

General operating and maintenance manual for hydraulic cylinders

- 1. general**
- 2. Safety instructions**
- 3. Personnel and qualifications**
- 4. Assembly and installation**
- 5. Start-up**
- 6. Cylinders with position measuring system**
- 7. Maintenance**
- 8. Storage space requirements**

1. General

Prior to starting-up the hydraulic cylinder observe the following notes and supplementary operating instructions for special cylinders. This applies particularly to telescopic cylinders and cylinders with position measuring systems.

2. Safety instructions

A hydraulic cylinder has primarily two properties: it acts as a pressure reservoir during operation or under pressure during its main function as a movement element. It is therefore **EXTREMELY IMPORTANT** that the following is observed:

- installation may only be carried out by a hydraulics engineer
- a safe working pressure must be maintained using a safety valve (pressure relief valve)
- safety standard EN 982 for hydraulics is to be observed
- Damage to components through which oil flows must be rectified without delay
- **WARNING:** hydraulic fluid jetting out can cause injuries. Do not allow hydraulic fluid to soak into the ground

3. Personnel and qualifications

Assembly, maintenance and repair work may only be carried out by trained or instructed personnel having special knowledge of hydraulics (and also of electronics when dealing with cylinders with position measuring systems).

4. Assembly and installation

Assembly

The following points are to be observed when assembling hydraulic cylinders:

- All screw connections used for fastening the cylinders and its fastening elements must comply with DIN/ISO 898 T1 minimum property class 8.8 (10.9 recommended)
- Make sure the area surrounding the hydraulic cylinder is clean
- The hydraulic cylinder must be vented well prior to start-up
- The operating medium must be compatible with the sealing material. Sealants such as hemp, mastic or sealing tape are not permitted
- Pipelines and containers are to be cleaned of dirt, scale, sand, swarf etc.
- Hot-bent or welded pipes must then be pickled, rinsed and oiled
- During cleaning use only non-fibrous material or special paper
- Use only the corresponding coupling clips for plug-in systems used for connecting hydraulic connections

Installation

The following points are to be observed when selecting and installing hydraulic cylinders:

- The maximum specified pressure for the hydraulic cylinder may not be exceeded
- When selecting a hydraulic cylinder observe the maximum permissible stroke length. The type of fastening, the installation position and the maximum operating pressure must be also be considered
- The hydraulic cylinder must be installed when it is tension-free. Shear forces must not be exerted on the cylinder, neither by the way in which the cylinder is fastened nor by its load. Shear forces can cause unplanned cylinder downtime, e.g. by damage to joint eyes, bent or broken piston rods

We would advise you against using the product in any way other than intended. Damage resulting from the misuse of or the use of the product other than for the purpose it is intended will result in a rejection of the warranty claims.

5. Start-up

Bleeding

- The hydraulic cylinder must be vented well prior to start-up When running empty undo the bleed screw and the floor side and rod side screw connection or plug-in system and allow the air to escape. Only tighten the bleed screw and screw connections when the oil is free of bubbles. Then tighten up the bleed screw and screw connections or the plug-in system so that they are pressure-tight.

Hydraulic fluid

- Check if the hydraulic fluid used in the system corresponds to that which is permitted for use in the hydraulic cylinders

- The maximal hydraulic fluid temperatures as recommended by the manufacturer must not be exceeded. It is recommended that hydraulic fluid be maintained at a constant temperature of (+/-5° C) in order to guarantee a consistent response

Filtering

- Reliable filtering increases the service life of the hydraulic cylinder. Please observe the recommendations for the maximum permissible degree of contamination of the hydraulic fluid in accordance with NAS 1638. Hydraulic filters with electronic contamination indicators are preferable

6 Cylinders with position measuring system

- NEVER load cylinders with a position measuring system using a magnet crane
- NEVER load the position measuring system using a magnet crane
- NEVER expose the position measuring system to strong magnetic fields

Observe the installation instructions and connection diagrams for the position measuring system (see the point referring to personnel with qualifications)!

7. Maintenance

- Hydraulic cylinders are generally maintenance-free. Ensure the bearing points (such as swivel bearings and articulated bearings) as well as the swivel pins
- Check the entire system for leaks and for externally visible damage at regular intervals
- Depressurize the entire system before opening it (e.g. when removing individual components)
- **Seal change:** seals and guides are wear parts. If internal or external leakage reaches an unacceptable level, we recommend that you have the seals and guides replaced at our works (always have the complete seal kit replaced) as the entire hydraulic cylinder is checked during disassembly.

8. Storage space requirements

- Hydraulic cylinders must be stored in a room which is dry and free of dust, which is also free of corrosive substances and vapors.
- If the hydraulic cylinders are stored for more than six months they must be filled with preservation oil and sealed.
- Where possible store the cylinders in an upright position when storing them for an extended length of time.

9. Disposal

In case of disposal of hydraulic cylinders, please contact us directly. We take care of a professional disassembly and proper disposal of the items. Do not dispose hydraulic cylinders to the normal household waste. You provide an important contribution to preserving the environment.