
  - 齿厚公差:  $-22\sim 0\mu\text{m}$
  - 右旋斜齿齿条
  - 齿面高周波50~55HRC并研磨
  - 四面研磨
- Accuracy grade DIN6/carbon steel
  - Tooth thickness tolerance:  $-22\sim 0\mu\text{m}$
  - Right-handed helical gear rack
  - High frequency 50~55HRC and grinding on the tooth surface
  - Four sided grinding

右旋\*研磨\*DIN6



单位: mm

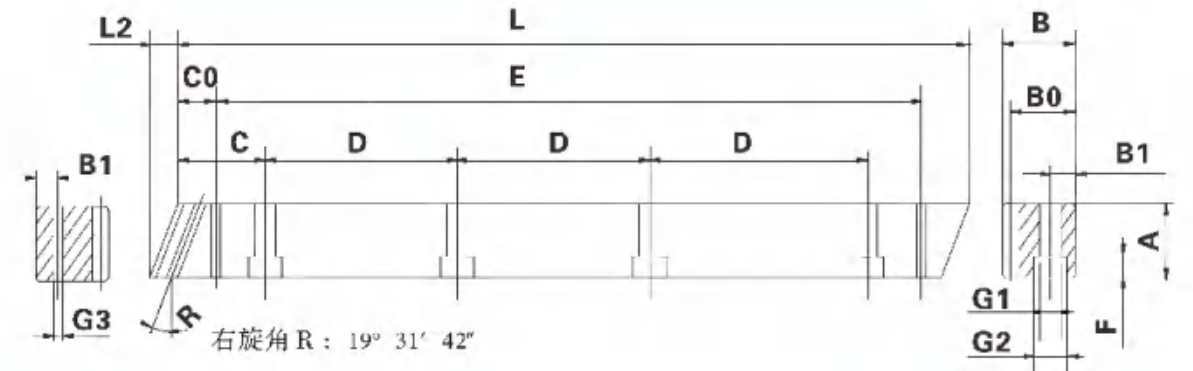
产品型号	L	L2	齿数	A	B	B0	C	D	孔数	B1	G1	G2	F	C0	E	G3
1.5CHR0506	500	6	100	17	17	15.5	62.5	125	4	8	6	9.5	7	31.7	436.6	5.7
1.5CHR1006	1000	6	200	17	17	15.5	62.5	125	8	8	6	9.5	7	31.7	936.6	5.7
02CHR0506	500	8.5	75	24	24	22	62.5	125	4	8	7	11	7	31.7	436.6	5.7
02CHR1006	1000	8.5	150	24	24	22	62.5	125	8	8	7	11	7	31.7	936.6	5.7
03CHR0506	500	10.3	50	29	29	26	62.5	125	4	9	10	15	9	35	430	7.7
03CHR1006	1000	10.3	100	29	29	26	62.5	125	8	9	10	15	9	35	930	7.7
4CHR0506	506.7	13.8	38	39	39	35	62.5	125	4	12	10	15	9	33.3	433	7.7
4CHR1006	1000	13.8	75	39	39	35	62.5	125	8	12	10	15	9	33.3	933.4	7.7
05CHR0506	500	17.4	30	49	39	34	62.5	125	4	12	14	20	13	37.5	425	11.7
05CHR1006	1000	17.4	60	49	39	34	62.5	125	8	12	14	20	13	37.5	925	11.7
06CHR0506	500	20.9	25	59	49	43	62.5	125	4	16	18	26	17	37.5	425	15.7
06CHR1006	1000	20.9	50	59	49	43	62.5	125	8	16	18	26	17	37.5	925	15.7
08CHR0506	480	28	18	79	79	71	60	120	4	25	22	33	21	120	240	19.7
08CHR1006	960	28	36	79	79	71	60	120	8	25	22	33	21	120	720	19.7
10CHR1006	1000	35.1	30	99	99	89	62.5	125	8	32	33	48	32	125	750	19.7

## CHR 斜齿齿条

CHR Helical racks

- 精度等级 DIN10/碳钢
  - 齿厚公差:  $-95\sim 0\mu\text{m}$
  - 右旋斜齿齿条
  - 齿面高周波50~55HRC并研磨
- Accuracy grade DIN10/carbon steel
  - Tooth thickness tolerance:  $-95\sim 0\mu\text{m}$
  - Right-handed helical gear rack
  - High frequency 50~55HRC and grinding on the tooth surface

