

- 海湾精工造中国好铣头 -
China's Precision Milling Heads, Made by Bay



铣头安装使用说明书

Milling Head Installation And Operation Manual



HAIWAN ANGLE HEAD

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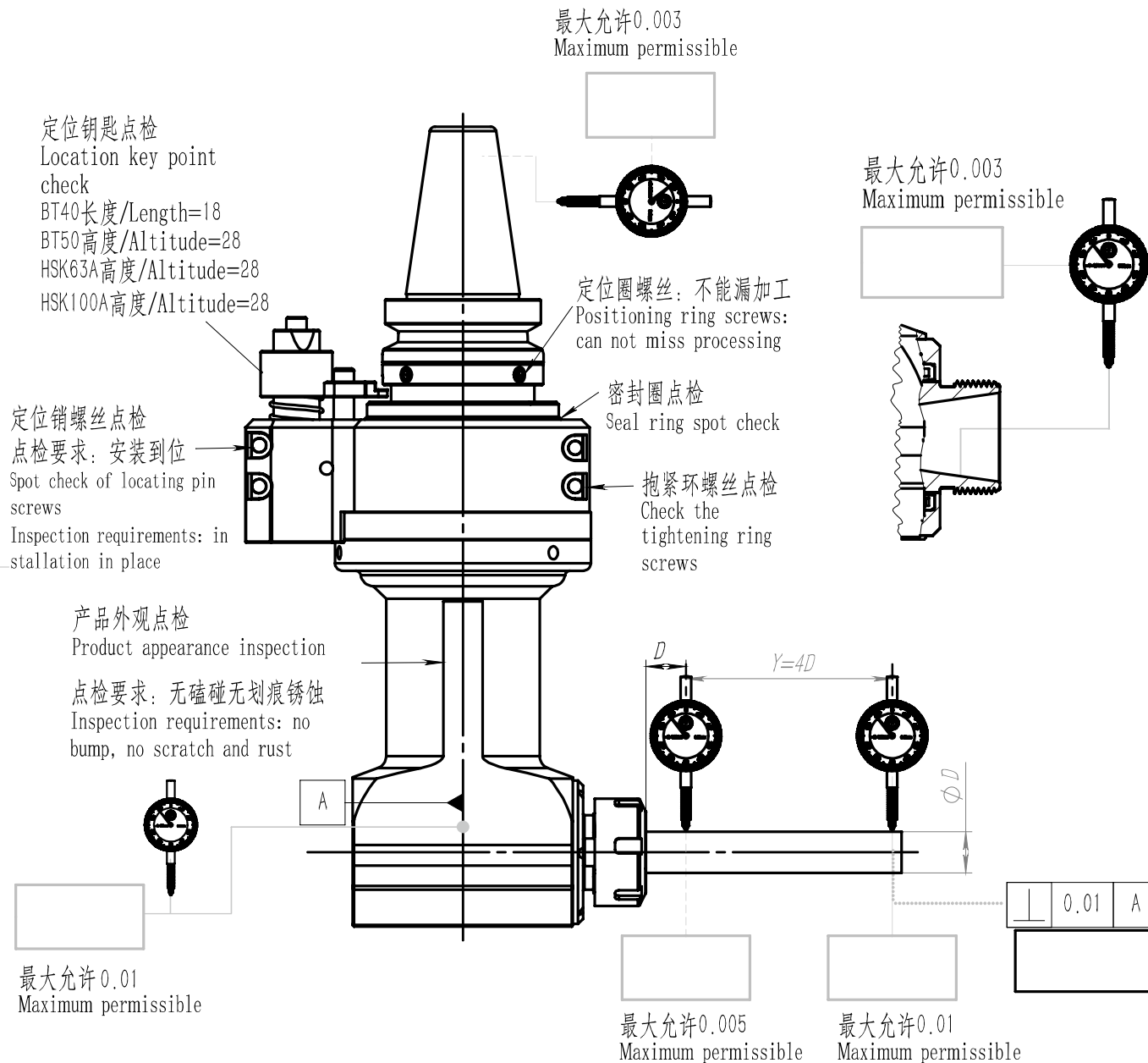
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角度头出厂检验报告

Angle head factory inspection report



编写方法：DK90+年月日及出第几支出货
举例：2023年10月1日出货第9个产品
编号为：DK90-20231001009
标刻位置：角度头参数栏 或者抱紧环上

检测结果/ Detection result		检测员/Inspector	日期 / DATE	出厂编号 / Factory number
合格 Eligible	<input type="checkbox"/>	不合格 Disqualification	<input type="checkbox"/>	

