

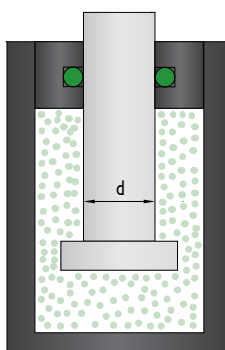
NITROGAS

Technical Features

NITROGAS gas springs can be divided into Piston Rod Sealed gas springs or Bore Sealed gas springs depending on the type of seal and where is it located. The force of each gas spring depends on the nitrogen charging pressure and the working surface.

$$F \text{ (daN)} = P \text{ (bar)} \times S \text{ (mm}^2\text{)} / 100 \quad \text{where} \quad S = \pi \times d^2 / 4$$

Piston Rod Sealed gas springs



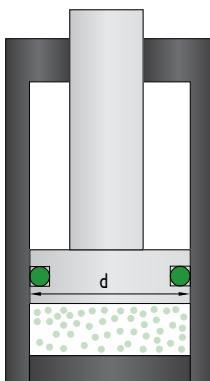
Piston rod gas springs suit a wide range of needs due to the high variety on their design.

To calculate the force of a piston rod sealed gas spring the diameter to take into account is the diameter of the rod.

Practical example using G-I500 gas spring:

$$\begin{aligned} d &= 36 \text{ mm} \\ P &= 150 \text{ bar} \\ S &= \pi \times 36^2 / 4 = 1018 \text{ mm}^2 \\ F &= 150 \times 1018 / 100 = 1527 \text{ daN} \end{aligned}$$

Bore Sealed gas springs



Bore sealed gas springs are ideal for small movements and very strong forces with a maximum contact pressure.

To calculate the force of a bore sealed gas spring the diameter to take into account is the diameter of the piston.

Practical example using TS-I800 gas spring:

$$\begin{aligned} d &= 40 \text{ mm} \\ P &= 145 \text{ bar} \\ S &= \pi \times 40^2 / 4 = 1257 \text{ mm}^2 \\ F &= 145 \times 1257 / 100 = 1822 \text{ daN} \end{aligned}$$



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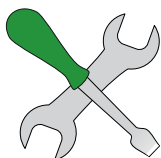
Safety Standards



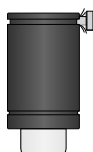
The gas springs contain high pressure gas. The rules detailed below are mandatory.

Any unauthorized operation performed, or improper use can cause serious material or personal injury. If there is any suspicion of damage to the gas spring, immediately remove it.

NITROGAS is not responsible for personal injury and damage that may happen because of violation of such security rules.



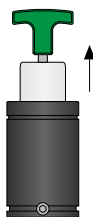
- 1 Maintenance must be performed exclusively by personal that has been trained and certified by NITROGAS. Any improper handling could cause serious safety hazards or limit the lifetime of the gas springs.
Before any repair, discharge the pressure and ensure that the rod is completely within the body.



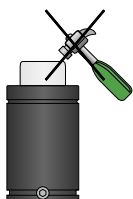
- 2 During discharge of the gas spring, orientate the gas flow in the opposite direction to the operator and position the discharge point as high as possible.
We recommend the use of eyewear.



- 3 Gas springs must only be charged with commercial nitrogen.
The maximum charge pressure (at 20 °C) is marked on each gas spring. Do not exceed the maximum charge pressure without the prior written consent of NITROGAS.



- 4 Before loading any gas spring, ensure that the piston rod is in its most extended position and the safety ring (in case any) is perfectly located in the housing.

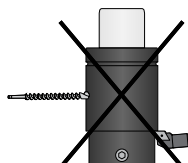


- 5 To test the force of a gas spring, there are specific tools for measurement to be used. Never hit on the rod to see if the gas spring is under pressure.

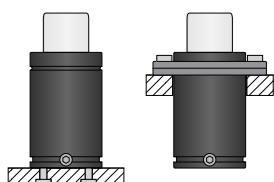
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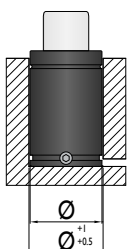
- 6 We recommend a regular visual inspection of the gas springs.
If a gas spring has damage to its structure, discharge the pressure prior to review.



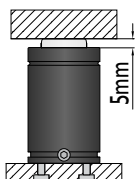
- 7 Any secondary operation (including grinding, machining, or welding) on any part of the gas spring is completely forbidden.
The risks increase if operations are performed with a loaded gas spring.



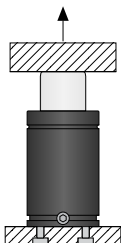
- 8 Gas springs must only be installed in the tool in the ways described in the specification sheet for each model.
The gas springs shall be securely held in place by the thread of the bottom of the body or by fastening accessories NITROGAS offers in each model.



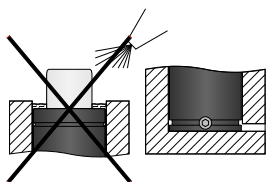
- 9 In the case of accommodating the gas spring in a pocket drilled in the tool, the body must be adjusted to the hole to prevent from pitching.
If the gas spring is housed in a pocket that can be flooded, please allow for drainage to facilitate the outlet of fluids.



- 10 Avoid using the last 5 mm of the gas spring stroke to prevent possible over-stroke caused by changes or errors in the tool.
An excessive stroke can have serious and obvious security risks that can cause permanent damage to the gas spring.



- 11 Prevent the sudden or uncontrolled rod output. Do not exceed the maximum speed specified in the file for each model.



- 12 Protect the gas springs from direct contact with liquids or solids contaminations. If the gas cylinder is housed in a pocket that can be flooded, include drains to facilitate any outlet of fluids. In the case of fluids, the body should protrude 5 mm from surface to prevent fluids accumulation.

