

产品说明书



1. 准备使用

数字螺旋尺专门应用在模型直升机上，用于测量其主旋翼的螺距值。它由两个CR2032纽扣电池供电。在干燥的环境下运行。出于安全及允许的情况下(CE),你不得更改或修改本产品。如果在上述范围之外使用该产品,可能会导致产品损坏。此外,使用不当可能会造成短路,引起火灾,电击等危害。请妥善保管说明书,并仔细阅读。如将该产品转让给第三方,请将说明书一并给予。

2. 安全说明

仔细阅读操作说明,特别留意其中的安全信息。如你不按照本手册中的安全说明和有关妥善处理的信息,我们对此造成的人身伤害或财产损失不承担任何责任。

产品适应人群

该产品不是儿童玩具,将其放置于儿童和宠物接触不到的地方。不要将其包装材料随意四处乱扔。儿童在玩这些包装材料的时候,可能有潜在的危险。让该产品远离高温,避免阳光直射,强震,高湿度,水分,腐蚀性气体,蒸汽和溶剂。不要将本品放置于任何机械刃口下。

如不能正常使用,请关电源,确保意外使用。如产品出现以下情况无法保证正常使用:

1. 明显损坏。
 2. 不在正常工作。
 3. 在同时存放在恶劣的环境下或在运输过程中受到外力的挤压。
- 妥善保管该产品,即使是低高度的震动,冲击或掉落均可能会损坏产品。同时还应注意其他连接到本产品的设备的安全性和操作说明。

电池

电池的负极不得反装。

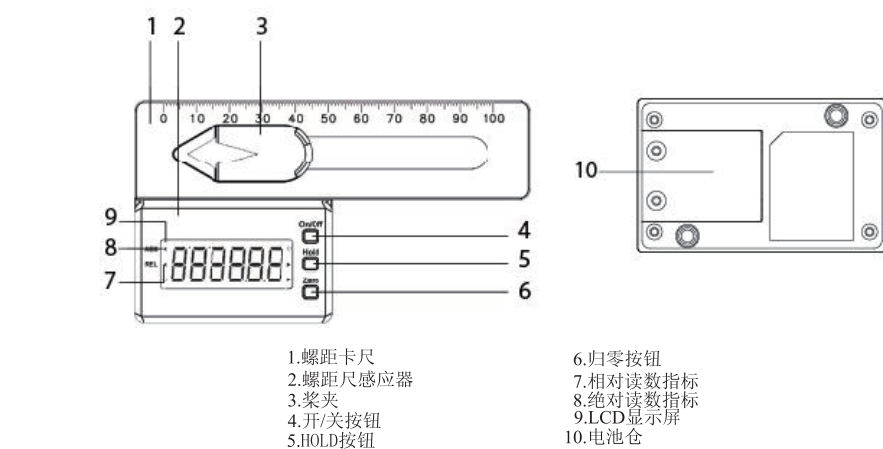
如长时间不使用,应将电池从设备中取出,以避免电池泄漏损坏设备。泄漏或损坏的电池与裸露的皮肤接触可能会导致酸烧伤。因此,需使用适当的防护手套,处理已损坏的电池。电池必须放在儿童或宠物接触不到的地方。不要将电池随意放置,儿童或宠物吞下电池的风险。应及时更换所有的电池,混合使用新旧电池可能会导致电池漏液及设备损坏。

不得将电池拆解,短路或投入火中,不要对非充电电池进行充电,否则有爆炸的危险!

其他

当操作:安全或设备连接有疑问时,请向工程师咨询。由专业的工程师或售后服务人员进行保养,改装和修理。通过上述操作说明,如您有任何疑问没有得到解答,请联系我们的技术支持服务人员或其他技术人员。

3. 产品简介



4. 插入/更换电池

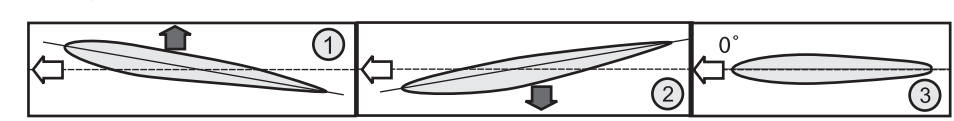
当显示屏显示字符“-ERR-”时,说明此时电池电压过低,应立即更换电池。

1. 用十字头螺丝刀卸下螺距尺后盖的两个螺丝,打开电池仓。
2. 拆下电池仓后盖,打开电池仓。
3. 放置/替换两个CR2032纽扣电池,同时观察极性是否正确。
4. 关闭电池仓,并将两个螺丝拧紧。

