Gas springs and dampers for industrial applications

STABILUS technology gives comfort
Gas springs and dampers for industrial applications

For decades now, STABILUS gas springs have been well known for their successful use in the automobile industry. Since the early 1960’s, STABILUS products have also been used in the furniture industry, notably for applications in swivel chairs. Today, the gas spring has become a practical design element in more than 100 different applications. Compact design, high level of operating convenience and safety in use are some of the reasons for the constant growth in the use of gas springs for the most varied applications.

STABILUS products are found in the general furniture sector, for example, to adjust table height or the angle of head and foot sections of beds. In the medical engineering industry, gas springs and dampers are used in hospital beds, theatre couches and in the operation of massage and beauty couches and equipment. In the office equipment sector, gas springs are an invisible aid in the positioning of covers and lids of photocopiers, acoustic hoods and computer swivel arms. In buildings, gas springs perform the task of opening roof windows or assisting the operation of awnings.

In the mechanical engineering industry, STABILUS gas springs are used to an increasing extent in safety and noise protection panels which can be effortlessly opened and closed by gas springs. The applications for STABILUS products are as varied as your ideas. We will be pleased to advise you regarding your specific application.

Operating principle of a gas spring

The gas spring is a hydropneumatic adjusting element, consisting of a pressure tube with a connecting fitting, a piston rod with piston system and a piston rod connection fitting.

A special seal and guide system seals off the interior to atmosphere. The gas spring is filled with compressed nitrogen. The filling pressure acts on the cross-sectional area of the piston rod and produces an extension force, which can be freely selected within physical limits. If the extension force of the gas spring is higher than the force of the counterweight, the piston rod extends. If the extension force is less, it contracts.

The extension rate is determined by the overflow cross-section in the piston system and pressure tube, respectively.

The interior of the gas spring is filled not only with nitrogen, but also with a precisely defined quantity of oil which, on the one hand, ensures proper lubrication of the piston and the seal guide system and, on the other, provides for proper dampening of the piston in the end position.

The gas spring is completely maintenance-free in operation. In the standard version, the gas spring is designed for at least 50,000 operations.
LIFT-O-MAT®

Lifting, lowering, moving, adjusting

The gas spring can be designed with an approximately linear, progressive or degenerative spring rate curve, to match the particular need. The characteristic curve of the spring describes the progression of the force of the gas spring over the stroke, from the extended to the compressed state and vice versa.

If the spring rate is flat and progresses in a practically linear manner, the force of the gas spring consequently rises only slightly over the entire spring travel.

Spring rate: \( X = \frac{F_2}{F_1} \)

The force diagram on the left shows the line of the extension and compression force with a flat spring rate. The difference between the two lines is the result of the system friction produced during compression and extension.

The measuring points \( F_1 \) and \( F_4 \) are each located 5 mm before the fully extended and compressed stroke. The measurements were conducted at a temperature of 20°C.

You can get details regarding tolerances from the technical drawings or on demand.

Product Range

The LIFT-O-MAT gas spring is available as follows:

- **Standard range**

<table>
<thead>
<tr>
<th>( \text{D}_1 )</th>
<th>( \text{D}_2 )</th>
<th>( \text{F}_1 )</th>
<th>( \text{Max. stroke} )</th>
<th>( \text{x} )</th>
<th>( \text{FR max.} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>15</td>
<td>100 - 400</td>
<td>150</td>
<td>1.5</td>
<td>60</td>
</tr>
<tr>
<td>8</td>
<td>19</td>
<td>120 - 600</td>
<td>250</td>
<td>1.35</td>
<td>60</td>
</tr>
<tr>
<td>10</td>
<td>22</td>
<td>150 - 1100</td>
<td>400</td>
<td>1.4</td>
<td>80</td>
</tr>
<tr>
<td>10</td>
<td>40</td>
<td>150 - 950</td>
<td>550</td>
<td>1.04</td>
<td>80</td>
</tr>
<tr>
<td>14</td>
<td>28</td>
<td>500 - 2100</td>
<td>500</td>
<td>1.5</td>
<td>80</td>
</tr>
<tr>
<td>20</td>
<td>42</td>
<td>1000 - 5200</td>
<td>500</td>
<td>1.45</td>
<td>150</td>
</tr>
</tbody>
</table>

