AK2机型使用说明书
USE INSTRUCTIONS FOR AK2 MODEL

注意！
ATTENTION!
重要安全说明见第9页
IMPORTANT SAFETY INSTRUCTIONS ON PAGE 9

1、介绍
1. Introduction

该装置是氮气弹簧（氮气瓶）的测力计。该装置通常用于测量氮气弹簧的初始力值，以验证其是否实际带电。氮气弹簧的初始力值通常以daN（deca-Newton）为单位进行测量：
This device is a load gauge for nitrogen gas springs (nitrogen cylinders). This device is usually used to measure the initial force of nitrogen gas springs, in order to verify that they are actually charged. The initial force of nitrogen gas springs is usually measured in daN (deca-Newton):

$$1 \, daN = 10 \, N \quad （10牛）$$
$$1 \, daN = 10 \, N \, (10 \, Newton)$$

1 daN几乎等于1千克力：
1 daN is almost equal to 1 kilogram-force:

$$1 \, kgf \approx 0,98 \, daN$$

2、规格
2. Specifications

零件（图2.1）：
Parts (fig. 2.1):

1. 千斤顶
1. JACK
2. 滑动支座
2. SLIDING SUPPORT BASE
3. 支座导柱
3. SUPPORT BASE GUIDE COLUMNS
4. 气弹簧支架
4. GAS SPRING SUPPORT
   适用于主体直径为Ø19mm至Ø120mm 的氮气弹簧。
   For gas springs with body diameter from Ø19mm to Ø120mm.
5. 封堵管柱（可旋开）
5. BLOCKING COLUMN (UNSCREWABLE)
6. 带测力计的测力传感器
6. LOAD CELL WITH LOAD GAUGE
7. 测力传感器固定板
7. LOAD CELL FIXING PLATE
8. 千斤顶杆
8. JACK LEVER

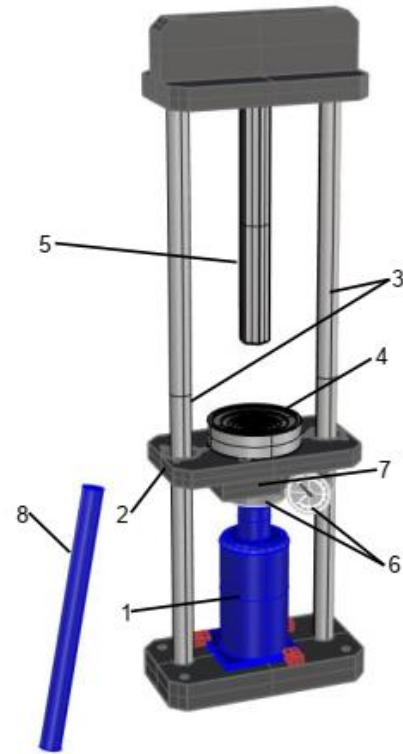尺寸（mm）：
Size (mm):

300x150x970

千斤顶规格：
Jack specifications:

- 最大行程：~150 mm
- MAX stroke: **~ 150 mm**
- 最大力值：12000 kgf ≈ 12000 daN
- MAX force: **12000 kgf ≈ 12000 daN**

2.1

3.测力传感器选型
3. Load cellselection

必须根据要测量的负载（这取决于待测氮气弹簧的规格）选择和订购正确的测力传感器。
The right load cell must be chosen and ordered depending on the load to be measured (which depends on the specifications of the nitrogen gas springs to be examined).

注：
NOTE:
使用的活塞杆行程越长，氮气弹簧的作用力越大。（图3.1）自给式氮气弹簧（未与其他氮气弹簧或气罐连接到开放系统）的全行程力F_{fin}通常是初始作用力F_{in}的1.3倍至2倍。
The more piston rod stroke is used, the more the force of a nitrogen gas spring increases. (fig. 3.1). The force at full stroke F_{fin} of a self- contained nitrogen gas spring (not connected to open system with other gas springs or tanks) is usually between 1.3 and 2 times the initial force F_{in}.
如果要在全行程（F_{fin}）或中间行程点（F）测量氮气弹簧力，请注意选择正确的测力传感器。
If the nitrogen gas spring force is going to be measured at full stroke (F_{fin}) or at intermediate stroke points (F), pay attention to choose the right load cell.