检测内容

Dard Test Table

检验项目 Inspection Items	检验标准 Inspection Methods	允许差值 Permissible Deviation	判定 Determine √/×
铣头型号 Milling Head Model			
刀柄型号 Shank Model			
定位钥匙高度 Height of Positioning Key	BT40 L=18 HSK63A H=28 BT50 H=28 HSK100A H=28		
定位圈螺丝 Locating Ring Screw	是否安装到位 Whether it is installed properly		
定位销螺丝 Positioning pin screw			
抱紧环螺丝 Clamping ring screw			
外观点检 Cosmetic Inspection	无划痕磕碰锈蚀 Free from scratches, dents, and corrosion	无明显划痕 No visible scratches	检测数据 Inspection Data
刀柄跳动 Shank Runout	<0.003MM	<0.003	
壳体跳动 Shell Runout	<0.008/200MM	<0.008	
不同转速 Housing Runout at Different Rotational Speeds			
50 rpm	<0.01MM	<0.01	
500 rpm	<0.01MM	<0.01	
1000 rpm	<0.01MM	<0.01	
垂直度 Perpendicularity	<0.01MM / 4D	<0.01	
夹持精度 Clamping accuracy	D<0.005MM	<0.005	
	4D<0.01MM	<0.01	

备注说明：
Remarks

配件/扳手对应型号齐全
Complete range of wrench accessories with matching models

1

2

3

4

A

A

B

B

C

C

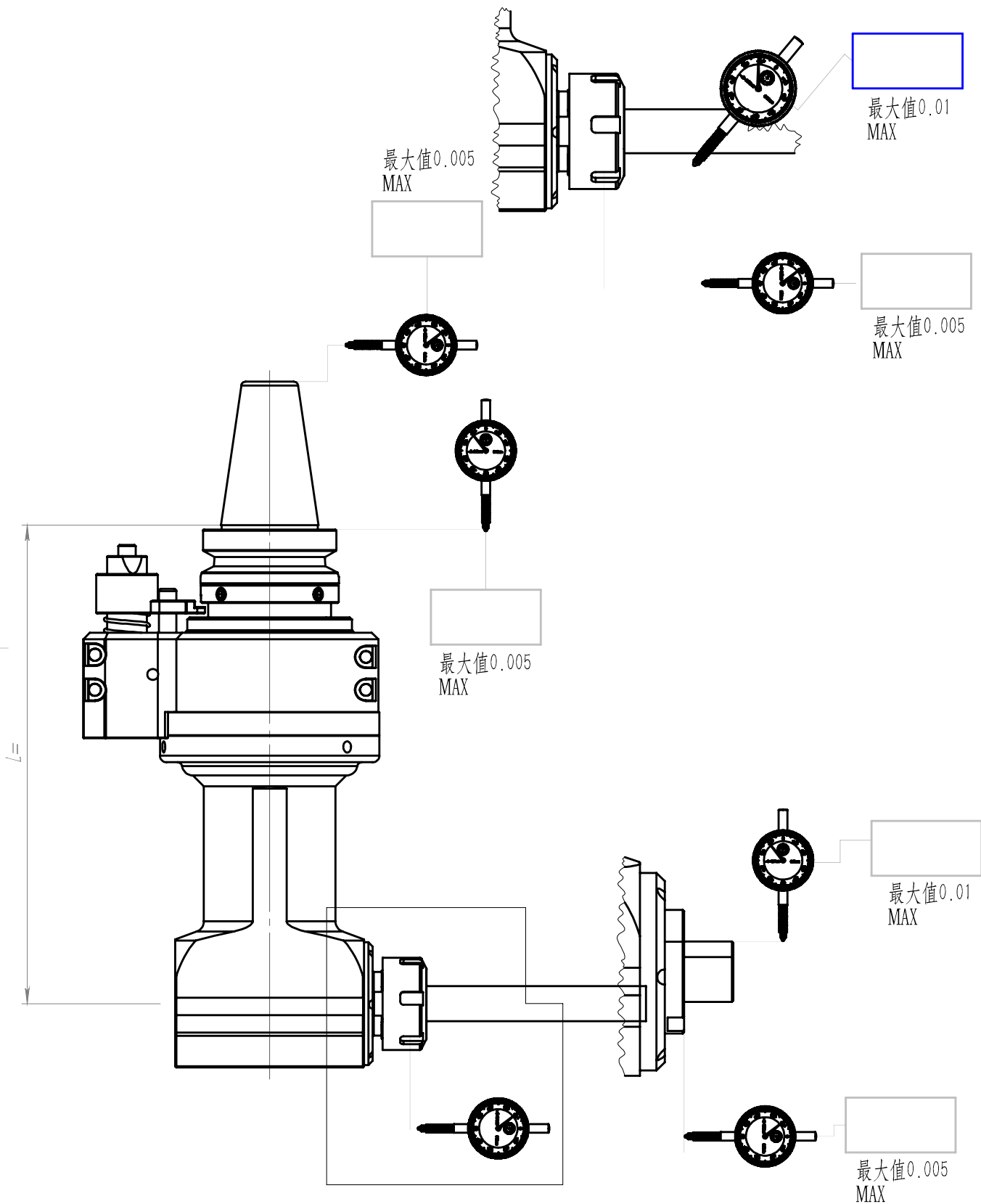
D

D

E

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F



检测结果/Detection result		日期 / DATE	检测员 / Inspector
合格 <input type="checkbox"/>	不合格 <input type="checkbox"/>		
Eligible	Disqualification		

