通用技术哈量公司
GENERTEC HMCT

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GEAR MEASURING INSTRUMENTS 全系列

齿轮量仪

服务专线

400-008-1952

通用技术集团哈尔滨量具刃具有限责任公司
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COMPANY
>> INTRODUCTION

企业概况

通用技术集团哈尔滨量具刃具有限责任公司(简称“通用技术哈量公司”）隶属于中央直接管理的国有重要骨干企业中国通用技术（集团）控股有限责任公司。通用技术哈量公司成立于 1952 年，是我国“一五”期间 156 项重点工程中唯一制造工量具产品的企业，被称为“中国工量具制造业的摇篮”。

通用技术哈量公司“连环（LINKS）”、“KELCH”品牌在国内外享有较高的市场知名度，企业先后被授予国家技术创新示范企业、国家知识产权优势企业、博士后科研工作站、机械工业数控工具系统工程研究中心、机械工业齿轮量仪重点实验室。

面对新的发展机遇，通用技术哈量公司深入贯彻新发展理念，突出技术创新，着力建设成为国内领先、国际一流的量具量仪及精密刀具科技型专业制造企业。

Genertec Harbin Measuring & Cutting Tool Co Ltd.(abbreviated NERTEC HMCT) is affiliated to China General Technology (Group) Holding Co., Ltd., a key state-owned enterprise directly managed by the central government. Established in 1952, GENERTEC HMCT was the only enterprise dedicated to the manufacturing of measuring and cutting tools among the 156 key projects of China's First Five-Year Plan, earning the reputation as the "Cradle of China's Measuring and Cutting Tool Industry."

The brands "LINKS" and "KELCH" under General Technology Hali enjoy significant market recognition both domestically and internationally. The company has been honored with titles such as National Technological Innovation Demonstration Enterprise, National Intellectual Property Advantage Enterprise, Postdoctoral Research Workstation, Engineering Research Center for CNC Tool Systems in the Machinery Industry, and Key Laboratory for Gear Measuring Instruments in the Machinery Industry.

In response to new development opportunities, GENERTEC HMCT thoroughly implements the new development philosophy, prioritizing technological innovation, and is committed to becoming a leading domestic and world-class scientific and professional manufacturer of measuring instruments, gauges, and precision cutting tools.

通用技术集团哈尔滨量具刃具有限责任公司办公大楼

诚信经营 信誉第一

Integrity management, Reputation first

We're scincere ...

“诚实守信”作为通用技术哈量公司员工素质训的重要内容，已化为企业的行为方式和员工的自觉行动贯穿于生产经营活动的全过程，企业一直坚持“以顾客满意为宗旨，以产品零缺陷为目标”的质量方针，不断创造着顾客满意的产品与服务。顾客的信赖是哈量创新发展的源泉和动力，哈量将以“进取在每一天”的企业精神，用先进的技术、优质的产品、真诚的服务回报我们的顾客。

As the important content of GENERTEC HMCT staff quality training, “Honest and Trustworthy” has been integrated into enterprise manners and staff conscious actions through the whole production and business activities. Enterprise maintains “Null defect of products as our goal and satisfaction of customers as our object” as the quality principal , and continuous create satisfied products and services for customers. Trust of customer is the source and power for innovation and development of GENERTEC HMCT. GENERTEC HMCT will keep the enterprise spirit “make a progress everyday” and repay customers with advanced technology, high-quality products and sincere service.

Enterprise Honor

专业优势 创新发展

Professional advantage, Innovative development

We're making innovations...

伴随着共和国成长的脚步，通用技术哈量公司经过七十余年的创新发展，其专业的研发水平、加工能力、生产规模及产品质量达到了同行业领先水平，连环牌产品以其雄厚的品牌实力和品质畅销全国及欧洲等 30 多个国家和地区，深受用户的信赖和好评。

面对新的发展机遇，通用技术哈量公司深入贯彻新发展理念，突出技术创新，着力建设成为国内领先、国际一流的量具量仪及精密刀具科技型专业制造企业。

Along with the growth of PRC, GENERTEC HMCT experiences 70 years of innovative development, the professional research and development level, processing ability, production scale and products quality have reached advanced level of same industry. With strong brand strength and excellent quality, LINKS products are well sold to more than 30 countries and areas all over domestic and abroad markets, and earns user's trust and good comments.

In the face of new development opportunities, GENERTEC HMCT implements the new development concept thoroughly, highlights technological innovation, and strives to build into a measuring instrument and precision tool technology professional manufacturing enterprise with domestic-leading measuring tool and international first-class.

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齿轮径向跳动测量仪

其他测量仪器

Gear Measuring Center Model T20/30/40/60/80

齿轮测量中心 T20/30/40/60/80 型

用 途 / APPLICATIONS

T 系列高精度三维齿轮测量中心，服务于机床、汽车制造及计量院等重点行业，用于齿轮、齿轮刀具、直齿锥齿轮、弧齿锥齿轮、RV 减速机结构件、摆线减速机结构件、转子、弧齿刀盘等工件的检测。

T-seris high-precision metrology 3D gear measurement center, serving key industries such as machine, automobile manufacture and metrology institutes, used for gears, gear cutters, spur bevel gears, spiral bevel gears, RV reducer structural parts, cycloid reducers Inspection of workpieces such as structural parts, rotors, and spiral cutters.

特 点 / FEATURES

- 测量精度高、效率高、软件功能丰富。
- 测量软件操作界面友好，便于操作。
- 采用高精度三维扫描测头、直线电机、多轴联动控制等多项先进技术。
- 具备工件装夹偏心误差修正功能。
- 可实现 RV 减速机关键部件等复杂工件检测。

- High measurement, high efficiency, and rich soft strip functions.
- Measurement software to do interface and other friends, easy to work.
- Multi-advance technology such as high-precision 3D scanning probe, linear motor, and multi-axis linkage control are used.
- Prepare the tool to include the eccentricity error correction function.
- It can be inspected by complex engineering references such as key components of speed machines.

LinksGear 三维测量软件特点

Characteristics of LinksGear 3D measurement software

- 实现了工件装卡偏心的自动补偿。
- 实现了多语言的动态切换，在不关闭软件的情况下直接切换语言。
- 齿轮测量采样频率及滤波器符合 ISO1328-2008 标准要求，也是首个对齿轮的测量数据处理提出具体要求的标准。
- 支持参数输入的图形化即符号化，降低测量人员的对专业知识的要求。
- 支持公差带的旋转，可以满足动态的判定形状而忽略角度误差因素的特定需求。

- It realizes the automatic compensation of the workpiece loading center.
- It realizes multi-lingual dynamic switching, and directly switches languages without closing the software.
- The sampling frequency and filter for gear measurement comply with the requirements of ISO1328-2008 standard, which is also the first standard to propose specific requirements for gear measurement data processing.
- Support graphical or symbolic input of parameters, reducing the demand for professional knowledge by measurement personnel.
- Supporting the rotation of tolerance zones can meet the specific needs of dynamically determining shape while ignoring angle error factors.

技术规格 / SPECIFICATIONS

单位：mm

型号 / 技术规格	T20	T30	T40	T60	T80
可测齿轮模数	≥0.5（0.2*）	≥0.5（0.2*）	≥0.5（0.2*）	≥0.5（0.2*）	≥0.5（0.2*）
可测齿轮最大外径	200	300	400	600	800
上下顶尖距离	15 - 500	15 - 500	15 - 500	20 - 800	30 - 1000
测头至下顶尖距离	5 - 380	5 - 380	5 - 380	5 - 380	10 - 600
可测螺旋角范围	0 - 90°	0 - 90°	0 - 90°	0 - 90°	0 - 90°
可测工件最大重量	300kg	300kg	300kg	400kg	1000kg
仪器净重	1500kg	1500kg	1500kg	2600kg	3000kg
仪器毛重	1700kg	1700kg	1700kg	3000kg	3500kg
仪器尺寸（长×宽×高）	1700×1060×1900	1700×1060×1900	1700×1060×1900	1900×1080×2295	2300×1365×2460
主机箱尺寸（长×宽×高）	1360×1200×2267	1360×1200×2267	1360×1200×2267	1574×1260×2047	1800×1560×2347
附件箱尺寸（长×宽×高）	1500×1000×1307	1500×1000×1307	1500×1000×1307	1500×1000×1307	1700×1030×1107

* 注：0.2mm 模数齿轮测量功能需要特定

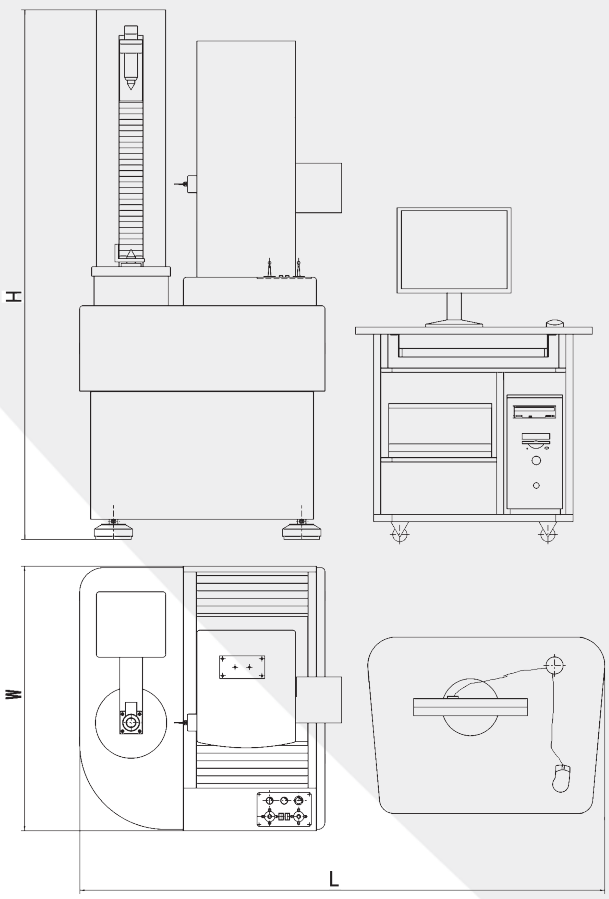
技术规格 & 仪器组成 & 安装图

Specifications \ Model	T20	T30	T40	T60	T80
Module	≥ 0.5（0.2*）	≥ 0.5（0.2*）	≥ 0.5（0.2*）	≥ 0.5（0.2*）	≥ 0.5（0.2*）
Max.workpiece diameter	200	300	400	600	800
Distance between centers	15 - 500	15 - 500	15 - 500	20 - 800	30 - 1000
Distance between stylus and lower center	5 - 380	5 - 380	5 - 380	5 - 380	10 - 600
Helix angle	0 - 90°	0 - 90°	0 - 90°	0 - 90°	0 - 90°
Max.permissible test gear weight	300kg	300kg	300kg	400kg	1000kg
Net weight of machine	1500kg	1500kg	1500kg	2600kg	3000kg
Gross weight of machine	1700kg	1700kg	1700kg	3000kg	3500kg
Overrall dimensions of basic unit（L×W×H）	1700×1060×1900	1700×1060×1900	1700×1060×1900	1900×1080×2295	2300×1365×2460
Overrall dimensions of packing box（L×W×H）	1360×1200×2267	1360×1200×2267	1360×1200×2267	1574×1260×2047	1800×1560×2347
Dimensions of computer packing box（L×W×H）	1500×1000×1307	1500×1000×1307	1500×1000×1307	1500×1000×1307	1700×1030×1107

*Note: 0.2mm the modulus gear measurement function needs to be specific

仪器组成 / SET OF MACHINE INCLUDES

基本配置	数量 / Unit	Stanard module
测量主机	1 台 / 1 pc	Basic machine
计算机	1 套 / 1 set	Microcomputer
打印机	1 台 / 1 pc	Printer
主机地脚	5 件 / 5 pcs	Host foot
3DS 三维测头	1 套 / 1 set	3D scanning probe
仪器附件	1 套 / 1 set	Configuration



安装图 / INSTALLATION LAYOUT

单位（Unit）：mm

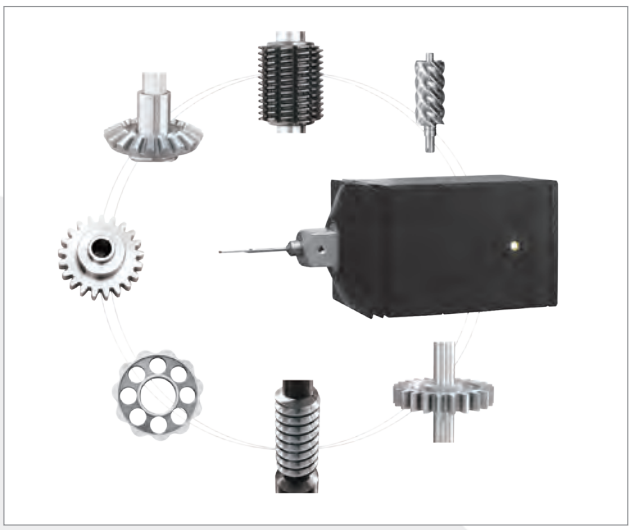
尺寸 \ 型号	T20	T30	T40	T60	T80
L	1700	1700	1700	1900	2300
W	1060	1060	1060	1080	1365
H	1900	1900	1900	2295	2460

Gear Measuring Center Model L45P
齿轮测量中心 L45P 型

用 途 / APPLICATIONS

L45P 高精度计量型三维齿轮测量中心，服务于机床、汽车制造及计量院等重点行业，用于齿轮、齿轮刀具、直齿锥齿轮、弧齿锥齿轮、RV 减速机结构件、摆线减速机结构件、转子、弧齿刀盘等工件的检测。

L45P high-precision metrology 3D gear measurement center, serving key industries such as machine, automobile manufacture and metrology institutes, used for gears, gear cutters, spur bevel gears, spiral bevel gears, RV reducer structural parts, cycloid reducers Inspection of workpieces such as structural parts, rotors, and spiral cutters.



特 点 / FEATURES

- 整机采用机电一体化设计理念，整机机械结构进行了全新优化设计，应用高精度密珠回转主轴、密珠保持架滚动副、主副导轨半包围刚性过盈导轨机构、线性导轨弹性消隙机构等新机械结构，保证仪器具有较高的系统精度；
- 采用基于 Ethercat 总线控制技术的电控系统，仪器可实现智能化、易于与机床系统、机械手等扩展模块的协作；
- 测量软件效率高、测量功能丰富：可检测圆柱齿轮、圆弧圆柱齿轮、直锥齿轮、弧锥齿轮、摆线齿轮、偏心轴等工件，尤其是转子检测功能、弧齿刀盘检测功能是哈量独有；
- 软件系统具有测针库管理功能，具有基于 SQL 数据库的数据安全与管理功能。

- The whole machine adopts the design concept of mechatronics, and the mechanical structure of the whole machine has been completely optimized. New mechanical structures such as mechanisms ensure that the instrument has high system accuracy;
- Using the electronic control system based on Ethercat bus control technology, the instrument can realize intelligent and easy cooperation with expansion modules such as machine tool system and manipulator;
- The measurement software has high efficiency and rich measurement functions: it can detect cylindrical gears, arc cylindrical gears, straight bevel gears, arc bevel gears, cycloidal gears, eccentric shafts and other functions, especially the rotor detection function and the arc tooth cutter disc detection function unique quantity;
- The software system has stylus library management function, data security and management function based on SQL database.Enabling the complicated analysiss of the core components on the RV reducer.

技术规格 / SPECIFICATIONS

单位（Unit）：mm

技术规格 / 型号	L45P	Specifications / Model
可测齿轮模数	≥ 0.5（0.2*）	Module
可测齿轮最大外径	450	Max.workpiece diameter
可测螺旋角范围	0 - 90°	Helix angle
工件立柱顶尖距离	10 - 800	Workpiece column center distance
测头至下顶尖距离	10 - 450	Distance between stylus and lower center
可测工件最大重量	300kg	Max.permissible test gear weight
仪器净重	3100kg	Net weight of machine
仪器毛重	3500kg	Gross weight of machine
主机箱外形尺寸（长 × 宽 × 高）	2100×1900×2507	Overrall dimensions of packing box（L×W×H）

* 注：0.2mm 模数齿轮测量功能需要特定　　*Note: 0.2mm the modulus gear measurement function needs to be specific

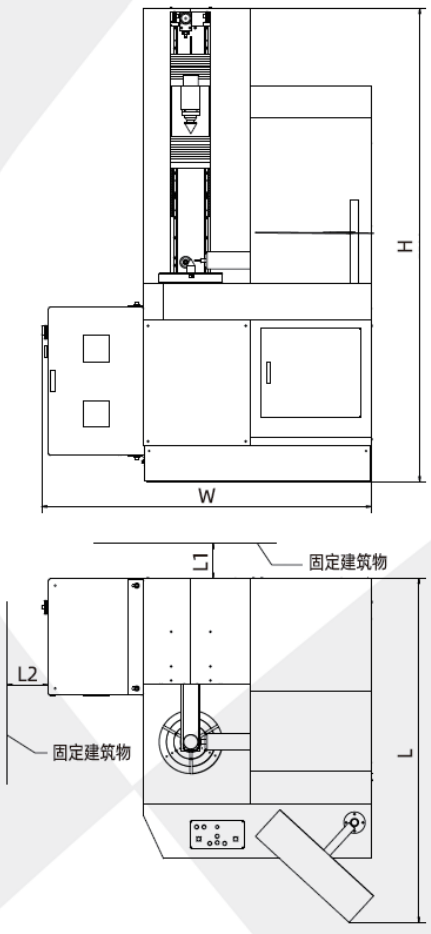
仪器组成 / SET OF MACHINE INCLUDES

基本配置	单位 / Unit	Standard module
仪器主机	1 台 / 1 pc	Basic unit
总线控制系统	1 套 / 1 set	Fieldbus Control System
打印机	1 台 / 1 pc	printer
标准芯轴	2 根 / 2 pcs	Testing arbor

基本配置	单位 / Unit	Standard module
带动器	1 套 / 1 set	Work driver
标准球基准球规	1 套 / 1 set	Datum ball
打印纸	1 包 / 1 pack	Printing paper

可选附件	单位 / Unit	Optional configuration
渐开线、螺旋线标准样板	1 块 / 1 set	Involute and helix master
高精度标准齿轮	1 个 / 1 pc	High precision master gear
三爪卡盘	1 套 / 1 set	3-jaw chuck
可涨芯轴	1 套 / 1 set	Expanding mandrel
稳压电源	1 台 / 1 pc	Voltage regulator
进口测头附件	1 套 / 1 set	Styli and accessory kit
测量报告二维码枪扫码功能	1 套 / 1 set	Measurement report 2D Code Gun scanning function
摄像头辅助定位功能	1 套 / 1 set	Camera-assisted location

安装图 / INSTALLATION LAYOUT



单位（Unit）：mm

型号 \ 尺寸	L	W	H
L45P	1625	1555	2235

Gear Measuring Center Model L30A/L45B
齿轮测量中心 L30A/L45B 型

用 途 / APPLICATIONS

L30A、L45B 型齿轮测量中心，测量功能除了可以测量圆柱齿轮外，还可以检测弧齿锥齿轮、圆弧圆柱齿轮、摆线齿轮、转子、包括直锥齿轮、专业直锥卡具、电极、直锥模具、锻压半成品在内的成套直锥工件等特殊齿轮，以及齿轮滚刀、剃齿刀、插齿刀等齿轮刀具。测量结果可以自动计算，并按不同标准进行自动评定，打印输出检测报告。

The model L30A/L45B gear measuring center can accomplish a variety of gear inspection tasks including cylindrical gear , circular arc gear , straight and spiral bevel gears , cycloidal gear , rotor , gear hob , as well as shaping and shaving cutters . The measuring program provides automatic gear evaluations and output of test report in accordance with the current international standards.

特 点 / FEATURES

- 测量精度高、效率高、软件功能丰富。
- 测量软件操作界面友好，便于操作。
- 采用三维数字扫描测头、直线电机、多轴联动控制等多项先进技术。
- 具备工件装夹偏心误差修正功能。
- 可实现 RV 减速机关键部件等复杂工件检测。

- High measuring accuracy and effeciency , powerful measuring software.
- User friendly measuring interfaces with simple operation.
- Machine integrated with 3D digital probe , linear motor and multi-axes motion control technology.
- Laige work stroke offset correction.
- Enabling the complicated analysiss of the core components on the RV reducer.

技术规格 / SPECIFICATIONS

单位（Unit）：mm

技术规格 型号	L30A	L45B	Model Specifications
可测齿轮模数	≥ 0.5（0.2*）	≥ 0.5（0.2*）	Module
可测齿轮最大外径	300	450	Max.workpiece diameter
上下顶尖距离	30 - 700	30 - 700	Distance between centers
测头至下顶尖距离	10 - 360	10 - 360	Distance between stylus and lower center
可测螺旋角范围	0 - 90°	0 - 90°	Helix angle
可测工件最大重量	300kg	300kg	Max.permissible test gear weight
仪器净重	2100kg	2100kg	Net weight of machine
仪器毛重	2600kg	2600kg	Gross weight of machine
仪器尺寸（长 × 宽 × 高）	1600×1060×2150	1600×1060×2150	Over dimensions of basic unit（L×W×H）
主机箱外形尺寸（长 × 宽 × 高）	1900×1650×2357	1900×1650×2357	Dimensions of packing box（L×W×H）

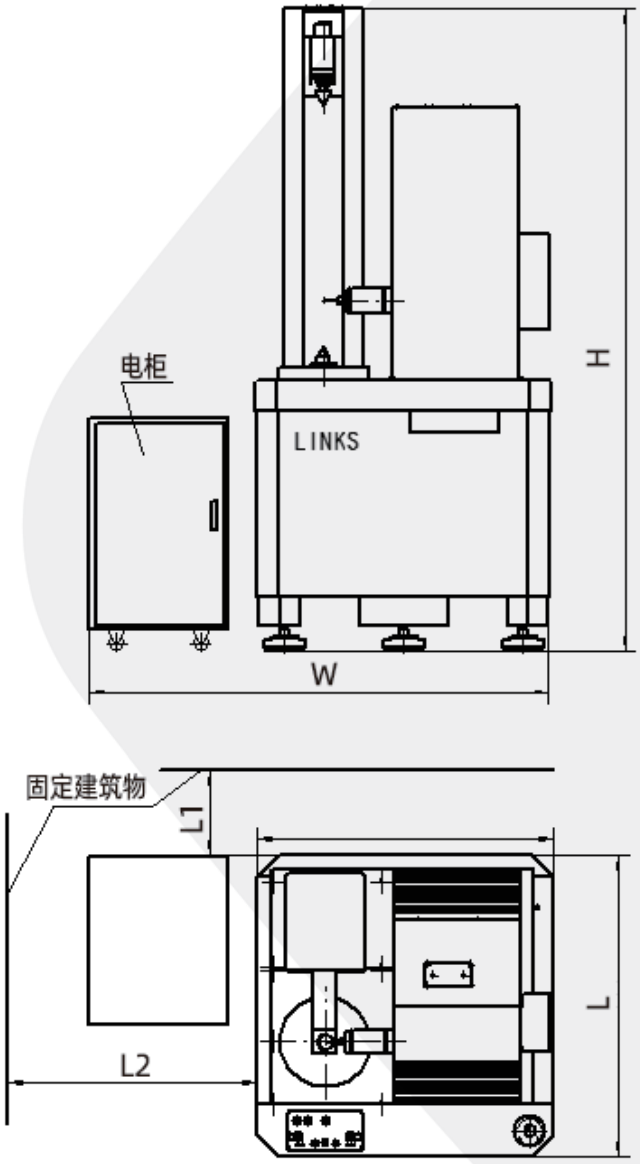
* 注：0.2mm 模数齿轮测量功能需要特定　　*Note: 0.2mm the modulus gear measurement function needs to be specific

仪器组成 / SET OF MACHINE INCLUDES

基本配置	单位 / Unit	Standard module
仪器主机	1 台 / 1 pc	Basic unit
总线柜	1 套 / 1 Set	Ethercat electric cabinet
打印机	1 台 / 1 pc	printer
标准芯轴	2 根 / 2 pcs	Testing arbor
带动器	1 套 / 1 set	Work driver
标准球基准球规	1 套 / 1 set	Datum ball
打印纸	1 包 / 1 pack	Printing paper

可选附件	单位 / Unit	Optional configuration
渐开线、螺旋线标准样板	1 块 / 1 set	Involute and helix master
高精度标准齿轮	1 个 / 1 pc	High precision master gear
三爪卡盘	1 套 / 1 set	3-jaw chuck
可涨芯轴	1 套 / 1 set	Expanding mandrel
稳压电源	1 台 / 1 pc	Voltage regulator
进口测头附件	1 套 / 1 set	Styli and accessory kit
测量报告二维码枪扫码功能	1 套 / 1 set	Measurement report 2D Code Gun scanning function
摄像头辅助定位功能	1 套 / 1 set	Camera-assisted location

安装图 / INSTALLATION LAYOUT



单位（Unit）：mm

尺寸 \ 型号	L30A	L45B
L	1060	1060
W	1600	1600
H	2150	2150

注：L1、L2 为安装修理空间尺寸，其中 L1 ≥ 500mm、L2 ≥ 1000mm；安装地点需要满足图示尺寸要求。
Note: L1 and L2 are the dimensions of the installation and repair space, of which L1 ≥ 500mm and L2 ≥ 1000mm; The installation site needs to meet the size requirements shown in the diagram.

三维测量软件特色介绍 / DESCRIPTIONS OF 3D GEAR MEASRRING SOFTWARE

- **复杂曲面工件的 3D 模型交互**

3D 模型交互功能对于转子、直锥、斜锥、弧锥、蜗轮、包络蜗杆等具有复杂曲面的工件，支持直接导入 igs 格式文件作为测量和误差计算的理论模型使用，也支持导入 dxf 格式的端面型线、轴截面型线文件，通过输入导程后的旋转拉伸自动生成三维理论模型用于工件的测量及误差计算。

因此，对于复杂曲面工件或者自定义创新型工件，LinksGear 三维软件能够轻松提供满足用户要求的测量解决方案。

- **工件装卡偏心修正**

装卡允许误差由原来的 μm 级降低到 mm 级，满足了工件快速装卡的要求，极大降低了对操作人员安装水平的要求，最大程度降低了装卡误差对测量结果的影响。

- **测量坐标系的快速复位**

仪器上电后只需简单回零运动即可工作，省去了重新校球的步骤。

- **各轴光栅尺激光校准**

光栅尺激光校准功能的使用，使各轴光栅尺的精度得到了很好的还原。

- **三维测头自动校准**

三维测头的自动校准功能，提高测头测量精度的同时，降低了对测头安装误差的要求。

- **测针库管理**

测针库管理功能，可对多种规格及方向的测针进行标定及管理，同时记录测头标定的详细信息，测量时根据需要自动更换指定测针，省时省力。

- **数据安全与管理**

采用 SQL 数据库进行数据管理，为用户提供参数及数据的快速检索、排序、共享及远程操作。

- **可实现虚拟测量功能，提前验证工件参数和测量参数的正确性。**

- **3D model interaction for complex surface workpieces**

3D model interaction function For workpieces with complex surfaces such as rotors, straight cones, oblique cones, arc cones, worm gears, and enveloping worms, it supports directly importing igs format files as theoretical models for measurement and error calculation, and also supports importing dxf format files. End face profile, shaft section profile file, automatically generate three-dimensional theoretical model for workpiece measurement and error calculation by rotating and stretching after inputting the lead.

Therefore, for complex curved workpieces or custom innovative workpieces, LinksGear 3D software can easily provide measurement solutions that meet user requirements.

- **Automatic workholding alignment**

To meet the demand for quick workpiece holding , the permissble setup alignment accuracy can be reduced from μm to mm . Thus the chanllenge facing the experienced operator with high adjusting skill is substantially decreased , and the impact factor of the allowable misalignment on the measured results will considerably eliminated .