5. 操作

不同的螺距角度

“螺距”表示的角度是指主旋翼(从侧面看)的旋转平面(由虚线显示)



1. 采用正螺距角度时,直升机上升(上升)在正常飞行的位置。
 2. 负螺距角度时,直升机下降(下降)在正常飞行的位置。
 3. 当主旋翼角度为“0”时,直升机悬停。
- 开始时,多数型号的直升机有轻微的负螺距,通过这种方式,转子可达到所需的转速,无须使模型直升机升高。非常大的主旋翼螺距设置直升机的倒飞及侧翻。

主旋翼基本设置

在开始测试之前,你应该先根据厂商提供的详细信息,安装连杆和伺服控制杆。这允许粗略的主旋翼螺距的设置。不同主旋翼螺距间的精确值在所需模型直升机使用说明书中也有描述。

打开数字螺距尺

1. 拆开电池的塑料外包装,装入电池(仅在第一次)。
2. 按“ON/OFF”按钮,打开数字螺距尺。

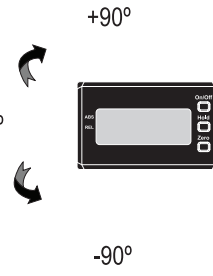
开始测量

- 正在测量时,不要连接与达。
- 测量角度时,记录主旋翼的旋转方向。
- 螺距尺是专为顺时针或者逆时针旋转设计的。
- 当主旋翼是正螺距时,显示正值。当主旋翼是负螺距时,显示负数。对于逆时针旋转主旋翼,请将符号反转的读出。
- 将直升机放置于绝对水平,水平排列的表面。
- 将螺距尺贴到桨尖上。通过螺距尺表面的磁体,将刻度夹与螺距尺相连接。
- 将螺距尺拉到一定的长度,这样就可以通过螺距尺头住主旋翼。

两个旋翼必须朝向对方成180°对准。

4. 主旋翼螺距在显示屏上显示。当螺距尺全方位旋转时,显示也跟着翻转。如果表面不是完全水平的,使用相对的测量功能,以获得0°的基准角。(注:校正的时候,选择的平面越接近水平面,螺距尺的精度越高。选择的相对平面角度最好不要超过水平面5°)

多点对螺距进行测量,设置的螺距曲线应为线性,非线性是不准确的。



应根据不同直升机制造商的出厂说明,使用不同的螺距。

6. 通过调整发射头或接收头调整接收曲线,对主旋翼的螺距进行精确的调整。
7. 还可以通过通过扫描杆进行设置,检查或调整主旋翼螺距(最小和最大螺距)。

一般最大的螺距角度在10°到18°之间,最小螺距角度在-18°到-10°之间。

8. 通过第一片主旋翼设置或确定的螺距,然后也设置或确定第二片主旋翼角度。

使用相对测量功能

螺距尺在默认情况下检测结果显示的是绝对测量值(无偏移)。

- 绝对测量指示灯亮起时,螺距尺处于绝对测量模式。
- 将螺距尺设置到想要的角度,按下按钮ZERO,即螺距将被用来作为偏移值,相对读数指示灯亮起。
2. 按下按钮ZERO再次切换回绝对测量。

使用HOLD功能

1. 按HOLD按钮,锁定当前的读数。
2. 再次按下HOLD按钮,解除读数锁定。

校正螺距尺

在每次更换电池后,或你觉得有必要时,校准螺距尺。校正的时候,选择的平面越接近水平面,螺距尺的精度越高,选择的相对平面角度最好不要超过水平面5°。

1. 将螺距尺从刻度板上取下。
2. 按下ZERO按钮,并长按5秒。
3. 显示屏将显示“-01-”,表示螺距尺进入校准步骤1。
4. 将螺距尺放在水平地面或者其他水平表面上,如下图所示:



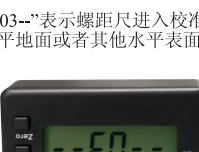
在进行校准的时候,要注意图片的方向。

5. 显示屏将显示“-02-”,表示螺距尺进入校准步骤2。
6. 将螺距尺放在水平地面或者其他水平表面上,如下图所示:



7. 显示屏将显示“-03-”,表示螺距尺进入校准步骤3。

8. 将螺距尺放在水平地面或者其他水平表面上,如下图所示:



INSTRUCTIONS



1. Intended Use

The digital pitch gauge is designed for application in model helicopters and serves to measure the rotor blade pitch value. The pitch gauge is powered by two CR2032 button cells. Only operate it in dry indoors. For safety and approval purposes (CE), you must not rebuild and/or modify this product. If you use the product for purposes other than those described above, the product may be damaged. In addition, improper use can cause hazards such as short circuiting, fire, electric shock etc. Read the instructions carefully and keep them. Make this product available to third parties only together with its operating instructions.

