

LOAD GAUGE DEVICE FOR NITROGEN GAS SPRINGS

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USE INSTRUCTIONS FOR AK2 MODEL

ATTENTION!
IMPORTANT SAFETY INSTRUCTIONS ON PAGE 9

1. Introduction

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):

$$1 \text{ daN} = 10 \text{ N (10 Newton)}$$

1 daN is almost equal to 1 kilogram-force:

$$1 \text{ kgf} \approx 0,98 \text{ daN}$$

2. Specifications

Parts (fig. 2.1):

1. JACK
2. SLIDING SUPPORT BASE
3. SUPPORT BASE GUIDE COLUMNS
4. GAS SPRING SUPPORT
- For gas springs with body diameter from Ø19mm to Ø120mm.
5. BLOCKING COLUMN (UNSCREWABLE)
6. LOAD CELL WITH LOAD GAUGE
7. LOAD CELL FIXING PLATE
8. JACK LEVER

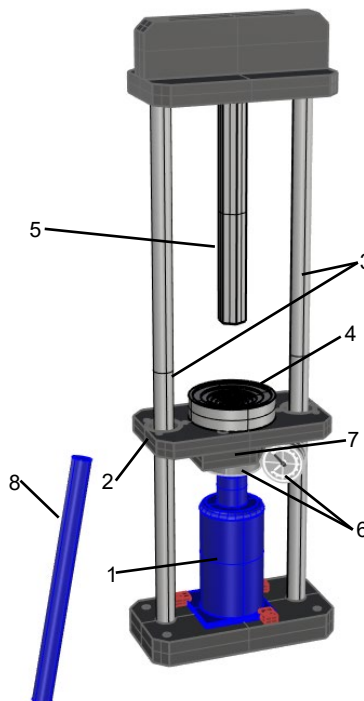
Size (mm):

300x150x970

Jack specifications:

- MAX stroke: ~ **150 mm**
- MAX force: **12000 kgf** $\approx$ **12000 daN**

2.1



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3. Load cell selection

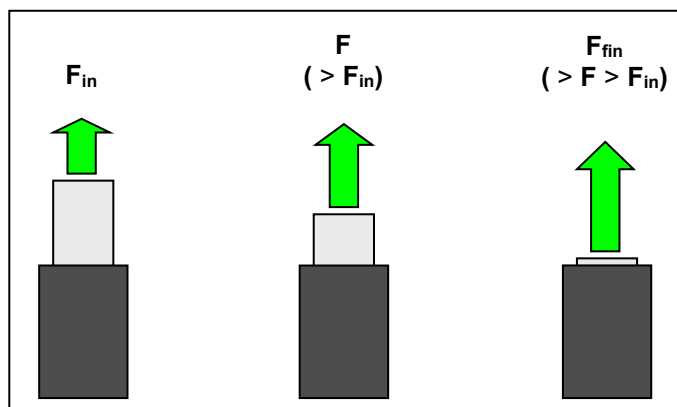
The right load cell must be chosen and ordered depending on the load to be measured (which depends on the specifications of the nitrogen gas springs to be examined).

NOTE:

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} .

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. Device installation

4A. Three different load cells can be used depending on the force to be measured:

- AH1000: load cell 100 - 1000 daN
- AH4000: load cell 400 - 4000 daN
- AH10000: load cell 1000 - 10000 daN

Each load cell has its corresponding holes pair on the fixing plate (fig. 4A.1).

4A.1



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

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

4B.1



4C.1



4D.1



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

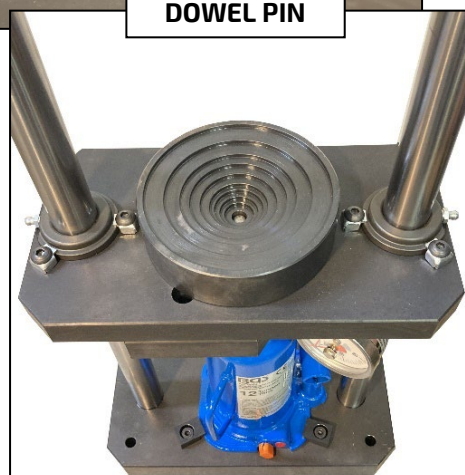
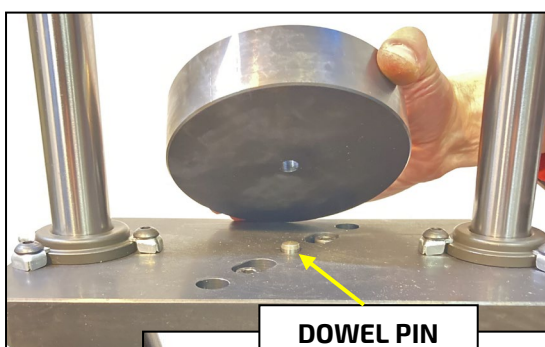
4E.1



4F.1



4F.2



4F.3

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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. 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



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

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



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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.

