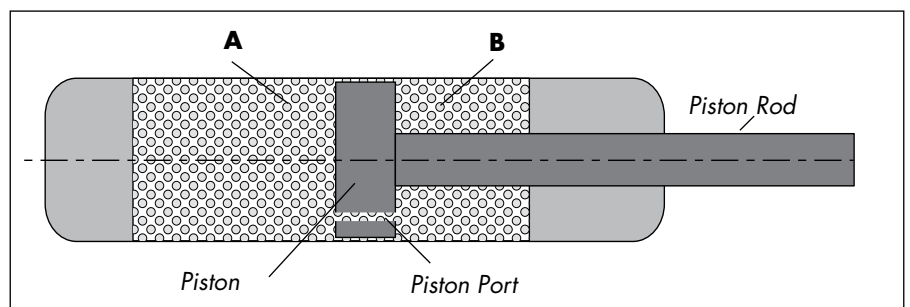


Push Type Gas Springs

In this section you will find a detailed explanation concerning the functioning of the different types of gas springs. All gas springs work on the same basic principle (see previous page): the gas pressure acting on the inside surface area of the piston rod forces the piston rod outwards of the cylinder.

The resultant force F in Newton [N] can be calculated by multiplying the internal pressure P [bar] by the surface area A of the piston rod [mm²]: $F = P \times A$

Push Type Gas Springs



As mentioned on the previous page, gas springs contain highly pressurised nitrogen. The pressure is the same on both sides of the piston. The piston port enables the gas pressure to equalise on both sides of the piston (volume A and volume B) when the piston rod is moved.

Additionally the piston port controls the extending speed of the piston rod by restricting the gas flow. A valve can also be integrated inside the piston in order to restrict the direction of this damping effect.

When ordering your gas spring (see pages 06.017.00 - 06.058.00) you can choose between four types of damping:

- Code 0 = without damping**
- Code 1 = damping on extending stroke**
- Code 2 = damping on compression stroke**
- Code 3 = damping on both extending and compression strokes**

The cylinder also contains oil to lubricate the piston rod seal. This oil must also flow through the port before the piston rod fully extends. This creates the final damping zone for the last 1 to 2 cm. If you need a longer final damping zone, our factory can supply a larger quantity of oil. Contact our technical advisory service for details.

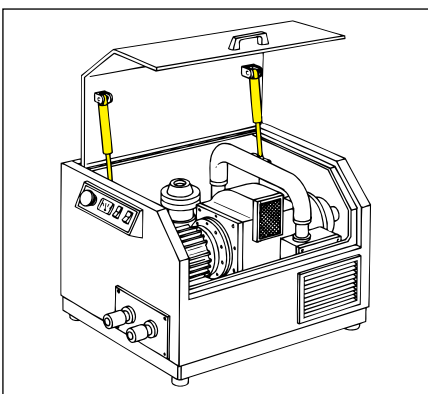
Please note: An oil chamber should be included in the gas spring specification if the gas spring operation is not vertical (near vertical with the piston rod pointing downwards). Please read the description on page 06.010.00.

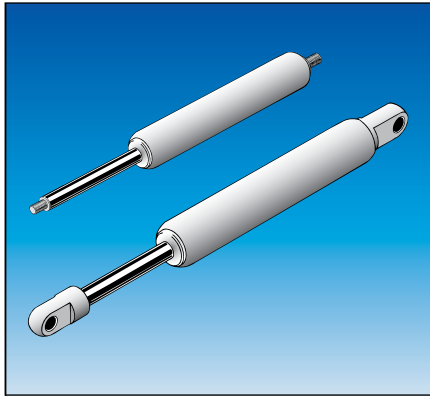
Push-type gas springs are used on a variety of applications. They usually serve as a counter weight on flaps, hatches, lids etc.

Please take advantage of our Advisory Service. Our computer gas spring calculation will calculate the specification of an ideal gas spring and its fixing points that give the required operating characteristics, e.g. minimum need of hand force.

We can also advise you on any special requirements as our product range contains many special characteristics which are explained on the following pages.

Technical data and measurements can be found starting on page 06.017.00.