产品描述

Product Description

角度头是一种机床附件，机床安装角度头后刀具旋转中心线可以与主轴旋转中心线成角度加工工件。即不需要二次装夹工件就可完成四个侧面的加工。角度头已广泛应用于航空、汽车模具、木材、石材等机械加工的众多领域。使用角度头无需改变机床结构就可以扩大其加工范围和提高其适应性，使一些用传统方法难以完成的加工得以实现，并能减少工件重复装夹，提高加工精度和效率。角度头主要用于立式或卧式加工中心，镗床、龙门铣床等。

The Angle head is a machine tool accessory. After the Angle head is installed on the machine tool, the rotating center line of the tool can process the workpiece at an Angle with the rotating center line of the spindle. That is, the processing of the four sides can be completed without double clamping of the workpiece. Angle head has been widely used in aviation, automotive mold, wood, stone and other mechanical processing fields. The use of Angle head can increase its processing range and adaptability without changing the machine structure, so that some processing difficult to complete with traditional methods can be realized, and can reduce the workpiece repeated clamping. Improve machining accuracy and efficiency. The Angle head is mainly used in vertical or horizontal machining centers, boring machines, planer milling machines, etc.

角度头分类

- 1、按结构分：单输出、双输出、四输出、可调、倾斜、偏置、非标。
- 2、按夹持方式分：筒夹型、刀柄型、侧固型、FM面铣刀型。
- 3、按安装分：固定支架型、法兰盘型，四个拉钉连接盘型。

Angle head classification

- 1, according to the structure: single output, double output, four output, adjustable, tilt, offset, non-standard.
- 2, according to the clamping method: simple clamp type, tool handle type, side solid type, FM face milling cutter type.
- 3, according to the installation: fixed bracket type, flange type, four nail connection disk type.

角度头特性

- 1、精密工件，一次定位，确保精度。
- 2、大型工件，多面加工，提高效率。
- 3、对倾斜的角、面、孔进行任意角度的加工。
- 4、孔中孔可用偏置或七字形角度头加工。
- 5、斜槽可用偏置万能角度头加工。

Angle head characteristic

- 1, precision workpiece, once positioning, to ensure accuracy.
- 2, large workpiece, multi-sided processing, improve efficiency.
- 3, the inclined Angle, surface, hole processing at any Angle.
- 4, the hole in the hole can be offset or seven font Angle head processing.
- 5, inclined groove can be offset universal Angle head processing.

如何选用角度头

1 首先，弄清机床参数、品牌、型号、立式、卧式、主轴类型、主轴刀具连接方式（ BT . NTHSK. CAT. DAT. . . . ）、有无冷却液（是否从主轴中心供给及其压力）、主轴功率、主轴扭矩NM、最大主轴转速、最大刀具承载重量、刀库类型，是否自动换刀，刀具允许最大长度。

2 、然后，核对角度头参数，如刀具夹持方式（ ER. SLC. BT. NT. FM. C. . . . ）、转速RPM、扭矩冷却方式（无冷却、内冷、外冷）等。

How to choose Angle head

1 First of all, find out the machine parameters, brand, model, vertical, horizontal, spindle type, spindle tool connection mode (BT.NT.HSK.CAT.DAT....) There is no coolant (whether it is supplied from the spindle center and its pressure), spindle power, spindle torque NM, maximum spindle speed, maximum tool carrying weight, tool library type, whether the tool is automatically changed, and the maximum length of the tool is allowed.

2. Then, check the parameters of the Angle head, such as the tool holding mode (ER.SLC.BT.NT.FM.C....) RPM , torque cooling mode (no cooling, internal cooling, external cooling), etc.

角度头使用注意事项

1、角度头在使用中温度会有较大上升，齿轮部位润滑油易流散，注意生产过程中添加齿轮润滑油（注：角度头每工作80小时需要对齿轮部位进行润滑），拧开注油孔螺栓用油枪加入注满油脂为止。