2. Safety Instructions

Read the operating instructions carefully and especially observe the safety information. If you do not follow the safety instructions and information on proper handling in this manual, we assume no liability for any resulting personal injury or damage to property. will invalidate the warranty/guarantee.

Persons / Product

The device is not a toy. Keep it out of the reach of children and pets. Do not leave packaging material lying around carelessly. These may become dangerous playing material for children. Protect the product from extreme temperatures, direct sunlight, strong jolts, high humidity, moisture, flammable gases, vapours and solvents. Do not place the product under any mechanical stress. If it is no longer possible to operate the product safely, take it out of operation and protect it from any accidental use. Safe operation can no longer be guaranteed if the product:

1. is visibly damaged.
2. is no longer working properly.
3. has been stored for extended periods in poor ambient conditions or has been subjected to any serious transport-related stresses.

Handle the product carefully. Jolts, impacts or a fall even from a low height can damage the product. Also observe the safety and operating instructions of any other devices which are connected to the product.

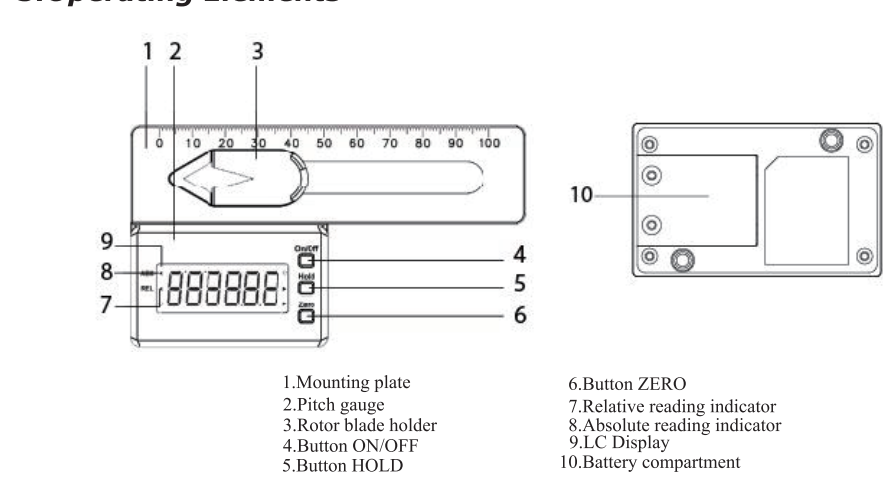
Batteries

Correct polarity must be observed while inserting the batteries. Batteries should be removed from the device if it is not used for a long period of time to avoid damage through leaking. Leaking or damaged batteries might cause acid burns when in contact with skin, therefore use suitable protective gloves to handle corrupted batteries. Batteries must be kept out of reach of children. Do not leave the battery lying around, as there is risk, that children or pets swallow it. All the batteries should be replaced at the same time. Mixing old and new batteries in the device can lead to battery leakage and device damage. Batteries must not be dismantled, short-circuited or thrown into fire. Never recharge non-rechargeable batteries. There is a risk of explosion!

Miscellaneous

Consult an expert when in doubt about operation, safety or connection of the device. Maintenance, modifications and repairs are to be performed exclusively by an expert or at a qualified shop. If you have questions which remain unanswered by these operating instructions, contact our technical support service or other technical personnel.

3. Operating Elements



4. Inserting/Changing Batteries

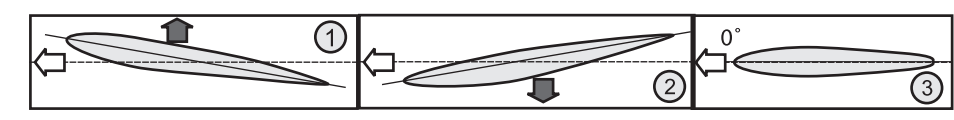
When the battery voltage is low, the display shows the word “-ERR-”. Change the batteries when it appears.