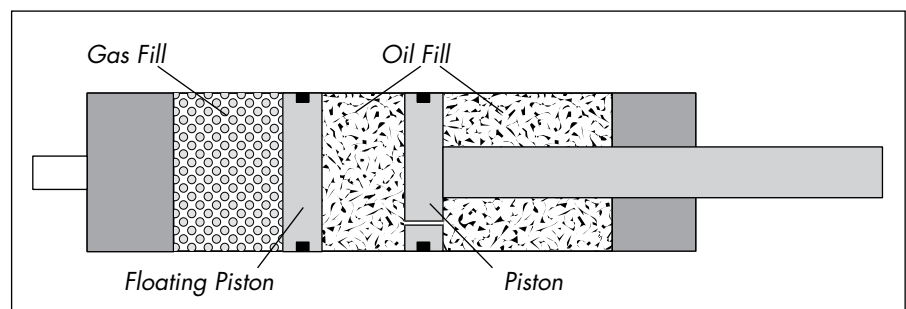
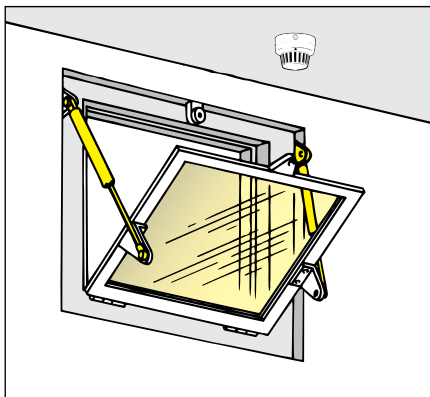
Gas Springs with Floating Piston and Pull Type Gas Springs

These gas springs have a second sealed piston additionally to the main piston which is attached to the piston rod. This separates the pressurised gas section from the oil or empty volume section.

The second piston of the gas springs with floating piston moves and transfers the pressure of the gas to the oil in the front part of the cylinder.

The second piston in pull type gas springs is firmly embedded in the cylinder and serves as guide for the thick piston rod into the empty volume.

Gas Springs with Floating Piston

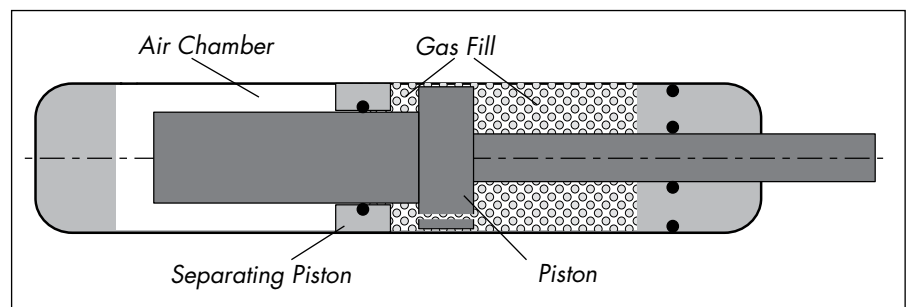
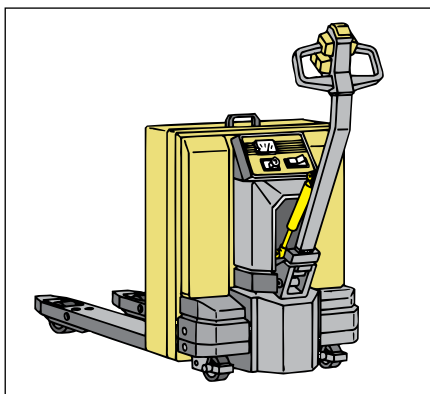


Inside gas springs with floating piston the section containing the normal piston is filled with oil. The small port in the piston causes the piston rod to move slowly. The floating piston separates the pressurised gas from the section containing the piston.

A floating piston is particularly advantageous if you require an exceptionally gentle movement as on smoke ventilators, sensitive visual appliances or precision machines.

Technical data and measurements can be found starting on page 06.029.00.

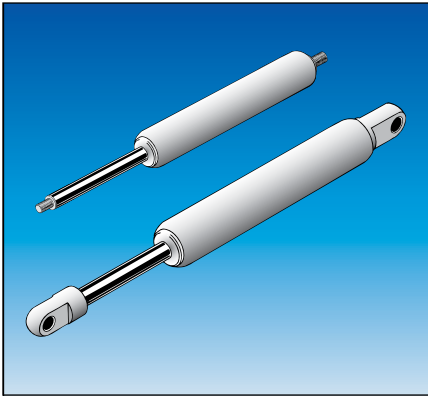
Pull Type Gas Springs



Pull type gas springs operate in the opposite direction to conventional gas springs. An additional wider piston rod in the rear of the cylinder is also exposed to the gas pressure at the front. The rear part of the cylinder (air chamber) is not under pressure and is sealed from the gas filled section by the second piston. The pressurised gas acts on the inner surface of the wider piston rod pushing this rod to the rear of the cylinder and - by doing this - pulling the thinner piston rod into the cylinder.

This type of gas spring is particularly advantageous when there is no space available for a push type gas spring as on a fork lift truck control arm.