- **Fast resetting of measuring coordinate system**

Once staring up the measuring centre , the convenient machine axis homing will simplify the time consuming operations of datum ball recalibration .

- **Multi-axis laser clibrations**

Thanks to the laser clibrations of the linear scales , the accuracies of the linear scales can be properly maintained .

- **Auto correction of the 3D measuring porbe**

Auto correction of the 3D measuring porbe enables the measurment accuracy to be improved and the demand for the stylus alignment to be decreased .

- **Stylus managment kit**

Stylus kit library enables the variaty of styli and stylus orientations to be calibrated andrecorder . In case the special measuring process is needed , the dedicated stylus can be changed automatically .

- **It can realize the virtual measurement function to verify the correctness of the workpiece parameters**

- **多语言动态切换**

主程序可在多种语言间动态切换而无需关闭主程序，并可在当前语言下输出其他语言的报告单，满足用户出口工件附带相应语言报告单的要求。

- **翻页查看并输出多齿测量误差曲线**

满足用户检测多齿并指定打印齿号或全部打印误差曲线报告的需求，并可缩印（1/2、1/4、1/8、1/16 倍）及输出 PDF、XPS 等电子版格式。

- **具备仪器的数字镜像功能，实时动态显示工件的测量状态；**

- **可根据输入参数动态生成并显示 3D 模型；**

- **Safety user data management**

SQL language is applied for quick seach , sequence ,share and remote contril of user data .

- **Multi-language conversion**

Dynamic Multi-language conversions are supported in the main program . This will facilitate the output of the current user test report with the other desired language interface .

- **Page review and multi-teeth testing curve outputs**

To meet the demand of multi-teeth or complete test report output , the measuring software allows zooming print(1/2、1/4、1/8、1/16fold), PDF and XPS file output .

- **With the digital mirroring function of the instrument, it can dynamically display the measurement status of the workpiece in real time**

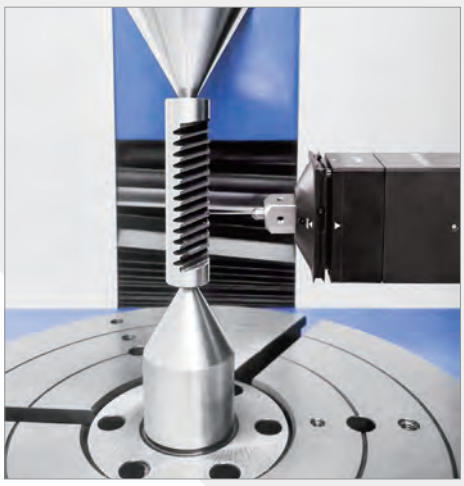
- **3D models can be dynamically generated and displayed according to input parameters**

三维测量软件功能介绍 / 3D GEAR MEASRRING SOFTWARE SOLUTIONS

- **齿条**

可测量齿条的齿形及多截面齿形偏差（F_{α}、$f_{f\alpha}$、$f_{H\alpha}$、C_{α}）、齿向及多截面齿向偏差（F_{β}、$f_{f\beta}$、$f_{H\beta}$）、齿距偏差（F_{p}、f_{pt} 、F_{u}）、齿槽跳动偏差（F_{r}）等基本误差项目，也支持齿形修缘量（FKo、Fuo）、齿向修缘量（OE、OB）等项目的计算。

评定方式：按标准评定 (GB10096-88)、自定义公差范围评定、修形评定、修缘评定。



- **Rack measurement software**

It can measure the tooth profile and multi-section tooth profile deviation of rack (F_{α}, $f_{f\alpha}$, $f_{H\alpha}$, C_{α}), tooth direction and multi-section tooth direction deviation (F_{β}, $f_{f\beta}$, $f_{H\beta}$), pitch deviation (F_{P}, f_{Pt}, F_{u}), Basic error items such as cogging runout deviation (F_{r}) also support the calculation of tooth shape trimming amount (FKo, Fuo), tooth trimming amount (OE, OB) and other items.

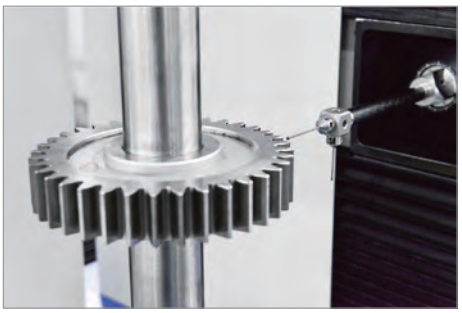
Evaluation standard: according to standard evaluation (GB10096-88), self-defined tolerance range evaluation, modification evaluation, and edge repair evaluation. FKo

- **圆柱齿轮**

可对普通圆柱内外齿轮、不完整齿（缺齿、联齿）、锥度齿及扇形齿进行测量及偏差评定：

（a）测量项目： 齿廓偏差（F_{α}、$f_{f\alpha}$、$f_{H\alpha}$）、螺旋线偏差（F_{β}、$f_{f\beta}$、$f_{H\beta}$）、齿距偏差（F_{p}、F_{pk}、f_{pt}、F_{u}）及径向跳动（F_{r}）、齿根直径（R_{d}）及顶圆直径（T_{d}）、公法线长度（W_{k}）、跨棒距（跨一球 M_{rk}、跨二球 M_{dk}）、齿厚（s）、及齿厚变动量（R_{s}）、形貌图。

（b）评定方式： 按标准评定（ISO1328、AGMA2015、GB/T10095、JIS B1702、DIN3962、GB2363、ANSI B92-01）、自由公差带范围评定（K 型图）、自定义公差范围评定、修形评定、修缘评定、鼓形量评定并按照标准规定显示相应的偏差项表示符号。

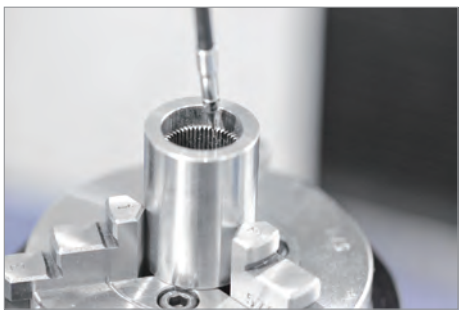


- **Cylindrical gear**

Measurement and analyses of the inner/outer spur tooth , incomplete tooth , bevel tooth , and segment gear are also available :

（a）Measuring items : Tooth profile deviation(F_{α}、$f_{f\alpha}$、$f_{H\alpha}$)、helix deviation(F_{β}、$f_{f\beta}$、$f_{H\beta}$)、pitch deviation(F_{p}、F_{pk}、f_{pt}、F_{u}), redial runout(F_{r}) , root diameter(R_{d}) , tip diameter(T_{d}) , base tangent length(W_{k}) , span over ball/balls(M_{rk}/M_{dk}) , tooth thickness(s) , tooth thickness variation(R_{s}) , 3D topograph .

（b）Evaluation modes : Analyes confirming to the standard ISO1328、AGMA2015、GB/T10095、JIS B1702、DIN3962、GB2363、ANSI B92-01、K-chart、user-defined tolerance band 、tooth modification 、tip relief 、tooth crowning .



- **圆弧圆柱齿轮**

可对圆弧圆柱齿轮进行测量及偏差评定：

（a）测量项目： 螺旋线偏差（F_{β}、$f_{f\beta}$、$f_{H\beta}$）、齿距偏差（F_{p}、F_{pk}、f_{pt}、F_{u}）及径向跳动（F_{r}）、弦齿深（E_{h}）、齿根直径（E_{df}）及齿顶直径（E_{da}）、公法线偏差（E_{w}）、公法线长度（W_{k}）及公法线长度变动（F_{w}）、齿厚（s）、及齿厚变动量（R_{s}）、形貌图。

（b）评定方式： 按标准评定（GB/T15753）、自定义公差范围评定。

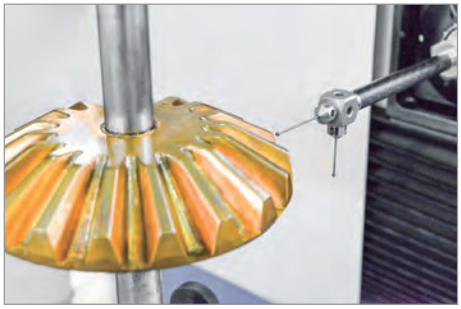
- **Circular arc gear**

Measurement and errer evaluation of the circular arc gear :

（a）Measuring items : helix deviation(F_{β}、$f_{f\beta}$、$f_{H\beta}$)、pitch deviation(F_{p}、F_{pk}、f_{pt}、F_{u}), redial runout(F_{r}) ,chordal depth(E_{h}), dedendum diameter(E_{df}) , tip diameter(E_{da}) , base tangent length(W_{k}) , allowable base tangent length(F_{w}) , tooth thickness(S) , tooth thickness variation(R_{s}) , 3D topograph .

（b）Evaluation modes : Standard GB/T15753、user-defined tolerance band .

三维测量软件功能介绍



- **直齿锥齿轮**

可对包括直锥齿轮、专业直锥卡具、电极、直锥模具、锻压半成品在内的成套直锥工件进行测量及偏差评定，并且支持拔模角的锥面基准进行轴线找正，其单个齿面的检测点数可达 25×25=625 个点，且检测齿数不限：

（a）测量项目：齿距偏差（F_p、F_{pk}、f_{pt}、F_u）、径向跳动（F_r）、及齿厚偏差（E_s）、形貌图。

（b）评定方式：按标准评定（ISO17485、AGMA2009、GB11365、DIN3965、GBT10225）、自定义公差范围评定。

- **Straight bevel gear**

The complete measurement and evaluations of the set of straight bevel components including the straight bevel gear , clamping holder , electrode , mould and forging stock can also be carred out . The conical datum for the darft angle is allowed tobe corrected in the axial direction . Upto 625 testing points are allowed on the single tooth flank and numbers of checking teeth are not limited :

（a）Measuring items : pitch deviation(F_p、F_{pk}、f_{pt}、F_u), redial runout(F_r) , tooth thickness variation(E_s) , 3D topograph .

（b）Evaluation modes : Standard ISO17485、AGMA2009、GB11365、DIN3965、GBT10225、 user-defined tolerance band .

- **弧齿锥齿轮**

可对格里森制式及奥利康制式的收缩齿弧齿锥齿轮及等高齿弧齿锥齿轮进行测量及误差评定，其单个齿面的检测点数可达 25×25=625 个点，且检测齿数不限：

（a）测量项目：齿距偏差（F_p、F_{pk}、f_{pt}、F_u）、径向跳动（F_r）、及齿厚偏差（E_s）、形貌图。

（b）评定方式：按标准评定（ISO17485、AGMA2009、GB11365、DIN3965、GBT10225）、自定义公差范围评定。

- **Spiral bevel gear**

Measurement and evaluations of the Gleason tapered tooth and Oerlikon Equidep gears can also be performed . Upto 625 testing points are allowed on the single tooth flank and numbers of checking teeth are not limited :

（a）Measuring items : pitch deviation(F_p、F_{pk}、f_{pt}、F_u), redial runout(F_r) , tooth thickness variation(E_s) , 3D topograph .

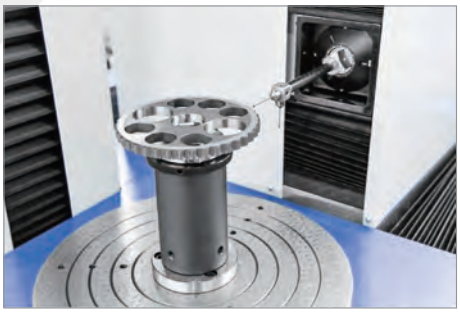
（b）Evaluation modes : Standard ISO17485、AGMA2009、GB11365、DIN3965、GBT10225、user-defined tolerance band .

- **摆线齿轮**

可对外摆线齿轮及内摆线齿轮进行测量及偏差评定：

（a）测量项目：齿廓偏差（F_{α}）、螺旋线偏差（F_{β}、$f_{f\beta}$、$f_{H\beta}$）、齿距偏差（F_p、F_{pk}、f_{pt}、F_u）及径向跳动（F_r）、顶根距（M）、截面综合偏差（F_n、f_n）。

（b）评定方式：按标准评定（JB/T10419-2005）、自定义公差范围评定。

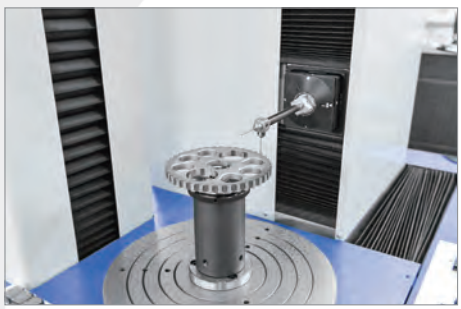


- **Cycloidal gear**

Measure and evaluate the deviation of external cycloid gear and internal cycloid gear :

（a）Measuring items : Tooth profile deviation(F_{α})、helix deviation(F_{β}、$f_{f\beta}$、$f_{H\beta}$)、pitch deviation(F_p、F_{pk}、f_{pt}、F_u), redial runout(F_r) , tooth depth from tip to root(M) , section composite deviation(F_n、f_n) .

（b）Evaluation modes : Standard JB/T10419-2005、user-defined tolerance band .



- **针轮、针齿壳测量软件**

可对针轮（外圆弧齿轮）和针齿壳（内圆弧齿轮）工件进行测量及误差评定。可测量齿廓的最大最小偏差范围（R_g）、中心圆半径偏差（F_{dr}）、齿向偏差（F_{β}、ff_{β}、fH_{β}）、齿距偏差（F_p、f_{pt}、F_u）及径跳偏差（Fr）等误差项目。

评定标准：按标准评定（JBT10419-2005）、自定义公差范围评定，并按照标准规定显示相应的误差项表示符号。

在支持普通工件偏心修正的基础上增加了通过均匀分布的轴承孔（2 个以上）定心的方式，以轴承孔中心为基准建立针轮的工作轴线，从而实现对装卡误差进行修正。

- **Needle wheel, needle gear shell measurement software**

The needle wheel (external arc gear) and the needle gear shell (internal arc gear) can be measured and error evaluated. It can measure the maximum and minimum deviation range of tooth profile (R_g), center circle radius deviation (Fdr), tooth direction deviation (F_{β}, ff_{β}, fH_{β}), tooth pitch deviation (F_p, f_{pt}, F_u) and radial run deviation (Fr), etc. Error item.

Evaluation standard: According to standard evaluation (JBT10419-2005), self-defined tolerance range evaluation, and display the corresponding error item symbol in accordance with the standard.

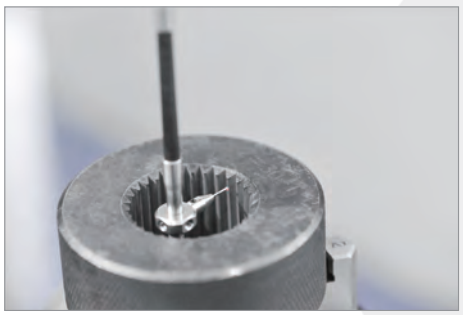
On the basis of supporting the eccentric correction of ordinary workpieces, the method of centering through evenly distributed bearing holes (2 or more) is added, and the working axis of the pin wheel is established based on the center of the bearing hole, so as to realize the correction of the installation error.

- **三角花键**

可对普通三角内外花键、不完整齿（缺齿、联齿）三角内外花键进行测量及偏差评定：

（a）测量项目：齿廓偏差（F_{α}、$f_{f\alpha}$、$f_{H\alpha}$）、工作齿面与轴线的平行度偏差（F_{β}、$f_{f\beta}$、$f_{H\beta}$）、齿距偏差（F_{p}、F_{pk}、f_{pt}、F_{u}）及径向跳动（F_{r}）、齿根直径（R_{d}）及顶圆直径（T_{d}）。

（b）评定方式：按标准评定（DIN5481）、自由公差带范围评定（K型图）、自定义公差范围评定、修形评定、修缘评定、鼓形量评定。



- **Triangle spline**

Measurement and evaluations of the inner/outer triangle splines inside the normal and incomplete tooth gears are available :

（a）Measuring items : Tooth profile deviation(F_{α}、$f_{f\alpha}$、$f_{H\alpha}$)、 Parallelism deviation between working tooth surface and axis(F_{β}、$f_{f\beta}$、$f_{H\beta}$)、pitch deviation(F_{p}、F_{pk}、f_{pt}、F_{u}), redial runout(F_{r}) , root diameter(R_{d}) , tip diameter(T_{d}) .

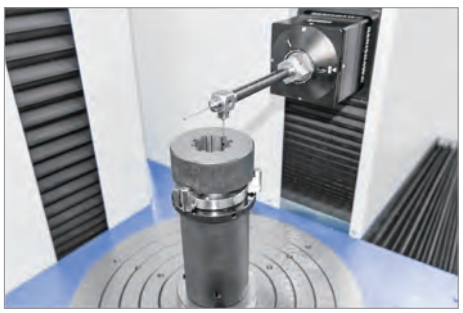
（b）Evaluation modes : Standard DIN5481、K-chart、user-defined tolerance band 、tooth modification 、tip relief 、tooth crowning .

- **矩形花键**

可对普通矩形内外花键、不完整齿（缺齿、联齿）矩形内外花键进行测量及偏差评定：

（a）测量项目：齿廓误差（F_{α}、$f_{f\alpha}$、$f_{H\alpha}$）、工作齿面与轴线的平行度误差（F_{β}、$f_{f\beta}$、$f_{H\beta}$）、齿距偏差（F_{p}、F_{pk}、f_{pt}、F_{u}）、齿根直径（R_{d}）及顶圆直径（T_{d}）。

（b）评定方式：按自由公差带范围评定（K型图）、自定义公差范围评定、修形评定、修缘评定、鼓形量评定。



- **Rectangle spline**

Measurement and evaluations of the inner/outer rectangle splines inside the normal and segment gears are available :

（a）Measuring items : Tooth profile deviation(F_{α}、$f_{f\alpha}$、$f_{H\alpha}$)、 Parallelism deviation between working tooth surface and axis(F_{β}、$f_{f\beta}$、$f_{H\beta}$)、pitch deviation(F_{p}、F_{pk}、f_{pt}、F_{u}), redial runout(F_{r}) , root diameter(R_{d}) , tip diameter(T_{d}) .

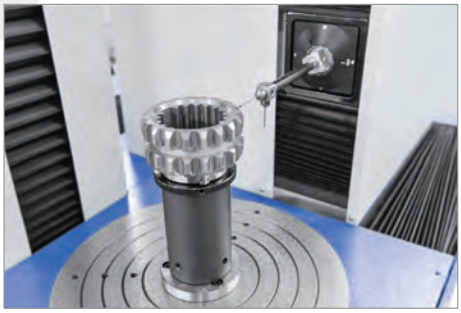
（b）Evaluation modes : K-chart、user-defined tolerance band 、tooth modification 、tip relief 、tooth crowning .

- **渐开线花键**

可对普通渐开线内外花键、不完整齿（缺齿、联齿）渐开线内外花键进行测量及偏差评定：

（a）测量项目：齿廓偏差（F_{α}、$f_{f\alpha}$、$f_{H\alpha}$）、齿向偏差（F_{β}、$f_{f\beta}$、$f_{H\beta}$）、齿距偏差（F_{p}、F_{pk}、f_{pt}、F_{u}）及径向跳动（F_{r}）、齿根直径（R_{d}）及顶圆直径（T_{d}）、公法线长度（W_{k}）、跨棒距（跨一球 M_{rk}、跨二球 M_{dk}）、齿厚（s）、及齿厚变动量（R_{s}）、形貌图。

（b）评定方式：按标准评定（GBT3478、DIN5480、ANSI B92-01）、自由公差带范围评定（K 型图）、自定义公差范围评定、修形评定、修缘评定、鼓形量评定。

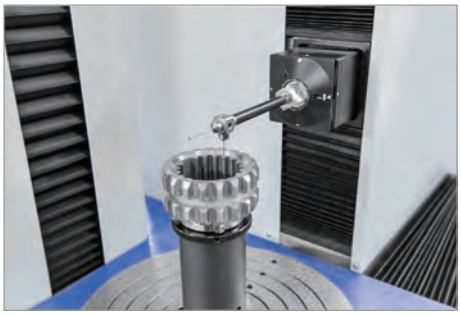


- **Involute spline**

Measurement and evaluations of the inner/outer involute splines inside the normal and incomplete tooth gears are available :

（a）Measuring items : Tooth profile deviation(F_{α}、$f_{f\alpha}$、$f_{H\alpha}$)、helix deviation(F_{β}、$f_{f\beta}$、$f_{H\beta}$)、pitch deviation(F_{p}、F_{pk}、f_{pt}、F_{u}), redial runout(F_{r}) , root diameter(R_{d}) , tip diameter(T_{d}) , base tangent length(W_{k}) , span over ball/balls(M_{rk}/M_{dk}) , tooth thickness(s) , tooth thickness variation(R_{s}) , 3D topograph .

（b）Evaluation modes : Standard GBT3478、DIN5480、ANSI B92-01、K-chart、user-defined tolerance band 、tooth modification 、tip relief 、tooth crowning .

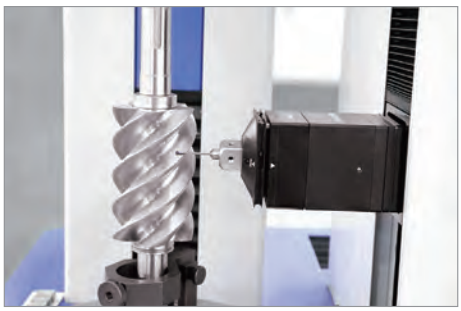


- **转子**

可对具有理论型线的内外转子进行扫描测量，并计算出各理论点的法向偏差值：

（a）测量项目：齿廓偏差（F_{α}）、螺旋线偏差（F_{β}、$f_{f\beta}$、$f_{H\beta}$）、齿距偏差（F_{p}、f_{pt}、F_{u}）。

（b）评定方式：自定义公差范围评定。

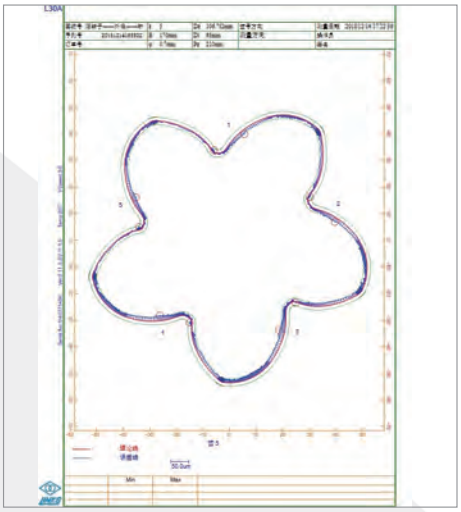


- **Rotor**

Scanning analysis on the inner/outer rotor with theoretical profile , and each key profile point can be calculated :

（a）Measuring items : Tooth profile deviation(F_{α})、helix deviation(F_{β}、$f_{f\beta}$、$f_{H\beta}$)、pitch deviation(F_{p}、f_{pt}、F_{u}) .

（b） Evaluation modes : Standard GB/T3478、DIN5480、K-chart、user-defined tolerance band 、tooth modification 、tip relief 、tooth crowning .



- **偏心轴**

可对偏心轴进行测量及偏差评定：

（a）测量项目：两个圆的圆度、两个圆的圆心位置。

（b）评定方式：自定义公差范围评定。

- **Eccentric**

Measurement and errer evaluation of the eccentric :

（a）Measuring items : roundness of two circles、center position of two circles .

（b）Evaluation modes : user-defined tolerance band .

- **滚刀**

可对 ZA（阿基米德造型）、ZI（渐开线造型）、ZN（法向直廓造型）等多种造型的齿轮滚刀、蜗轮滚刀及齿条滚刀、滚刀坯、盘形铣刀进行测量及偏差评定：

（a）测量项目：轴台径跳（f_{rp}）、轴台端跳（f_{ps}）、刀齿前面径向性（F_{fN}）、容屑槽周节（f_{tN}、f_{uN}、F_{tN}）、容屑槽导程（f_{HN}）、刀齿顶端跳动（f_{rk}）、刃口齿形（F_{fs}）、铲背齿形（F_{fs}）、刃口螺旋线（f_{HF}、F_{HF}、F_{H3}）、齿厚（f_s）、啮合线（f_e、F_e）、轴向齿距或分头偏差（f_{px}、F_{px}、F_{px3}）。

（b）评定方式：按标准评定（DIN3968、ISO4468、JISB4355、GBT6084、JBT7654、JBT2494、GBT5103）、自定义公差范围评定并按照标准规定显示相应的偏差项表示符号。

- **Hob**

Measurement and evaluations of gear hob , worm hob aiming at ZA modeling , ZI modeling , ZN modeling and hob blank , rack hob , disk milling cutter are also available ：

（a）Measuring items : radial runout of hub diameter(f_{rp}) , axial runout of hub face(f_{ps}) , from and position of cutting face(F_{fN}) , spacing of cutting face of gashes(f_{tN}、f_{uN}、F_{tN}) , gash lead(f_{HN}) , radial runout of tips teeth(f_{rk}) , profile over cutting edge(F_{fs}) , profile behind cutting edge(F_{fs}) , helix over cutting edge(f_{HF}、F_{HF}、F_{H3}) , tooth thickness(f_s) , line of action(f_e、F_e) , axial pitch or dividing error (f_{px}、F_{px}、F_{px3}).

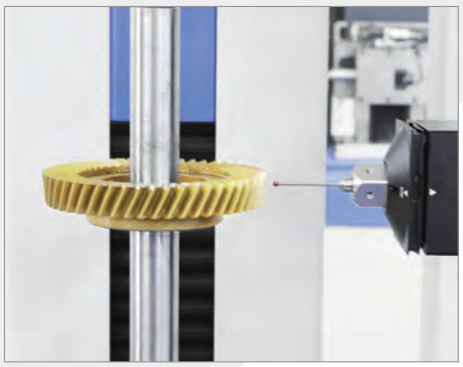
（b）Evaluation modes : analyses confirming to the standard DIN3968、ISO4468、JISB4355、GBT6084、JBT7654、JBT2494、GBT5103 user-defined tolerance band .

- **插齿刀**

可测量普通插齿刀、不完整齿插齿刀的齿廓及多截面齿廓偏差（F_{α}、$f_{f\alpha}$、$f_{H\alpha}$、C_{α}）、螺旋线及多截面螺旋线偏差（F_{β}、$f_{f\beta}$、$f_{H\beta}$、C_{β}）、齿距偏差（F_P、F_{PK}、f_{Pt} 、F_u）及径向跳动（F_r）等基本误差项目，也支持齿廓修缘量（FKo、Fuo）、螺旋线修缘量（OE、OB）及形貌图的计算。

对插齿刀的误差评定支持：

- 按标准评定 (DIN1829、GB6082)；
- 自定义公差范围；
- 自定义公差带（K 形图）进行评定，公差带支持直线、圆弧、二次曲线的任意组合。



- **Shaper cutter measurement software**

It can measure the deviation of tooth profile and multi-section tooth profile (F_{α}, $f_{f\alpha}$, $f_{H\alpha}$, C_{α}), spiral line and multi-section spiral line deviation (F_{β}, $f_{f\beta}$, $f_{H\beta}$, C_{β}) Basic error items such as tooth pitch deviation (F_P, F_{PK}, f_{Pt}, F_u) and radial runout (F_r) also support tooth profile trimming amount (FKo, Fuo,), spiral trimming amount (OE, OB) and shape Calculation of appearance map. Support for error assessment of gear shaping cutter:

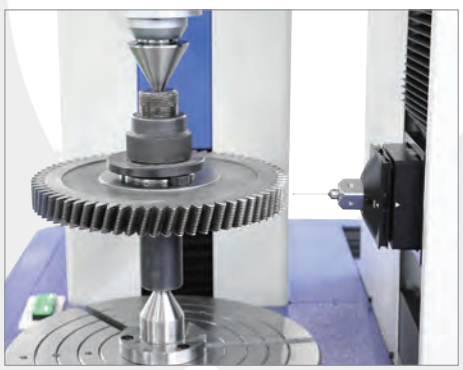
- Evaluation according to standards (DIN1829, GB6082);
- Customized tolerance range;
- Customized tolerance zone (K-shaped diagram) for evaluation. The tolerance zone supports any combination of straight lines, arcs, and quadratic curves.