2 、一般建议正常工作时转速不超过最高限速的 75 %为佳。

3 、标准法兰盘已固化与角度头连接的 T 型柱尺寸，但与机床主轴连接部位需与机床主轴配合安装孔，并自行配置连接盘。

Note on the use of Angle head

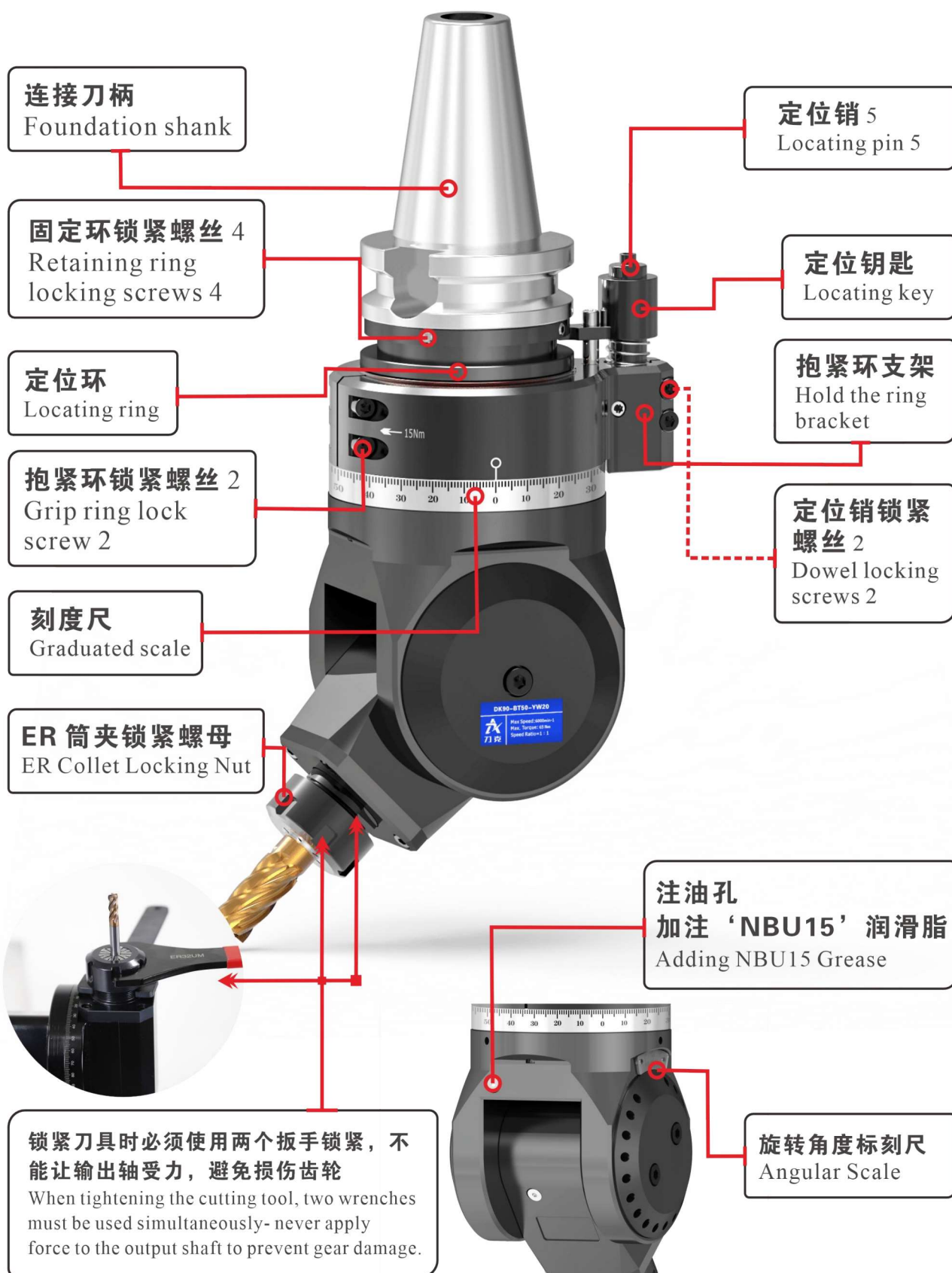
1. The temperature of the Angle head will rise greatly in use, and the lubricating oil in the gear part is easy to disperse. Pay attention to adding gear lubricating oil in the production process (note: The Angle head needs to lubricate the gear part every 80 hours), and unscrew the oil injection hole bolt and add about 5 ml of oil to the oil gun.

2, it is generally recommended that the speed does not exceed 75% of the maximum speed limit during normal operation.

3, the standard flange has been solidified and the T-column size connected with the Angle head, but the connecting part of the machine spindle needs to be matched with the mounting hole of the machine spindle, and the connecting disc is configured by itself.