Technical data and measurements can be found starting on page 06.033.00.



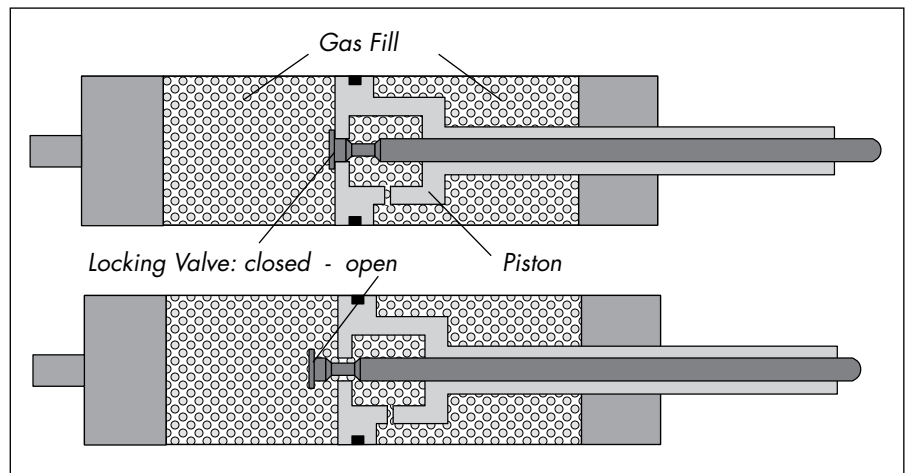
Locking Gas Springs

In locking gas springs the port in the piston is closed by a valve which is opened by a release pin located inside the piston rod. The piston rod can only move if the locking mechanism is disengaged.

Cushioned locking gas springs compress slightly when a load is applied without disengaging the locking feature, as the gas compresses in both directions.

Locking gas springs are used to lock levers and flaps in various positions. They should balance out the weight of the flap when released.

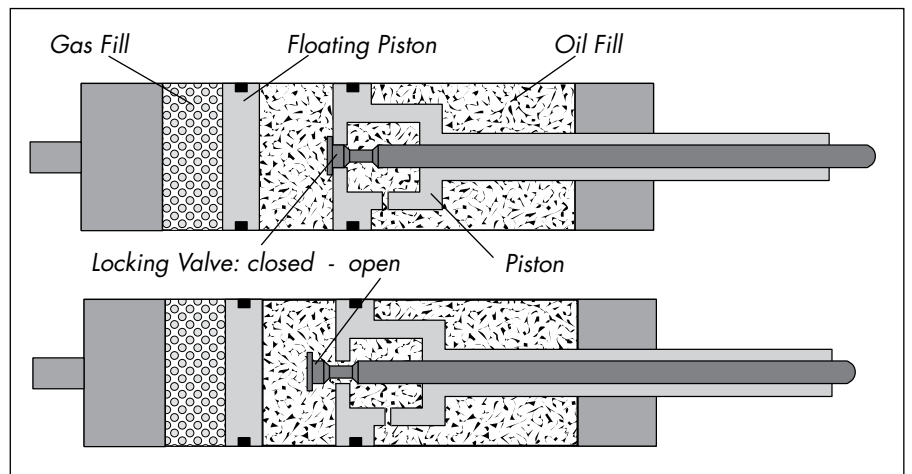
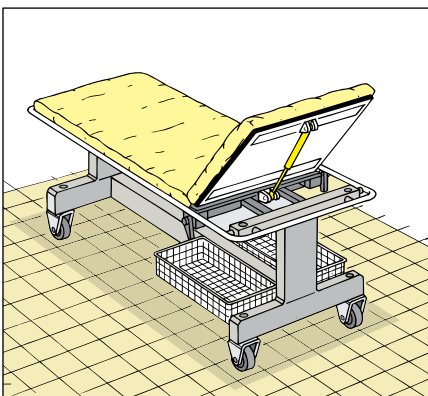
Cushioned Locking Gas Springs



The locking valve in the piston prevents the gas from flowing through until the release pin in the piston rod is pushed.

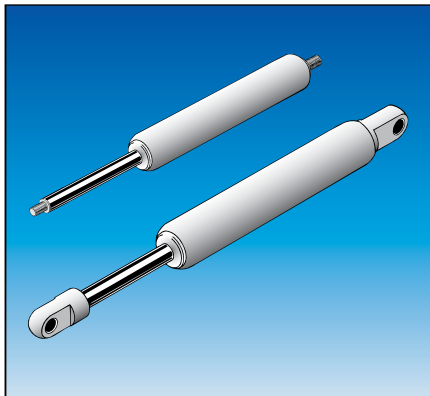
Technical data and measurements can be found on page 06.041.00.