- A choice can be made between the standard versions with eyelet end fittings or ball sockets
- Further connection variants available on request
- Standard features are the proven Nislide piston rod for extended life, with high resistance to corrosion and an environmentally friendly design
- Special gas spring types available with protective tube
- Roll-closed as standard at the pressure tube end to ensure optimal seal without weld seams and high resistance to corrosion
- With different sets of seals, depending upon the application
Variable positioning, rigid or spring blocking

Operating principle

This version operates on the same principle as the LIFT-O-MAT. In addition, the gas spring features an integrated valve and can thus be blocked in any desired position.

The piston is sealed at the pressure tube and separates two gas spaces.

Variants

- LIFT-O-MAT gas spring with mechanical external or internal limit lock as an additional safeguard to cope with varying weights, e.g. snow loads or wind gusts
- HYDRO-LIFT gas spring for stepless positioning at any desired point
- Gas spring with increased friction (Reib-LIFT-O-MAT) for stepless positioning at any desired point
- ELECTRO-LIFT gas spring with the additional benefit of transmitting an electric current of up to 25A/12V or with a switch function, e.g. for illuminating a stowage area in a camper

Product Range

The BLOC-O-LIFT gas spring is available both in a resilient and also a rigid blocking version as follows:

- Standard range of products

<table>
<thead>
<tr>
<th>D1 [mm]</th>
<th>D2 [mm]</th>
<th>Extension force F1 [N] max. stroke [mm] FR max. [N]</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>28</td>
<td>200 - 1500 150 1,1 80</td>
</tr>
</tbody>
</table>

- Special gas spring types are available with an 8 mm piston rod and 22 mm pressure tube diameter
- Fitted as standard with thread or eyelet end fittings
- Further connection variants available on request

Accessories:

- Release head with lever and handle, buffer and nuts, release head with bowden cable and operating unit

- With special sealing system suitable for continuous operation
- With special sealing system for any desired installation position
- With short release travel of 1 mm instead of the standard 2,5 mm
- With reversed valve operation (valve closes when released)
- Without extension force (HYDRO-BLOC)
The damper is a hydraulic damping element and consists of a pressure tube with a connection fitting, a piston rod with piston system and a piston rod connection fitting. The piston rod is mounted in a special seal-guide system in the pressure tube. The piston rod in the pressure tube features damping piston and the related valve system. The movement of the piston displaces the filling medium (oil), which is pressed through the valve system and thus produces a damping force. Dampers are needed to influence the nature of movements and vibrations. Dampers are designed to optimally match the particular application.

**Product Range**

The damper is available as follows:

- **STAB-O-SHOC** as a position-dependent damper without extension force with damping forces in one direction or in the extension and compression direction
- **STAB-O-SHOC** as a position-dependent damper with extension force, with damping forces in one direction or in the extension and compression direction
- **STAB-O-SHOC** as a position-independent damper without extension force with damping forces in one direction or in the extension and compression direction
- **Standard range of products**
- **Special types of dampers with higher damping forces available on request**
- **Fitted as standard with eyelets at both ends**
- **Further connection variants available on request**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>15,6</td>
<td>1000</td>
<td>80</td>
</tr>
<tr>
<td>8</td>
<td>24</td>
<td>5000</td>
<td>180</td>
</tr>
<tr>
<td>10</td>
<td>24</td>
<td>5000</td>
<td>180</td>
</tr>
<tr>
<td>10</td>
<td>29</td>
<td>7000</td>
<td>280</td>
</tr>
<tr>
<td>8</td>
<td>38</td>
<td>1600</td>
<td>250</td>
</tr>
<tr>
<td>11</td>
<td>40</td>
<td>2500</td>
<td>350</td>
</tr>
<tr>
<td>14</td>
<td>64</td>
<td>2500</td>
<td>400</td>
</tr>
</tbody>
</table>

**Variants**

The damping force characteristic may be designed to be linear, progressive or degressive. The damper may be used up to a temperature of 100°C. Special designs for temperatures in excess of 100°C are possible.
STABILUS Quality

Quality ranks high at STABILUS and is the basis for our leading position in the market. The high quality standard for STABILUS products which the market demands was the impetus for establishing a Quality Assurance System several decades ago which constantly integrates growing requirements and new knowledge.