- **剃齿刀**

可测量普通环形剃齿刀、带错位量的螺旋型剃齿刀及不完整齿剃齿刀（环形及螺旋型）的齿廓及多截面齿廓偏差（F_{α}、$f_{f\alpha}$、$f_{H\alpha}$、C_{α}）、螺旋线及多截面螺旋线偏差（F_{β}、$f_{f\beta}$、$f_{H\beta}$、C_{β}）、齿距偏差（F_P、F_{PK}、f_{Pt} 、F_u）及径向跳动（F_r）等基本误差项目，也支持齿廓修缘量（FKo、Fuo）、螺旋线修缘量（OE、OB）、公法线长度（Wk）、跨棒距（跨一球 Mrk、跨两球 Mdk）、齿厚（s）及齿厚变动量（Rs）的计算。

对剃齿刀的误差评定支持：

- 按标准评定 (GB14333、GB21950、DIN3962)；
- 自定义公差范围；
- 自定义公差带（K 形图）进行评定，公差带支持直线、圆弧、二次曲线的任意组合。



- **Shaving cutter measurement software:**

It can measure the tooth profile and multi-section tooth profile deviation (F_{α}, $f_{f\alpha}$, $f_{H\alpha}$, C_{α}), spiral of ordinary ring shaving cutter, spiral shaving cutter with misalignment and incomplete tooth shaving cutter (ring and spiral type) Basic error items such as line and multi-section spiral deviations (F_{β}, $f_{f\beta}$, $f_{H\beta}$, C_{β}), tooth pitch deviations (F_P, F_{PK}, f_{Pt}, F_u) and radial runout (F_r) also support tooth profile trimming (FKo , Fuo), helix trimming amount (OE, OB), common normal length (Wk), span bar pitch (Mrk across one ball, Mdk across two balls), tooth thickness (s) and tooth thickness variation (Rs) Calculation. Support for error assessment of shaving cutters:

- Assessment according to standards (GB14333, GB21950, DIN3962);
- Customized tolerance range;
- Customized tolerance zone (K-shaped diagram) for evaluation. The tolerance zone supports any combination of straight lines, arcs, and quadratic curves.

- **蜗轮**

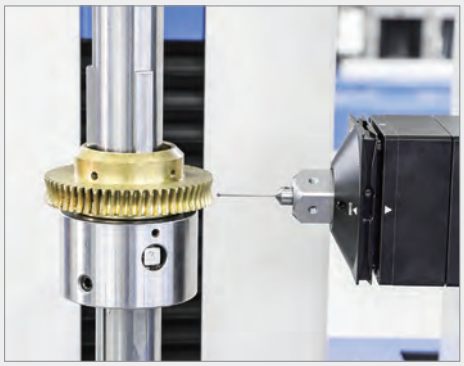
可对与 ZA（阿基米德造型）、ZI（渐开线造型）、ZN（法向直廓造型）的多种造型的蜗杆配对的普通蜗轮、不完整齿蜗轮进行测量及误差评定。可测量齿廓偏差（F_{α}、$f_{f\alpha}$、$f_{H\alpha}$、C_{α}）、齿距偏差（F_P、f_{Pt}、F_u）、径跳（F_r）等基本误差项目，也支持齿廓修缘量（FKo、Fuo）及齿厚（s）、齿厚变动量（Rs）等项目的计算。

评定标准：按标准评定 (DIN3974、GB10089_2018、GB10089_1988、GBT10227)、自定义公差范围评定、修形评定、修缘评定，并按照标准规定显示相应的误差项表示符号。

- **Worm gear measurement software**

It can measure and evaluate errors of common worm gears and incomplete tooth worm gears that are paired with ZA (Archimedes modeling), ZI (involute modeling), ZN (normal straight profile modeling) worms of various shapes. It can measure basic error items such as tooth profile deviation (F_{α}, $f_{f\alpha}$, $f_{H\alpha}$, C_{α}), tooth pitch deviation (F_P, f_{Pt}, F_u), radius jump (F_r), and also supports tooth profile margin (FKo, Fuo) and tooth Calculation of items such as thickness (s) and tooth thickness variation (Rs).

Evaluation standard: according to standard evaluation (DIN3974、GB10089_2018、GB10089_1988、GBT10227), custom tolerance range evaluation, shape modification evaluation, edge evaluation, and display the corresponding error symbol according to the standard.



- **蜗杆**

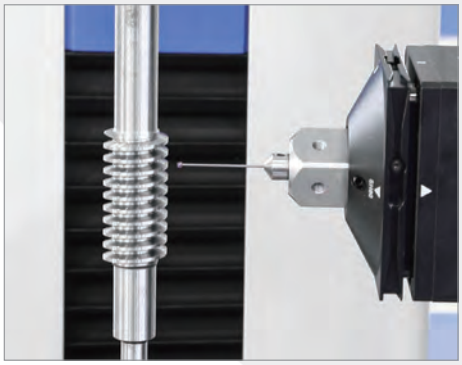
可对 ZA（阿基米德造型）、ZI（渐开线造型）、ZN（法向直廓造型）的多种造型的单头蜗杆及多头蜗杆进行测量及误差评定。可测量齿廓及多截面齿廓偏差（F_{α}、$f_{f\alpha}$、$f_{H\alpha}$、C_{α}）、螺旋线及多截面螺旋线偏差（F_{β}、$f_{f\beta}$、$f_{H\beta}$、C_{β}）、齿距偏差（F_P、f_{Pt}、F_u）、径跳（F_r）等基本误差项目，也支持齿廓修缘量（FKo、Fuo）、螺旋线修缘量（OE、OB）、一转螺旋线偏差（fh）、螺旋线节距误差（fpx）及齿厚（s）、齿厚变动量（Rs）等项目的计算。

评定标准：按标准评定 (DIN3974、GB10089_2018、GB10089_1988、GBT10227)、自定义公差范围评定、修形评定、修缘评定，并按照标准规定显示相应的误差项表示符号。

- **Worm measurement software**

It can measure and evaluate errors of single-headed worms and multi-headed worms with various shapes such as ZA (Archimedes modeling), ZI (involute modeling), ZN (normal straight profile modeling) Measurable tooth profile and multi-section tooth profile deviation (F_{α}, $f_{f\alpha}$, $f_{H\alpha}$, C_{α}), helix and multi-section helix deviation (F_{β}, $f_{f\beta}$, $f_{H\beta}$, C_{β}), pitch deviation (F_P, f_{Pt}, F_u), diameter Basic error items such as jump (F_r), also support tooth profile trimming amount (FKo, Fuo), spiral trimming amount (OE, OB), one-turn spiral deviation (fh), spiral pitch error (fpx) And calculation of items such as tooth thickness (s) and tooth thickness variation (Rs).

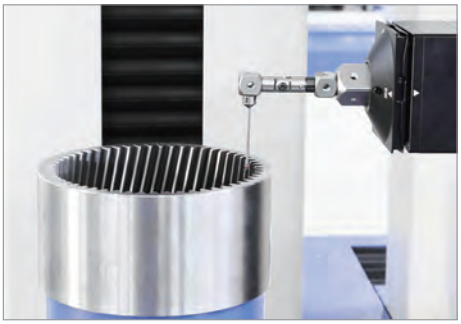
Evaluation standard: according to standard evaluation (DIN3974、GB10089_2018、GB10089_1988、GBT10227), custom tolerance range evaluation, shape modification evaluation, edge correction evaluation, and display the corresponding error item representation symbols according to the standards.



- **未知渐开线圆柱齿轮（内齿轮，外齿轮）**

可实现渐开线外齿轮，渐开线内齿轮，渐开线花键进行未知参数测量，只需输入齿数和设置测量区域就可全自动完成测量法向模数，法向压力角，螺旋角，分度圆直径，基圆半径、基圆螺旋角、法向齿厚、变位系数、齿顶圆直径、齿根圆直径等 10 项参数。

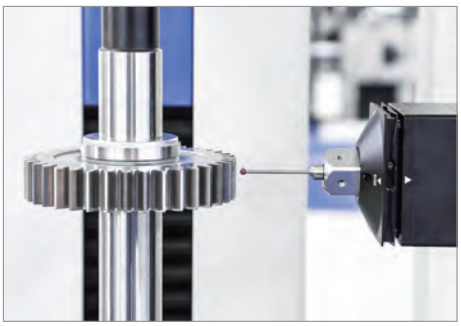
未知齿轮测量支持工件轴线找正功能，即测量坐标系以工件坐标系为准，测量数据消除了装卡偏心的影响，参数计算更加精准，尤其是内齿轮。



- **Unknown involute cylindrical gear (internal gear, external gear)**

It can realize involute external gear, involute internal gear, and involute spline to measure unknown parameters. Simply input the number of teeth and set the measurement area to automatically measure the normal modulus, normal pressure angle, helix angle , The index circle diameter, base circle radius, base circle helix angle, normal tooth thickness, displacement coefficient, addendum circle diameter, tooth root circle diameter and other 10 parameters.

Unknown gear measurement supports the alignment function of the workpiece axis, that is, the measurement coordinate system is based on the workpiece coordinate system. The measurement data eliminates the effect of eccentric loading, and the parameter calculation is more accurate, especially the internal gear.



- **多联齿轮**

实现一根轴上的齿轮、花键、键槽一次全自动完成所有项目的测量。

- **Multi gear measurement software**

The gears, splines, and keyways on one shaft can be used to complete the measurement of all items at once.

- **正时关系**

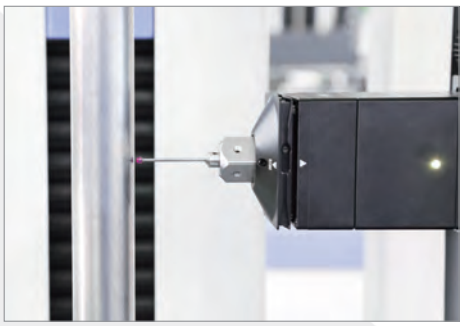
可以测量一根轴上齿轮、花键、键槽之间的相位及高度值，包含齿对齿、齿对槽、槽对槽之间的角度关系。

- **Timing measurement**

It can measure the phase and height values between gears, splines, and keyways on a shaft, including the angle relationship between tooth-to-tooth, tooth-to-slot, and slot-to-slot.

- **圆柱锥度塞规（塞规、环规）**

可对圆柱锥度塞规及环规的齿向偏差 (Fb、ffb、fHb)、圆锥角误差 (ATa) 进行测量，也可满足对圆柱内孔及芯轴的圆度误差 (Dev)、圆心半径差 (Std)、圆直径 (CircleD)、齿向偏差 (Fb、ffb、fHb)、圆锥角误差 (ATa) 的测量，并按照自定义公差范围进行误差评定。



- **Cylindrical taper plug gauge (plug gauge, ring gauge)**

It can measure the tooth deviation (Fb, fb, fHb), conical angle error (ATa) of the cylinder taper plug gauge and ring gauge, the circle error (Dev), center radius difference (Std), circle diameter (CircleD), tooth deviation (Fb, ffb, fHb) of the bore and mandreles of the cylinder, and make the error assessment according to the custom tolerance range.

三维测量软件功能介绍

- **分度盘**

可对分度盘进行测量及偏差评定：

（a）测量项目：齿廓偏差（F_{α}、$f_{f\alpha}$、$f_{H\alpha}$）、齿向偏差（F_{β}、$f_{f\beta}$、$f_{H\beta}$）、齿距偏差（F_{p}、F_{pk}、f_{pt}、F_{u}）、形貌图。

（b）评定方式：自由公差带范围评定（K 型图）、自定义公差范围评定、修形评定、修缘评定、鼓形量评定。

- **Indexing plate**

Measurement and error envaluation of the indexing component :

（a）Measuring items : Tooth profile deviation(F_{α}、$f_{f\alpha}$、$f_{H\alpha}$)、helix deviation(F_{β}、$f_{f\beta}$、$f_{H\beta}$)、pitch deviation(F_{p}、F_{pk}、f_{pt}、F_{u}), 3D topograph .

（b）Evaluation modes : K-chart、user-defined tolerance band 、tip relief and crowning evaluations .

- **凸轮**

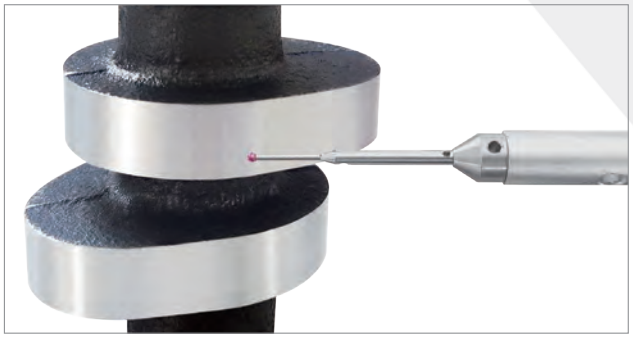
可根据用户提供的理论端面型线数据点进行测量，可测量凸轮轮廓的形状偏差 (F_{α})、最大偏差 (Max)、最小偏差 (Min) 及平均偏差 (Mean)，并按照自定义公差范围进行误差评定。

可以实现一根轴上的多个凸轮的一次全自动测量。

- **Camshaft**

Measurements can be made based on the theoretical end face profile data points provided by the user. The shape deviation(F_{α}), maximum deviation(Max), minimum deviation(Min), and average deviation(Mean) of the cam profile can be measured. And the error evaluation is conducted according to the custom tolerance range.

It is possible to achieve fully automatic measurement of multiple cams on a single axis at once.



- **二维码枪扫码功能模块**

软件支持二维码枪扫码功能，能实现工件参数及测量报告的快速输入、读取及筛选。

- **QR code gun scanning function module**

The software supports the QR code gun scanning function, which can realize the quick input, reading and screening of workpiece parameters and measurement reports.

- **摄像头功能模块**

软件支持摄像头的实时监测、放大、拍照、照明等功能，很好地解决了测量小模数齿轮观测不便等问题。

- **Camera function module**

The software supports the real-time monitoring, zooming, photographing, lighting and other functions of the camera, which solves the inconvenience of measuring small modulus gears.

- **在线帮助功能模块**

软件支持在线帮助功能，实现了最新帮助文档的智能查询，根据遇到问题及所需查询功能的不同，增加热键调取功能，帮助用户快速定位，提高查阅效率。

- **Online help function module**

The software supports the online help function, and realizes the intelligent query of the latest help documents. According to the different problems encountered and the query functions required, the hotkey retrieval function is added to help users locate and improve the efficiency of retrieval quickly.

- **弧锥铣刀盘测量软件**

可对弧锥铣刀盘刀槽自身精度和位置精度进行检测及误差评定。可分别测量深刀槽及浅刀槽的中心距、偏心距、刀槽宽度、顶面平面度、顶面平行度、顶面圆跳动、顶面相邻槽圆跳动、侧面平行度、侧面圆跳动等误差项目。

在支持普通工件偏心修正的基础上增加带锥角的径向基准校正方式，使装卡误差的修正更为精准。

- **Arc taper milling cutter head measurement software**

Accuracy and position accuracy of the grooves of the arc taper milling cutter can be detected and error evaluated. It can respectively measure the center distance, eccentricity, width of the groove, top surface flatness, top surface parallelism, top surface circle runout, top surface adjacent slot circle runout, side parallelism, and side circle. Error items such as jitter.

On the basis of supporting the eccentric correction of ordinary workpieces, a radial datum correction method with taper angle is added to make the correction of the installation error more accurate.

Gear Measuring Center Model L65G/L100A
齿轮测量中心 L65G/L100A 型

用 途 / APPLICATIONS

L65G、L100A 型齿轮测量中心，仪器综合精度达到 VDI/VDE2612、2613 一类仪器精度要求，可以满足高精度齿轮的测量要求。仪器测量功能除了可以测量标准圆柱齿轮外，还可以检测蜗轮蜗杆、直齿锥齿轮、斜齿锥齿轮、弧齿锥齿轮等特殊齿轮，以及齿轮滚刀、剃齿刀、插齿刀等齿轮刀具。测量结果可以自动计算，并按不同标准进行自动评价，打印输出检测报告。

本仪器主要面向计量院、研究所等需要计量型齿轮测量中心的客户。

The comprehensive accurcy grade of the type L65G/L100A gear measuring center is equivalent to grade-one accuracy under VDI/VDE 2613 , 2613 standards . It is a high-precision metrology oriented gear measuring center . The center can not only measure cylindrical gears , but also can measure worms and worm wheeles as well as special gears such as straight bevel gears , spiral bevel gears . Beside this , the measuring center also can measure gear cutting tools such as hobs , shaving cutters and slotting cutters . The measuring center system can automatically calculate the measurment protocols .

The majority of customers for this machine come from metrology institutes , research institutes who need metrology type gear measuring center .

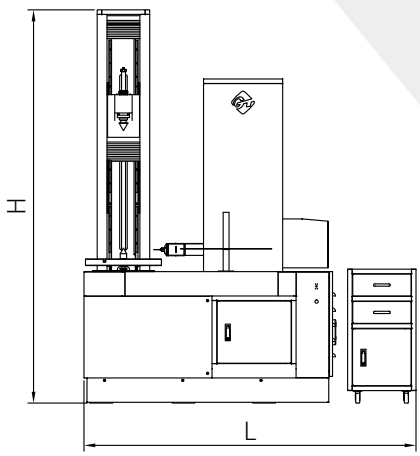
特点 & 安装图

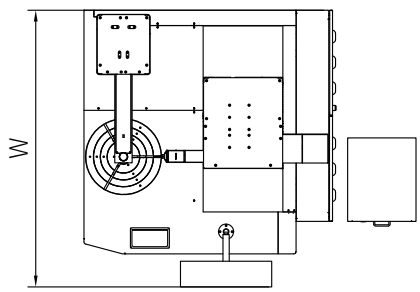
特 点 / FEATURES

- 主机结构紧凑，测量精度高，外形美观。密珠滚动导轨、刚性好、示值稳定。测量主机采用四坐标测量系统；德国海德汉高精度光栅传感器；英国雷尼绍三维数字式测头；直线电机等进口高性能电气配件。
- 测量参数多、应用范围广。可测量齿轮的齿廓偏差（Fα、ffα、fHα）、螺旋线偏差（Fβ、ffβ、fHβ）、齿距偏差（Fp、Fpk、fpt）及径向跳动（Fr）等，并且还可测量齿轮滚刀、蜗轮滚刀、插齿刀、剃齿刀、径向剃齿刀、蜗轮、蜗杆、直齿锥齿轮、斜齿锥齿轮、弧齿锥齿轮等工件的误差。
- 全自动完成测量循环，装卡速度快，具有偏心修正功能，被测齿轮一次装卡，自动完成全部检测项目。

- Compact and aesthetic design , heigh level of measuring accuracy and stable displayed values . By using compact ball bearing guide-ways to obtain good rigidity and stable value display . the equipment uses the 4-coordinate measuring system , Heidenhain precision grating ruler sensors and Renishaw 3D digital probes , DDL.
- Extensive measuring range and applications . the peoduct can measure parameters like tooth profile deviation(Fα、ffα、fHα)、helix deviation(Fβ、ffβ、fHβ)、pitch deviation(Fp、Fpk、fpt), redial runout(Fr) , and it can also measure the relevantparameters of gear cutters like hobs , worm hobs , shaving cuttrts , slotting cutters , radial gear shaving cutters , and workpieces like worms and worm wheels , straight bevel gears , helical bevel gears , spiral bevel gears , etc .
- Quick full-automatic measuring cycle , with an ecc enteccentricity correction function . Using one time clamping , can all be measured on the test gear .

安装图 / INSTALLATION LAYOUT





单位（Unit）：mm

尺寸 \ 型号	L65G	L100A
L	2185	2185
W	1825	1825
H	2600	2600

技术规格 / SPECIFICATIONS

单位（Unit）：mm

技术规格 型号	L65G	L100A	Model Specifications
可测齿轮模数	≥ 0.5（0.2*）	≥ 0.5（0.2*）	Module
可测齿轮最大外径	650	1000	Max.workpiece diameter
上下顶尖距离	10 - 1100	10 - 1100	Distance between centers
测头至下顶尖距离	0 - 600	0 - 600	Distance between stylus and lower center
可测螺旋角范围	0 - 90°	0 - 90°	Helix angle
可测工件最大重量	2000kg	2000kg	Max.permissible test gear weight
仪器净重	5000kg	5000kg	Net weight of machine
仪器毛重	5500kg	5500kg	Gross weight of machine
仪器尺寸（长 × 宽 × 高）	2185×1825×2600	2185×1825×2600	Over dimensions of basic unit（L×W×H）
主机箱外形尺寸（长 × 宽 × 高）	2400×2150×2527	2400×2150×2527	Dimensions of packing box（L×W×H）
工件立柱包装箱尺寸（长 × 宽 × 高）	2150×1000×1357	2150×1000×1357	Dimensions of column packing box（L×W×H）
附件箱外形尺寸（长 × 宽 × 高）	---	1050×1050×297	Dimensions of accessory case（L×W×H）

* 注：0.2mm 模数齿轮测量功能需要特定　　*Note: 0.2mm the modulus gear measurement function needs to be specific

仪器组成 / SET OF MACHINE INCLUDES

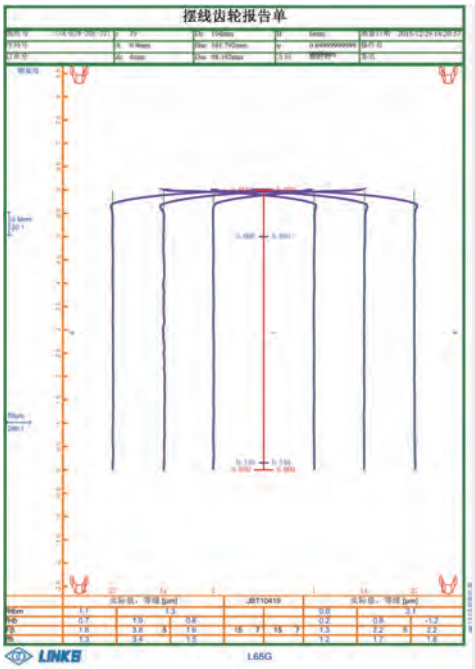
基本配置	数量 / Unit	Standard module
仪器主机	1 台 / 1 pc	Basic unit
总线控制系统	1 套 / 1 set	Fieldbus Control System
打印机	1 台 / 1 pc	printer
标准芯轴	2 根 / 2 pcs	Testing arbor
带动器	1 套 / 1 set	Work driver
打印纸	1 包 / 1 box	Printing paper

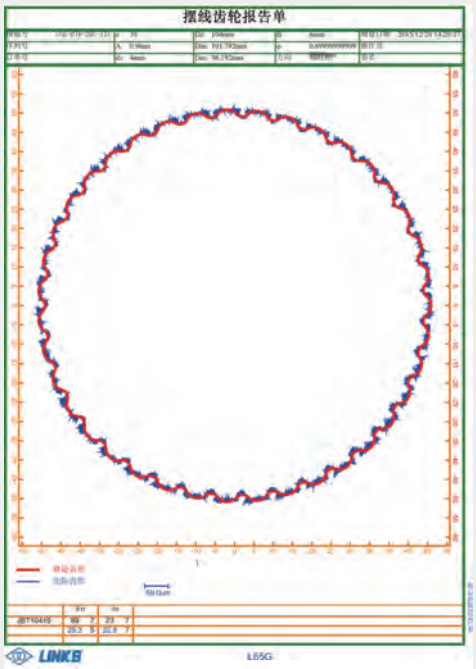
可选附件	单位 / Unit	Optional configuration
渐开线、螺旋线标准样板	1 块 / 1 set	Involute and helix master
高精度标准齿轮	1 个 / 1 pc	High precision master gear
三爪卡盘	1 套 / 1 set	3-jaw chuck
可涨芯轴	1 套 / 1 set	Expanding mandrel
稳压电源	1 台 / 1 pc	Voltage regulator
进口球测头及附件	1 套 / 1 set	Ball-tip styli and accessory kit
测量报告二维码枪扫码功能	1 套 / 1 set	Measurement report 2D Code Gun scanning function
摄像头辅助定位功能	1 套 / 1 set	Camera-assisted location

齿轮测量报告单

摆线齿轮测量报告单

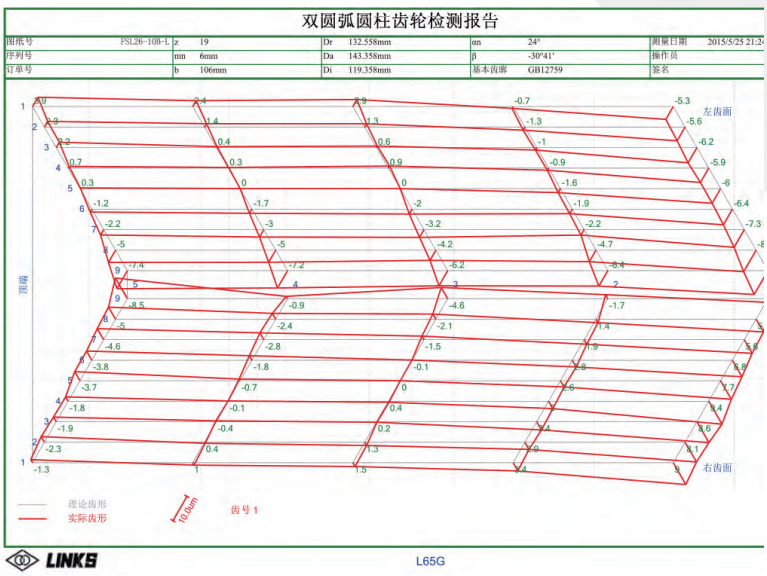
Measurement report of the cycloidal gear

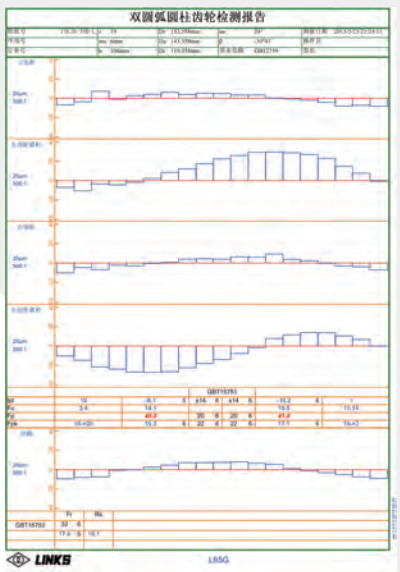




双圆弧齿轮测量报告单

Measurement report of the double-circular-arc cycloidal gear



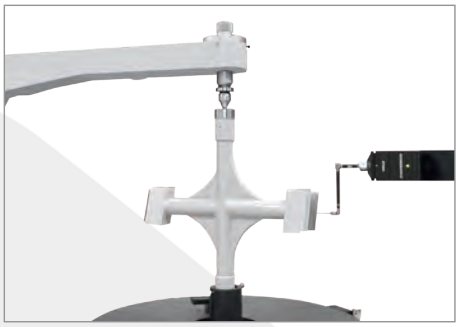


Gear Measuring Center Model L150A
齿轮测量中心 L150A 型

用 途 / APPLICATIONS

L150A 型齿轮测量中心通过三维测头可测量直齿圆柱齿轮、斜齿圆柱齿轮、人字齿轮、双圆弧齿轮、齿轮滚刀、多联齿轮等工件，特别适合于造船、冶金、矿山等重型机械工业中大型齿轮的测量。

Model L150A gear measuring center can accomplish a variety of gear measuring tasks including the inspections of tooth data on cylindrical gear (external spur and helical gears) and It can be measured by three-dimensional probe herringbone gear (standard module) , double arc gear , hob , multi-gear . These gear measuring center series particularly suit heavyduty industrial applications like ship building , ming and metallurgy .