3.1
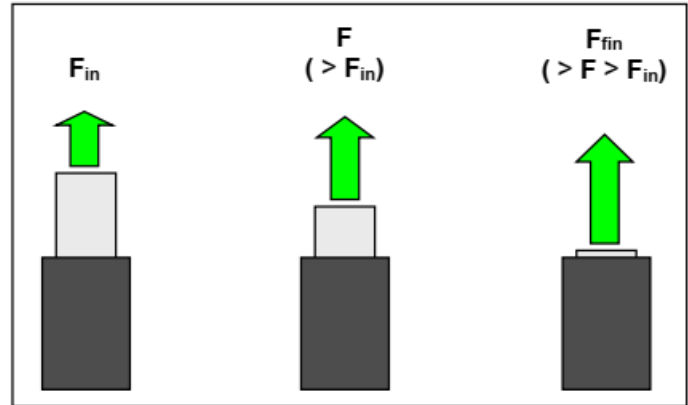
4.装置安装
4.Device installation

4A. 根据要测量的作用力，可以使用三种不同的测力传感器：
4A. Three different load cells can be used depending on the force to be measured:
 - AH1000：测力传感器 100 - 1000 daN
 - AH1000: load cell 100 - 1000 daN
 - AH4000：测力传感器 400 - 4000 daN
 - AH4000: load cell 400 - 4000 daN
 - AH10000：测力传感器 1000 - 10000 daN
 - AH10000: load cell 1000 - 10000 daN

每台测力传感器在固定板上都有相应的孔对（图4A.1）.
Each load cell has its corresponding holes pair on the fixing plate (fig. 4A.1).

4A.1

4B.1

4B. 固定板通过中心螺钉预先装配在滑动支座上。抬起固定板+滑动支座（图4B.1）。

4B. The fixing plate is pre-assembled on the sliding support base, via a central screw. Lift the fixing plate + sliding support base block (fig. 4B.1).

4C. 将测力传感器放置在千斤顶上方，继续抬高固定板+滑动支座（图4C.1）。

4C. Place the load cell above the jack, keeping the fixing plate + sliding support base block lifted (fig. 4C.1).

4D. 向下推动固定板+滑动支座，直到其与测力传感器接触（图4D.1）。

4D. Pull down the fixing plate + sliding support base block, until it comes in contact with the load cell (fig. 4D.1).

4C.1

4D.1

4E. 转动测力传感器，将其两个自由孔与固定板+滑动支座垫块上的自由孔对准轴线。再用附带的螺钉将测力传感器固定在垫块上（图4E.1）。

4E. Turn the load cell until its two free holes are on axis with the ones on the fixing plate + sliding support base block. Then fasten the load cell on the block with the provided screws (fig. 4E.1).

4F. 安装氮气弹簧支架（图4F.1），使用合适的定位销（图4F.2、图4F.3）。

4F. Install the gas spring support (fig. 4F.1), on the sliding support base, using the appropriate dowel pin (fig. 4F.2, fig. 4F.3).
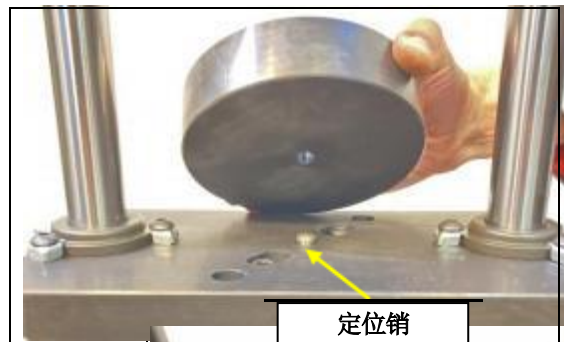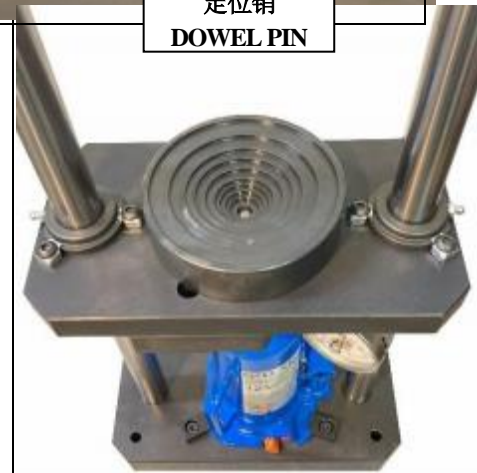
4E.1

4F.1

4F.2

定位销
DOWEL PIN

4F.3

4G. 根据待测氮气弹簧的高度，在可用的封堵管柱中选择合适的封堵管柱（图4G.1）。然后将其固定在上底座（图4G.2）。

4G. Choose the right blocking column among the available ones (fig. 4G.1) according to the height of the nitrogen gas spring to be examined. Then screw it into the upper base (fig. 4G.2).