The product philosophy of ongoing further development which STABILUS pursues is aimed at achieving zero faults. The STABILUS Quality Assurance System controls the quality-assuring elements from the product idea through to customer implementation on the basis of “Total Quality Management” (TQM).

The basis for this is our certification in conformity with ISO 9001. Internal as well as specific customer requirements are fully considered.

Use is made in this connection of special quality measuring instruments such as “Design of Experiments”, FMEA, SPC.

Installation instructions

- Install without twisting
- Pivot only at the connections provided
- Avoid lateral forces
- It is recommended to install the unit with the piston rod facing down, if possible
- Protect piston rod from dirt, paint and damage
- Do not perform any metal-cutting work on the unit

Calculating installation of a LIFT-O-MAT gas spring

To help you choose the right LIFT-O-MAT gas spring for your application you need to know:

- the stroke $A$ [mm]
- the extended length $B$ [mm]
- the extension force $F_1$ [N]
- and the type of connection

Determining the extension force $F_1$ [N]

$$F_1 = \frac{G \cdot L}{b \cdot n} \cdot 11 \text{ [N]}$$

$G$ = Weight of flap in kg
$L$ = Distance of centre of gravity to pivot point in mm
$b$ = Effective lever arm of gas spring in mm, flap open
$n$ = Number of gas springs
$11$ = Conversion factor kg $\cdot$ N + safety margin
$P$ = Flap attachment approx. 2/3 $L$

Example:
$G = 30$ kg, $L = 400$ mm, $b = 200$ mm, $n = 2$
$$F_1 = \frac{30 \cdot 400}{200 \cdot 2} \cdot 11 = 330 \text{ N}$$

Please request detailed information.

Disposal in conformity with SN 03.10-00/13

Subject to modification.
Convenient Operation and Safety in Automotive Engineering with Gas Springs and Dampers

STABILUS technology gives comfort
Pioneering achievements

STABILUS is a member of the Sachs Group within the MANNESMANN Concern, with over 60 years experience in the manufacture of hydropneumatic equipment. In addition to having produced hydraulic dampers over several decades, STABILUS presented the world’s first standard production gas spring in 1962.

Each STABILUS gas spring embodies the experience of more than 750 million units produced.

Gas springs and dampers for the automobile industry

STABILUS gas springs and dampers have been used for decades in ever increasing numbers in general automobile engineering. They offer the user a high level of operating convenience and security and are characterised by their compact design and thus their practical integration in vehicle design. STABILUS gas springs and dampers are used in a wide range of applications in general vehicle engineering, examples being superstructures, bodies and vehicle seats. In addition, STABILUS products are used increasingly in agricultural vehicles, in special bodies, in railway vehicles and in the general transport sector.

STABILUS is a major supplier to the international automobile industry and many millions of STABILUS products are fitted each year to passenger cars and commercial vehicles.

STABILUS gas springs open, adjust and close hoods, covers, hatches, doors and casings in a controlled and damped movement and permit the stepless adjustment of seats. STABILUS dampers find application in steering systems, engines, gearshift and throttle linkages, V-belts, overrun brakes and driver seats. The applications of STABILUS products in automotive engineering are as varied as your ideas and the answer to your problems.

Operating principle of a gas spring

The gas spring is a hydropneumatic adjusting element, consisting of a pressure tube with a connecting fitting, a piston rod with piston system and a piston rod connection fitting.

A special seal and guide system seals off the interior to atmosphere. The gas spring is filled with compressed nitrogen. The filling pressure acts on the cross-sectional area of the piston rod and produces an extension force, which can be freely selected within physical limits. If the extension force of the gas spring is higher than the force of the counterweight, the piston rod extends. If the extension force is less, it contracts.

The extension rate is determined by the overflow cross-section in the piston system and pressure tube, respectively.