1. Open the battery compartment by removing the two screws at the back of the pitch gauge with a Phillips-head screwdriver.
2. Remove the battery compartment cover and open the battery compartment.
3. Insert / replace two CR2032 batteries while observing the correct polarity, positive side facing upwards.
4. Close the battery compartment and fasten it with the two screws.

5. Operation

Different pitch angles

The term “rotor blade pitch angle” denotes the angle that the rotor blade takes on (seen from the side) to the plane of rotation (displayed by the dotted line).



1. With a positive rigging angle of incidence, the helicopter is lifted (ascends) in normal flight position.
 2. With a negative rigging angle of incidence, the helicopter is lowered (descends) in normal flight position.
 3. The helicopter hovers if the rigging angle of incidence is “0”.
- Many helicopter models have a slightly negative rotor blade pitch angle for starting. This way, the rotor can achieve the required rotation speed without lifting the model helicopter up. Very large negative rotor blade pitch angles are set on aerobically flight helicopters to enable hovering in supine position.

Basic settings of the rotor head

Before you start testing, you should first mount the link rods and the servo levers according to the manufacturer’s details. This allows a rough setting of the rotor blade pitch angles. The exact values of the different rotor blade pitch values required for flying are also indicated in the model helicopter’s instruction manual.

Turning on the digital pitch gauge

1. Remove the plastic sheet on the batteries (for the first time only).
2. Press the button ON/OFF to turn on the pitch gauge.

Performing the measuring

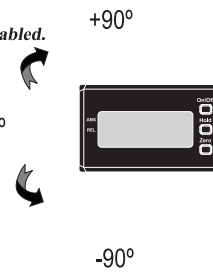
Do not connect the motor while performing the measuring. Observe the rotation direction of the rotor when measuring the angle. The pitch gauge is designed for clockwise rotor rotation or clockwise rotor rotation, it shows a positive reading when the rotor blade is at a positive rigging angle; it shows a negative reading when the rotor blade is at a negative rigging angle. For counter-clockwise rotor rotation, please invert the sign of the reading.

1. Place the helicopter on an absolutely level and horizontally aligned surface.
2. Place the pitch gauge on the mounting plate. The position of the pitch gauge will be fixed by the magnets on the pitch gauge and the mounting plate.
3. Pull the rotor blade holder far enough apart so that you can place the rotor blade into the holder.

Both rotor blades must be aligned at exactly 180° towards each other.

4. The pitch measurement is shown on the display. The display will be flipped when the pitch gauge is turned upside down. If the surface is not perfectly horizontal, use the relative measurement function to obtain a 0° reference angle.

For pitch measurement, the pitch curve must set to be linear, and all mixing disabled.



5. Switch the transmitter and the receiver on and put the pitch control stick into the position in which you want to measure the pitch angle of the rotor blades. E.g. for hover flight, the pitch should be set at 0° when the control stick is in the central position and the swash plate at an absolutely exact 90° angle to the main rotor shaft.

Use the pitch values suggested by the helicopter manufacturer if it differs.

6. For exact adjustment of the required rotor blade pitch angle, you either have to change the linkage rods on the rotor head or readjust the pitch curve on the receiver.
7. Then also check or adjust the default rotor blade pitch angles for the remaining control stick settings (minimum and maximum pitch angles).

General maximum pitch angles range between 10° to 18°, with minimum pitch angles ranging between -18° to -10°

Using the relative measurement function

The pitch gauge default is to use the absolute measurement (no offset value). The absolute reading indicator will light up when the pitch gauge is in absolute measurement mode. 1. Turn the pitch gauge to your desired angle and press the button ZERO. That pitch angle will be used as the offset value. The relative reading indicator will light up. 2. Press the button ZERO again to switch back to absolute measurement.

Using the hold function

1. Press the button HOLD to freeze the current reading.
2. Press the button HOLD again to unfreeze the reading.

Calibrating the pitch gauge

In order to optimize the performance, calibrate the pitch gauge every time after changing batteries or whenever you feel necessary.