产品功能

Product Features



角度头安装方法

Angle head installation method

1、安装前先松掉螺丝

Loosen the screws before installation



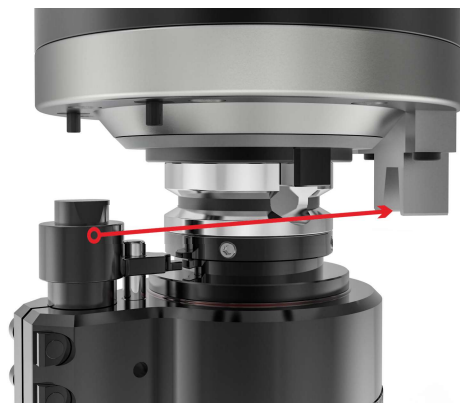
2、把固定块安装在主轴上锁紧(定位块必须安装在干涉到机械手抓取的位置)

Install the fixed block on the spindle and lock it (the positioning block must be installed in a position that does not interfere with the grasp of the manipulator)



3、主轴M19锁定,再安装角度头,将定位销旋转至定位块处如图

Lock the spindle M19, then install the Angle head, and rotate the positioning pin to the positioning block as shown in the figure



4、让定位销在弹簧的作用下自动向上滑动与定位块卡槽贴合

Let the positioning pin automatically slide upward under the action of the spring and fit the positioning block card slot



5、锁紧定位销螺丝

Lock the positioning pin screws tightly



6、旋转固定环将倒“V”型刻线旋转对齐如图B，并锁紧螺丝

Rotate the fixing ring to align the V-shaped line and lock the screw as shown in Figure B



7、确认定位钥匙脱离定位环，脱离距 > 1mm 悬空状态

Confirm that the positioning key is removed from the positioning ring, and the separation distance is >1mm suspended state

如右图:

As shown on the right:



8、卸下角度头刀柄,确定定位卡块能放入定位槽,然后再次安装刀柄

Remove the tool handle of the Angle head, make sure that the positioning card block can be placed into the positioning slot, and then install the tool handle again



9、在标记位置打表校直角度头
Use a dial indicator mounted on a magnetic base to align the angle head



10、校直后锁紧抱紧环上的螺丝
Tighten the clamping ring screws to secure the alignment.

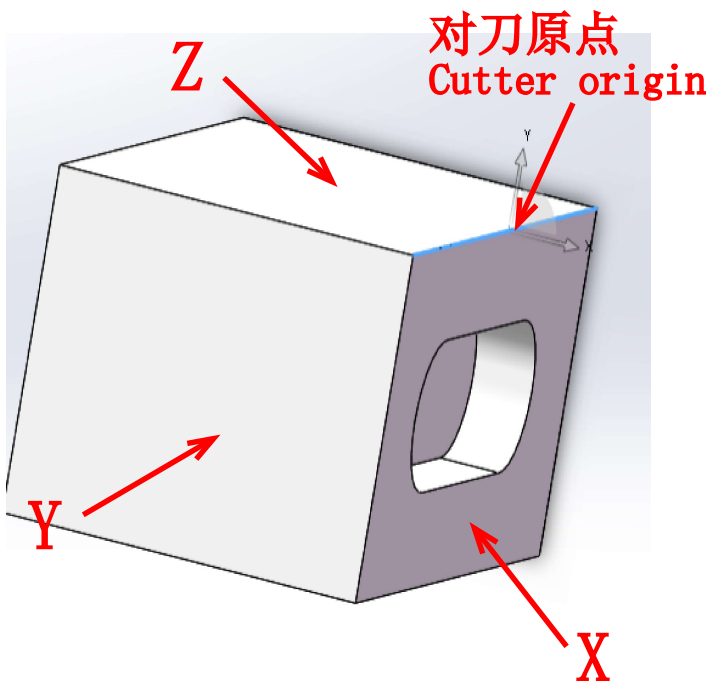


11、校正加工角度时,表针需靠到刀柄上打表

When calibrating the machining angle, place the dial indicator needle against the tool shank to take a reading.

12、校表角度无误后,锁紧各部位螺丝,解除主轴锁定,手动旋转输出轴确认主轴可正常旋转无干涉即调试完成
After verifying the angle calibration is correct, tighten all securing screws, release the spindle lock, manually rotate the output shaft to confirm smooth and interference-free rotation of the spindle, indicating the setup is complete.

对刀步骤/ Tool setting procedure



Z 轴对刀：刀具最低点与Z轴上平面接触，**Z 轴**减去对刀棒一半为 **Z 轴**原点抄数在 **G54 Z** 数字

Z-axis tool setting: When the tool's lowest point contacts the Z-axis reference plane, subtract half the diameter of the tool setting bar from the Z-axis reading to determine the Z-axis zero point. Input the calculated value into the G54 Z-offset register.