The interior of the gas spring is filled not only with nitrogen, but also with a precisely defined quantity of oil which, on the one hand, ensures proper lubrication of the piston and the seal guide system and, on the other, provides for proper dampening of the piston in the end position.

The gas spring is completely maintenance-free in operation. In the standard version, the gas spring is designed for at least 50,000 operations.
The gas spring can be designed with an approximately linear, progressive or degressive spring rate curve, to match the particular need.

The characteristic curve of the spring describes the progression of the force of the gas spring over the stroke, from the extended to the compressed state and vice versa. If the spring rate is flat and progresses in a practically linear manner, the force of the gas spring consequently rises only slightly over the entire spring travel.

Spring rate: \( X = \frac{F_2}{F_1} \)

The force diagram on the left shows the line of the extension and compression force with a flat spring rate. The difference between the two lines is the result of the system friction produced during compression and extension. The measuring points \( F_1 \) and \( F_4 \) are each located 5 mm before the fully extended and compressed stroke. The measurements were conducted at a temperature of 20° C. You can get details regarding tolerances from the technical drawings or on demand.

**Product Range**

The LIFT-O-MAT gas spring is available as follows:

- **Standard range**

<table>
<thead>
<tr>
<th>( D_1 ) [mm]</th>
<th>( D_2 ) [mm]</th>
<th>Extension force ( F_1 ) [N] min.</th>
<th>Max. stroke ( H ) [mm]</th>
<th>( X )</th>
<th>FR max. [N]</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>15</td>
<td>50 - 400</td>
<td>160</td>
<td>1.3</td>
<td>80</td>
</tr>
<tr>
<td>8</td>
<td>19</td>
<td>100 - 850</td>
<td>250</td>
<td>1.35</td>
<td>80</td>
</tr>
<tr>
<td>10</td>
<td>22</td>
<td>150 - 1150</td>
<td>400</td>
<td>1.4</td>
<td>80</td>
</tr>
<tr>
<td>10</td>
<td>49</td>
<td>100 - 950</td>
<td>500</td>
<td>1.04</td>
<td>80</td>
</tr>
<tr>
<td>14</td>
<td>28</td>
<td>500 - 2150</td>
<td>500</td>
<td>1.3</td>
<td>80</td>
</tr>
<tr>
<td>20</td>
<td>42</td>
<td>1000 - 5200</td>
<td>950</td>
<td>1.46</td>
<td>150</td>
</tr>
</tbody>
</table>

- A choice can be made between the standard versions with eyelet end fittings or ball sockets

- Further connection variants available on request

- Standard features are the proven Nislide piston rod for extended life, with high resistance to corrosion and an environmentally friendly design

- Special gas spring types available with protective tube

- Roll-closed as standard at the pressure tube end to ensure optimal seal without weld seams and high resistance to corrosion

- With different sets of seals, depending upon the application
Variable positioning, rigid or spring blocking

Operating principle

This version operates on the same principle as the LIFT-O-MAT. In addition, the gas spring features an integrated valve and can thus be blocked in any desired position.

The piston is sealed at the pressure tube and separates two gas spaces.

When the valve is closed, the gas spring is fixed which enables it to be blocked in any desired position. If the release plunger is operated, the valve is opened and the gas spring unit can be moved into any desired position.

The extension rate and the damping can be varied accordingly by the choice of nozzle in the piston.

Variants

- BLOC-O-LIFT gas spring with resilient blocking in the extension or compression direction. If the piston is moved over the range of stroke in the gas, a resilient blocking effect is achieved as gas is compressible
- BLOC-O-LIFT gas spring with rigid-blocking in the extension or compression direction. If the piston is moved over the range of stroke in the oil, a rigid blocking effect is achieved as oil is not compressible

In the case of the position-independent rigid blocking variant, the gas and oil spaces are separated by a separating piston and rigid blocking is possible in the extension or compression direction, depending on the design.

