

## Technical Instruction

Pay attention to these instruction before designing, installing or storing!!!

1. If gas springs, tension springs or dampers are fitted in applications where their falling would mean a risk of health or life, additional locking mechanisms must be employed. The mounting and dismounting of gas springs, tension springs and dampers must be carried out according to safety rules.

2. When mounting / storing:

Gas springs: piston rod must point downwards

Dampers: piston rod must point downwards

Tension springs: piston rod must point upwards

A loss of pressure due to long storage is not to be expected, but we do recommend not storing the products longer than 1 year. There may be a sticking effect (slip stick) when the spring is operated the first time after a long rest. Therefore the force for retraction or compression will be higher than the given nominal force. Before installing the springs the plastic sleeves are to be removed.

3. Gas springs, tension springs and dampers are no safety parts! Gas springs, tension springs and dampers wear out after a certain period of time. Corrosion must be avoided to achieve higher life expectancy and fatigue strength. Minor quantities of hydraulic fluid may leak from the products. These must not get in contact with food or similar goods or subsoil water.

4. Avoid tilting of piston rod. Long strokes need additional guidance or particular bearings to avoid bending and tilting of the product, no axial forces must be avoided.

5. Even minor damage, corrosion or paint residues on the piston rod may result in a failure of the unit (damage of sealing). The cylinder must not be damaged or deformed. Any changes of product through third parties will expiring any warranty / guaranty.

6. Gas springs must not be loaded with traction forces, tension springs not with compressive forces.

7. None of the gas springs, tension springs and dampers must be extended or retracted over their respective limit stops in both the closed and open position.

8. Tension springs and gas springs may be used as a limit stop. However, the tension or compression load must not exceed the nominal force +30 %. Torsion or transverse forces must be avoided. Where possible, physical stops should be employed, limiting the extended and compressed lengths of the products to within 5 mm of their maximum closed and open lengths.

9. Use the product only within a temperature range of -20°C to +80°C, if used in the former – or even lower temperatures – please inform us in any case. Do not heat up over 80°C. Temperature variances affect the extension and compression force (approx. 3% of nominal force by a change of 10°C). The oil's viscosity also changes. To avoid non-usability this must be taken into account.

10. To re-charge the springs you need a written approval from us.

11. Tension springs are open systems. It must be avoided, that dirt or other mediums may enter the spring through the hole in the cylinder base plate. Tension springs should be mounted with the piston rod upwards. The springs may not be used in closed applications where there is condensation due to temperature changes.

12. A locking gas spring's piston rod is in fact a tube in which a plunger is fitted. Should dirt or detergents get into the piston rods inside this may cause corrosion which then leads to the plunger sticking fast. Preferably locking springs should be mounted with the piston rod downwards. If locking springs are installed in places where they may get into contact with detergents (hospital beds), this must be indicated in your order. Max number of release operations = approx. 30000.

13. We cannot guarantee for application proposals or drawings

since there may be parameters not indicated and therefore not taken into account on the enquiry. Hence caution must be applied when mounting the gas springs. Generally the order must indicate whether the springs are used in "normal" conditions (20° C, natural environment = air) or whether other mediums (water stream > 80° C, chemicals, detergents, etc.) are involved.

14. The application and employment of gas springs, tension springs and dampers ought to be tested by the user because the varying employment situations of our products cannot be simulated by us and the products behavior may differ from case to case. High acceleration or velocities during extending or compressing must not lead to overloading the products.

### Tolerances / characteristics / disposal

1. Maximum pressure 160 bar (at 20° C)

2. Maximum speed of the piston is approx. 300 mm/s. Fast operation rates will lead to excessive heat buildup with subsequent internal seal damage. High acceleration or velocities during extending or compressing must not lead to overloading the products.

3. Length tolerance on the products is +/- 2 mm, force tolerance between +/- 3 N, +/- 5 % of the nominal force and 10 % of the nominal force (depending on the nominal force). Exact tolerances are given in our force measuring instructions. Force for releasing locking gas spring = 18 % of nominal force of the spring.

4. Life expectancy: gas springs, damper (stroke 10 km), tension springs (stroke 2 km) – optimal conditions.

5. Gas springs, tension springs and dampers are under pressure and filled with oil. For disposal please read our respective leaflet thoroughly.

***No warranty / guaranty applies our instruction are being followed.***