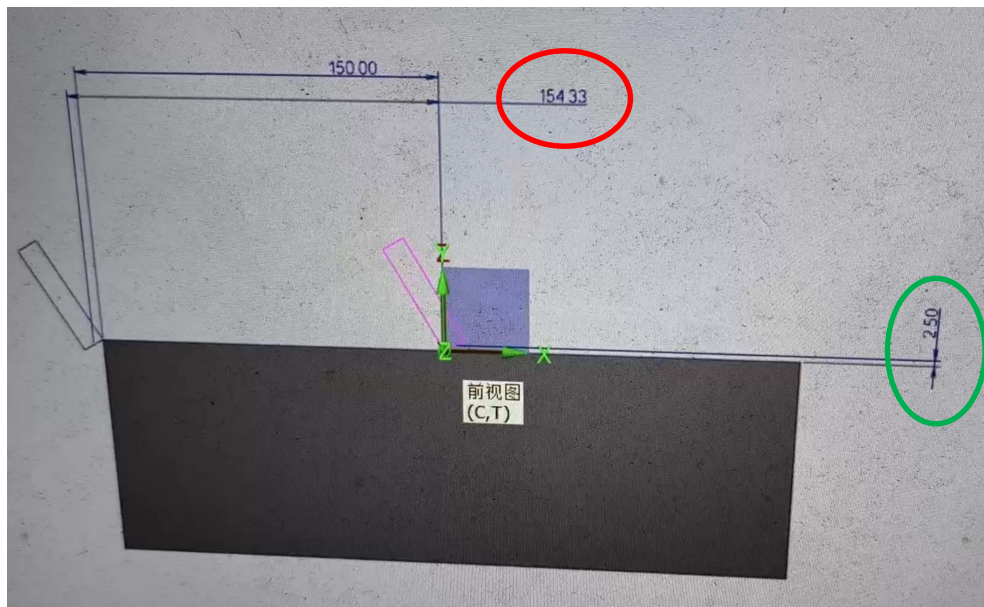
Y 轴对刀：**Y 轴**分中写入 **G54** 坐标系

Y-axis tool setting: Perform Y-axis centering and input the calculated center position into the G54 coordinate system.



X 轴向对刀：刀尖与工件表面接触
X 轴减去对刀棒一半为 **X 轴**原点，抄数在 **G54 X** 数字

X-axis tool setting: When the tool tip contacts the workpiece surface, calculate the X-axis zero point by subtracting half the diameter of the tool setting bar from the X-axis reading, and input the result into the G54 X-offset register.



我们在电脑上测量刀头中心到Z原点的距离（红圈），刀头中心到加工工件端面的距离（绿圈），记住这两个数值

On the computer, we measure the distance from the tool center to the Z-axis origin (marked by the red circle) and the distance from the tool center to the workpiece end face (marked by the green circle). Record these two values. On the computer, we measure the distance from the tool center to the Z-axis origin (marked by the red circle) and the distance from the tool center to the workpiece end face (marked by the green circle). Record these two values.



在机床系统上，根据实际加工方向输入上面系数的正值或负值。这样我们的对刀就完成了

Enter the above coefficients into the machine tool system. This completes our tool setting process.

Ensure the correct sign (+/-) is applied to the input values based on the machining direction.

— 编程参考案例 / Programming case —

00001

G17G40G49G80 ————— 状态取消
M6T1 ————— 自动换刀T1 (法兰式角度头不用自动换刀)
N10 (G19-END MILL-12MM) ————— G19 ZY平面, 刀具轴, X轴, 使用端铣刀进行铣削
G17G40G49G80
G91G28Z0
G19G00G90G55X-100. Y-100Z100. — 使用G55工件坐标, ZY轴定位
G43H01Z20. S500M3 ————— 刀具轴进行刀长补正, 角度头反转M04, 角度头正转
M03 G00Y60. Z-15. ————— ZY轴定位至下刀起始位置
G0X-10. ————— X轴至下刀起始位置 (刀具轴)
G01X1. F150 ————— 铣削深度1mm
Y-60. ————— Y轴铣削长度120mm
G0X-100. ————— X轴退刀
G91G28Z0
M30
%

00002

M6T2 ————— 自动换刀T2 (锁固式角度头不用自动换刀)
N20 (G18-DIRLL-10. 2) ————— G18, ZX平面, 刀具轴, Y轴, 进行钻孔
G18G40G49G80 ————— 状态取消
G91G28Z0
G18G0G90G56X0Y-50. Z60. ————— 使用G56工件坐标, 加工孔定位
G43H02Z20. S1100M03 ————— 刀具轴进行刀长补正
G0Z-15. ————— Z轴平移-15mm
G83X0Y20. . R-5. Q2. F120 ————— 钻孔指令G83, Y轴钻孔深度20mm, Y轴钻孔第一孔
X30. ————— X轴平移30mm, Y轴钻孔第二孔
X60. ————— X轴平移30mm, Y轴钻孔第三孔
X90. ————— X轴平移30mm, Y轴钻孔第四孔
G0G80
G0Y-100. ————— Y轴退刀
G91G28Z0
M30
%