Product Range

The BLOC-O-LIFT gas spring is available both in a resilient and also a rigid blocking version as follows:

- Standard range of products
- Special spring types are available with an 8 mm piston rod and 22 mm pressure tube diameter
- Fitted as standard with thread or eyelet end fittings
- Further connection variants available on request

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>28</td>
<td>28</td>
<td>28</td>
<td>100</td>
<td>150</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>80</td>
</tr>
</tbody>
</table>

Accessories:

- Release head with lever and handle, buffer and nuts, release head with bowden cable and operating unit
- With special sealing system suitable for continuous operation
- With special sealing system for any desired installation position
- With short release travel of 1 mm instead of the standard 2,5 mm
- With reversed valve operation (valve closes when released)
- Without extension force (HYDRO-BLOC)
Hydraulic dampening of vibrations

The damper is a hydraulic damping element and consists of a pressure tube with a connection fitting, a piston rod with piston system and a piston rod connection fitting. The piston rod is mounted in a special seal-guide system in the pressure tube. The piston rod in the pressure tube features damping piston and the related valve system. The movement of the piston displaces the filling medium (oil), which is pressed through the valve system and thus produces a damping force.

Dampers are needed to influence the nature of movements and vibrations, Dampers are designed to optimally match the particular application.

Product Range

The damper is available as follows:

- **STAB-O-SHOC** as a position-dependent damper without extension force with damping forces in one direction or in the extension and compression direction
- **STAB-O-SHOC** as a position-dependent damper with extension force, with damping forces in one direction or in the extension and compression direction
- **STAB-O-SHOC** as a position-independent damper without extension force with damping forces in one direction or in the extension and compression direction

- **Standard range of products**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>15,6</td>
<td>1000</td>
<td>80</td>
</tr>
<tr>
<td>8</td>
<td>24</td>
<td>5000</td>
<td>100</td>
</tr>
<tr>
<td>10</td>
<td>24</td>
<td>5000</td>
<td>150</td>
</tr>
<tr>
<td>10</td>
<td>29</td>
<td>7000</td>
<td>200</td>
</tr>
<tr>
<td>8</td>
<td>38</td>
<td>1600</td>
<td>250</td>
</tr>
<tr>
<td>11</td>
<td>50</td>
<td>2500</td>
<td>300</td>
</tr>
<tr>
<td>14</td>
<td>64</td>
<td>3000</td>
<td>400</td>
</tr>
</tbody>
</table>

- **Special types of dampers with higher damping forces available on request**
- **Fitted as standard with eyelets at both ends**
- **Further connection variants available on request**

Variants

The damping force characteristic may be designed to be linear, progressive or degressive. The damper may be used up to a temperature of 100° C. Special designs for temperatures in excess of 100° C are possible.
STABILUS Quality

Quality ranks high at STABILUS and is the basis for our leading position in the market.

The high quality standard for STABILUS products which the market demands was the impetus for establishing a Quality Assurance System several decades ago which constantly integrates growing requirements and new knowledge.

The product philosophy of ongoing further development which STABILUS pursues is aimed at achieving zero faults. The STABILUS Quality Assurance System controls the quality-assuring elements from the product idea through to customer implementation on the basis of “Total Quality Management” (TQM).

The basis for this is our certification in conformity with ISO 9001. Internal as well as specific customer requirements are fully considered.

Use is made in this connection of special quality measuring instruments such as “Design of Experiments”, FMEA, SPC.

Calculating installation of a LIFT-O-MAT gas spring

To help you choose the right LIFT-O-MAT gas spring for your application you need to know:

- the stroke A [mm]
- the extended length B [mm]
- the extension force F1 [N]
- and the type of connection

Determining the extension force F1 [N]

\[
F_1 = \frac{G \cdot L}{b \cdot n} \cdot 11 [N]
\]

G = Weight of flap in kg
L = Distance of centre of gravity to pivot point in mm
b = Effective lever arm of gas spring in mm, flap open
n = Number of gas springs
11 = Conversion factor kg ↓ N + safety margin
P = Flap attachment approx. 2/3 L

Example:

G = 30 kg, L = 400 mm, b = 200 mm, n = 2

\[
F_1 = \frac{30 \cdot 400}{200 \cdot 2} \cdot 11 = 330 N
\]

STABILUS technology gives comfort

A company of Mannesmann Sachs
Gas Springs and Dampers for Automotive Applications

STABILUS technology gives comfort
Gas Springs and Dampers for Cars

STABILUS quality

Quality ranks high at STABILUS and is the basis for our leading position in the market. The high quality standard for STABILUS products which the market demands was the impetus for establishing a Quality Assurance System several decades ago which constantly integrates growing requirements and new knowledge. The product philosophy of continuous development which STABILUS pursues is aimed at achieving zero faults. The STABILUS Quality Assurance System controls the quality-assuring elements from the product idea through to customer implementation on the basis of “Total Quality Management” (TQM).