测量样板 Checking the involute

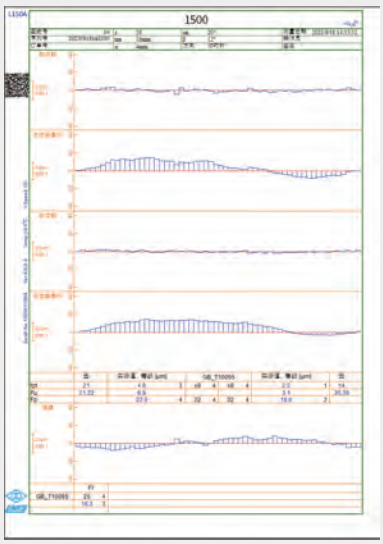
特 点 / FEATURES

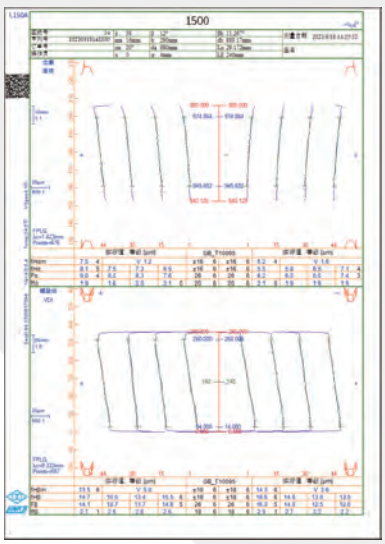
- 主机结构紧凑，测量精度高，示值稳定。测量主机采用四坐标测量系统，密珠滚动导轨，德国海德汉高精度光栅传感器，进口电机。
- 测量参数多、应用范围广。可测量齿轮的齿廓偏差（Fα、ffα、fHα）、螺旋线偏差（Fβ、ffβ、fHβ）、齿距偏差（Fp、Fpk、fpt）及径向跳动（Fr）等。
- 全自动完成测量循环，速度快。在被测齿轮一次装卡中，自动完成齿轮齿廓、螺旋线、齿距、径跳测量项目的检测。
- 软件功能齐全、内容丰富、操作方便。用户可根据被测工件，选择被测项目。

圆柱齿轮测量结果可按 GB/T10095.1,GB/T10095.2,DIN3962 等标准自动评定。对于特殊要求，齿廓有 K 形图、齿廓凸度 Cα、螺旋线鼓度 Cβ 特定公差带进行评估。

- Compact construction of basic machine , high measuring accuracy and reliability .The basic units of these gear measuring centers areprivided with 4-axis measuring system . With the help of rigid multirow rolling guides , Heidenhain encoders made in Germany , imported motor , high measuring reliability is guaranteed .
- Complete measurement of tooth data and wide range of application . The functions of the measuring software include evaluations of tooth profile deviations（Fα、ffα、fHα）、helix deviations（Fβ、ffβ、fHβ）、pitch deviations（Fp、Fpk、fpt）and radial runout（Fr）.
- Full automatic measuring cycle with fast measuring speed . This measuring center permits automatic checking of all test items such as profile , helix and pitch deviations and runout in one set-up .
- Convenient and powerful measuring software . The measuring items can be selected accroding to the workpiece to be tested .

This user friendly measuring software provides automatic evaluation of cylindrical gears according to GB/T10095.1 , GB/T10095.2 , DIN3962 , ISO1328 , AGMA and other assessment criteria for automatic assessment . The special functions in the measuring software include evaluations of K chart for profile , profile barreling Cα,and toote crowning Cβ for helix .





齿轮测量报告 Gear test report

技术规格 / SPECIFICATIONS

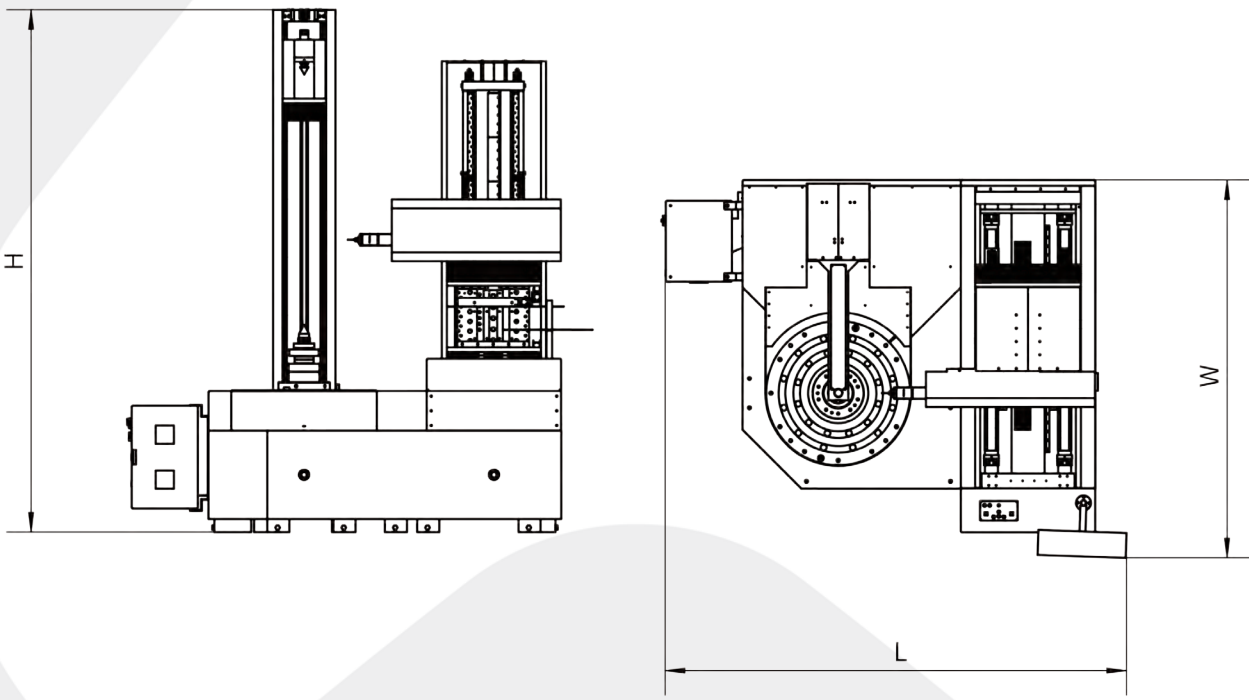
单位（Unit）：mm

型号 / 技术规格	L150A	Model / Specification
可测齿轮模数	≥ 0.5	Module
可测齿轮最大外径	1500	Max.workpiece diameter
上下顶尖距离	20 - 1500	Distance between centers
测头到下顶尖距离	50-1100	Distance from stylus to the lower centre
可测螺旋角范围	0 - 90°	Helix angle
可测工件最大重量	5000kg	Max.permissible test gear weight
主机尺寸（长 × 宽 × 高）	3200×2600×3560	Over dimensions of basic unite（LxWxH）

仪器组成 / SET OF MACHINE INCLUDES

基本配置	数量 / Unit	Stanard module
测量主机	1 台 / 1 pc	Basic machine
总线柜	1 套 / 1 set	Ethercat electric cabinet
打印机	1 台 / 1 pc	Laser printer
小号带动器	1 套 / 1 pc	Small-size Work driver
大号带动器	1 套 / 1 pc	Large-size Work driver
内六方扳手	5 件 / 5 pcs	Inter hexagon key
芯杆	2 件 / 2 pcs	Mandrel
齿轮托盘	1 套 / 1 set	Gear ssupport plate
标准软件配置	1 套 / 1 set	Standard measuring software

安装图 / INSTALLATION LAYOUT



单位（Unit）：mm

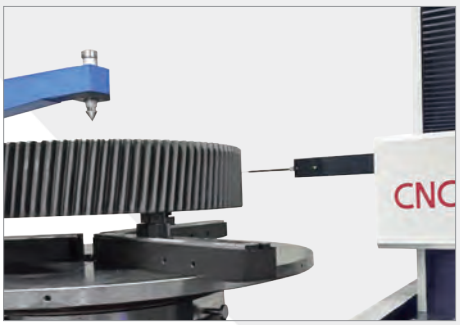
尺寸 / 型号	L	W	H
L150A	3200	2600	3560

Gear Measuring Center Model L200A
齿轮测量中心 L200A 型

用 途 / APPLICATIONS

L200A 型齿轮测量中心通过三维测头可测量直齿圆柱齿轮、斜齿圆柱齿轮、人字齿轮、双圆弧齿轮、齿轮滚刀、多联齿轮等工件，特别适合于造船、冶金、矿山等重型机械工业中大型齿轮的测量。

Model L200A gear measuring center can accomplish a variety of gear measuring tasks including the inspections of tooth data on cylindrical gear (external spur and helical gears) and It can be measured by three-dimensional probe herringbone gear (standard module) , double arc gear , hob , multi-gear . These gear measuring center series particularly suit heavyduty industrial applications like ship building , ming and metallurgy .



测量大型齿轮 Measure large gear

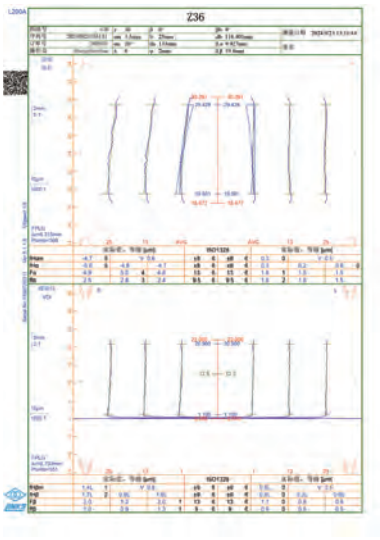
特 点 / FEATURES

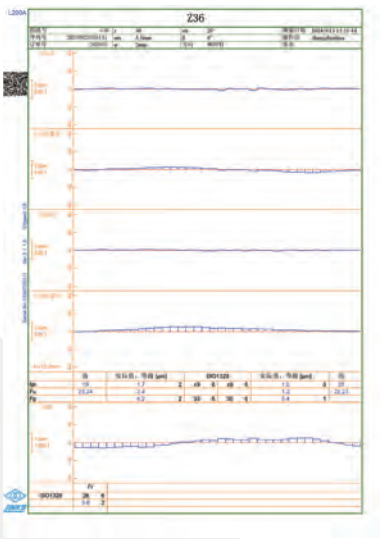
- 主机结构紧凑，测量精度高，示值稳定。测量主机采用四坐标测量系统，密珠滚动导轨，德国海德汉高精度光栅传感器，进口电机。
- 测量参数多、应用范围广。可测量齿轮的齿廓偏差（Fα、ffα、fHα）、螺旋线偏差（Fβ、ffβ、fHβ）、齿距偏差（Fp、Fpk、fpt）及径向跳动（Fr）等。
- 全自动完成测量循环，速度快。在被测齿轮一次装卡中，自动完成齿轮齿廓、螺旋线、齿距、径跳测量项目的检测。
- 软件功能齐全、内容丰富、操作方便。用户可根据被测工件，选择被测项目。

圆柱齿轮测量结果可按 GB/T10095.1,GB/T10095.2,DIN3962 等标准自动评定。对于特殊要求，齿廓有 K 形图、齿廓凸度 Cα、螺旋线鼓度 Cβ 特定公差带进行评估。

- Compact construction of basic machine , high measuring accuracy and reliability .The basic units of these gear measuring centers areprivided with 4-axis measuring system . With the help of rigid multirow rolling guides , Heidenhain encoders made in Germany , imported motor , high measuring reliability is guaranteed .
- Complete measurement of tooth data and wide range of application . The functions of the measuring software include evaluations of tooth profile deviations（Fα、ffα、fHα）、helix deviations（Fβ、ffβ、fHβ）、pitch deviations（Fp、Fpk、fpt）and radial runout（Fr）.
- Full automatic measuring cycle with fast measuring speed . This measuring center permits automatic checking of all test items such as profile , helix and pitch deviations and runout in one set-up .
- Convenient and powerful measuring software . The measuring items can be selected accroding to the workpiece to be tested .

This user friendly measuring software provides automatic evaluation of cylindrical gears according to GB/T10095.1 , GB/T10095.2 , DIN3962 , ISO1328 , AGMA and other assessment criteria for automatic assessment . The special functions in the measuring software include evaluations of K chart for profile , profile barreling Cα,and toote crowning Cβ for helix .





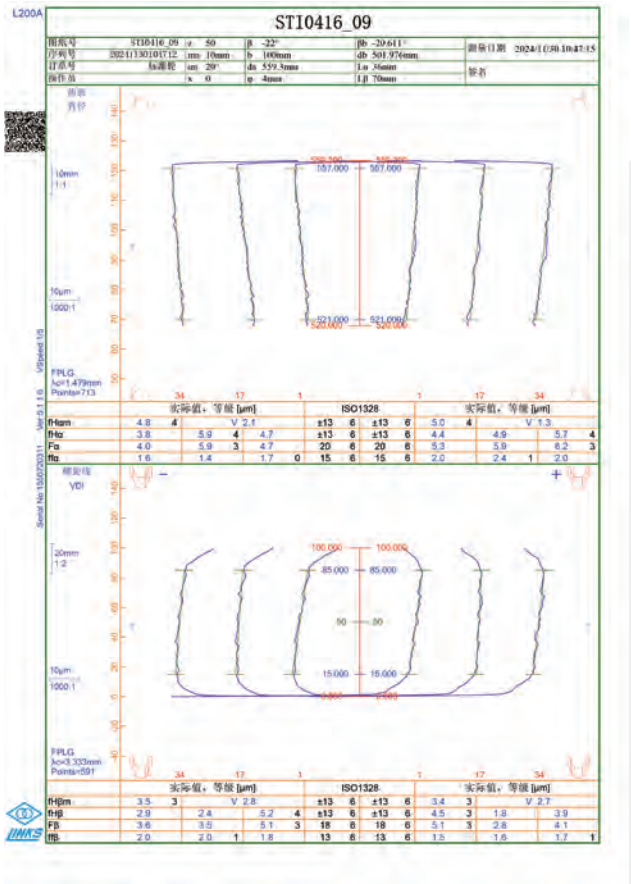
齿轮测量报告 Gear test report

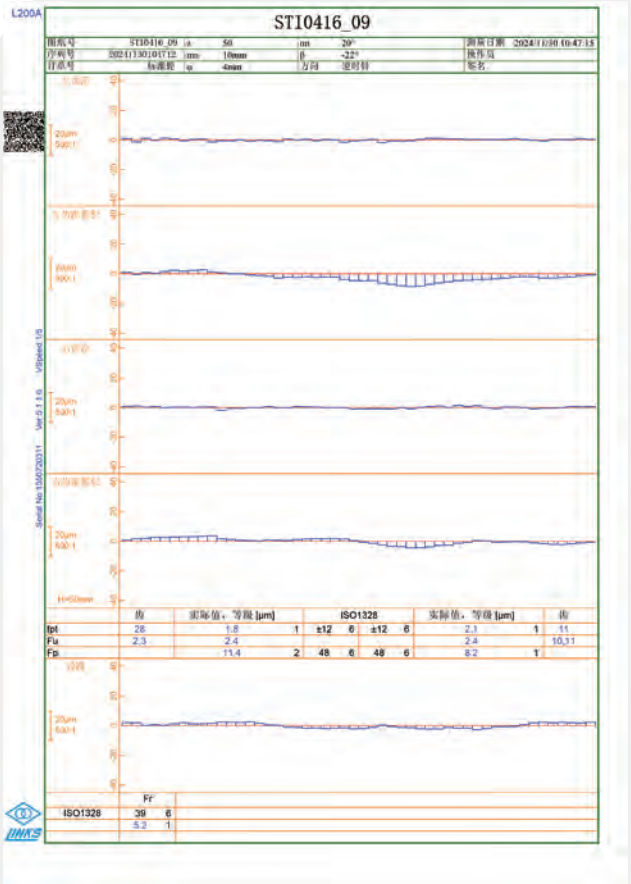
技术规格 / SPECIFICATIONS

单位（Unit）：mm

型号 / 技术规格	L200A	Model / Specification
可测齿轮模数	≥ 0.5	Module
可测齿轮最大外径	2000	Max.workpiece diameter
上下顶尖距离	20 - 1500	Distance between centers
测头到下顶尖距离	50-1100	Distance from stylus to the lower centre
可测螺旋角范围	0 - 90°	Helix angle
可测工件最大重量	10000kg	Max.permissible test gear weight
主机尺寸（长 × 宽 × 高）	4350×2100×3450	Over dimensions of basic unite（LxWxH）

标准轮检测报告 & 仪器组成



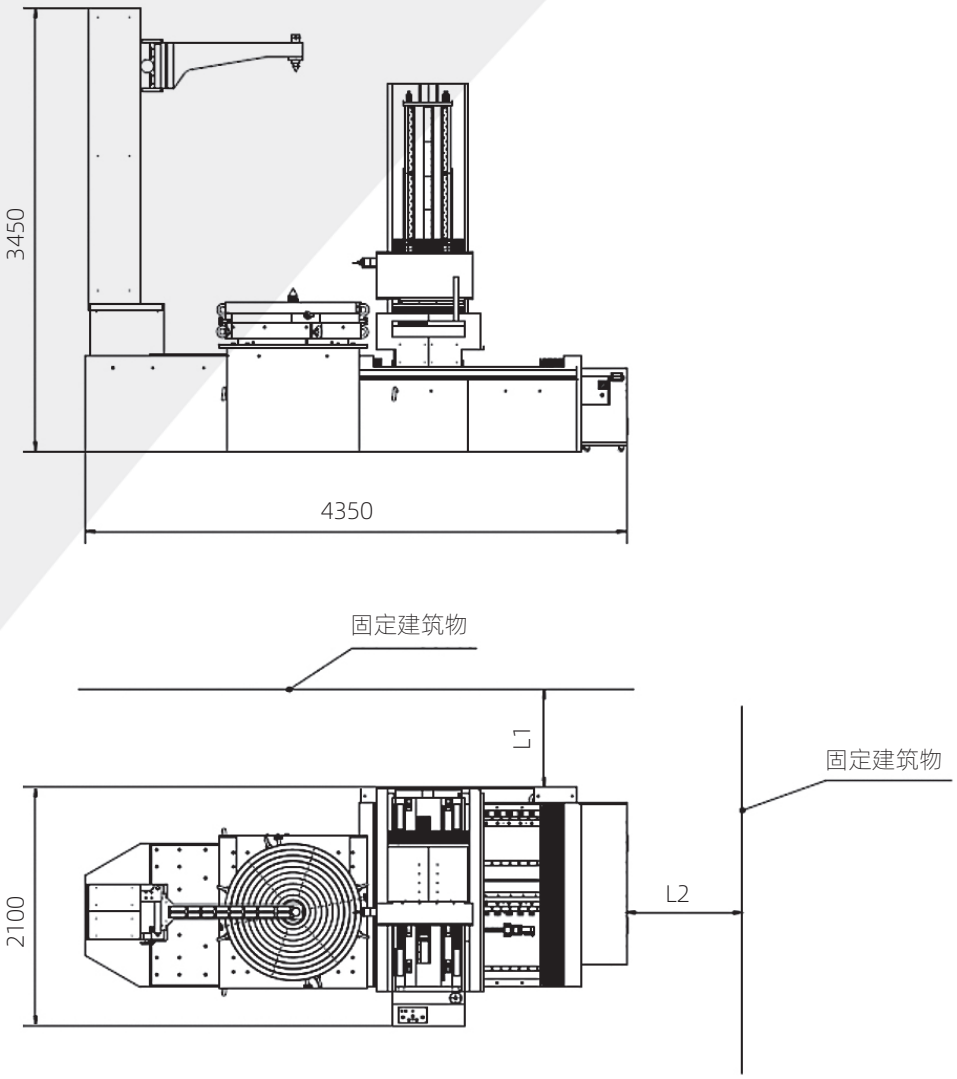


标准齿轮 - 测量报告 Standard gear-measuring report

仪器组成 / SET OF MACHINE INCLUDES

基本配置	数量 / Unit	Stanard module
测量主机	1 台 / 1 pc	Basic machine
打印机	1 台 / 1 pc	Laser printer
小号带动器	1 套 / 1 pc	Small-size Work driver
大号带动器	1 套 / 1 pc	Large-size Work driver
内六方扳手	5 件 / 5 pcs	Inter hexagon key
芯杆	2 件 / 2 pcs	Mandrel
齿轮托盘	1 套 / 1 set	Gear ssupport plate
标准软件配置	1 套 / 1 set	Standard measuring software

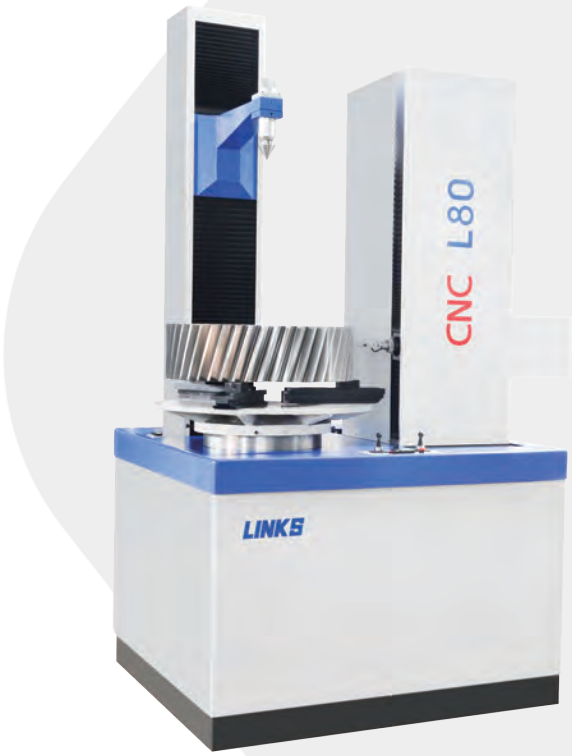
安装图 / INSTALLATION LAYOUT



注：仪器背面与固定建筑物间距离 L1，仪器右侧与固定建筑物间距离 L2，需要保证 L1 ≥ 600mm，L2 ≥ 1000mm，便于售后安装服务人员售后维修。

Note: the distance L1 between the back of the instrument and the fixed building the distance L2 between the right side of the instrument and the fixed building，You should ensure L1 ≥ 600mm and L2 ≥ 1000mm respectively to facilitate the after-sales installation service personnel for maintenance.

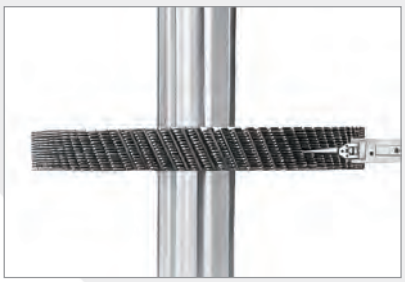
Gear Measuring Center Model L80/L100
齿轮测量中心 L80/L100 型

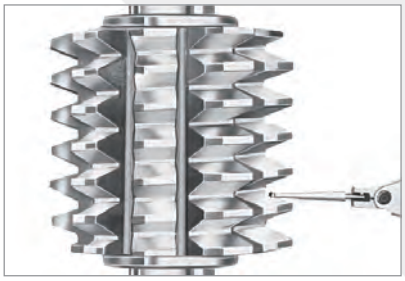


用 途 / APPLICATIONS

L80、L100 型齿轮测量中心，基本测量软件可以测量圆柱齿轮，可选测量软件有：齿轮滚刀测量软件、蜗轮滚刀测量软件、剃齿刀测量软件、插齿刀测量软件、蜗杆测量软件、蜗轮测量软件、直齿锥齿轮测量软件，可按照用户要求进行扩展。

In combination with standard software module , the model L80、L100 gear measuring center series are designed to check cylindrical gear . The optional measuring software modules include hob , worm , worm gear , spur bevel gear packages etc. In addition , the special extended measuring functions are available on request .





特 点 / FEATURES

- 主机结构紧凑，测量精度高，示值稳定，外形美观。测量主机采用四坐标测量系统；德国海德汉高精度光栅传感器；瑞士 TESA 高精度电感测头，密珠滚动导轨。
- CNC 系统采用新型运动控制卡，DDR 电机驱动的全闭环轨迹控制。
- 软件功能齐全、内容丰富，用户可根据被测工件，选择测量项目。圆柱齿轮测量结果可按 GB/T10095.1、GB/T10095.2、DIN3962-1978、ISO1328、AGMA-2000-A88 等多种评定标准自动评定；齿廓 K 形图、齿廓凸度、螺旋线鼓度等项目的评定。
- 软件操作简单，被测工件一次装卡，由计算机控制自动完成测量，测量效率高；齿廓和螺旋线偏差可由用户自由选齿测量；测量曲线评定范围可由鼠标拖动；测量速度可由操作者在软件中选择。
- 可由用户选择多种打印报表格式；测量参数修改时可以重新计算绘图；测量中间数据可由用户选择存储，用于分析；可视化参数输入。

- Compact construction and 4-axis measuring system with high measurement accuracy and stability , Heidenhain encoders made in Germany , Test heigh precision inductive probe made in Switzerland as well as ball rolling guideways .
- Newly-designed motion control card in the CNC system and closed loop patch control for DDR/DDL motor drive .
- The powerful measuring functions : The test item can be selected according to the workpiece to be tested . This user friendly measuring software allows evaluation of cylindrial gear (incl . k-chart , profile crowing and crowing in tooth trace directon in accordance with GB/T10095.1、GB/T10095.2、DIN3962-1978、ISO1328、AGMA-2000-A88 standard .
- This measuring center permits the chaecking of all test items such as profile and helix deviations on freely selected tooth in one set-up . The evaluation range of the test curve is defined on a mouse drag action and the measuring velocity can also be controlled in the software . The measuring cycle is automatically controlled .
- Visualized parameter entry and multiple print chart formats for customer choice . Data calculation and testing chart can be updated when the measuring parameters modified and middle data can be saved at customer's request for further analysis .