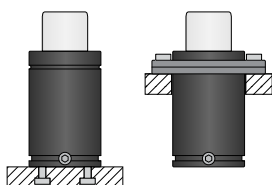
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Specifications for Installation and Use



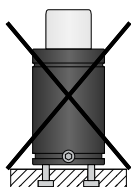
For proper operation, gas springs must be installed following the specifications for installation and use described below.

NITROGAS is not liable for damages or premature wear caused to gas springs, due to failure to comply with these specifications for installation and use.



- 1 Install gas springs in the tool only in the ways described in the specification sheet for each model.

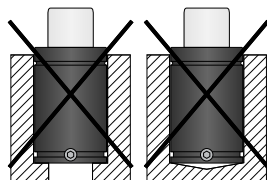
Gas springs must be securely fastened by the threads of the bottom of the body or by fastening the accessories NITROGAS offers for each model.



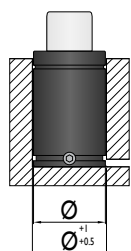
- 2 Check that the length of the fastening screw used is adequate so that the settlement of the gas spring is always on its base.

Tighten the clamping screws holding the base of the cylinder to the recommended torque:

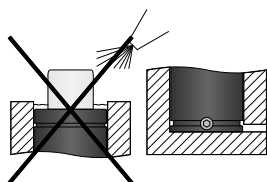
M6 = 10Nm, M8 = 24Nm, M10 = 45Nm, M12 = 80Nm.



- 3 The base of the gas spring must rest on a plane support. Inadequate housing can damage the gas spring or reduce its life.

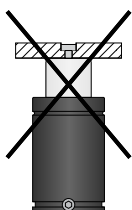


- 4 In case of accommodating the gas spring in a drilled pocket in the tool, the body must be adjusted to the hole to prevent from pitching.

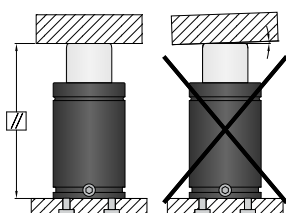


- 5 Protect gas springs from liquid or solid contamination. If the gas spring is housed in a pocket that can be flooded, include drains to facilitate any fluid outlet. In the case of fluids, the body should protrude 5 mm from surface to prevent fluids accumulation.

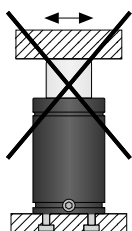
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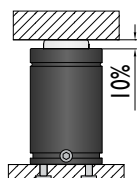
- 6 Do not use the threaded holes in the rod end to fix the gas spring to the tool.
This hole is only intended for maintenance. Do not use for transport operations of gas springs.



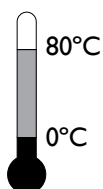
- 7 Ensure parallelism between the surface of the gas spring and the rod pushing surface to prevent the occurrence of lateral forces.
The hardness of the contact surface should be sufficient.
Ensure full contact on the bearing surface of the rod.



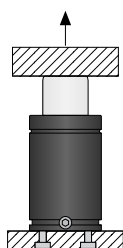
- 8 Avoid any lateral displacement of the gas spring while running. Give special attention to any vibrations during movement of the rod.



- 9 It is recommended to provide a reserve of travel at least 10% of the nominal stroke.
The recommended reserve of travel for each gas spring is indicated in the specification sheet for each model.



- 10 The operating temperature of the gas springs is between 0 °C and 80 °C.
Upon request NITROGAS can supply gas springs supporting temperatures between - 20 °C and 180 °C.



- 11 Prevent the sudden or uncontrolled rod output. Do not exceed the maximum speed specified in the file for each model.

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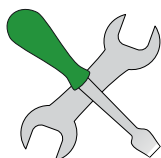
Maintenance Recommendations



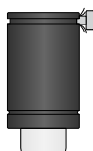
Maintenance must be carried out exclusively by personal that has been trained and certified by NITROGAS. Any improper handling could cause serious safety hazards or limit the lifetime of the gas springs.



- 1 Before any repair, discharge entirely the pressure and ensure that the rod is completely within the body.



- 2 We recommend a regular visual inspection of the gas springs. If a cylinder has damage to its structure, fully discharge the pressure prior to review.



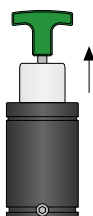
- 3 During unloading of the gas spring, direct the flow of gas away from the operator and position the discharge point as high as possible. We recommend using safety glasses.



- 4 Never throw away the gas spring without having properly discharged the pressure.

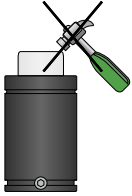


- 5 Gas springs must be loaded with commercial nitrogen. The maximum loading pressure (at 20 °C) is marked on each gas spring. Do not exceed the maximum charge pressure without the prior written consent of NITROGAS.

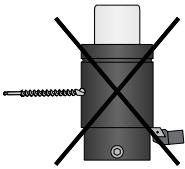


- 6 Before loading any gas spring, make sure that the rod is in its most extended position and the safety ring (in case any) is perfectly located in the housing.

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- 7 To test the strength of a specific cylinder there are specific tools for measuring the force. Never hit the rod to see if the gas spring is under pressure.



- 8 To ensure correct operation of the gas spring, the surfaces of the rod and body of the gas spring must remain free of blows, scratches, or any type of deformation.
The secondary operations of any part of the gas spring (including grinding, machining, welding, etc.) are completely forbidden.



- 9 Protect gas springs during transportation. Protect gas springs from hitting each other; protect them from oxidation in the case of maritime transport.