The basis for this is our certification in conformity with ISO 9001. Internal as well as specific customer requirements are fully considered. Use is made in this connection of special quality measuring instruments such as “Design of Experiments”, FMEA and SPC.

STABILUS has achieved a number of quality awards from the international automotive industry.

Gas Springs and Dampers for Commercial Vehicles

Engine vibration damping

Centre console

Telephone console
Gas Springs and Dampers for Cars

**Pioneering achievements**

Since the foundation of the company in Koblenz in 1934, STABILUS has been producing hydraulic damping elements for the automotive industry. In the fifties, STABILUS offered the first hydraulic damper for horizontal installation. Since then, many millions have been used particularly for steering damping.

In 1962, STABILUS presented the world’s first standard production gas spring. This hydropneumatic adjusting element gradually replaced mechanical systems. Today it is being increasingly used by the automotive industry in further applications additionally to the existing, such as hatchbacks, bonnets, trunk lids, and seat adjustments.

Established know-how and solid quality have made STABILUS the world leader for gas springs. Product innovations in the field of hydraulic dampers and gas springs have started their triumphal campaign from Koblenz.

There are STABILUS production facilities in Germany, the United Kingdom, Spain, Italy, the U.S.A., Australia and Mexico.

**Development supplier**

STABILUS has been supplying the international automotive industry for decades and is a recognised development supplier. Throughout the world STABILUS employees perform creative innovative work to further enhance our products.

The multiplicity of technical solutions guarantees an optimal solution to our customers’ requirements. STABILUS gas springs and dampers have become the international standard. STABILUS offers its customers extensive service and development support, ranging from computer-supported analysis to on-site fine-tuning on the vehicle by mobile workshops.
Gas Springs and Dampers for Commercial Vehicles
Gullwing doors
Folding headlights
Folding table
Roll bar

**LIFT-O-MAT®**
Lifting, lowering, moving, adjusting.
The LIFT-O-MAT® raises weights and offers a weight compensation.
If the extension force of the gas spring is higher than the force of the counterweight, the piston rod extends, e.g. lifting the hatchback. If the extension force is smaller, it compresses.

**Convertible top**
Convertible top adjustment

**Bonnet**

**Seat adjustment**

**Trunk lid**

**Radiator mascot (disappearing)**

**STAB-O-SHOC®**
Hydraulic dampening of vibrations.
Vibration dampers for the steering engine and other applications.

**Injection pump damping**

**Steering damping**

**Belt-tension damping**

**Applications in commercial vehicles**
- Storage tray for driver
- Storage of hand luggage
- Glove compartment
- Battery box
- Sliding folding top
- Hatchback
- Luggage lid
- Maintenance lid
- Seats
- Roof lid
- Steering column
- Radio lid

**Engine bonnet**
**Steering**
**Hood**
**Bonnet**
**Streamline deflector**
**Sleeper berth**

**Engine**
**Injection control linkage**
**Manual transmission**
**Driver's seat**
**Driver's cab**
Design of a gas spring

Submission to STABILUS of specifications, drawings, geometrical data by the customer.

Check of data by using the installation proposal programme. Determination of the parameters for the design of the gas spring.

Design of the gas spring. Counter-check of installation proposals. Confirmation of data.

Fine-tuning of the gas spring on vehicle prototypes by using STABILUS’s mobile workshop.

Release of the gas spring and finalization of the design.

Series introduction of the gas spring at STABILUS. MCS, FMEA, SPC and TQM to ensure volume production.

Fulfilment of the customer’s expectations through performance and quality.