1. Detach the pitch gauge from the mounting plate.
2. Press and hold the button ZERO for five seconds.
3. The display will show “-01-”, which indicates that the pitch gauge is now in calibration step 1.
4. Place and hold the pitch gauge vertically against a wall or any vertical surface, as shown below:

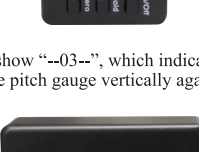


Pay attention to the orientation of the picture while performing the calibration.

5. The display will show “-02-”, which indicates that the pitch gauge is now in calibration step 2.
6. Place hold the pitch gauge horizontally on the floor or any horizontal surface, as shown below:



7. The display will show “-03-”, which indicates that the pitch gauge is now in calibration step 3.
8. Place and hold the pitch gauge vertically against a wall or any vertical surface, as shown below:



9. The display will show “-04-”, which indicates that the pitch gauge is now in calibration step 4.
10. Place hold the pitch gauge horizontally on the floor or any horizontal surface, as shown below:



11. Place hold the pitch gauge horizontally on the floor or any horizontal surface, as shown below:



12. When the screen shows the angle values, then calibration is finished.

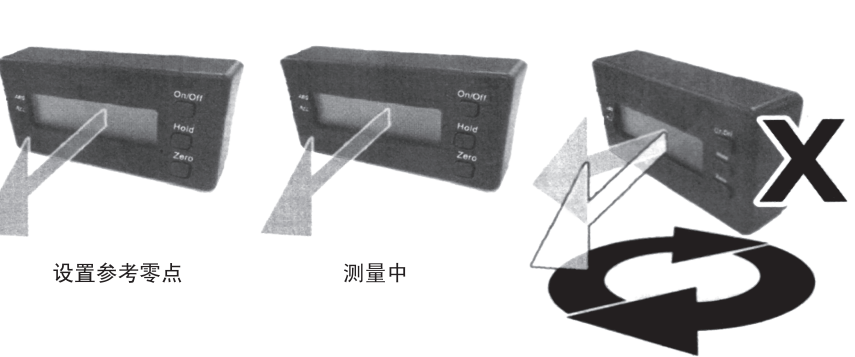
Turning off the pitch gauge

Press the button ON/OFF again to turn the pitch gauge off. Or it will be turned off automatically after being idle for three minutes.

6. 技术参数

螺距尺刚开机时进入绝对测量模式,也就是说,它采取地平面作为参考零点。绝对/相对指示符将显示在ABS绝对测量模式。由于不同的遥控直升机可能有不同的垂直轴,为了确保测量的准确性,你需要在任何测量之前设置主旋翼或电机作为参考平面。当一个参考平面被设置,绝对/相对指示符将显示在REL上。

尽管这些螺距尺可以翻转使用,但是在整个测量过程中,螺距尺的方向必须保持一致。也就是说,如果你以翻转的方向设置螺距尺的参考平面,你必须在翻转的方向测量以保持数据的准确性。在每次测量之前,你需要设置螺距尺的零点参考平面。在测量期间要保持螺距尺的方向不变。如果需要在不同的方向测量,要在新的方向上重新设置参考零点。

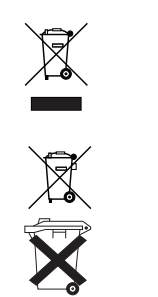


7. 处理

一般情况
为了维护,保护及改善环境质量,保护人类健康,慎重合理地利用自然资源。按照法规,用户应返回废旧产品,交叉带轮子的箱子表示该产品需要单独处理,不能当城市垃圾随意乱扔。

电池/充电电池

用户在法律上有义务(环保法电池管理规定)返回的废旧电池和可充电电池。禁止将用过的电池当家庭废弃物处理! 电池及可充电电池均含有毒物质,都标有义的轮式垃圾箱,符号禁止按城市垃圾处理。有毒物质的化学符号是:
Hg = 汞, Pb = 铅
您可以向当地政府部门的电池回收点、销售商店废旧电池及充电电池进行回收处理。



8. 技术参数

| | |
|-----------------|--|
| 工作电压: | 3 V/DC 2个CR2032纽扣电池 |
| 电流消耗: | 3 mA |
| 分辨率: | 0.1° |
| 工作环境: | 0 to +40 °C |
| 尺寸 (W x H x D): | 60 x 37 x 16 mm (螺距尺电子部分) 120 x 68 x 6 mm (刻度尺) |
| 重量: | 55 g |

9. 彩盒内涵

一套电子螺距尺、2个CR2032纽扣电池、一份中英文双语说明书