技术规格 / SPECIFICATIONS

单位（Unit）：mm

型号 / 技术规格	L80	L100	Model / Specifications
可测齿轮模数	0.5 - 20	0.5 - 20	Module
可测齿轮最大外径	800	1000	Max.workpiece diameter
上下顶尖距离	40 - 1000	100 - 1100	Distance between centers
测头至下顶尖距离	20 - 600	20 - 600	Distance between stylus and lower center
可测螺旋角范围	0 - 90°	0 - 90°	Helix angle
可测工件最大重量	1000kg	2000kg	Max.permissible test gear weight
仪器净重	2500kg	2600kg	Net weight of machine
仪器毛重	3000kg	3100kg	Gross weight of machine
主机尺寸（长 × 宽 × 高）	1400×1310×2408	1465×1435×2590	Overrall dimensions of basic unit（L×W×H）
主机包装外形尺寸（长 × 宽 × 高）	1600×1700×2357	1650×1760×2357	Overrall dimensions of packing box（L×W×H）
工件立柱包装箱尺寸（长 × 宽 × 高）	1760×800×957	2000×1000×1167	Dimensions of column packing box（L×W×H）
微机包装箱尺寸（长 × 宽 × 高）	1700×1030×1107	1700×1030×1107	Dimensions of computer packing box（L×W×H）

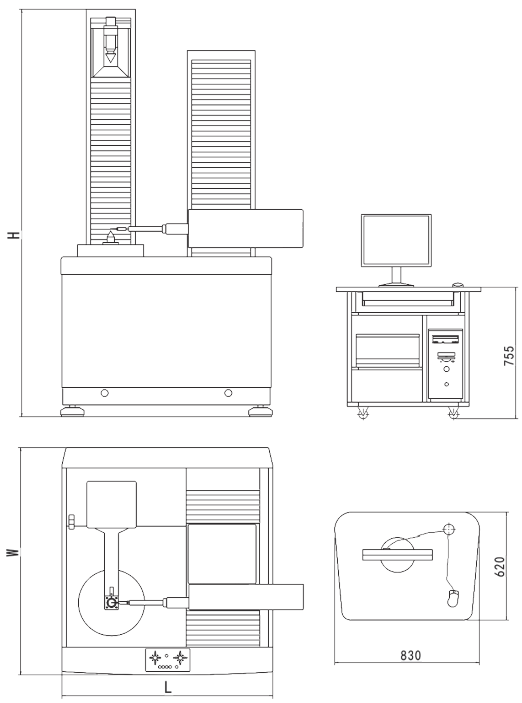
仪器组成 & 安装图

仪器组成 / SET OF MACHINE INCLUDES

基本配置	数量 / Unit	Stanard module
测量主机	1 台 / 1 pc	Basic machine
计算机	1 套 / 1 pc	Microcomputer
微机桌	1 台 / 1 pc	Electronic cabinet
打印机	1 台 / 1 pc	Laser printer
球形测头：φ0.6、φ0.8、φ1、φ1.5、φ2、φ3、φ4	各 2 个 / 2 each	Ball-tip styli:φ0.6、φ0.8、φ1、φ1.5、φ2、φ3、φ4
带动器	1 套 / 1 pc	Work driver
测杆	1 套 / 1 pc	Stylus extension
标准芯轴	2 根 / 2 pcs	Standard mandrel
打印纸	1 包 / 1 pack	Printing paper

可选附件（价格另议）	数量 / Unit	Optional accessories（at extra cost）
渐开线、螺旋线样板	1 块 / 1 pc	Involute and helix master template
高精度标准齿轮	1 个 / 1 pc	High precision master gear
可涨芯轴	1 套 / 1 pc	Expanding mandrel
稳压电源	1 台 / 1 pc	Voltage regulator

安装图 / INSTALLATION LAYOUT



单位（Unit）：mm

尺寸 \ 型号	L80	L100
L	1400	1465
W	1310	1435
H	2408	2590

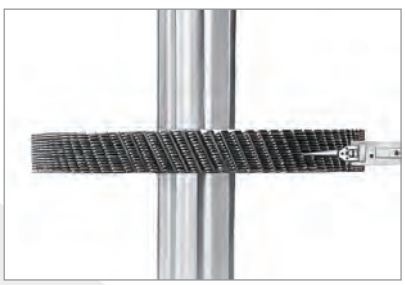
Gear Measuring Center Model Prec 20/30/40/60/80

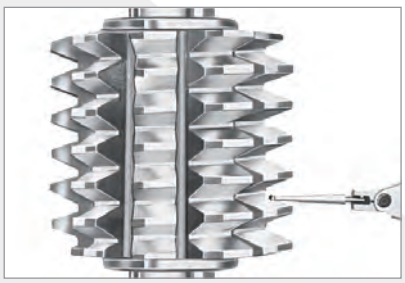
齿轮测量中心 Prec 20/30/40/60/80 型

用 途 / APPLICATIONS

该系列齿轮测量中心，基本配置软件可以测量圆柱齿轮，可选测量软件有：齿轮滚刀测量软件、蜗轮滚刀测量软件、剃齿刀测量软件、插齿刀测量软件、蜗杆测量软件、蜗轮测量软件、直齿锥齿轮测量软件、弧齿锥齿轮测量软件等，并可按客户要求扩展。

This kinds of Gear Measuring Center with basic configuration software for measuring cylindrical gears . Optional measurement software : Gear hob measurement software , Worm hob measurement software , Shaving cutter measurement software , Shaper cutter measurement software , Worm measurement software , Worm gear measurement Software , straight bevel gear measurement software , bevel gear measurement software , spiral bevel gear measurement software , etc ., and can be extended according to customer requirements .





特 点 / FEATURES

- 主机结构紧凑、测量精度高，示值稳定，外形美观。测量主机采用四坐标测量系统；德国海德汉光栅传感器；瑞士 TESA 高精度电感测头；密珠滚动导轨。
- CNC 系统采用新型运动控制卡，DDR、DDL 电机驱动的全闭环轨迹控制。
- 软件功能齐全、内容丰富，用户可根据被测工件，选择测量项目。圆柱齿轮测量结果可按 GB/T10095.1,GB/T10095.2,DIN3962 等标准自动评定。
- 软件操作简单，被测工件一次装卡，由计算机控制自动完成测量，测量效率高；齿廓和螺旋线偏差可由用户自由选齿测量；测量曲线评定范围可由鼠标拖动；测量速度可由操作者在软件中选择。
- 用户可选择多种打印报表格式；测量参数修改时可以重新计算绘图；测量中间数据可由用户选择存储，用于分析；可视化参数输入。

- Host structure is compact , high accuracy, showing the value of stability , beautiful appearance. Measuring host using four coordinate measuring system ; Germany HEIDENHAIN grating sensor ; Switzerland TESA high-precision inductive probe ; Pearl ball rolling guide.
- CNC system uses a new type of motion control card , DDR、 DDL motor-driven full-closed-loop trajectory control .
- The software is complete in function and rich in content . The user can select the measurement items according to the tested work-piece . Cylindrical gear measurement results according to GB/T10095.1 , GB/T10095.2 , DIN3962 , ISO1328 , AGMA and other assessment criteria for automatic assessment ; profile K-shaped figure , profile convexity, spiral drum rating and other projects .
- The software is easy to operate and the tested work-piece is loaded once . The measurement is done automatically by the computer. The measurement efficiency is high . The tooth profile and helix deviation can be measured freely by the user . The evaluation range of the measurement curve can be dragged by the mouse . Choose in software .
- Users can choose a variety of print report format; measurement parameters can be recalculated when drawing changes; measurement of intermediate data can be stored by the user for analysis ; visualization parameters input .

技术规格 / SPECIFICATIONS

单位：mm

型号 / 技术规格	Prec20	Prec30	Prec40	Prec60	Prec80
可测齿轮模数	0.5 - 15	0.5 - 15	0.5 - 15	0.5 - 20	0.5 - 20
可测齿轮最大外径	200	300	400	600	800
上下顶尖距离	15 - 500	15 - 500	15 - 500	20 - 800	30 - 1000
测头至下顶尖距离	-10 - 390	-10 - 390	-10 - 390	5 - 405	10 - 600
可测螺旋角范围	0 - 90°	0 - 90°	0 - 90°	0 - 90°	0 - 90°
可测工件最大重量	80kg	300kg	300kg	400kg	1000kg
仪器净重	1500kg	1500kg	1500kg	2600kg	3000kg
仪器毛重	1700kg	1700kg	1700kg	3000kg	3500kg
主机尺寸（长×宽×高）	1700×1060×1900	1700×1060×1900	1700×1060×1900	1900×1080×2295	2300×1365×2460
主机箱尺寸（长×宽×高）	1360×1200×2267	1360×1200×2267	1360×1200×2267	1574×1260×2047	1800×1560×2347
附件箱尺寸（长×宽×高）	1500×1000×1307	1500×1000×1307	1500×1000×1307	1500×1000×1307	1700×1030×1107

Unit：mm

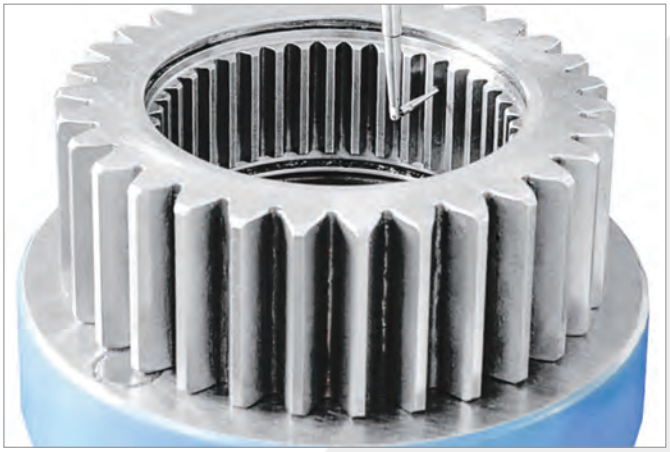
Specifications \ Model	Prec20	Prec30	Prec40	Prec60	Prec80
Module	0.5 - 15	0.5 - 15	0.5 - 15	0.5 - 20	0.5 - 20
Max.workpiece diameter	200	300	400	600	800
Distance between centers	15 - 500	15 - 500	15 - 500	20 - 800	30 - 1000
Distance between stylus and lower center	-10 - 390	-10 - 390	-10 - 390	5 - 405	0 - 600
Helix angle	0 - 90°	0 - 90°	0 - 90°	0 - 90°	0 - 90°
Max.permissible test gear weight	80kg	300kg	300kg	400kg	1000kg
Net weight of machine	1500kg	1500kg	1500kg	2600kg	3000kg
Gross weight of machine	1700kg	1700kg	1700kg	3000kg	3500kg
Overrall dimensions of basic unit （L×W×H）	1700×1060×1900	1700×1060×1900	1700×1060×1900	1900×1080×2295	2300×1365×2460
Overrall dimensions of packing box （L×W×H）	1360×1070×2047	1360×1070×2047	1360×1070×2047	1574×1260×2047	1800×1560×2337
Dimensions of computer packing box（L×W×H）	1300×1000×1107	1300×1000×1107	1300×1000×1107	1300×1000×1107	1700×1030×1107

仪器组成 / SET OF MACHINE INCLUDES

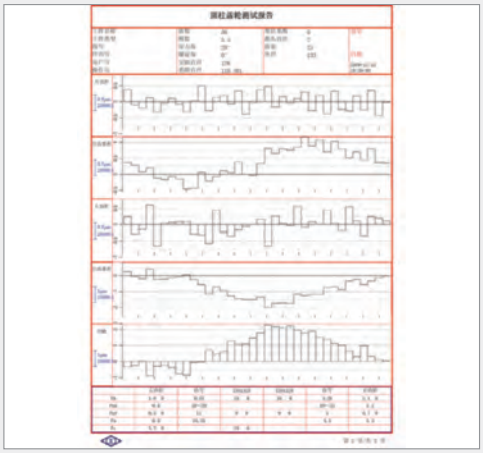
基本配置	数量 / Unit	Stanard module
测量主机	1 台 / 1 pc	Basic machine
计算机	1 套 / 1 set	Microcomputer
打印机	1 台 / 1 pc	Printer
带动器	1 套 / 1 set	Work driver
标准芯轴	2 根 / 2 pcs	Testing arbor
Prec20/30/40 测头 (Φ0.4,Φ0.6,Φ0.8,Φ1,Φ1.5,Φ2,Φ3)	各 2 个 / 2 each	Prec20/30/40 Styli （Φ0.4,Φ0.6,Φ0.8,Φ1,Φ1.5,Φ2,Φ3)
Prec60/80 测头 (Φ0.4,Φ0.6,Φ0.8,Φ1,Φ1.5,Φ2,Φ3,Φ4）	各 2 个 / 2 each	Prec60/80 Styli （Φ0.4,Φ0.6,Φ0.8,Φ1,Φ1.5,Φ2,Φ3,Φ4)

可选附件	数量 / Unit	Optional accessories（at extra cost）
高精度渐开线螺旋线样板	1 块 / 1 pc	Involute and helix master
可涨芯轴	1 套 / 1 set	Expanding mandrel
稳压电源	1 台 / 1 pc	Voltage regulator
高精度标准齿轮	1 套 / 1 set	High precision master gear

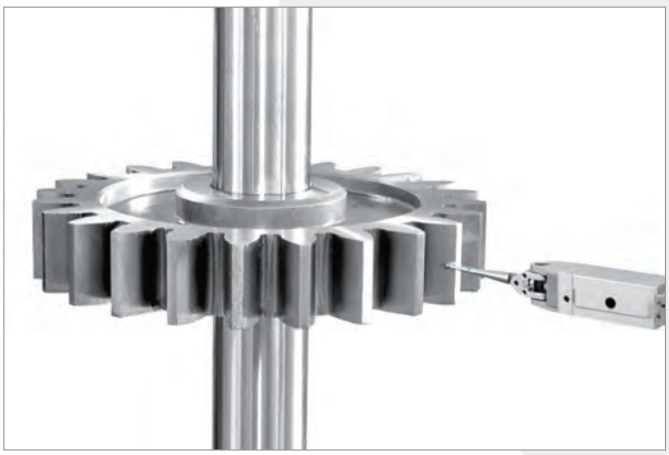
齿轮测量报告单



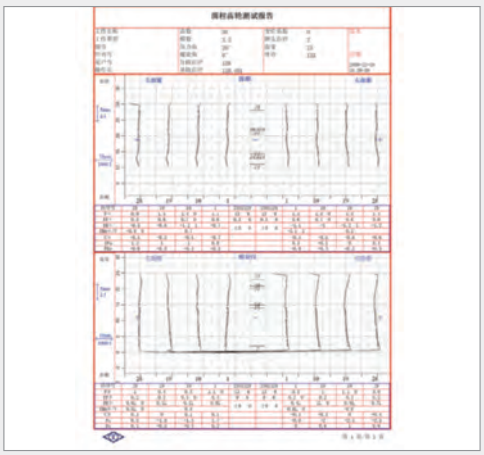
内齿轮测量
Internal gear



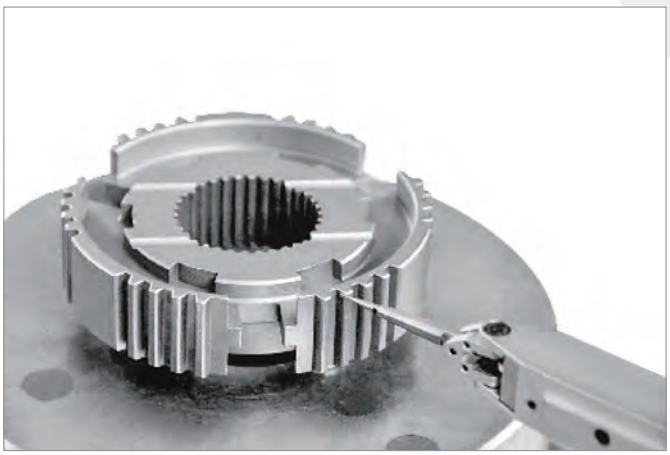
圆柱齿轮齿距测量报告单
Pitch mesaurement report of the cylindrical gear



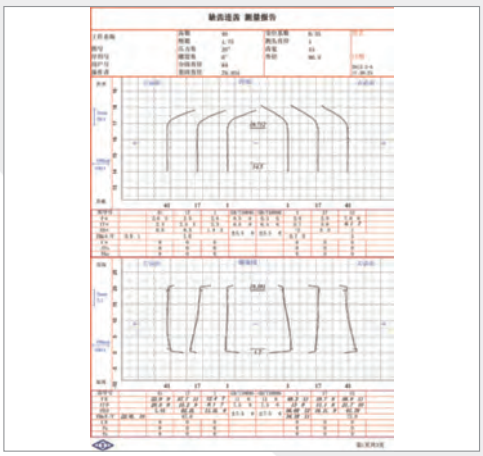
齿轮测量
Spur gear



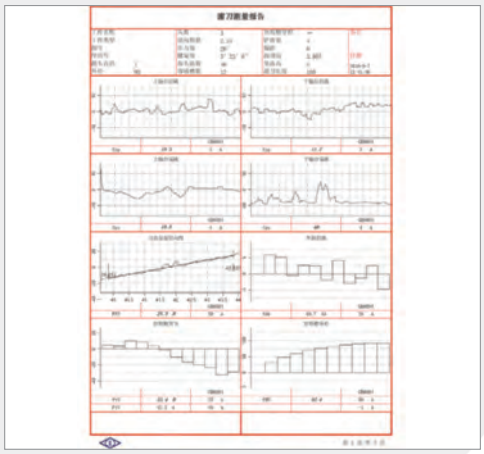
圆柱齿轮齿廓与螺旋线偏差测量报告单
Tooth profile and helix devication mesaurement report of the cylindrical gear



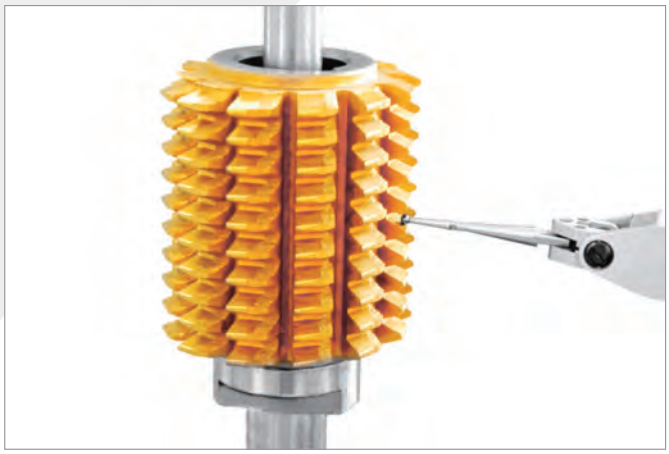
缺齿联齿齿轮测量
Missing and uncut tooth gear



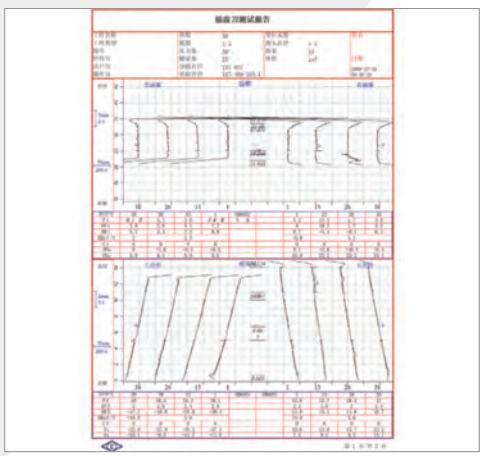
缺齿联齿齿轮齿廓与螺旋线偏差测量报告单
Tooth profile and helix devication mesaurement report of the Missing and uncut tooth gear



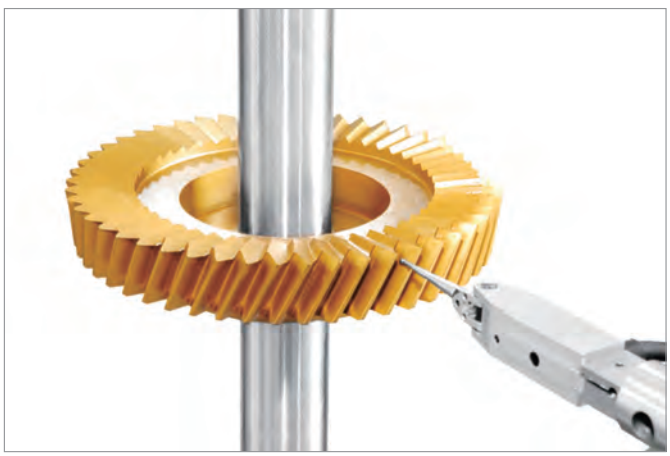
滚刀测量报告单
Mesaurement report of hob cutter



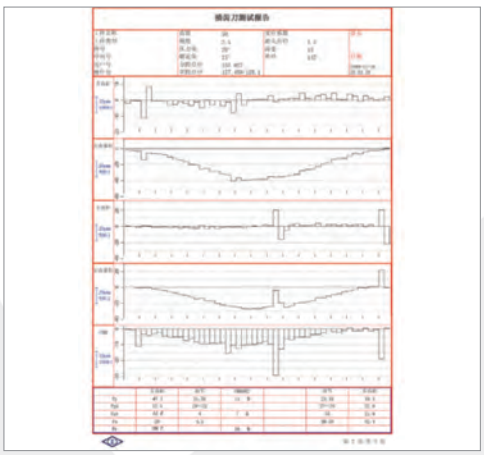
滚刀测量
Hob



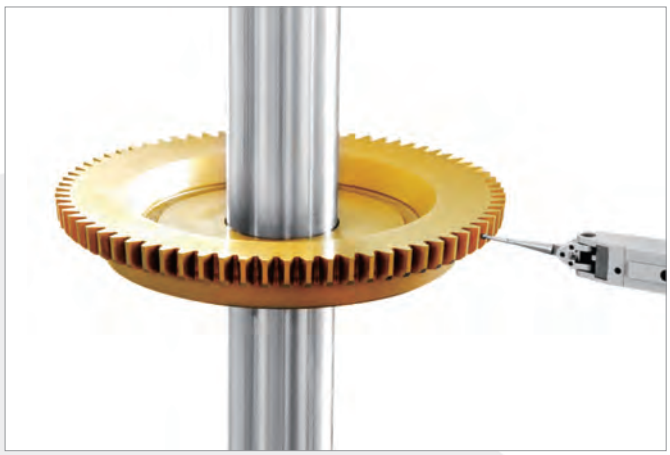
插齿刀齿廓偏差和螺旋线偏差测量报告单
Mesaurement report of Tooth profile and helix helix error of shapint cutter



插齿刀测量
Shaping cutter



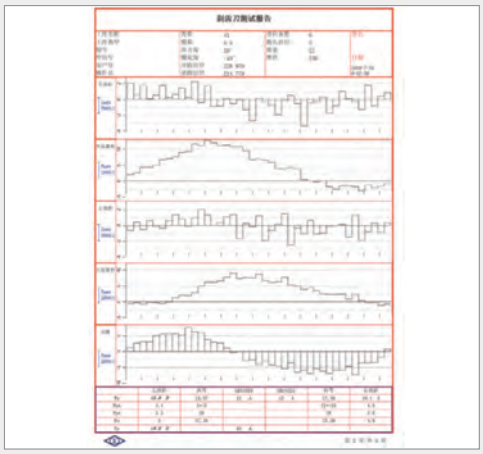
插齿刀齿距偏差测量报告单
Mesaurement report of tooth pitch erroer shaping cutter



插齿刀测量
Shaping cutter

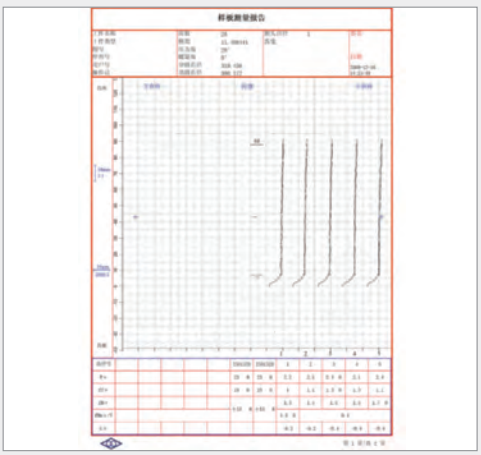
齿轮测量报告单

剃齿刀测量
Shaving cutter



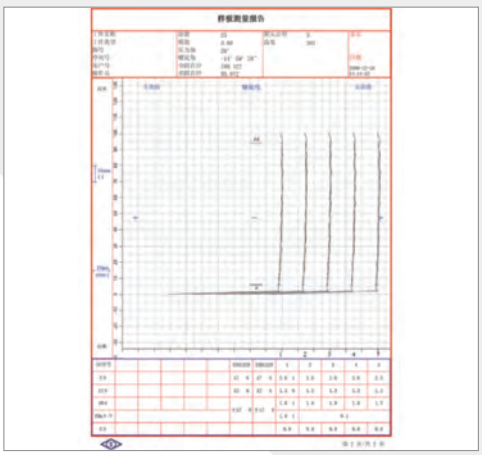
剃齿刀测量报告单
Mesaurement report of the shaving cutter

渐开线样板测量
Involute master

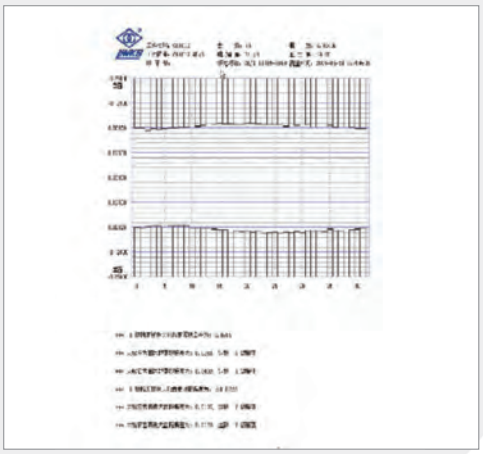


渐开线样板测量报告单
Mesaurement report of the involute master temllate

螺旋线样板测量
Lead master

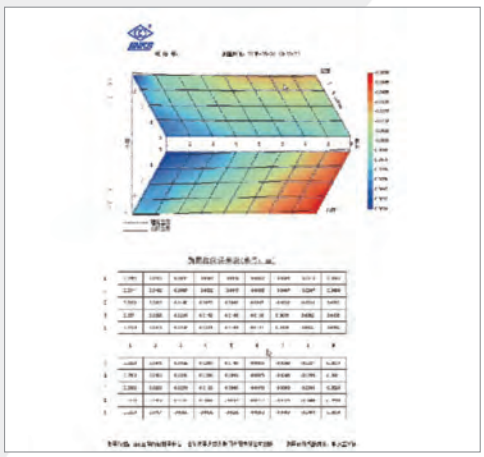


螺旋线样板测量报告单
Mesaurement report of the helix master temllate



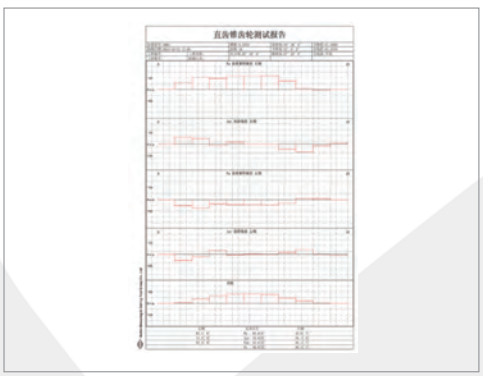
弧齿锥齿轮齿距测量报告单
Mesaurement report of the tooth pitch of spiral bevel gear

弧齿锥齿轮测量
Spiral bevel gear



弧齿锥齿轮齿面测量报告单
Mesaurement report of the tooth profile of spiral bevel gear

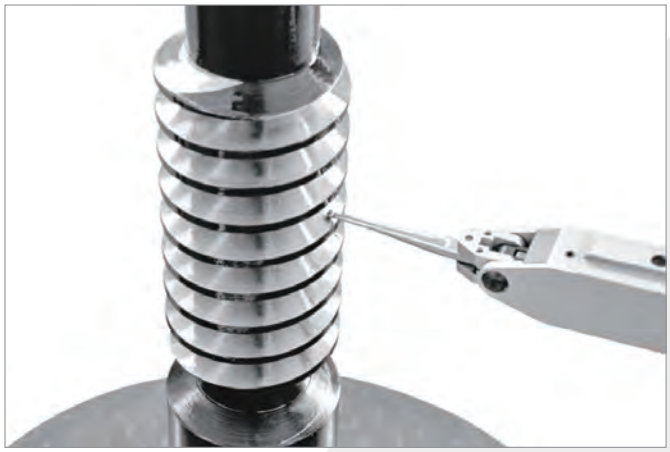
弧锥齿轮测量
Spiral bevel gear with shaft



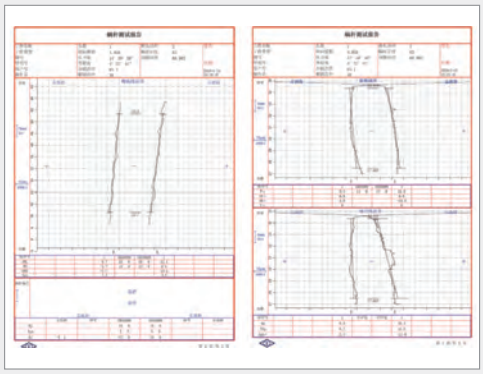
直齿锥齿轮测量报告单
Mesaurement report of the straight bevel gear