STABILUS GmbH
Wallersheimer Weg 100
D-56070 Koblenz
P.O. Box 2029, D-56020 Koblenz
Ph. (0261) 8900-0
Fax (0261) 8900-479
Telex stabk 862 495

Please request more detailed information.

STABILUS technology gives comfort

A company of Mannesmann Sachs
Gas springs in swivel chairs
stepless and ergonomic adjustment

STABILUS technology gives comfort
Stepless adjustment of seat angle and backrest of swivel chairs

Product Range

The BLOC-O-LIFT gas spring is available both with resilient and also with rigid blocking as follows:

- With pressure tube diameter 22 and 28 mm
- In different lengths, especially also in different strokes (10 - 50 mm)
- With different end-fittings
- With special sealing systems, suitable for continuous release
- With special sealing systems for any desired installation position
- With short release travel of 1 mm instead of standard 2.5 mm
- With pressure relief valve
- With reversed valve operation (valve closes during release)
- Without extension force (HYDRO-BLOC)

Accessories:
Release head with lever and handle, buffers and nuts, release head with bowden cable and operating unit

Variants

Depending on requirements, the gas spring can be designed with rigid or resilient blocking.

Resilient blocking is achieved if the piston moves over the lift range in the gas as the gas is compressible. Rigid blocking is achieved if the piston moves over its lift range in the oil as the oil is not compressible.

In the case of rigid blocking, the gas and oil spaces are separated by a separating piston and, depending on design, rigid blocking is possible in the extension or compression direction.

Swivel chair engineering from STABILUS

Until the introduction of the gas spring in series production, swivel chairs were adjusted by means of spindles or detent mechanisms. The gas spring has performed this function to an ever increasing extent since the sixties as a practical and compactly dimensioned adjusting element. Many hundreds of swivel chair manufacturers throughout the world have been placing their faith for decades now in STABILUS gas springs.

Swivel chair manufacturers and practitioners of occupational medicine rightly regard STABILUS as the pioneer in the development and manufacture of gas springs for ergonomic sitting in the swivel chair sector. The gas spring enables a swivel chair to be adjusted steplessly in height in the most comfortable manner. A single operation of the adjusting lever, and the swivel chair user glides downwards in a gently controlled movement. If the chair is not occupied, the seat glides smoothly upwards. A pleasant deep springing exists in the working position. The same principle is applied for adjusting the seat angle and backrest. The gas springs can also be designed on request with a fixed blocking mechanism.
Pioneering achievements

STABILUS, a member of the SACHS Group within the MANNESMANN Concern, with over 60 years experience in the construction of hydropneumatic equipment, presented to the swivel chair industry the world’s first standard production gas spring in 1962.

STABILUS sees itself as a problem solver for the most varied demands and has attached the greatest significance to perfect operation and safety since the start of production in 1962. STABILUS gas springs comply with DIN standards, have the authorised safety seal of test institutes (such as the German Technical Inspection Authority - TÜV - and regional industrial inspection boards - LGA), and are in conformity with leading European standards.

STABILUS, with its production facilities in Germany, United Kingdom, Spain, Italy, USA, Mexico, Brazil and Australia, have been an increasingly important supplier for several decades now to the swivel chair, furniture and building industries. Each STABILUS gas spring embodies the experience of more than 750,000,000 units produced.

Operating principle

The STAB-O-MAT/STAB-O-BLOC- and BLOC-O-LIFT - gas springs are hydropneumatic adjusting elements which can be set to any desired height and feature a self contained gas/oil system as an energy store. The spring force is produced by a compressed nitrogen filling.

A special sealing system between piston rod and tube wall seals off the inner space to atmosphere. The filling pressure acts on the cross-sectional area of the piston rod and produces the extension force F1, which can be freely selected within the physical limits.
Stepless height adjustment of swivel chairs

Variants

The STAB-O-MAT and STAB-O-BLOC gas springs are designed in accordance with the same operating principle. The difference is in the arrangement of an additional supporting tube around the STAB-O-BLOC gas spring. Whereas the STAB-O-MAT gas spring with its supporting tube performs the guiding function in the column, the gas spring of the STAB-O-BLOC is surrounded by an additional outer supporting tube which absorbs the bending stress. The gas spring is flanged into this supporting tube or alternatively screwed in to permit easy subsequent replacement. Both gas spring variants feature an outer tube with a chromium-plated surface which is guided by a bush within a support tube.