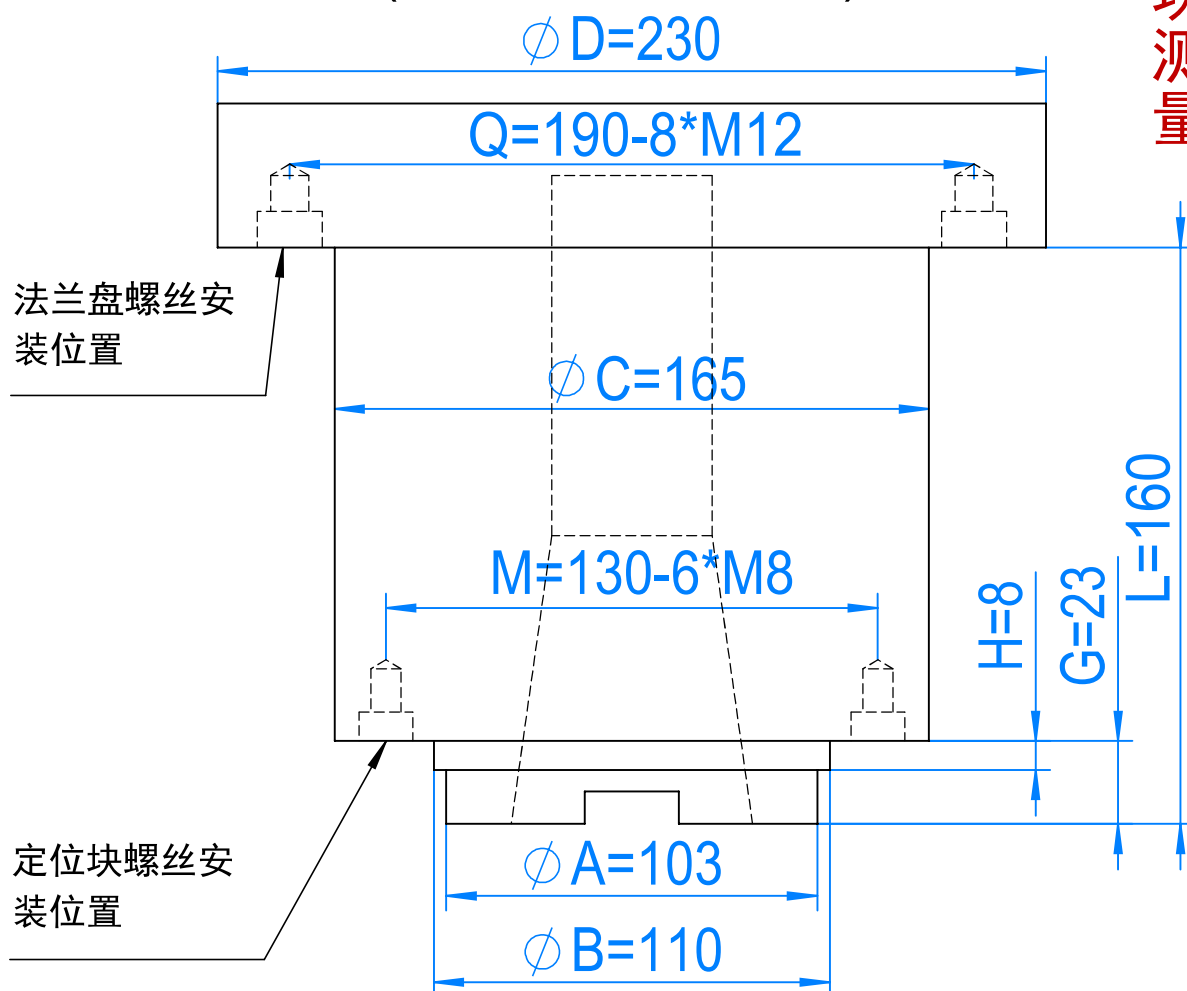
00003

M6T3 ————— 自动换刀T3(锁固式角度头不用自动换刀)
N30(G18-TAP-M12*1.75) ————— G18ZX平面, 刀具轴Y轴, 进行攻牙
G18G40G49G80 ————— 状态取消
G91G28Z0
G18G0G90G56X0Y-50.Z60. ————— 使用G56工件座标, 加工孔定位
G43H03Z20.S200M03 ————— 刀具轴进行刀长补正
G0Z-15. ————— Z轴平移-15mm
M29S200 ————— 指令刚性攻牙
G84X0Y12.Z-15.R-5.F350 ————— 攻牙指令G84(反转G74), Y轴攻牙深度12mm, Y轴
攻牙第一孔
X30. ————— X轴平移30mm, Y轴攻牙第二孔
X60. ————— X轴平移30mm, Y轴攻牙第三孔
X90. ————— X轴平移30mm, Y轴攻牙第四孔
G0G80
G0Y-100. ————— Y轴退刀
G91G28Z0
M30
%

角度头定位块制作必要参数测定

(以下图尺寸为例)

定位块测量



定位块连接提供以下尺寸 (例1)

A	103	B	110	C	165
G	23	H	8	M	130
N	6*M8均分 螺丝规格, 分布数量				
法兰盘连接还需要提供L Q及D尺寸					
L	160	D	230		
Q	190	N2	8*M12		
螺丝规格, 分布数量					

主轴使用刀柄: ☐ SK ☐ CAT ☐ BT ☐ CAPTO ☐ NT ☐ HSK

使用注意事项

Precautions for use

1、 角度头在使用之前需检查定位块锁紧螺丝，定位销螺丝，固定环锁紧螺丝，是否有松动。

1, The Angle head before installation need to check the fixing bracket locking screws, positioning pin screws, fixed Ring lock screws, whether loose.