4H. 将氮气弹簧放置在其支架上（图4H.1）。确保氮气弹簧妥善固定在其底座上，垂直于滑动支座，无倾斜。

4H. Place the nitrogen gas spring on its support (fig. 4H.1). Make sure that the nitrogen gas spring is well-positioned into its seating, perpendicular to the sliding support base with no inclination.

4G.1

4G.2

4H.1

4I. 顺时针方向充分旋转千斤顶节流螺丝（图4J.1），使用千斤顶杆的适当端侧。

4I. Completely turn clockwise the jack choking screw (fig. 4J.1), using the appropriate end side of the jack lever.

4J. 操作千斤顶杆（图4J.1），直到氮气弹簧的活塞杆与封堵管柱接触（图4J.2）。确保完全在轴线上进行，无倾斜。

4J. Operate the jack lever (fig. 4J.1) until the piston rod of the nitrogen gas spring comes in contact with the blocking column (fig. 4J.2). Make sure that this happens perfectly on axis, with no inclination.

4I.1

4J.1

4J.2

4K. 再次操作千斤顶杆，以一定的活塞杆行程S压缩氮气弹簧（图4K.1）。如果在压缩氮气弹簧时出现问题，请再次尝试顺时针转动千斤顶节流螺丝（第4I点），同时操作千斤顶杆。

4K. Operate the jack lever again in order to compress the nitrogen gas spring by a certain piston rod stroke **S** (fig. 4K.1). If there are problems in compressing the nitrogen gas spring, try again to turn clockwise the jack choking screw (point 4I.) while operating the jack lever.

在活塞杆行程S为1mm时测量氮气弹簧的初始作用力（初始载荷）。

The initial force (initial load) of a nitrogen gas spring is measured at 1 mm piston rod stroke S.

注意：测量全行程作用力时需小心：切勿压缩氮气弹簧超过其最大额定行程S_{max}（切勿超过图**4K.1**中的红色限制，其中**H**可等于或大于安全超行程，其值因氮气弹簧型号而异）。

ATTENZIONE: <u>be careful while measuring the force at full stroke: never compress the nitrogen gas spring over its max nominal stroke S_{max}</u> **(never exceed the red limit in fig. 4K.1, where H can be equal to or even greater than the safety over-stroke and its value is different with different nitrogen gas spring models).**
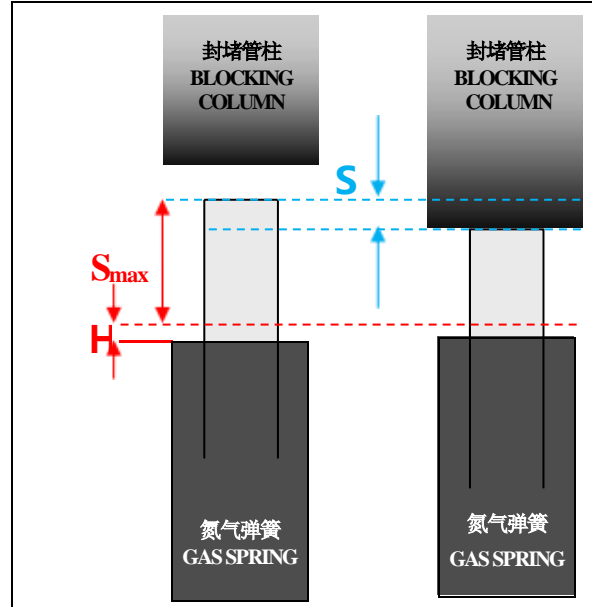
4L. 测力传感器仪表将显示测得的力值（图4L.1）.

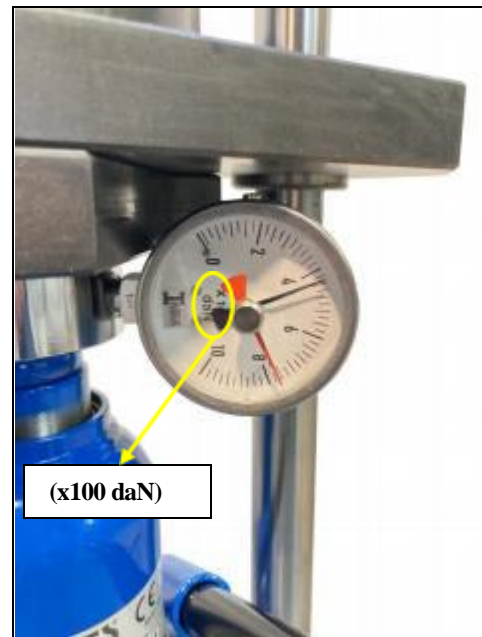4L. The load cell gauge will display the measured force value (fig. 4L.1).