右旋\*铣齿\*DIN10



单位: mm

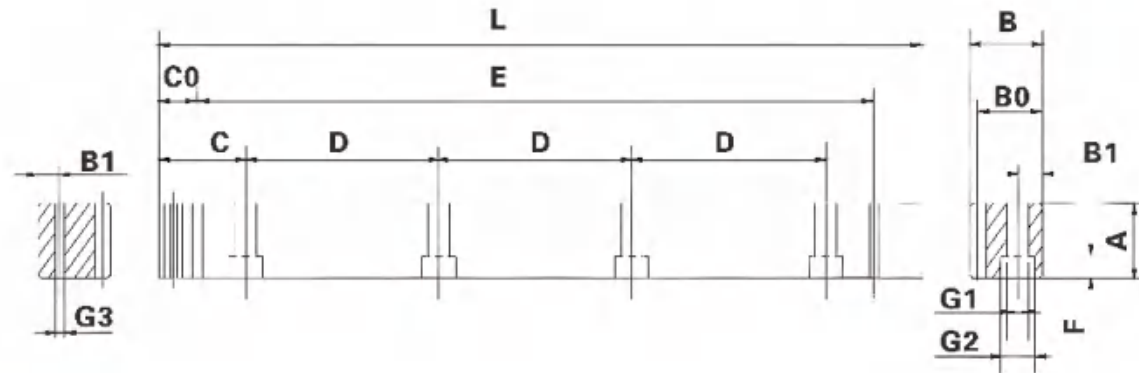
产品型号	L	L2	齿数	A	B	B0	C	D	孔数	B1	G1	G2	F	C0	E	G3
1.5CHR0510	500	6	100	17	17	15.5	62.5	125	4	8	6	9.5	7	31.7	436.6	5.7
1.5CHR1010	1000	6	200	17	17	15.5	62.5	125	8	8	6	9.5	7	31.7	936.6	5.7
02CHR0510	500	8.5	75	24	24	22	62.5	125	4	8	7	11	7	31.7	436.6	5.7
02CHR1010	1000	8.5	150	24	24	22	62.5	125	8	8	7	11	7	31.7	936.6	5.7
03CHR0510	500	10.3	50	29	29	26	62.5	125	4	9	10	15	9	35	430	7.7
03CHR1010	1000	10.3	100	29	29	26	62.5	125	8	9	10	15	9	35	930	7.7
04CHR0510	506.7	13.8	38	39	39	35	62.5	125	4	12	10	15	9	33.3	433	7.7
04CHR1010	1000	13.8	75	39	39	35	62.5	125	8	12	10	15	9	33.3	933.4	7.7
05CHR0510	500	17.4	30	49	39	34	62.5	125	4	12	14	20	13	37.5	425	11.7
05CHR1010	1000	17.4	60	49	39	34	62.5	125	8	12	14	20	13	37.5	925	11.7
06CHR0510	500	20.9	25	59	49	43	62.5	125	4	16	18	26	17	37.5	425	15.7
06CHR1010	1000	20.9	50	59	49	43	62.5	125	8	16	18	26	17	37.5	925	15.7
08CHR0510	480	28	18	79	79	71	60	120	4	25	22	33	21	120	240	19.7
08CHR1010	960	28	36	79	79	71	60	120	8	25	22	33	21	120	720	19.7
10CHR1010	1000	35.1	30	99	99	89	62.5	125	8	32	33	48	32	125	750	19.7

## CHI 直齿齿条

CHI SPUR racks

- 精度等级 DIN6/碳钢
- 齿厚公差:  $-22\sim 0\mu\text{m}$
- 直齿齿条
- 齿面高周波50~55HRC并研磨
- 四面研磨
- Accuracy grade DIN6/carbon steel
- Tooth thickness tolerance:  $-22\sim 0\mu\text{m}$
- Straight toothed rack and pinion
- High frequency 50~55HRC and grinding on the tooth surface
- Four sided grinding