直齿锥齿轮测量
Straight bevel gear

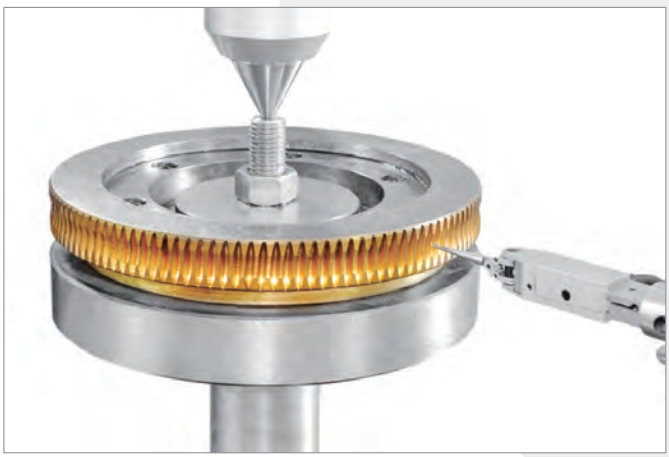
齿轮测量报告单



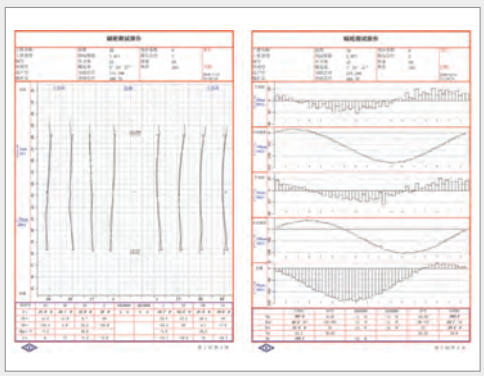
蜗杆测量
Worm



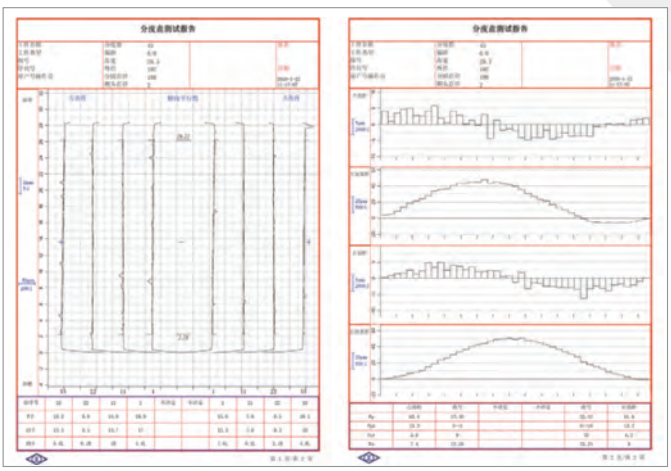
蜗杆测量报告单
Mesaurement report of worm



蜗轮测量
Worm wheel

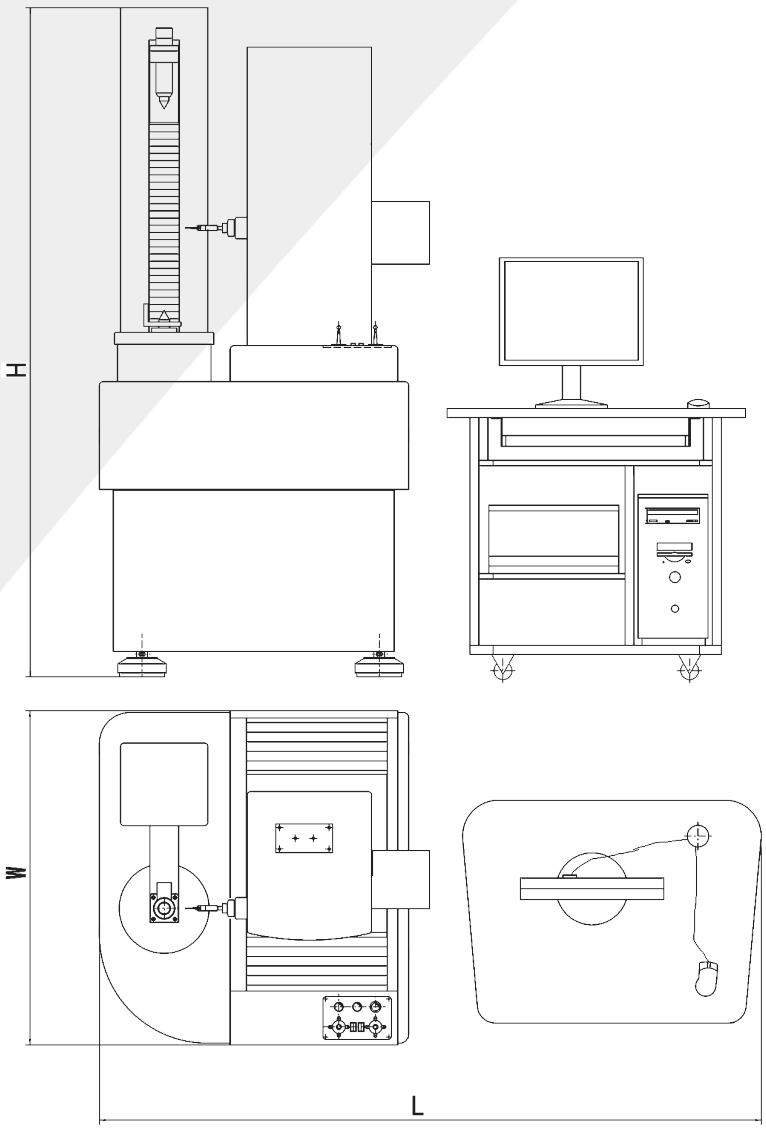


蜗轮测量报告单
Mesaurement report of the worm wheel



分度盘测试报告
Mesaurement report of the division plate

安装图 / INSTALLATION LAYOUT



单位（Unit）：mm

尺寸 \ 型号	Prec20	Prec30	Prec40	Prec60	Prec80
L	1700	1700	1700	1900	2300
W	1060	1060	1060	1080	1365
H	1900	1900	1900	2295	2460

Gear Measuring Center Model Econ30
齿轮测量中心 Econ30 型

用 途 / APPLICATIONS

Econ 30 型齿轮测量中心，基本配置软件可以测量圆柱齿轮，可选测量软件有：齿轮滚刀测量软件、蜗轮滚刀测量软件、剃齿刀测量软件、插齿刀测量软件、蜗杆测量软件、蜗轮测量软件、直齿锥齿轮测量软件、弧齿锥齿轮测量软件等，并可按客户要求扩展。

Econ 30 Gear Measuring Centre permits the cylindrical gear to be inspected with the standard software package . Optional application packs for gear hob , worm hob , shaving cutter , Shaper cutter , worm , worm gear, straight bevel gear and spiral bevel gear can be offered , and extended at customer's requests .

特 点 / FEATURES

- 主机结构紧凑、测量精度高，示值稳定，外形美观。测量主机采用四坐标测量系统；瑞士 TESA 高精度电感测头；密珠滚动导轨。

- Compact construction of basic machine and high measuring accuracy.The gear measuring centre is provided with a 4-axis measuring system with high-precision TESA inductive probe and ball rolling guide . Thus system measurement accuracy and stability are greatly improved .

- CNC 系统采用新型运动控制卡，DDR、DDL 电机驱动的全闭环轨迹控制。
- 软件功能齐全、内容丰富，用户可根据被测工件，选择测量项目。圆柱齿轮测量结果可按 GB/T10095、DIN3962、ISO1328、AGMA 等多种评定标准进行自动评定；齿廓 K 形图、齿廓凸度、螺旋线鼓度等项目的评定。
- 软件操作简单，被测工件一次装卡，由计算机控制自动完成测量，测量效率高；齿廓和螺旋线偏差可由用户自由选齿测量；测量曲线评定范围可由鼠标拖动；测量速度可由操作者在软件中选择。
- 用户可选择多种打印报表格式；测量参数修改时可以重新计算绘图；测量中间数据可由用户选择存储，用于分析；可视化参数输入。

- Full-closed-loop CNC system based on advanced motion control card , DDR and DDL motors is designed and developed.
- Powerful and versatile measuring software functions : The measuring item can be selected according to the workpiece to be tested . This user friendly measuring software allows automatic evaluation of cylindrical gears in accordance with GB10095 , DIN3962 , ISO1328 or AGMA standard . The measuring accessments including tolerance bands for profile and helix testing (evaluations of K charts) , profile barreling (Ca), and tooth crowning (Cb) are also available .
- This measuring machine allows easy-to-operate inspection of all test items in one set-up . Fully automatic measuring cycle is controlled by the computer with high measuring efficiency . Customized tooth selection for profile and lead test is possible . The evaluation range of measurement curve is defined by a mouse drag operation . The measuring velocities can also be controlled in the software
- Multiple print chart formats are offered to match customer need . Data calculation and testing chart can be updated when the measuring parameters modified . Intermediate data can be stored for further analysis . Visual Parameter Input is available .

技术规格 / SPECIFICATIONS

单位（Unit）：mm

型号 / 技术规格	Econ30	Model / Specifications
可测齿轮模数	0.5 - 15	Module
可测齿轮最大外径	300	Max.workpiece diameter
上下顶尖距离	15 - 500	Distance between centers
测头至下顶尖距离	-5 - 390	Distance from stylus to the lower centre
可测螺旋角范围	0 - 90°	Helix angle
可测工件最大重量	150kg	Max.permissible test gear weight
仪器净重	1700kg	Net weight of machine
仪器毛重	2000kg	Gross weight of machine
主机尺寸（长 × 宽 × 高）	1200×1000×1900	Over dimensions of basic unite（L × W × H）

仪器组成 / SET OF MACHINE INCLUDES

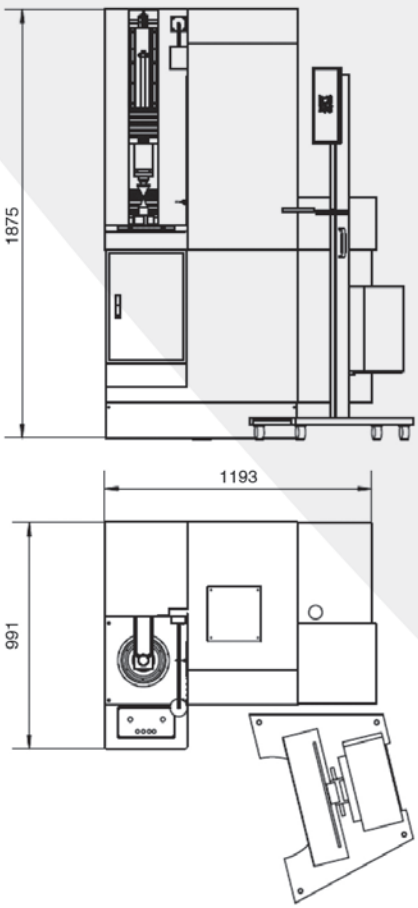
基本配置	数量 / Unit	Stanard module
测量主机	1 台 / 1 pc	Basic machine
计算机	1 套 / 1 set	Microcomputer
打印机	1 台 / 1 pc	Printer
带动器	1 套 / 1 set	Work driver

仪器组成 & 安装图

基本配置	数量 / Unit	Stanard module
标准芯轴	2 根 / 2 pcs	Testing arbor
测头 (Φ0.4,Φ0.6,Φ0.8,Φ1,Φ1.5,Φ2)	各 2 个 / 2 each	Styli （Φ0.4,Φ0.6,Φ0.8,Φ1,Φ1.5,Φ2)

可选附件	数量 / Unit	Optional accessories
高精度渐开线螺旋线样板	1 块 / 1 pc	Involute and helix master
可涨芯轴	1 套 / 1 set	Expanding mandrel
稳压电源	1 台 / 1 pc	Voltage regulator
标准齿轮	1 件 / 1 pc	Stanard gear

安装图 / INSTALLATION LAYOUT



Double Flank Rolling Gear Tester Model 3101 / 3101A / 3101B

齿轮双面啮合综合测量仪 3101/3101A/3101B 型

用 途 / APPLICATIONS

3101、3101A、3101B 型齿轮双面啮合综合测量仪可用于测量圆柱齿轮和蜗轮副的径向综合总偏差和一齿径向综合偏差，也可以用于测量两轴夹角 90°的圆锥齿轮分度圆锥顶点的偏移量，可广泛应用于汽车、农机等机械制造业。

This tester is designed for measuring the double flank total composite deviation and the tooth composite deviation of cylindrical gears and worm-gear pairs . It can also be uesd for checking the error of reference cone apex of bevel gears at right shaft angle . And it is widely used in automobile and agricultural machinery industries etc .

特 点 / FEATURES

- 长期、稳定的精度：本仪器测量滑板在滚动导轨上运动灵活，导轨采用高级合金钢制成，经特殊工艺处理和精加工，故长时间连续使用仍可保持原有精度。
- 方便、实用、经济：本仪器结构简单、合理、操作、维修方便，因对使用环境要求不高，特别适合生产现场使用。

- High degree of measuring accuracy and reliability : The measuring slide of tester moves smoothly on a rolling guide way , which consists of a series of high precision steel balls and a pair of carefully lapped alloy steel guide , runs freely frictionless and wearless .
- Convenient 、economic and practical use : Simple and well designed construction , convenient in operation and maintenance . Less demand for environment temperature . It is suitable for use in the workshop .

技术规格 / SPECIFICATIONS

单位：mm

型号 / 技术规格	3101	3101A	3101B
可测齿轮模数	1 - 10	1 - 10	1 - 10
两芯轴中心距离	50 - 320	50 - 320	50 - 320
带轴齿轮最大外圆直径	200	200	---
带轴齿轮轴长	110 - 350	110 - 350	---
蜗杆最大外圆直径	100	---	---
蜗杆轴长	120 -240	---	---
被测齿轮最大重量	50kg	50kg	50kg
仪器净重	150kg	120kg	100kg
仪器毛重	220kg	200kg	150kg
仪器应用范围	可测带孔、带轴圆柱齿轮、蜗轮副和锥齿轮	可测带孔、带轴圆柱齿轮	可测带孔圆柱齿轮
包装外形尺寸（长 x 宽 x 高）	1000×925×747	1000×925×747	960×450×617

Unit：mm

Model / Specifications	3101	3101A	3101B
Module	1 - 10	1 - 10	1 - 10
Distance between centers	50 - 320	50 - 320	50 - 320
Max.outside dia.of gear	200	200	---
Leng of gear shaft	110 - 350	110 - 350	---
Max.outside dia.of worm	100	---	---
Leng of worm shaft	120 -240	---	---
Max.Weight of gear to be tested	50kg	50kg	50kg
Net weight	150kg	120kg	100kg
Application range	220kg	200kg	150kg
Gross weight	cylindrical gear with hole or shaft, worm gear pairs and bevel gear	cylindrical gear with hole or shaft	cylindrical gear with hole
Dimensions of packing box（LxWxH）	1000×925×747	1000×925×747	960×450×617

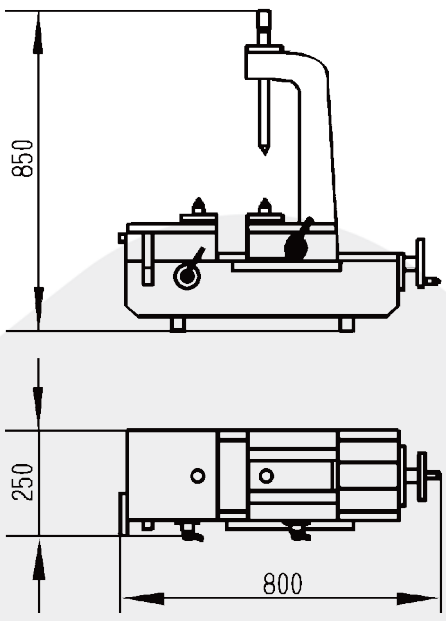
仪器组成 / SET OF MACHINE INCLUDES

型号 / 基本配置	3101	3101A	3101B
测量主机	1 台	1 台	1 台
顶尖座	1 件	1 件	---
蜗杆支架	1 件	---	---
百分表	1 块	1 块	1 块

型号 / 基本配置	3101	3101A	3101B
标准齿轮芯轴	1 件	1 件	1 件
标准齿轮转动套	1 件	1 件	1 件
垫圈	2 件	2 件	2 件
装齿轮用芯轴	1 件	1 件	1 件
顶尖座定位芯轴	1 件	1 件	---
锥齿轮芯轴	1 件	---	---

Model / Standard module	3101	3101A	3101B
Basic tester	1 pc	1 pc	1 pc
Support for the center	1 pc	1 pc	---
Worm mounting decice	1 pc	---	---
Dial indicator	1 pc	1 pc	1 pc
Mandrel for master gear	1 pc	1 pc	1 pc
Mandrel bushing for master gear	1 pc	1 pc	1 pc
Washer for master gear	2 pcs	2 pcs	2 pcs
Mandrel for mounting the gear with hole	1 pc	1 pc	1 pc
locating mandrel for support of center	1 pc	1 pc	---
Mandrel for mounting the bevel gear	1 pc	---	---

安装图 / INSTALLATION LAYOUT



Double Flank Rolling Gear Tester Model 3101E / 3101L
齿轮双面啮合综合测量仪 3101E/3101L 型

用 途 / APPLICATIONS

3101E、3101L 型齿轮双面啮合综合测量仪可用于测量圆柱齿轮和蜗轮副的径向综合总偏差和一齿径向综合偏差，也可以用于测量两轴夹角 90°的圆锥齿轮分度圆锥顶点的偏移量，可广泛应用于汽车、农机等机械制造业。

This tester is designed for measuring the double flank total composite deviation and the tooth composite deviation of cylindrical gears and worm-gear pairs . It can also be uesd for checking the error of reference cone apex of bevel gears at right shaft angle . And it is widely used in automobile and agricultural machinery industries etc .

特 点 / FEATURES

- 长期、稳定的精度，高级合金钢滚动测量导轨，精心的加工和特殊工艺处理。
- 方便、实用、经济，结构简单、合理，操作、维修方便。对使用环境要求不高，适合生产现场使用。

- High degree of measuring accuracy and reliability . A rolling guide way made of high degree alloy steel elaborate manufacting and special technique processing .
- Convenient 、economic and practical use , simple and well designed construction , convenient in operation and maintenance . Less demand for environment temperature . It is suitable for use in the workshop .

技术规格 / SPECIFICATIONS

单位：mm

技术规格 \ 型号	3101E	3101L
可测齿轮模数	1 - 10	1 - 10
两芯轴中心距离	50 - 320	50 - 320
带轴齿轮最大外圆直径	200	200
带轴齿轮轴长	110 - 350	110 - 350
蜗杆最大外圆直径	140	---
蜗杆轴长	120 -240	---
加高立柱可测齿轮轴长	---	250 - 750
被测齿轮最大重量	50kg	50kg
仪器净重	210kg	200kg
仪器毛重	280kg	280kg
仪器应用范围	可测带孔、带轴圆柱齿轮、蜗轮副和锥齿轮	可测带长轴齿轮
包装外形尺寸（长 x 宽 x 高）	1000×925×747	1000×925×1017

Unit：mm

Specifications \ Model	3101E	3101L
Module	1 - 10	1 - 10
Distance between centers	50 - 320	50 - 320
Max.outside dia.of gear	200	200
Leng of gear shaft	110 - 350	110 - 350
Max.outside dia.of worm	140	---
Leng of worm shaft	120 -240	---
Measurable length of gear shaft with extension column	---	250 - 750
Max.Weight of gear to be tested	50kg	50kg
Net weight	210kg	200kg
Application range	280kg	280kg
Gross weight	cylindrical gear with hole or shaft, worm gear pairs and bevel gear	gears with hole or extended shaft
Dimensions of packing box（LxWxH）	1000×925×747	1000×925×1017

仪器组成 / SET OF MACHINE INCLUDES

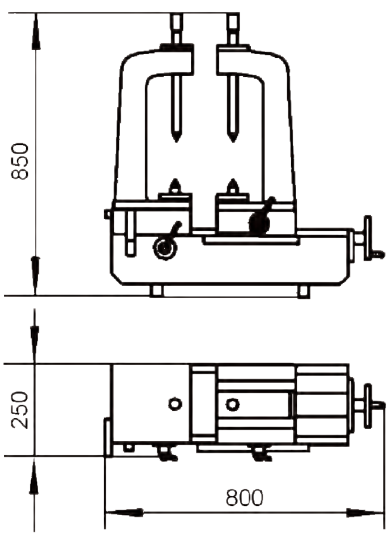
基本配置 \ 型号	3101E	3101L
测量主机	1 台	1 台
顶尖座	2 件	1 件

仪器组成 & 安装图

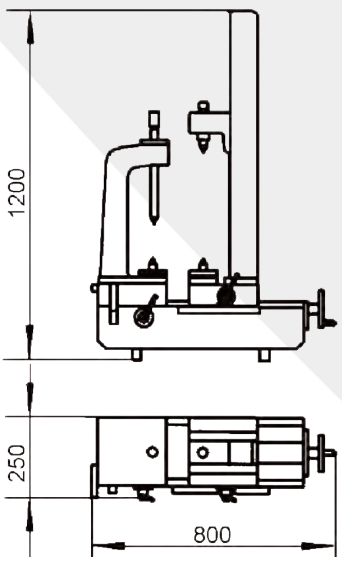
基本配置 \ 型号	3101E	3101L
蜗杆支架	1 件	---
加高顶尖立柱	---	1 件
标准齿轮芯轴	1 件	1 件
标准齿轮转动套	1 件	1 件
垫圈	2 件	2 件
装齿轮用芯轴	1 件	1 件
顶尖座定位芯轴	2 件	2 件
锥齿轮芯轴	1 件	---
百分表	1 块	1 块

Standard module \ Model	3101E	3101L
Main unit	1 pc	1 pc
Support for the center	2 pcs	1 pc
Worm mounting decice	1 pc	---
Extension column	---	1 pc
Mandrel for master gear	1 pc	1 pc
Mandrel bushing for master gear	1 pc	1 pc
Washer for master gear	2 pcs	2 pcs
Mandrel for the gear with hole	1 pc	1 pc
locating mandrel for support of center	2 pcs	2 pcs
Mandrel for bevel gear	1 pc	---
Dial indicator	1 pc	1 pc

安装图 / INSTALLATION LAYOUT



3101E



3101L

Double Flank Rolling Gear Tester Model 3102 / 3102A
齿轮双面啮合综合测量仪 3102/3102A 型

用 途 / APPLICATIONS

3102、3102A 型齿轮双面啮合综合测量仪可用于测量圆柱齿轮径向综合总偏差和一齿径向综合偏差，该仪器可广泛应用于汽车、摩托车等机械制造业。

This tester is designed for inspection of the radial composite deviation and tooth to tooth composite deviation cylindrical gear . It is widely used in machine building industries such as automobile and motorcycles .

特 点 / FEATURES

- 3102、3102A 型齿轮双面啮合综合测量仪为纯机械结构测量仪，结构简单、体积小、重量轻、操作方便、测量精度稳定，即可测量带轴圆柱齿轮，亦可测量带孔圆柱齿轮，比较适合生产现场使用。
- 3102A 型测量仪由专业数显表显示测量结果，具有超差报警功能，有较高的测量精度和效率。

- Light in weight , compact structure and convenient operation , reliable measuring accuracy and durable stability . Both measurements of cylindrical gear and shaft gear are possible , suitable for use on the workshop .
- Test results are shown in a special digital display unit (model 3102A). Out of tolerance warning alarm function , high measuring accuracy and effeciency (model 3102A).

技术规格 / SPECIFICATIONS

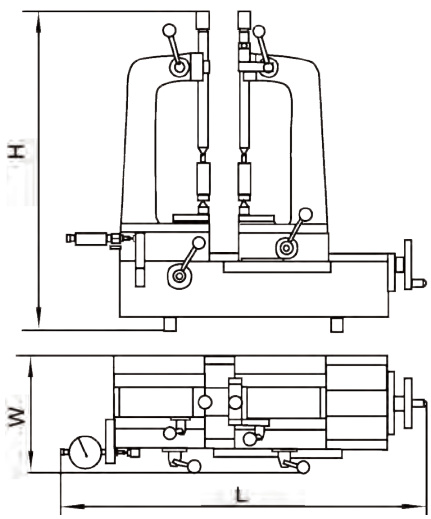
单位（Unit）：mm

技术规格 / 型号	3102	3102A	Model / Specifications
可测齿轮模数	1 - 6	1 - 6	Module
两芯轴中心距离	20 - 160	20 - 160	Centre distance (axis distance)
带轴齿轮最大外圆直径	150	150	Max. outer diameter of gear shaft
带轴齿轮轴长	50 - 200	50 - 200	Length of gear shaft
仪器净重	47kg	47kg	Net weight
仪器毛重	100kg	100kg	Application range
主机尺寸（长 × 宽 × 高）	610×200×550	550×230×570	Over dimensions of basic unit（L×W×H）
包装尺寸（长 × 宽 × 高）	960×480×667	960×480×667	Dimensions of packing box（L×W×H）

仪器组成 / SET OF MACHINE INCLUDES

基本配置 / 型号	3102	3102A	Model / Standard module
测量主机	1 台 / 1 pc	1 台 / 1 pc	Module
带孔圆柱齿轮芯杆	2 件 / 2 pcs	2 件 / 2 pcs	Arbor for cylindrical gear
扳手	1 支 / 1 pc	1 支 / 1 pc	Spanner for center
百分表	1 块 / 1 pc	---	Dial indicator
专用数显表	---	1 块 / 1 pc	Professional number table
光栅传感器	---	1 件 / 1 pc	Linear scale sensor

安装图 / INSTALLATION LAYOUT



单位（Unit）：mm

尺寸 / 型号	3102	3102A
L	610	550
W	200	230
H	550	570

Intelligent Double Flank Rolling Gear Tester Model 3100B/3100C/3100L

智能齿轮双面啮合综合测量仪 3100B/3100C/3100L 型

用 途 / APPLICATIONS

3100B、3100C、3100L 型智能齿轮双面啮合综合测量仪为机电一体化的新型、智能化的齿轮测量仪器，主要用于测量圆柱齿轮径向综合总偏差 F_i''和一齿径向综合偏差 f_i''以及综合测试得到的径向跳动 F_r''和跨棒距 M 值，自动判别并“挑出”存在齿面毛刺和划痕的齿牙。本产品在测量中由显示屏和键盘以对话方式输入测量要求和参数，测量后由显示屏、打印机输出测量结果。

The tester are specially designed to enable the inspections of the total radial composite deviation F_i'', tooth-to-tooth radial composite deviation f_i'' and run F_r'' as well as tooth span M over pins on the cylindrical gear . The gear tooth with cutting burr and scratch can automatically be identified and " picked out ".

特 点 / FEATURES

- 3100B、3100C、3100L 型智能齿轮双面啮合综合测量仪为新型自动化、智能化的齿轮双面啮合综合测量仪。
- 由微机控制进行自动测量与数据处理，显示屏显示测量结果与误差曲线，还可以由打印机输出检测报告。
- 具有功能强、体积小、重量轻、操作方便、测量精度稳定的特点。

- Automatic PC measurement control and data processing in an intelligent way.
- Measuring mode and data are entered via keyboard ; Test resurlt and curve are displayed on the monitor screen . Test report can be output via printer .
- Compact construction , easy operation and high measurement reliablitiy with powerful checking function .