► 示例：见图4L.1，显示的力值约为435 daN。

► *Example: on figure 4L.1 it is displayed a force value of about 435 daN.*

4K.1

4L.1

(x100 daN)

4M. 逆时针旋转千斤顶节流螺丝（图4M.1），这样千斤顶将无法平衡氮气弹簧力，活塞杆将回到其初始位置（完全伸展）。

4M. Turn counter clockwise the jack choking screw (fig. 4M.1), so that the jack will be unable to balance the nitrogen gas spring force and the piston rod will come back in its initial position (full extension).

注意： 通过验证测力传感器仪表显示的值是否为零，确保氮气弹簧实际上回到其"松弛"状态。当氮气弹簧被压缩在千斤顶和封堵管柱之间时，请勿对其进行手动操作。

ATTENTION: make sure that the gas spring is actually back to its"relaxed"state by verifying that the load cell gauge displays a value of zero. Do not operate manually on the nitrogen gas spring while it is compressed between the jack and the blocking column.

要取出氮气弹簧（如果千斤顶立柱不自行下降），用手向下推动滑动支座（图4M.2）。如果千斤顶仍有阻力，再次尝试逆时针旋转千斤顶节流螺丝。

In order to takeout the gas spring (in case the jack column does not go down by itself), pull down the sliding support base by hand (fig. 4M.2). If the jack still offers some resistance, try again to turn counter clockwise the jack choking screw.

4M.1

4M.2

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注意！ ATTENTION!
操作本装置时应遵循的安全说明
SAFETY INSTRUCTIONS TO BE FOLLOWED WHENEVER OPERATING THIS DEVICE

</div>

1. 在测量过程中，确保氮气弹簧妥善固定在其支架上，无倾斜。当氮气弹簧被压缩在千斤顶和封堵管柱之间时，活塞杆和氮气弹簧体必须与它们在同一轴线上。

1. DURING THE MEASUREMENT, MAKE SURE THAT THE NITROGEN GAS SPRING IS WELL-POSITIONED ON ITS SUPPORT AND THERE IS NO INCLINATION. WHEN THE NITROGEN GAS SPRING IS COMPRESSED BETWEEN THE JACK AND THE BLOCKING COLUMN, THE PISTON ROD AND THE GAS SPRING BODY MUST BE ON AXIS WITH THEM.
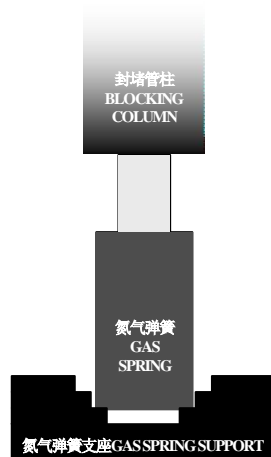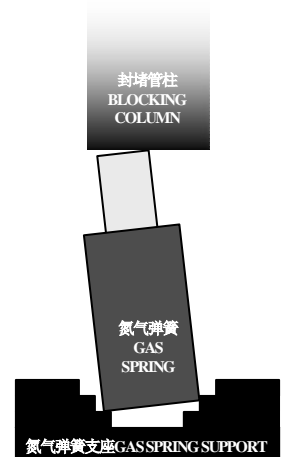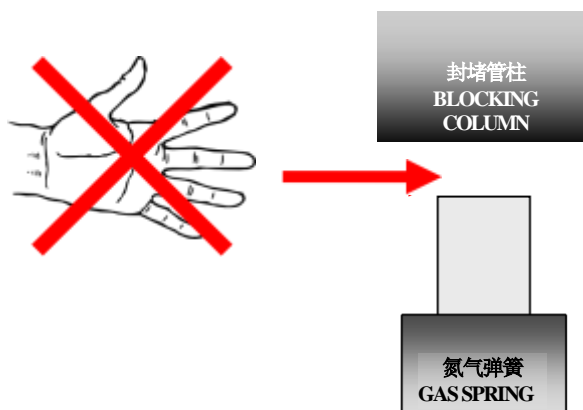

2. 切勿将手指或其他身体部位放在活塞杆和封堵管柱之间。氮气弹簧产生的力非常大。

2. DO NOT PUT FINGERS OR OTHER BODY PARTS BETWEEN THE PISTON ROD AND THE BLOCKING COLUMN. THE FORCES GENERATED BY NITROGEN GAS SPRINGS ARE REALLY HIGH.

3、 请勿对千斤顶或本装置的任何其他部分进行任何机械作业。仅由授权人员进行维护。

3. DO NOT MAKE ANY MECHANICAL WORK ON THE JACK OR ANY OTHER PART OF THIS DEVICE. MAINTENANCE BY AUTHORIZED PEOPLE ONLY.