

**Technical regulations**  
**Must be observed prior to mounting, construction or storage!**

**Safety**

1. If gas pressure springs, gas tension springs or dampers are used in situations where a failure of the product can lead to personal injury and/or property damage, additional safety elements must be installed. The installation/removal of TSC products must always be carried out in compliance with the accident prevention regulations!
2. TSC products are not safety components! Gas pressure springs, gas tension springs and dampers are maintenance-free products that are subject to wear and tear and must therefore be regularly tested for their function depending on the load and application. In order to increase service life and fatigue strength, the products must in particular be protected against corrosion. Most of our products are also produced in stainless steel (V2A and V4A). Small quantities of hydraulic oil may leak from the products; it must not come into contact with foodstuffs or ground water. In addition to the standard hydraulic oil, alternative types of oil can be used for other areas such as the food industry.
3. Gas springs are filled with technically pure nitrogen. Technically pure nitrogen does not burn, does not explode and is not harmful to the environment. Gas springs are under high pressure and may only be opened according to instructions (*see point IV. Storage/Disposal*).
4. TSC products must not be overheated or exposed to open fire.
5. Before disassembly or other handling, the products must be checked for visible damage such as deformed connecting parts or a bent piston rod. In case of visible damage, the pressure must be released before disassembly.

**Installation/Function**

6. Gas pressure springs and dampers should preferably be installed with the piston rod pointing downwards, tension springs with the piston rod pointing upwards.  
For alternative installation solutions, please contact our technical sales department.
7. In order not to impair the service life, gas springs must not be subjected to canting, bending or transverse forces; only axial loads are permissible. Depending on the force, stroke, series and overall length of our products, there may be a risk of kinking. The piston rod must be protected against impacts, scratches, dirt and paint. Depending on several factors such as installation situation/application, the model series, the stroke used, ambient conditions, a service life of more than 50,000 cycles is possible.

8. A gas spring is subject to a technical loss of force overtime. This occurs even if the piston rod is not moved. The amount of force loss depends, among other things, on the type, size, gaskets used and application. Values of 5% within the first 12 months and 10% within 4 years are quite normal, but in individual cases they can be significantly higher.
9. Screwed-on fittings such as eyes, angle joints, etc. must be completely screwed in and rest against the front. Loose connections must be completely screwed on before installation. If vibrations occur, the connections must be secured against loosening.
10. Environmental conditions (dust, temperature fluctuations, humidity, etc.), aggressive media, incorrect installation or mechanical influences can lead to damage and affect the service life. To help you find the right solution, please contact our technical sales department.
11. Gas pressure springs, gas tension springs and dampers may not be used as end stops if the nominal force does exceed (no overstretching or compression of the product), i.e., the products may only be loaded with their nominal force on compression or tension. Mechanical stops should be additionally attached, particularly at high forces, in order to prevent the product from being compressed or overstretched.
12. Standard range of application for our gas springs and dampers: -20°C to +80°C. We offer also solutions for a range from -40°C to +200°C. To help you find the right range, please contact our technical sales department.
13. Gas tension springs are open systems, i.e., it must be avoided that dirt or other media get into the tension springs through the ventilation hole at the cylinder end.
14. Lockable gas pressure springs have a through hole in the piston rod with a release pin. It must be avoided that foreign media such as dirt or cleaning agents penetrate the piston rod hole (protection is provided by an optional piston rod seal). Contamination can lead to corrosion in the piston rod and cause the release pin to get wedged. When installing a release system, make sure that the permissible release travel is adhered to.
15. Some products in the TSC Gasfedern range are fitted with a valve. As an option, further products can be equipped with a valve. A valve can be used to increase the force by refilling or reduce the force by draining. The instructions for the correct handling of the valve can be found on our homepage.
16. Filling of the products only with written permission of TSC Gasfedern GmbH.
17. Angle joints may be supplied with a safety catch. For safety reasons, this catch must be used when mounting the spring, to avoid injury.

18. We use 3.5 mm threads for the G03-08 and G03-10 model ranges. This is not the standard setup. The outside diameter is smaller than indicated in the standard specifications. However, connectors using a standard 3.5 mm thread can be used without problem.

### **Tolerances/characteristics**

19. Maximum traverse speed for gas springs = 300 mm/s in installed condition.

20. Length tolerance of the products = +/- 2 mm

21. The damping force of adjustable dampers is increased or decreased by turning the piston rod in the end positions. The total length changes when the piston rod is turned.

22. The tolerance for extension or tensile forces at 20° is generally:

F1 nominal force  $\pm 10\%$ , at least  $\pm 3$  Newton.

The nominal force is measured statically when the stroke is extended (for tension springs when the stroke is retracted) 5 mm before the end of the stroke (standard). For further information, please contact our technical sales department.

23. The indicated F1 force for gas pressure springs and gas tension springs is based on an ambient temperature of 20°C. This force is increased or decreased at a different ambient temperature. A temperature difference of 10°C results in a change of the F1 force by approx. 3-3.5 %.

When the ambient temperature changes, the properties of products with oil filling also change.

### **Storage/Disposal**

24. Gas pressure springs and dampers should be stored with the piston rod pointing downwards, tension springs with the piston rod pointing upwards. If properly stored, no pressure losses are to be expected; however, the products should not be stored for more than 1 year (see II Installation/Function Point 3).

25. Before the piston rod is moved for the first time, the film tubes must be removed.

When the products are operated (retraction/extension of piston rod) for the first time after longer periods of non-use, a sticking effect can occur (breakaway torque and slip-stick effect), which means that higher forces are required to move the product. This effect levels out after one or two cycles. Storage of gas springs should be carried out according to the FIFO principle (First in First Out). After a longer storage period, a slight oil wetting may occur on the piston rod side. This is system-related and has no effect on the functionality.

26. Disposal: Dampers, gas pressure and gas tension springs are under pressure. They must not be opened or heated. The products may only be opened according to the instructions of TSC

Gasfedern GmbH. You will find the disposal regulations/instructions for opening the products on our homepage. We are happy to take back our products and dispose of them for you.

### **Warranty**

27. Warranty claims expire one year after the date of manufacture of the products. The warranty is void if the date of manufacture on the labels of our products is illegible or has been removed. Defects in the quality of the products must be reported immediately. Returns will only be processed with a fully completed return note.

28. Warranty is excluded for any installation suggestions/drawings for the installation of gas pressure springs, gas tension springs and dampers. Product installation must be carried out with utmost care, since friction values or accelerations cannot or can only roughly be considered in the theoretical suggestion. In order to calculate as precisely as possible your desired application, we ask you to fill in our forms for the calculation of gas pressure springs, tension springs and/or dampers as accurately and completely as possible. The forms can be found on our homepage

### **General information**

29. Our products are manufactured to order. A cancellation or subsequent changes as well as an exchange or return of the product is therefore excluded.

30. If dampers, gas pressure springs and gas tension springs are sent in for testing, the consent to open the product is granted and the right of ownership expires. The products sent in will be disposed of 4 weeks after notification of the test results.

31. In case of returns, the buyer bears the shipping costs, returns by cash on delivery are not accepted.

**Failure to observe our technical regulations will void any warranty.**