技术规格 / SPECIFICATIONS

单位：mm

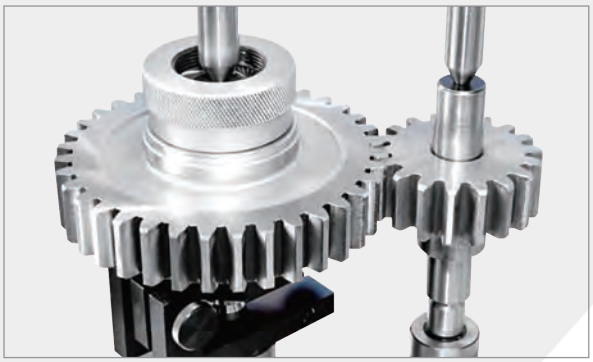
型号 / 技术规格	3100B	3100C	3100L
可测齿轮模数	0.5 - 6	0.5 - 6	0.5 - 6
两芯轴中心距离	40 - 175	40 - 175	40 - 150
带轴齿轮最大外圆直径	---	150	200
带轴齿轮轴长	---	50 - 170	200-700 （齿轮距轴端距离不大于 170mm）
仪器示值分辨力	0.0005	0.0005	0.0005
仪器最大示值误差	0.005	0.005	0.005
仪器净重	35kg	40kg	50kg
仪器应用范围	可测带孔圆柱齿轮	可测带孔、带轴圆柱齿轮	可测带长轴圆柱齿轮
主机外形尺寸（长 × 宽 × 高）	600×200×350	600×200×560	600×200×1100
包装外形尺寸（长 × 宽 × 高）	1100×950×807	1160×1020×830	1100×950×1297

Unit：mm

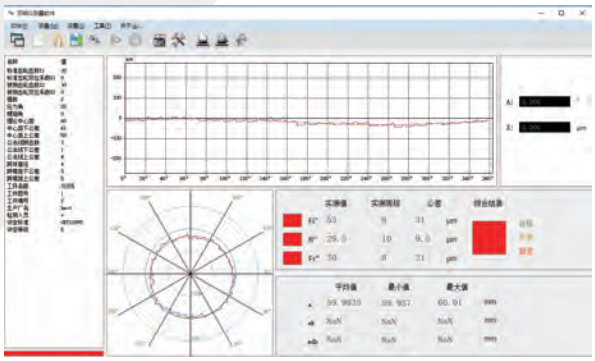
Model / Specifications	3100B	3100C	3100L
Module	0.5 - 6	0.5 - 6	0.5 - 6
Distance between centers	40 - 175	40 - 175	40 - 150
Max.outer diameter of gear shaft	---	150	200
Leng of gear shaft	---	50 - 170	200-700（distance between gear and shaft end is not greater than 170mm）
Measued value resolution	0.0005	0.0005	0.0005
Max.indication error	0.005	0.005	0.005
Net weight	35kg	40kg	50kg
Application range	cylindrical gear with hole	cylindrical gears with hole or extended shaft	cylindrical gear shaft
Dimensions of the basic unit（L×W×H）	600×200×350	600×200×560	600×200×1100
Dimensions of packing box（L×W×H）	1100×950×807	1160×1020×830	1100×950×1297

仪器组成 / SET OF MACHINE INCLUDES

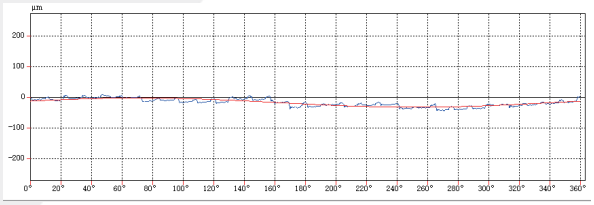
型号 / 基本配置	3100B	3100C	3100L	Model / Standard module
测量主机	1 台 / 1 pc	1 台 / 1 pc	1 台 / 1 pc	Main unit
控制电箱	1 台 / 1 pc	1 台 / 1 pc	1 台 / 1 pc	Eletronic unit
计算机	1 套 / 1 set	1 套 / 1 set	1 套 / 1 set	Microcomputer
打印机	1 台 / 1 pc	1 台 / 1 pc	1 台 / 1 pc	Printer
测量带孔圆柱齿轮芯轴	1 件 / 1 pc	1 件 / 1 pc	---	Mandrel for test gear with hole
安装标准齿轮用螺帽	1 件 / 1 pc	---	---	Clamp nut for master gear
带动器	---	1 套 / 1 set	1 套 / 1 set	Work driver
联轴器	---	1 件 / 1 pc	---	Clamping unit



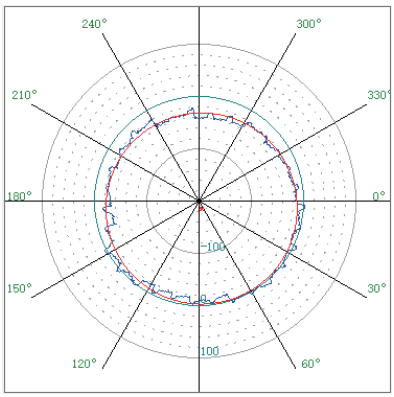
齿轮测量
Gear measuring



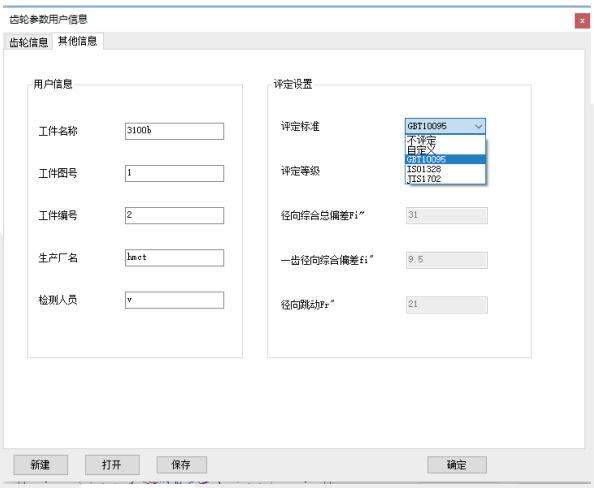
测量主界面
Main measuring program window



测量数据直角坐标显示
Rectangular coordinate display of measurement data



测量数据极坐标显示
Polar display of measurement data



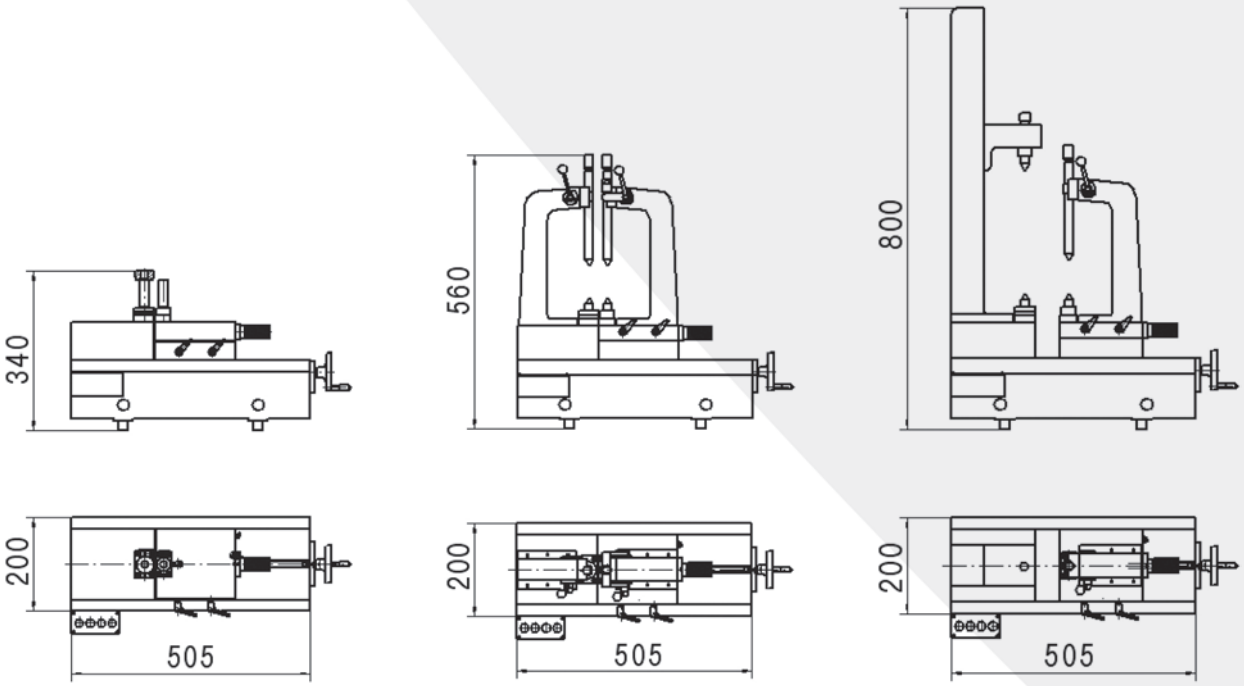
参数输入界面
Gear parameter input window

评定方式界面
Evaluation mode window

安装图 / INSTALLATION LAYOUT

3100B 型智能齿轮双面啮合综合测量仪
Double flank rolling gear tester model 3100B

3100L 型智能齿轮双面啮合综合测量仪
Double flank rolling gear tester model 3100L



3100B　　3100C　　3100L

Intelligent Double-Flank Rolling Gear Tester Model 3100W
智能齿轮双面啮合综合测量仪 3100W 型

用 途 / APPLICATIONS

本产品为机电一体化的新型、智能化的齿轮测量仪器，主要用于测量蜗杆蜗轮副径向综合总偏差 F_i''和一齿径向综合偏差 f_i''以及综合测试得到的径向跳动 F_r，自动判别并“挑出”存在齿面毛刺和划痕的齿牙。本产品在测量中由显示屏和键盘以对话方式输入测量要求和参数，测量后由显示屏、打印机输出测量结果。

The Tester is new model of gear measuring machine featuring in intelligent operation and mechanical and electrical integration . It is mainly designed for measuring total radial composite deviation F_i'' , tooth to tooth radial composite deviation f_i'' and radial run out of comprehensive test of woms and wom pairs . It can automatically “pick out” the tooth surfaces with burs or scratches. The measuring commands and parameters are entered via keyboard and displayed in the monitor. The measurement results are displayed in the monitor or printed out by printer.

特 点 / FEATURES

- 本产品为新型自动化、智能化的齿轮双面啮合综合测量仪。
- 由微机控制进行自动测量与数据处理，显示屏显示测量结果与误差曲线，还可以由打印机输出检测报告。
- 具有功能强、体积小、重量轻、操作方便、测量精度稳定的特点。

- The Tester is new type of automatic and intelligent double-flank rolling gear tester with integrated functions.
- PC controlled measurement and data process. The monitor displays measurement results and error curves and print measurement report .
- It is small and powerful, easy to handle and has stable measuring accuracy .

技术规格 / SPECIFICATIONS

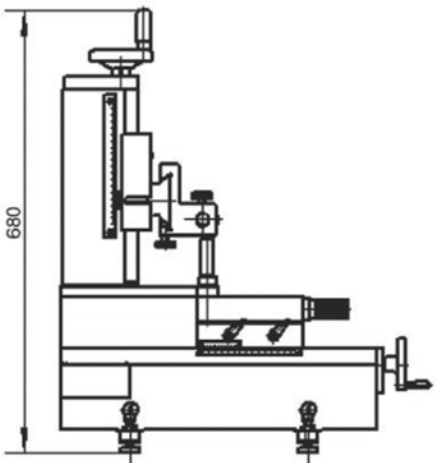
单位（Unit）：mm

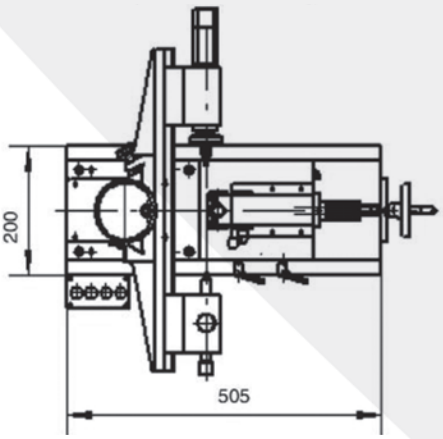
技术规格 / 型号	3100W	Model / Specifications
可测齿轮模数	0.5 - 6	Module
中心距离	10 - 120	Centre distance
蜗杆最大外圆直径	100	Max.worm O.D.
蜗杆轴长	120 - 240	Length of worm shaft
仪器示值分辨力	0.0005	Indicating value resolution
仪器最大示值误差	0.005	Max.indication error
仪器净重	40kg	Net weight
仪器毛重	100kg	Gross weight
主机外形尺寸（长×宽×高）	500×200×680	Dimensions of the tester
包装外形尺寸（长×宽×高）	1100×1000×907	Dimensions of packing box

仪器组成 / SET OF MACHINE INCLUDES

基本配置	单位 / Unit	Standard module
测量主机	1 台 / 1 pc	Main unit
控制电箱	1 台 / 1 pc	Eletronic unit
计算机	1 套 / 1 set	Microcomputer
打印机	1 台 / 1 pc	Printer
芯轴	1 件 / 1 pc	Mandrel
滚花螺帽	1 件 / 1 pc	Knurled cap
带动器	1 套 / 1 set	Work driver

安装图 / INSTALLATION LAYOUT





Intelligent Double-Flank Rolling Gear Tester Model 3100Z
智能齿轮双面啮合综合测量仪 3100Z 型

用 途 / APPLICATIONS

本产品为机电一体化的新型、智能化的齿轮测量仪器，主要用于测量轴交角为 90°的圆锥齿轮锥顶点的偏移量。检测圆锥齿轮径向综合总偏差 Fam"和一齿径向综合偏差 fam"，自动判别并“挑出”存在齿面毛刺和划痕的齿牙。本产品在测量中由显示屏和键盘以对话方式输入测量要求和参数，测量后由显示屏、打印机输出测量结果。

The Tester is new model of gear measuring machine featuring in intelligent operation and mechanical and electrical integration . It is mainly designed for measuring the offset of bevel gear conical point with 90 ° crossed axis angle. And check the total radial composite deviation Fam , tooth to tooth radial composite deviation fam of bevel gears . It can automatically “pick out” the tooth surfaces with burs or scratches . The measuring commands and parameters are entered via keyboard and displayed in the monitor . The measurement results are displayed in the monitor or printed out by printer .

特 点 / FEATURES

- 本产品为新型自动化、智能化的齿轮双面啮合综合测量仪。
- 由微机控制进行自动测量与数据处理，显示屏显示测量结果与误差曲线，还可以由打印机输出检测报告。
- 具有功能强、体积小、重量轻、操作方便、测量精度稳定的特点。

- The Tester is new type of automatic and intelligent double-flank rolling gear tester with integrated functions.
- PC controlled measurement and data process. The monitor displays measurement results and error curves and print measurement report .
- It is small and powerful, easy to handle and has stable measuring accuracy .

技术规格 / SPECIFICATIONS

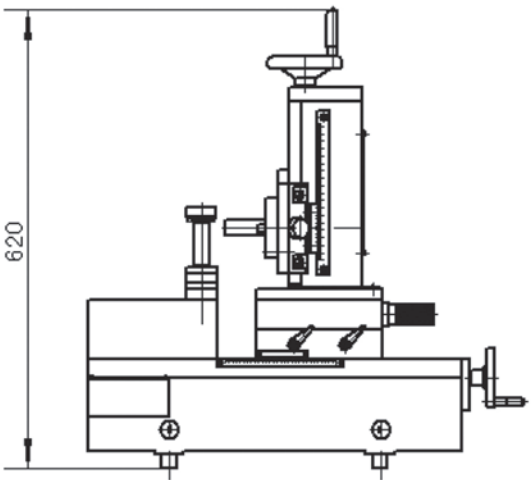
单位（Unit）：mm

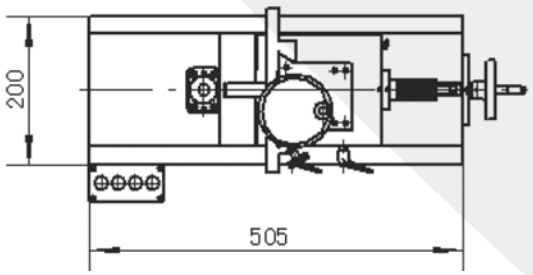
型号 / 技术规格	3100Z	Model / Specifications
可测齿轮模数	0.5 - 6	Module
安装距离	40 - 175	Mounting distance
仪器示值分辨力	0.0005	Indicating value resolution
仪器最大示值误差	0.005	Max.indication error
仪器净重	40kg	Net weight
仪器毛重	100kg	Gross weight
主机外形尺寸（长×宽×高）	500×200×620	Dimensions of the tester
包装外形尺寸（长×宽×高）	1700×950×780	Dimensions of packing box

仪器组成 / SET OF MACHINE INCLUDES

基本配置	单位 / Unit	Standard module
测量主机	1 台 / 1 pc	Main unit
控制电箱	1 台 / 1 pc	Eletronic unit
计算机	1 套 / 1 set	Microcomputer
打印机	1 台 / 1 pc	Printer
芯轴	1 件 / 1 pc	Mandrel
滚花螺帽	1 件 / 1 pc	Knurled cap

安装图 / INSTALLATION LAYOUT





Intelligent Double-Flank Rolling Gear Tester Model 3104B/3104D
智能齿轮双面啮合综合测量仪 3104B/3104D 型

用 途 / APPLICATIONS

本仪器主要用于测量带孔圆柱齿轮径向综合总偏差 F_i''和一齿径向综合偏差 f_i''以及径向跳动 F_r''，齿厚的跨棒距 M 值，互啮齿轮中心距及其变化量。

This instrument is mainly used to measure the total radial deviation F_i'' and the one-tooth radial comprehensive deviation F_i'' and the radial runout F_r'' of the cylindrical gear with holes, the cross-bar distance M value of the tooth thickness, the center distance of the intermeshing gear and its change quantity.

特 点 / FEATURES

- 独特的单滑板结构，简化结构
- 使用测力传感器，测量时啮合力可调可见
- 机电一体的自动化、智能化的齿轮测量仪器，操作方便，测量精度稳定
- 多种测量模式和标准齿轮精度修正功能，提高测量精度

- Unique single-slide structure, simplified structure
- Using a load cell, the meshing force is adjustable and visible during measurement
- Mechanical and electrical integration of automatic and intelligent gear measuring instrument, easy to operate, stable measurement accuracy
- Multiple measurement modes and standard gear accuracy correction function to improve measurement accuracy

仪器系列 & 技术规格 & 仪器组成

仪器系列 / INSTRUMENT SERIES

机械结构采用模块化设计，系列仪器包含：

3104B——基础型　（应对带孔齿轮）

3104D——双立柱型（应对带轴齿轮）

The mechanical structure adopts a modular design, and the series of instruments include:

3104B - Basic type (for gears with holes) Basic

3104D - Double column type (for shaft gear) Double

3104B 型

3104D 型

技术规格 / SPECIFICATIONS

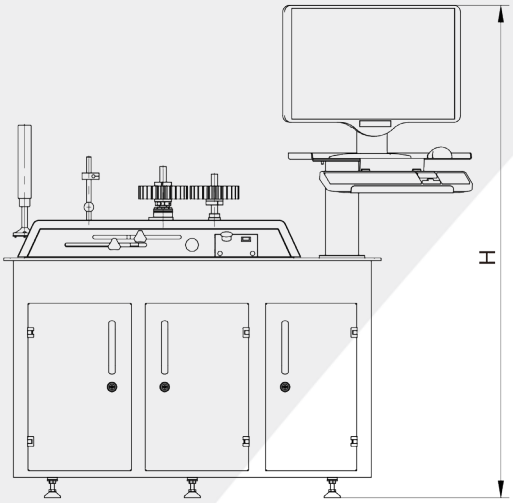
单位（Unit）：mm

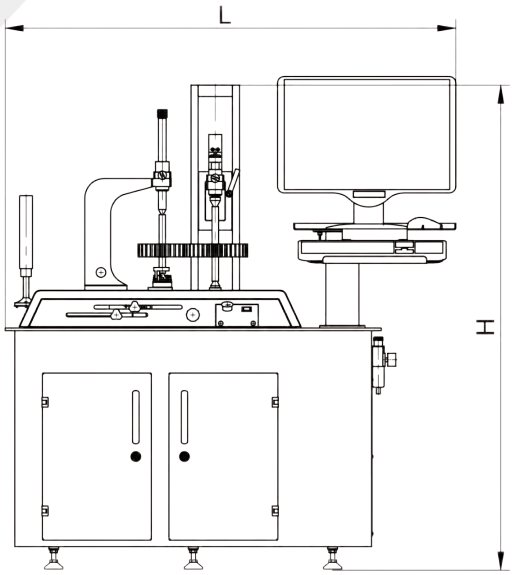
型号 / 技术规格	3104B	3104D	Model / Specifications
模数范围	0.5 - 6	0.5 - 6	Module
两芯轴中心距范围	60 - 200	60 - 200	The range of the center distance between the two mandrels
测量系统分辨率	0.001	0.001	Measurement system resolution
仪器示值误差	0.005	0.005	Instrument indication error
主轴规格	ϕ20 圆柱孔 /ϕ20 cylindrical hole	ϕ20 圆柱孔 /ϕ20 cylindrical hole	Spindle specifications
标准齿轮	---	顶尖距 Distance between centers：40~200 最大直径 Maximum diameter：Φ250	Standard gear
被测齿轮	---	顶尖距 Distance between centers：40~400 最大直径 Maximum diameter：Φ360	Gear under test
主机净重	300Kg	350Kg	Host net weight
主机外形尺寸（长 x 宽 x 高）	1440×740×1510	1440×740×1570	Mainframe dimensions (length x width x height)

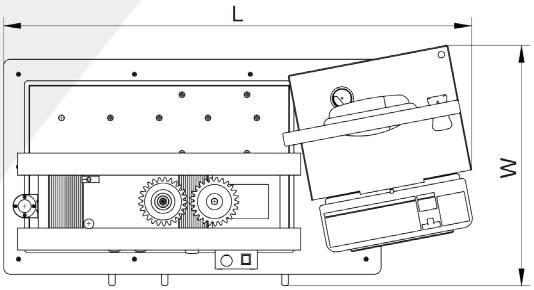
仪器组成 / SET OF MACHINE INCLUDES

基本配置	单位 / Unit	Standard module
仪器主机	1 台 / 1 pc	Instrument host
计算机	1 台 / 1 pc	Computer
打印机	1 台 / 1 pc	Printer
ϕ20 校准心轴	1 对 / 1 pair	ϕ20 calibration mandrel
80mm 块规	1 块 / 1 block	80mm block gauge
千分表	1 块 / 1 block	Dial indicator
防护板	1 块 / 1 block	Fenders

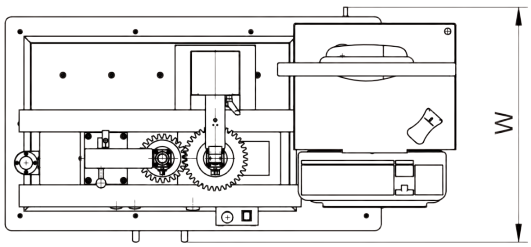
安装图 / INSTALLATION LAYOUT







3104B 型

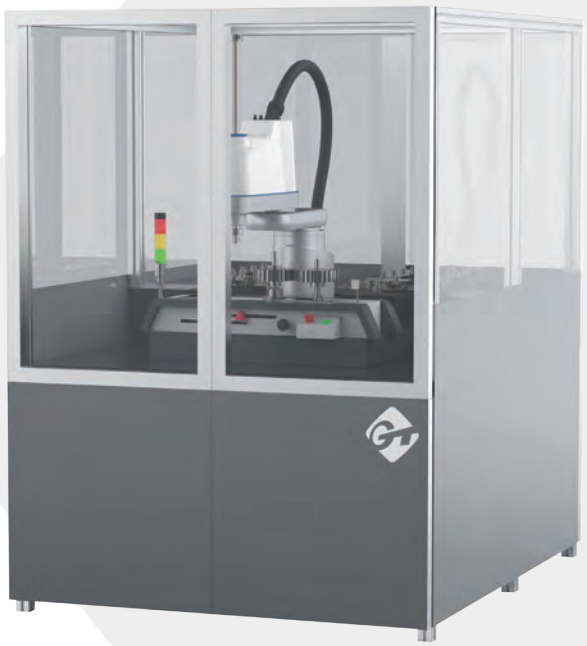


3104D 型

单位（Unit）：mm

型号 \ 尺寸	L	W	H
3104B	1440	740	1510
3104D	1440	740	1570

Double Mesh Automatic Detection Line
双啮自动检测线



用 途 / APPLICATIONS

双啮自动检测线是基于通用技术哈量公司生产的智能双啮仪，配合机械手实现自动检测功能，可根据齿轮生产厂家的实际需求，现场使用环境、操作习惯相结合，定制化设计产品检测产线。

The double rodent automatic detection line is an intelligent double rodent detection instrument produced by GENERTEC HMCT. It works with the manipulator to realize the automatic detection function. It can be customized according to the actual needs of the gear manufacturer, combining the on-site use environment and operation habits.

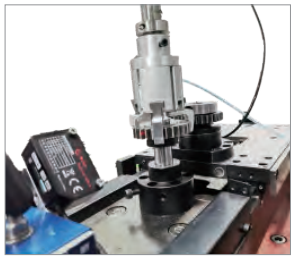
特 点 / FEATURES

- 防碰齿功能

根据被测齿轮齿形表面的各个位置实时检测，与标准齿轮啮合位置相匹配，有效地避免了在齿轮进齿时的磕碰，避免工件损伤。

- 质量分选

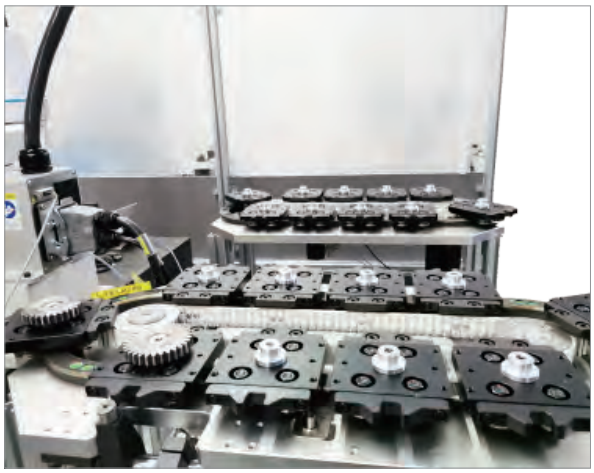
通过质量分选过程，对合格与不合格品按照设定进行分选，同时进行分类统计，提高生产环节效率，缩短人工检测时间，完全实现自动化检测需求。



防碰齿功能 Anti-touch Tooth Function

- Anti-touch Tooth Function

According to the real -time detection of each position of the surface of the gear tooth , it is matched with the standard gear meshing position to effectively avoid bumps when the gear enters the teeth and avoid workpiece damage.



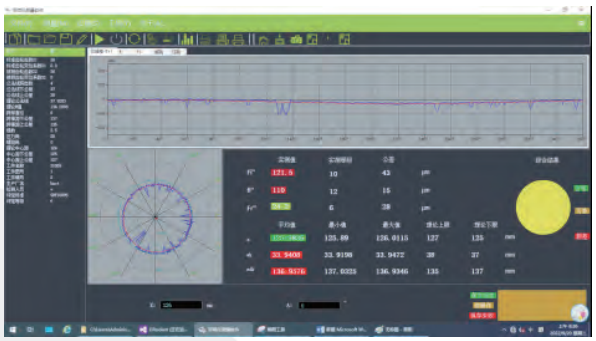
质量分选 Quality Sorting

- Quality Sorting

Through the quality sorting process, the qualified and unqualified products are sorted according to the setting. And the classification statistics are conducted to improve the efficiency of the production link, shorten the manual testing time, and realize the requirements of automatic testing fully.

系统软件 / System Software

啮合线测量仪软件界面友好，曲线简洁清晰。可以实现过程能力分析计算 CP、CPK、PP、PPK 值等，具有 SPC 的 X-R 控制图。自动完成齿轮径向综合总偏差 Fi ″ 和一齿径向综合偏差 f i ″ 以及径向跳动 Fr ″，齿厚的跨棒距 M 值，互啮齿轮中心距及其变化量，及齿轮内孔孔径测量等检测项目。具有多种测量模式和标准齿轮修正功能， 提高测量精度，测量节拍短。



软件界面 Software Interface

The software has friendly interface and simple curve, which can realize the process capability analysis to calculate CP, CPK, PP, PPK values, and have the X-R control diagram with SPC. Automatically complete the radial comprehensive total deviation of gear Fi "and one tooth radial comprehensive deviation fi" andradial beating Fr ", the span distance M value.

of tooth thickness, the center distance of mutual rodent wheel and its variation, and the aperture measurement in the gear. It has a variety of measurement modes and standard gear correction function, improved measurement accuracy and short measurement beat.