Rigid Locking Gas Springs



In rigid locking gas springs the piston with the locking valve is situated in the oil compartment. The pressurised gas exerts pressure on the floating piston.

Technical data and measurements can be found on page 06.042.00.



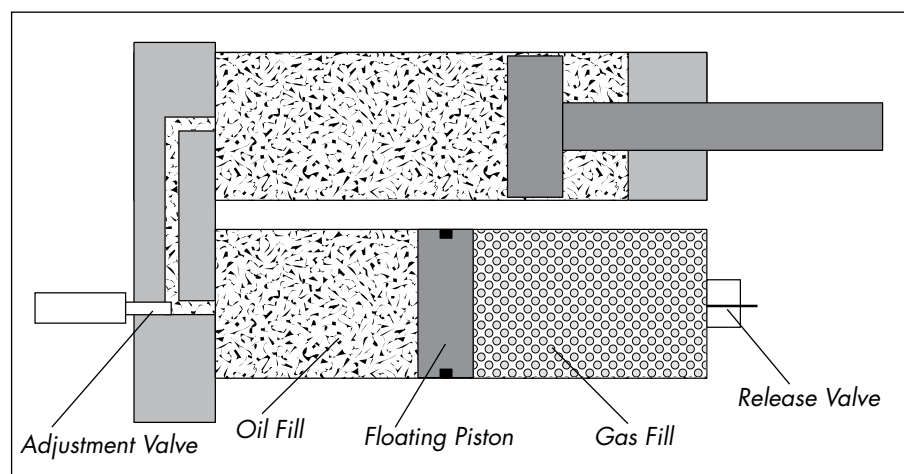
Double Cylinder Gas Springs

DICTATOR double cylinder gas springs consist of two cylinders connected by an adjustable valve. This enables you to reduce the extending speed and control it exactly.

The pressurised gas is sealed from the oil compartment by a floating piston. A valve at the front end of the gas cylinder enables you to release gas for reduced gas spring force.

Double cylinder gas springs are used in applications where a slow and adjustable extending speed is required. They can be used to automatically open folding doors in fire station buildings, for example.

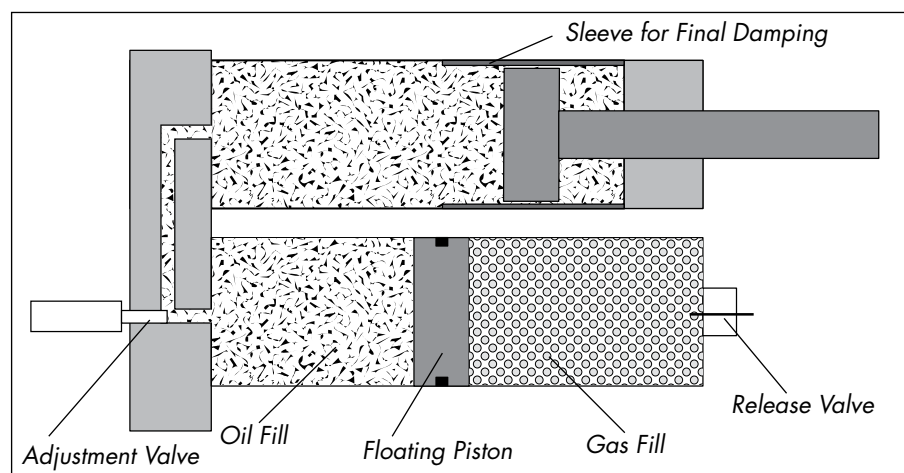
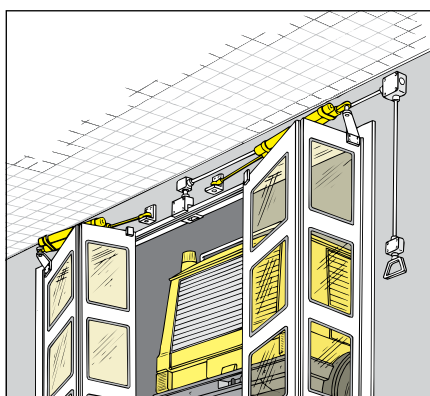
Double Cylinder Gas Springs without Final Damping



Double cylinders without final damping are more cost-effective. The piston rod remains at the same speed over the whole distance.

Technical data and measurements can be found on page 06.060.00.

Double Cylinder Gas Springs with Final Damping



Double cylinders with final damping do not only push the piston rod out with the speed set by the adjustment valve, but they also move it slowly at the end of the motion. This can prevent doors from crashing together for example.

Technical data and measurements can be found on page 06.060.00.