2、 检查固定块与加工机床主轴端面安装孔是否相配

2, Check whether the fixed block and the machining machine spindle end face mounting hole match, if not recommended Direct use of rapid positioning system.

3、 加工之前需校正基准位，基准位校正好后一定要锁紧螺丝。

3, Before processing need to correct the reference position, the reference position must be locked after correction.

① 定位销的螺丝是否锁紧

Whether the screws of the positioning pins are locked

② 在抱紧环螺丝是否锁紧

Whether the grip ring screws are locked

③ 定位块螺丝是否锁紧

Whether the fixing block screws are locked

4、 连续加工2小时后，需要停机5分钟，防止齿轮轴承过热。

4, Processing 2 hours need to stop for 5 minutes to prevent gear bearing overheating.

5、 每周需要定时添加润滑油脂（ NBU15 ），用油枪注入。（每次加入量以加满为止）

5, The weekly need to add lubricating grease, oil gun injection.

6、 不使用时需要妥善做好防锈保护工作。（如长时间不使用时，建议在角度头低速运转状态下，往注油孔内注满保护油脂，确保轴承和齿轮得到充分润滑）

6, Need to do a good job of rust protection when not in use. (If not used for a long time, it is

recommended to inject 10ml of protective grease into the Angle head at low speed to ensure that bearings and gears are fully lubricated)

7、 严禁带刀库机床安装使用四面快速定位系统。

7, It is strictly prohibited to install and use four-sided rapid positioning system for tool library machine tools.

8、 严禁角度头安装后定位钥匙仍然未脱离固定环的固定槽状态下进行加工操作。

8. Do not process when the positioning key is not removed from the fixed slot of the fixing ring after the installation of the Angle head.

9、 严禁操作人员输入过高转速，必须控制在角度头可承受范围内进行加工操作。

9, It is strictly prohibited for the operator to enter too high speed, and it must be controlled within the tolerable range of the Angle head Line processing operation.

10、 严禁大力敲打角度头外壳，防止角度头壳体发生变形引发轴承、输入、输出轴等形变。

10, It is strictly prohibited to vigorously knock the Angle head housing to prevent the deformation of the Angle head housing causing bearing, Input, output axis deformation.

11、 安装前须在机床主轴下方放置一块缓冲物，用于防止失误导致角度头伤人。

11. Before installation, a buffer should be placed under the spindle of the machine tool to prevent errors from causing angles The head hurts people.

12、 刀库存放角度头时，相连两边的刀夹子不能再存放另外刀具。

12. When the knife stock is placed at the Angle head, the knife clips connected on both sides can not be stored in another tool.

13、 使用角度头时，需时刻保持输入基础柄与输出轴内锥孔的清洁。

13. When using the Angle head, it is necessary to keep the input base handle and the Inner cone hole of the output shaft clean at all times.

- 装箱单 -

Packing list

角度头型号/Model:

角度头数量/Quantity: 件/PCS

扳手类型/Wrench Type:

固定块类型/Fixed block type:

使用说明/Instructions for use: 一份/A copy

装箱人员/Packing personnel:

检验盖章/Inspection stamp:

出厂日期: 年 月 日

Date of production

- 质 保 卡 -

Warranty card

产品型号/Product model :

产品编号/Product number :

质保时间/Warranty period : 出厂后一年/One Year

质保单位/Quality assurance unit :

质保电话/Warranty telephone :

出货检验 : (签名)

Inspector

出货日期 : 年 月 日

Date

综合精度 : $<0.01\text{mm}$ 机床精度除外

Comprehensive accuracy: $<0.01\text{mm}$ machine accuracy excepted

盖 章 :

Seal

海湾精工 · 专注服务

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Quality commitment

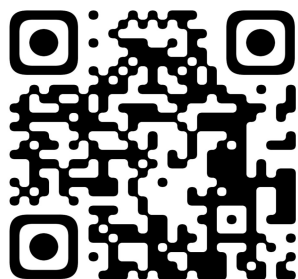
地址：江苏省常熟市北新路12号神州智
造园10幢（海湾精工）

Address: No. 12-10 Shenzhou Manufacturing Park,
Beixin Road, Changshu City, Jiangsu Province, China

WEB: <https://www.cexitou.com>

WEB: <https://www.haiwan99.com>

TEL: 18061616031 / 15268369233



官网二维码