直齿\*研磨\*DIN6



单位: mm

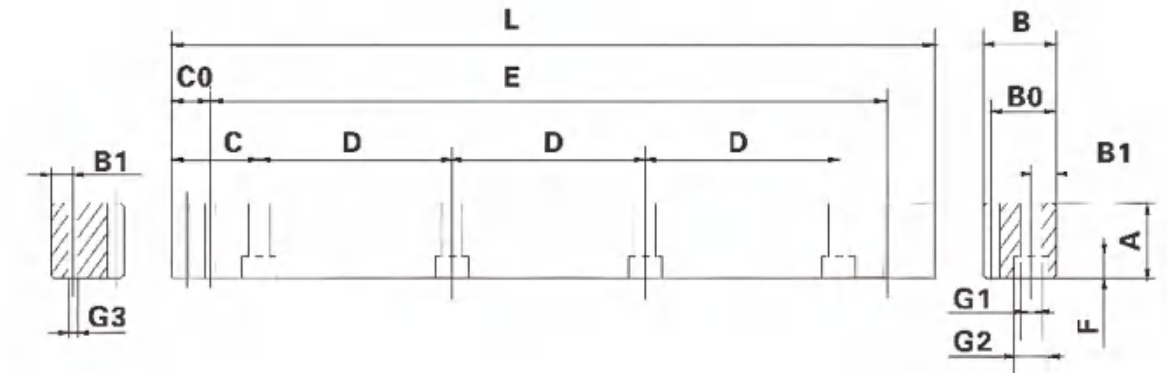
产品型号	L	齿数	A	B	B0	C	D	孔数	B1	G1	G2	F	C0	E	G3
1.5CHI0506	499.51	106	17	17	15.5	62.44	124.88	4	8	6	9.5	7	29.0	441.5	5.7
1.5CHI1006	999.03	212	17	17	15.5	62.44	124.88	8	8	6	9.5	7	29.0	941.0	5.7
02CHI0506	502.64	80	24	24	22	62.83	125.66	4	8	7	11	7	31.3	440.1	5.7
02CHI1006	1005.28	160	24	24	22	62.83	125.66	8	8	7	11	7	31.3	942.7	5.7
03CHI0506	508.95	54	29	29	26	63.62	127.23	4	9	10	15	9	34.4	440.1	7.7
03CHI1006	1017.9	108	29	29	26	63.62	127.23	8	9	10	15	9	34.4	949.1	7.7
04CHI0506	502.64	40	39	39	35	62.83	125.66	4	12	10	15	9	37.5	427.7	7.7
04CHI1006	1005.28	80	39	39	35	62.83	125.66	8	12	10	15	9	37.5	930.3	7.7
05CHI0506	502.65	32	49	39	34	62.83	125.66	4	12	14	20	13	30.1	442.4	11.7
05CHI1006	1005.31	64	49	39	34	62.83	125.66	8	12	14	20	13	30.1	945	11.7
06CHI0506	508.95	27	59	49	43	63.62	127.23	4	16	18	26	17	31.4	446.1	15.7
06CHI1006	1017.9	54	59	49	43	63.62	127.23	8	16	18	26	17	31.4	955	15.7
08CHI0506	502.64	20	79	79	71	62.83	125.66	4	25	22	33	21	26.6	449.5	19.7
08CHI1006	1005.28	40	79	79	71	62.83	125.66	8	25	22	33	21	26.6	952	19.7
10CHI1006	1005.28	32	99	99	89	62.83	125.66	8	32	33	48	32	125.6	754	19.7

## CHI 直齿齿条

CHI SPUR racks

- 精度等级 DIN10/碳钢
- 齿厚公差:  $-95\sim 0\mu\text{m}$
- 直齿齿条
- 齿面高周波50~55HRC并研磨
- Accuracy grade DIN10/carbon steel
- Tooth thickness tolerance:  $-95\sim 0\mu\text{m}$
- Straight toothed rack and pinion
- High frequency 50~55HRC and grinding on the tooth surface

直齿\*铁齿\*DIN10



单位: mm

产品型号	L	齿数	A	B	B0	C	D	孔数	B1	G1	G2	F	C0	E	G3
1.5CHI0510	499.51	106	17	17	15.5	62.44	124.88	4	8	6	9.5	7	29.0	441.5	5.7
1.5CHI1010	999.03	212	17	17	15.5	62.44	124.88	8	8	6	9.5	7	29.0	941.0	5.7
02CHI0510	502.64	80	24	24	22	62.83	125.66	4	8	7	11	7	31.3	440.1	5.7
02CHI1010	1005.28	160	24	24	22	62.83	125.66	8	8	7	11	7	31.3	942.7	5.7
03CHI0510	508.95	54	29	29	26	63.62	127.23	4	9	10	15	9	34.4	440.1	7.7
03CHI1010	1017.9	108	29	29	26	63.62	127.23	8	9	10	15	9	34.4	949.1	7.7
04CHI0510	502.64	40	39	39	35	62.83	125.66	4	12	10	15	9	37.5	427.7	7.7
04CHI1010	1005.28	80	39	39	35	62.83	125.66	8	12	10	15	9	37.5	930.3	7.7
05CHI0510	502.65	32	49	39	34	62.83	125.66	4	12	14	20	13	30.1	442.4	11.7
05CHI1010	1005.31	64	49	39	34	62.83	125.66	8	12	14	20	13	30.1	945	11.7
06CHI0510	508.95	27	59	49	43	63.62	127.23	4	16	18	26	17	31.4	446.1	15.7
06CHI1010	1017.9	54	59	49	43	63.62	127.23	8	16	18	26	17	31.4	955	15.7
08CHI0510	502.64	20	79	79	71	62.83	125.66	4	25	22	33	21	26.6	449.5	19.7
08CHI1010	1005.28	40	79	79	71	62.83	125.66	8	25	22	33	21	26.6	952	19.7
10CHI1010	1005.28	32	99	99	89	62.83	125.66	8	32	33	48	32	125.6	754	19.7