Product Range

STAB-O-MAT and STAB-O-BLOC are offered as follows:

- In the diameters 28 and 30 mm
- In various lengths, offering a range of adjustment stroke lengths (50 - 300 mm)
- In various taper dimensions for mounting into the seat carrier
- As complete columns with various diameters of upright tube and taper dimensions for swivel chair bases
- As telescopic column for over proportional adjustment range
- With various surface finishes of upright tube
- With additional mechanical deep springing systems, also in lowest seat position
- With adjustable release pins
- STAB-O-MAT with short release travel of 1 mm instead of standard 2,5 m
- STAB-O-BLOC with standard release travel of 1,7 mm
- STAB-O-MAT with reduced release force
- With cardan guide bushes as sliding element not susceptible to twisting

Accessories:
- Plastic bushes, cardan guide bushes bearing parts, rubber buffers, simple release mechanisms and bowden cable release

STAB-O-MAT®
with additional supporting tube

Special Equipment

Connection to seat carrier selectable according to product range

Valve system regulating speed and dampening

Pressure cylinder with filling medium

Piston rod with minimal peak-to-valley height and wear-resistant surface

Stab-O-Mat®/ Stab-O-Bloc®

Adjustable pin

Cardan guide bush

Additional deep springing
Stepless height adjustment of swivel chairs

- Various range of products
- Technical assistance for applications
- Suggestions and solutions for difficult applications
- Quality with ISO 9000
- Security with DIN 4550 and 4551
- Tested by LGA, TÜV, ANSI, BIFMA
- Excellent service
- High quality guarantee
Stepless adjustment of seat angle and backrest of swivel chairs

- As the pioneers in gas spring technology, STABILUS presented the first standard production unit for the height adjustment of swivel chairs in 1962
- For more than 30 years quality and security
- More than 450 swivel chair manufacturers in the world have confidence in STABILUS
- Each quality product of STABILUS contains the experience of more than 750,000,000 produced gas springs for different applications
STABILUS-Quality

Quality ranks high at STABILUS and is the basis for our leading position in the market.

The high quality standard for STABILUS products which the market demands was the impetus for establishing a Quality Assurance System several decades ago which constantly integrates growing requirements and new knowledge.

The product philosophy of ongoing further development which STABILUS pursues is aimed at achieving zero faults.

The STABILUS Quality Assurance System controls the quality-assuring elements of the product idea through to customer implementation on the basis of "Total Quality Management" (TQM). This is founded on international quality standards (e.g. ISO 9000). The system also takes into account internal as well as specific customer demands.

Use is made of recognized quality measuring instruments such as „Design of Experiments“, FMEA, SPC.

By means of production self-inspections based on statistical aspects as well as parameter control on automatic production facilities, a range of product- accompanying tests and inspections are conducted from the Incoming Goods Department through to Shipping. These measures assure to-specification manufacture of all STABILUS products. The quality inspection seal on each package is verification that the product fully complies with specification.

Numerous international quality awards are confirmation of the efficiency and the success of STABILUS quality.

The STABILUS Test Centre

The STABILUS in-house Test Centre conducts the tests laid down by independent institutes (e.g. TÜV, LGA, FIRA, ANSI/BIFMA) as well as additional tests in conformity with STABILUS standards. The principal tests are:

- **The drop test.** Test of complete swivel chairs in conformity with LGA Specification; DIN 4551.
- **The alternate bending test.** Test of complete swivel chair in conformity with DIN 4551.
- **The misuse test** (drop test II). Test of complete swivel chair in conformity with ANSI X5.1-1985/BIFMA.
- **The backrest test.** Test of BLOC-O-LIFT (for seat angle and backrest) or swivel chairs in installation position.

STABILUS
1201 Tulip Drive
Gastonia, NC 28052
Tel. 704-865-7444
Fax 704-865-7781

STABILUS technology gives comfort

A company of Mannesmann Sachs