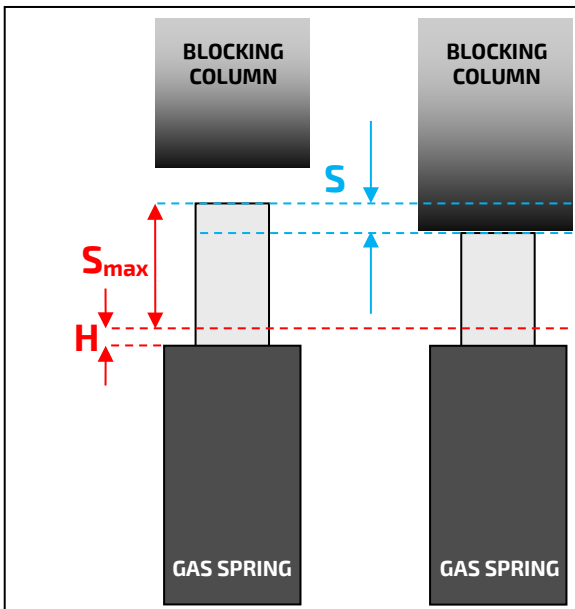
The initial force (initial load) of a nitrogen gas spring is measured at 1 mm piston rod stroke **S.**

ATTENZIONE: be careful while measuring the force at full stroke: never compress the nitrogen gas spring over its max nominal stroke **S_{max}** (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).

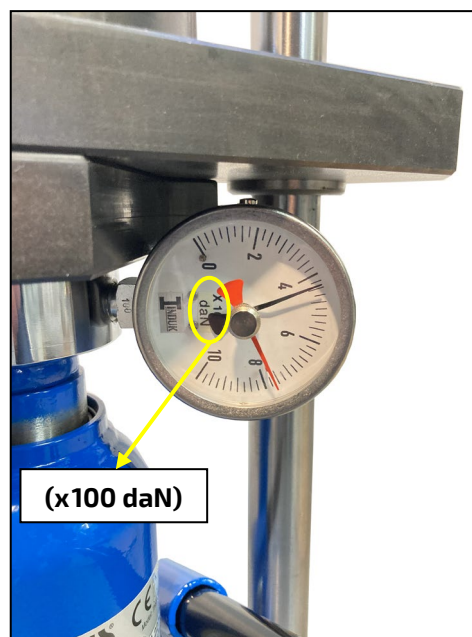
4L. The load cell gauge will display the measured force value (fig. 4L.1).

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

4K.1



4L.1



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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).

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.

In order to take out 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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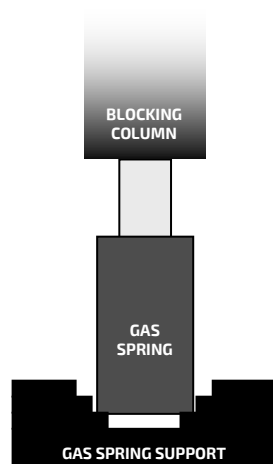
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ATTENTION!

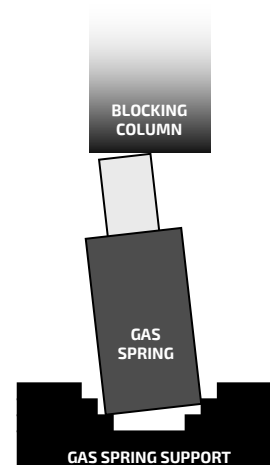
SAFETY INSTRUCTIONS TO BE FOLLOWED WHENEVER OPERATING THIS DEVICE

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.

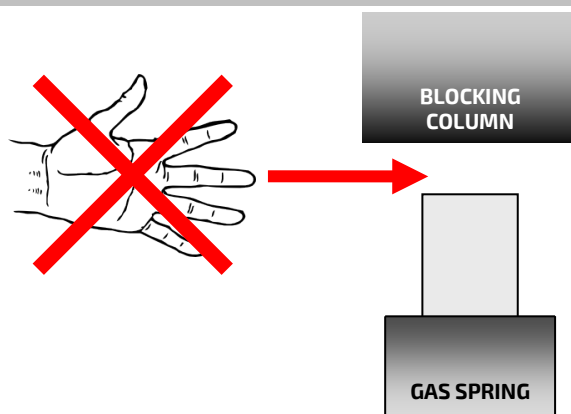
OK



NO



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