Double Flank Rolling Gear Tester Model 3103A

小模数智能齿轮双面啮合综合测量仪 3103A 型

用 途 / APPLICATIONS

本测量仪主要用于测量小模数圆柱齿轮径向综合总偏差、一齿径向综合偏差、径向跳动，自动判别并“挑出”存在齿面大毛刺的齿牙。本测量仪可用于机床、医疗机械、印刷机械、办公设备、纺织机械、娱乐保健机械、家用电器、电动工具、机器人、汽车、摩托车、电动车、雷达等机械制造行业。

The Model 3103A Double-Flank Rolling Gear Tester is specially designed for checking of total radial composite deviation Fi , tooth to tooth radial composite deviation fi and radial run-out Fr of small module cylindrical gear . The poorly deburred gear tooth can be automatically identified and “picked out” . This measuring instrument is widely used for machine tool , medical device , printing machine , office equipment, automobile and motorcycle industries .

特 点 / FEATURES

本测量仪为新型自动化、智能化的齿轮双面啮合综合测量仪，由微机控制进行自动测量与数据处理，显示屏显示测量结果与误差曲线，还可以由打印机输出检测报告。它具有功能强、体积小、重量轻、操作方便、测量精度稳定等特点。

Used in conjunction with the computer technology , the model 3101A automatic and intelligent double flank roller gear tester features compact construction , light weight , simple operation and reliable measurement accuracy . Automatic measurement run and data handling are carried out under the control of the microcomputer . The test results and error curve can be displayed or output via printer .

技术规格 / SPECIFICATIONS

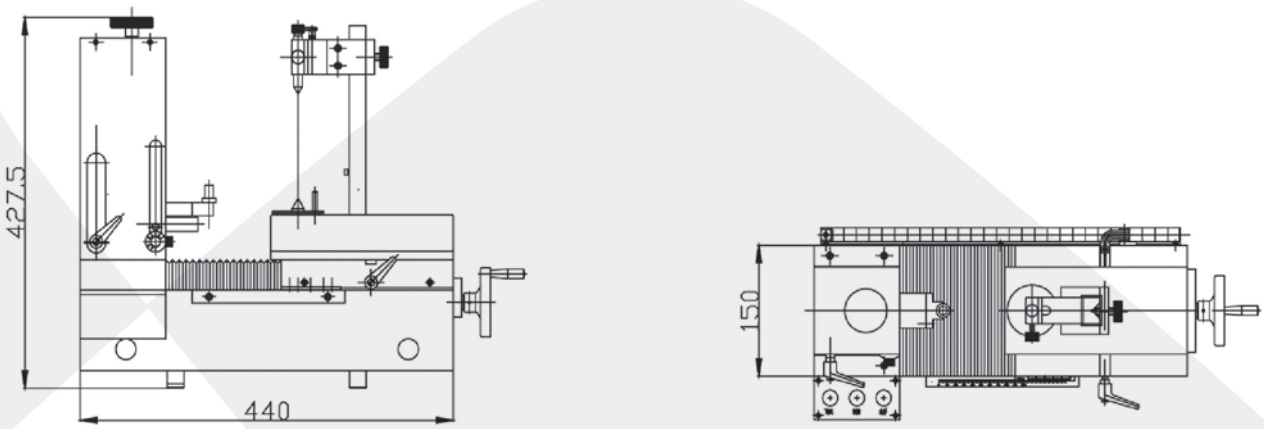
单位（Unit）：mm

技术规格 / 型号	3103A	Model / Specifications
可测齿轮模数	0.15 - 2	Module
两芯轴中心距离	0 - 100	Centre distance (axis distance)
带轴齿轮最大外圆直径	55	Max. outer diameter of gear shaft
带孔齿轮最大外圆直径	80	Max. outer diameter of gear with hole
带轴齿轮轴长	160	Length of gear shaft
仪器示值分辨力	0.0005	Resolution of the tester
仪器最大示值误差	0.0025	Indication error
主机尺寸（长 × 宽 × 高）	524×210×428	Over dimensions of basic unit（LxWxH）

仪器组成 / SET OF MACHINE INCLUDES

基本配置	单位 / Unit	Standard module
测量主机	1 台 / 1 pc	Basic gear tester unit
电箱	1 台 / 1 pc	Control unit
计算机	1 台 / 1 pc	Computer
打印机	1 台 / 1 pc	Printer
测带轴齿轮附件	2 套 / 2 set	Accessories for test shaft
带动器	1 套 / 1 set	Work driver

安装图 / INSTALLATION LAYOUT



Gear Radial Run Out Tester Model 3602
齿轮径向跳动测量仪 3602 型

用 途 / APPLICATIONS

本仪器主要用于齿轮加工现场或车间检查站测量圆柱齿轮或圆锥齿轮的径向跳动，同时也可以用于测量回转类零件的径向跳动误差。

This tester is designed for check of radial run-out of spur bevel gear on the shopfloor or metrology inspection room . It is also suitable for inspection of radial run-out of the rotary workpieces .

特 点 / FEATURES

- 导轨面采用磨削后刮研工艺，精度高，美观耐用。
- 测量力及测量方向可调，并配有多种尺寸的测头，适用不同类型的齿轮。
- 纯机械结构，千分表示值，读数直观，操作方便。

- Attractive and durable guide way using grinding / scraping techniques for high accuracy and good outlooks .
- Measuring force and direction can be adjusted , and a set of styli are supplied for different type gear .
- Full machanical component and dial indicator supplied ensure simple operation and direct reading .

技术规格 / SPECIFICATIONS

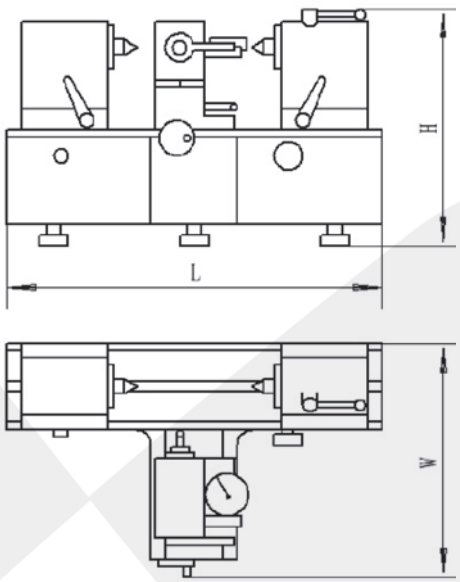
单位（Unit）：mm

技术规格 / 型号	3602	Model / Specifications
可测齿轮直径	10 - 200	Max.outer diameter
左右两端顶尖距离	0 - 200	Distance between center
可测齿轮模数	0.5 - 8	Module
示值变动性	0.002	Indication variation
示值误差	0.004	Indication error
仪器净重	70kg	Net weight of machine
仪器毛重	150kg	Gross weight of machine
主机尺寸（长 × 宽 × 高）	560×390×320	Overrall dimensions of basic unit（L×W×H）
主机包装外形尺寸（长 × 宽 × 高）	700×550×507	Overrall dimensions of packing box（L×W×H）

仪器组成 / SET OF MACHINE INCLUDES

基本配置 / 型号	3602	Model / Standard module
测量主机	1 台 / 1 pc	Main unit
千分表	1 块 / 1 pc	Dial indicator
测头：ϕ0.8 锥形、ϕ1.2、ϕ2、ϕ3、ϕ4、ϕ5、ϕ6、ϕ8、ϕ10、ϕ12，ϕ14（3603A）、ϕ16（3603A）	各 1 件 / 1 each	Conical probeϕ0.8、ϕ1.2、ϕ2、ϕ3、ϕ4、ϕ5、ϕ6、ϕ8、ϕ10、ϕ12，ϕ14（3603A）、ϕ16（3603A）

安装图 / INSTALLATION LAYOUT



单位（Unit）：mm

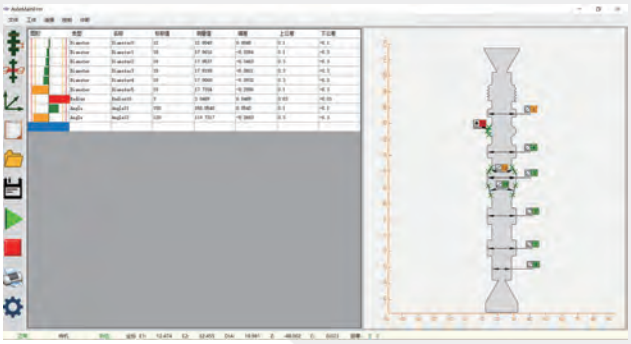
尺寸 / 型号	L	W	H
3602	560	390	320

Shaft Parts Measuring Machine Model M45
轴类零件测量仪 M45 型

用 途 / APPLICATIONS

M45 型轴类零件测量仪，基于光学成像技术，可实现阶梯轴、锥度芯轴、曲轴、凸轮轴、偏心轴等轴类零件的高精度、快速检测，在数秒内快速完成轴类零件测量，输出直径、长度、角度、半径、圆度等多样尺寸，判定零件是否合格，主要应用于机床、汽车制造等领域。

M45 shaft parts measuring instrument, based on optical imaging technology, can realize the ladder shaft, taper mandrel, crankshaft, camshaft, eccentric shaft, class parts, high precision, rapid detection, in a few seconds quickly complete shaft, parts measurement, output diameter, length, Angle, radius, circle, sample size, determine whether the parts qualified, mainly used in machine tools, automobile manufacturing and other fields.



软件界面 Software Interface

特 点 / FEATURES

- M45 型轴类零件测量仪具有高精度机械主机，保证仪器的测量精度；
- 软件功能丰富，操作简单，具有基于 SQL 数据库的数据安全及管理功能；
- 自主研发 EtherCAT 总线技术测控系统，为在线检测、智能化生产提供了强有力的技术支撑；
- 测量效率高，可在数秒内完成全自动检测并输出多个尺寸，节省时间，降低成本；
- 采用 OPC-UA 标准通讯协议，可接入智能化工厂；
- 数字孪生技术，实现了仪器在虚拟空间中的映射，可接入数字化工厂。

- M45 shaft parts measuring instrument has high precision mechanical host, Ensure the measurement accuracy of the instrument;
- Rich software functions, simplicity of operator, with data security and management functions based on SQL;
- Independent development of EtherCAT technology measurement and control system. Provide strong technical support for online detection and intelligent production;
- High measurement efficiency, Automatic detection and output of multiple sizes in several seconds, timesaver, cost reduction;
- Adopt the OPC-UA standard communication protocol, access to an intelligent factory;
- Digital twin technology, implement the mapping of the instruments in the virtual space, access to the digital factory.

技术规格 / SPECIFICATIONS

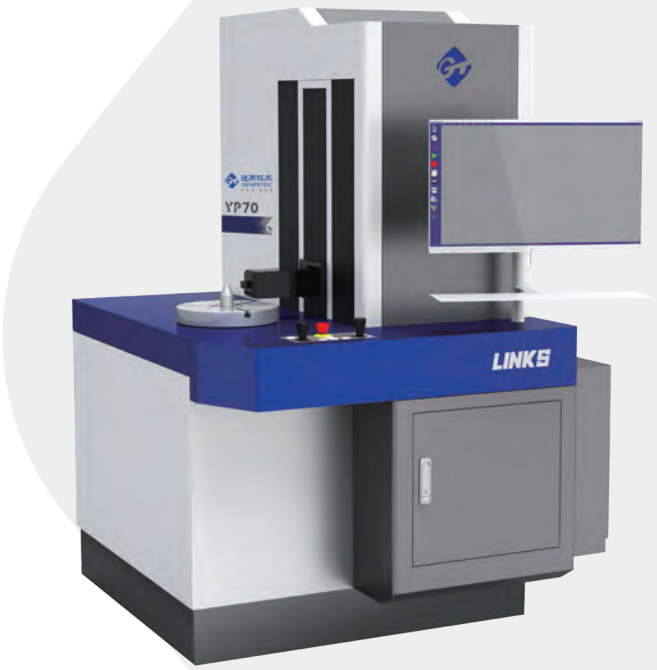
单位（Unit）：mm

型号 / 技术规格	M45	Model / Specifications
可测量零件最大外径	45	Max.workpiece diameter
可测量零件最大长度	500	Max.permissible test gear length
可测量零件最大重量	15kg	Max.permissible test gear weight
主机外形尺寸（长 × 宽 × 高）	1500×540×1800	Mainframe dimensions (length × width × height)

仪器组成 / SET OF MACHINE INCLUDES

基本配置	单位 / Unit	Standard module
仪器主机	1 台 / 1 pc	Instrument host
计算机	1 台 / 1 pc	Computer
打印机	1 台 / 1 pc	Printer
卡盘	1 套 / 1 set	chuck
打印纸	1 包 / 1 pack	Printing paper

Blade Measuring Machine Model YP70
叶片测量机 YP70 型



用 途 / APPLICATIONS

YP70 型叶片测量机通过 3D 模型可视化交互技术构建叶片测量模型，并基于虚拟测量和数字孪生技术实现测量过程的实时动态展示；结合高速四轴联动扫描测量系统快速捕获叶片表面三维数据，同步驱动数字孪生体与实体叶片的虚实融合比对；最终依托叶片质量分析系统，对型面偏差、轮廓精度等核心指标进行量化评估，形成“建模 - 交互 - 测量 - 分析”一体化的闭环检测流程。

通用技术哈量公司自主研发的 YP70 型航空发动机叶片测量机突破我国四坐标平台测量航空发动机叶片的技术瓶颈，实现了航空发动机叶片型面精度的高柔性、高节拍、高精度检测。

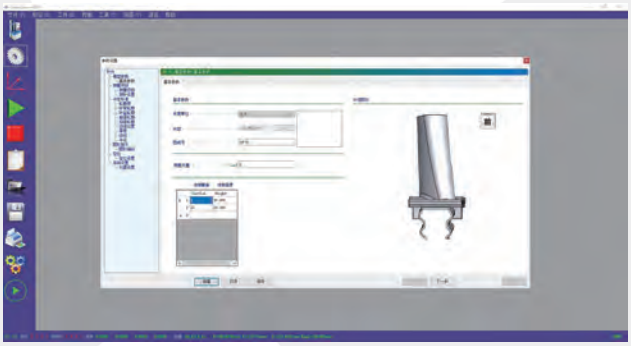
The YP70 blade measuring machine constructs a blade measurement model through 3D model visualization and interactive technology, and achieves real-time dynamic display of the measurement process based on virtual measurement and digital twin technology; Combining high-speed four axis linkage scanning measurement system to quickly capture three-dimensional data of blade surface, synchronously driving the virtual real fusion comparison between digital twin and solid blade; Ultimately, relying on the blade quality analysis system, the core indicators such as profile deviation and contour accuracy are quantitatively evaluated, forming an integrated closed-loop detection process of "modeling interaction measurement analysis".

The YP70 aircraft engine blade measuring machine independently developed by GENERTEC HMCT has broken through the technical bottleneck of measuring aircraft engine blades on a four coordinate platform in China, achieving high flexibility, high beat rate, and high-precision detection of aircraft engine blade surface accuracy.

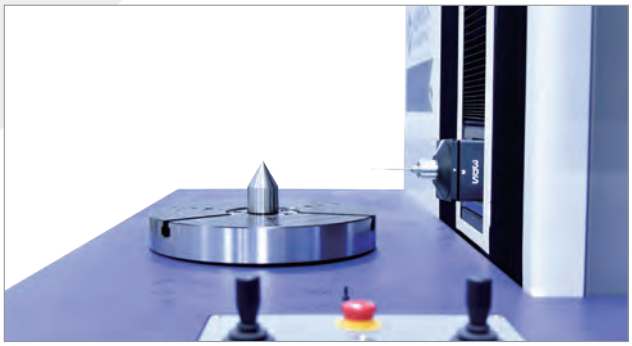
特 点 / FEATURES

- 搭载自主研发的高精度总线三维扫描测头，基于 EtherCat 总线技术，利用纳秒级同步精度提高了数据传输速度和实时性，减少传输环节，提升抗干扰性，降低动态误差，降低设备耦合性，具有亚微米级的测量精度和重复性。
- 采用自主研发的基于先进的 EtherCat 总线通讯、集测量与控制为一体的通用 PLC 软核控制器，实现了叶片复杂曲面的实时跟踪、连续扫描与控制，兼容多种通讯协议及 IO 模块拓展，并突破数字孪生及虚拟测量技术，满足数字化工厂的智能化检测需求。
- 采用高精度四坐标测量平台全新设计的机械结构，满足设备各项精度指标要求，保证仪器具有较高的系统精度，配合高精度回转主轴，完美实现叶片的高速四轴联动扫描，提高测量的可达性和测量效率。

操作面板 Operation panel



软件界面 Software Interface



- Equipped with independently developed high-precision bus 3D scanning probes, based on EtherCat bus technology, utilizing nanosecond level synchronization accuracy to improve data transmission speed and real-time performance, reduce transmission links, enhance anti-interference ability, lower dynamic errors, and reduce equipment coupling, it has sub micron level measurement accuracy and repeatability.
- Adopting independently developed advanced EtherCat bus communication and integration The universal PLC soft core controller integrating measurement and control realizes real-time tracking, continuous scanning and control of complex blade surfaces, compatible with multiple communication protocols and IO module expansion, and breaks through digital twin and virtual measurement technology to meet the intelligent detection needs of digital factories.
- The newly designed mechanical structure adopts a high-precision four coordinate measurement platform, Meet the precision requirements of the equipment, ensure that the instrument has high system accuracy, and work with a high-precision rotary spindle to perfectly achieve high-speed four axis linkage scanning of the blades, improving the accessibility and efficiency of measurement.

软件特点 / SOFT FEATURES

- 自主研发基于 3D 模型可视化交互技术的叶片复杂曲面测量模型构建算法，实现了叶片 CAD 模型的解析与多姿态导入。
- 自主研发叶片法向极坐标测量及采样策略优化的叶片复杂路径控制技术，通过平台回转密集采点，实现了叶片高曲率区域重要特征的高速高精检测。
- 自主研发集叶片模型导入设置、测量路径规划及误差和特征参数分析为一体的叶片测量及分析系统，软件界面直观人性化，操作简单便捷，对检测人员要求低，实现了对叶片叶身轮廓度误差及多项特征参数的测量、计算和分析。

- We have independently developed an algorithm for constructing complex blade surface measurement models based on 3D model visualization interaction technology, which enables the analysis and multi pose import of blade CAD models.
- Independently developed blade normal polar coordinate measurement and optimized sampling strategy. The complex path control technology of the blade achieves high-speed and high-precision detection of important features in the high curvature area of the blade through the platform rotation of dense sampling points.
- Independently developed blade model import settings, measurement path planning, and errors. A blade measurement and analysis system that integrates difference and characteristic parameter analysis, with an intuitive and user-friendly software interface, simple and convenient operation, and low requirements for detection personnel. It realizes the measurement, calculation, and analysis of blade profile errors and multiple characteristic parameters.

技术规格 / SPECIFICATIONS

单位（Unit）：mm

型号 / 技术规格	YP70	Model / Specifications
主轴径向跳动	≤ 1μm	Radial runout of spindle
X 轴 /Y 轴 /Z 轴直线度	≤ 1μm/200mm	X-axis/Y-axis/Z-axis straightness
综合测量精度	（1.8 + L/250）[μm]（L= 长度单位 mm）	Comprehensive measurement accuracy

仪器组成 / SET OF MACHINE INCLUDES

基本配置	单位 / Unit	Standard module
仪器主机	1 台 / 1 pc	Instrument host
计算机	1 台 / 1 pc	Computer
打印机	1 台 / 1 pc	Printer
打印纸	1 包 / 1 pack	Printing paper

齿轮量仪产品一览表

单位：mm

仪器名称与产品型号 / 技术要求与测量功能	一维测头齿轮测量中心								三维测头齿轮测量中心（L 系列）
	Prec20	Prec30	Prec40	Prec60	Prec80	Econ30	L80	L100	L30A
可测齿轮模数	0.5-15	0.5-15	0.5-15	0.5-20	0.5-20	0.5-15	0.5-20	0.5-20	≥0.5(0.2*)
可测齿轮最大外径	200	300	400	600	800	300	800	1000	300
上下顶尖距离	15-500	15-500	15-500	20-800	30-1000	15-500	40-1000	100-1100	30-700
测头到下顶尖距离	-10-390	-10-390	-10-390	5-405	0-600	-5-390	20-600	20-600	10-360
可测工件最大重量	80kg	300kg	300kg	400kg	1000kg	150kg	1000kg	2000kg	300kg
圆柱外齿轮	●	●	●	●	●	●	●	●	●
圆柱内齿轮	■	■	■	■	■	■	■	■	■
齿轮滚刀	■	■	■	■	■	■	■	■	■
插齿刀	■	■	■	■	■	■	■	■	■
剃齿刀	■	■	■	■	■	■	■	■	■
蜗轮滚刀	■	■	■	■	■	■	■	■	■
蜗轮	■	■	■	■	■	■	■	■	■
蜗杆	■	■	■	■	■	■	■	■	■
分度盘	■	■	■	■	■	■	■	■	■
直齿锥齿轮	■	■	■	■	■	■	■	■	■
弧齿锥齿轮	■	■	■	■	■	■	■	■	■
齿条	■	■	■	■	■	■	■	■	■
拉刀	■	■	■	■	■	■	■	■	▲
未知齿轮	■	■	■	■	■	■	■	■	■
矩形花键	■	■	■	■	■	■	■	■	■
三角花键	■	■	■	■	■	■	■	■	■
转子	▲	▲	▲	▲	▲	▲	▲	▲	■
双圆弧齿轮	▲	▲	▲	▲	▲	▲	▲	▲	■
摆线齿轮	▲	▲	▲	▲	▲	▲	▲	▲	■
偏心轴	▲	▲	▲	▲	▲	▲	▲	▲	■
多联齿轮	▲	▲	▲	▲	▲	▲	▲	▲	■
正时关系	▲	▲	▲	▲	▲	▲	▲	▲	■
弧锥铣刀盘	▲	▲	▲	▲	▲	▲	▲	▲	■

备注：● 标配　■ 选配　▲ 不可选　　* 注：0.2mm 模数齿轮测量功能需要特定

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齿轮量仪产品一览表

单位：mm

仪器名称与产品型号 / 技术要求与测量功能	三维测头齿轮测量中心（L 系列）						三维测头齿轮测量中心（T 系列）				
	L45B	L45P	L65G	L100A	L150A	L200A	T20	T30	T40	T60	T80
可测齿轮模数	≥0.5(0.2*)	≥0.5(0.2*)	≥0.5(0.2*)	≥0.5(0.2*)	≥0.5	≥0.5	≥0.5(0.2*)	≥0.5(0.2*)	≥0.5(0.2*)	≥0.5(0.2*)	≥0.5(0.2*)
可测齿轮最大外径	450	450	650	1000	1500	2000	200	300	400	600	800
上下顶尖距离	30-700	10-800	10-1100	10-1100	20-1500	20-1500	15-500	15-500	15-500	20-800	30-1000
测头到下顶尖距离	10-360	10-450	0-600	0-600	50-1100	50-1100	5-380	5-380	5-380	5-380	10-600
可测工件最大重量	300kg	300kg	2000kg	2000kg	5000kg	10000kg	300kg	300kg	300kg	400kg	1000kg
圆柱外齿轮	●	●	●	●	●	●	●	●	●	●	●
圆柱内齿轮	■	■	■	■	■	■	■	■	■	■	■
齿轮滚刀	■	■	■	■	■	■	■	■	■	■	■
插齿刀	■	■	■	■	■	■	■	■	■	■	■
剃齿刀	■	■	■	■	■	■	■	■	■	■	■
蜗轮滚刀	■	■	■	■	■	■	■	■	■	■	■
蜗轮	■	■	■	■	■	■	■	■	■	■	■
蜗杆	■	■	■	■	■	■	■	■	■	■	■
分度盘	■	■	■	■	■	■	■	■	■	■	■
直齿锥齿轮	■	■	■	■	■	■	■	■	■	■	■
弧齿锥齿轮	■	■	■	■	■	■	■	■	■	■	■
齿条	■	■	■	■	■	■	■	■	■	■	■
拉刀	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
未知齿轮	■	■	■	■	■	■	■	■	■	■	■
矩形花键	■	■	■	■	■	■	■	■	■	■	■
三角花键	■	■	■	■	■	■	■	■	■	■	■
转子	■	■	■	■	■	■	■	■	■	■	■
双圆弧齿轮	■	■	■	■	■	■	■	■	■	■	■
摆线齿轮	■	■	■	■	■	■	■	■	■	■	■
偏心轴	■	■	■	■	■	■	■	■	■	■	■
多联齿轮	■	■	■	■	■	■	■	■	■	■	■
正时关系	■	■	■	■	■	■	■	■	■	■	■
弧锥铣刀盘	■	■	■	■	■	■	■	■	■	■	■

备注：● 标配　■ 选配　▲ 不可选　* 注：0.2mm 模数齿轮测量功能需要特定

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齿轮量仪产品一览表

单位：mm

仪器名称与产品型号 / 技术要求与测量功能	齿轮双面啮合综合测量仪						
	3101	3101A	3101B	3101E	3101L	3102	3102A
可测齿轮模数	1-10	1-10	1-10	1-10	1-10	1-6	1-6
可测带轴齿轮最大外径	200	200	---	200	200	150	150
两芯轴中心距离	50-320	50-320	50-320	50-320	50-320	20-160	20-160
带轴齿轮轴长	110-350	110-350	---	110-350	250-750	50-200	50-200
蜗杆轴长	120-240	---	---	120-240	---	---	---
可测最大蜗杆外径	100	---	---	140	---	---	---
示值分辨力	---	---	---	---	---	---	---
最大示值误差	---	---	---	---	---	---	---
带孔圆柱齿轮	●	●	●	●	●	●	●
带轴圆柱齿轮	●	●	▲	●	●	●	●
蜗轮副	●	▲	▲	●	▲	▲	▲
锥齿轮	●	▲	▲	●	▲	▲	▲

单位：mm

仪器名称与产品型号 / 技术要求与测量功能	智能齿轮双面啮合综合测量仪							小模数齿轮智能双面啮合综合测量仪
	3100B	3100C	3100L	3100W	3100Z	3104B	3104D	3103A
可测齿轮模数	0.5-6	0.5-6	0.5-6	0.5-6	0.5-6	0.5 - 6	0.5 - 6	0.15-2
可测带轴齿轮最大外径	---	150	200	---	---	---	---	55（带轴）80（带孔）
两芯轴中心距离	40-175	40-175	40-150	10-120	40-175（安装距）	60-200	60-200	0-100
带轴齿轮轴长	---	50-170	200-700	---	---	---	---	160
蜗杆轴长	---	---	---	120-240	---	---	---	---
可测最大蜗杆外径	---	---	---	100	---	---	---	---
示值分辨力	0.0005	0.0005	0.0005	0.0005	0.0005	0.001	0.001	0.0005
最大示值误差	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.0025
带孔圆柱齿轮	●	●	▲	▲	▲	●	■	●
带轴圆柱齿轮	▲	●	●	▲	▲	▲	●	●
蜗杆副	▲	▲	▲	●	▲	▲	▲	▲
锥齿轮	▲	▲	▲	▲	●	▲	▲	▲

齿轮量仪产品一览表

单位：mm

仪器名称与产品型号 / 技术要求与测量功能	齿轮径向跳动测量仪
	3602
可测齿轮模数	0.5-8
可测齿轮最大外径	10-200
左右两端顶尖距离	0-200
示值变动性	0.002
示值误差	0.004
圆柱外齿轮径向跳动 Fr	●
锥齿轮	●

备注：● 标配　■ 选配　▲ 不可选

声明：产品最终配置以技术协议为准，通用技术集团哈尔滨量具刃具有限责任公司保留最终解释权与修改权。