FLUID SYSTEM

MOTION & AUTOMATION

ENGLISH

HYDRAULIC CYLINDERS

USER MANUAL

Manual code: FS/PD-mc-11/14

- **TIE-ROD CYLINDERS**
- **CYLINDERS WITH COUNTER-FLANGES**
- **INNER SCREWED HEAD CYLINDERS**
- **COMPACT CYLINDERS**




INFORMATION PROVIDED FOR PRODUCT DESCRIPTION

The usage information is an example of use and non-guaranteed characteristics.
The information provided does not exempt the user from carrying out their own assessments and verifications. All our products inevitably undergo a natural process of wear and ageing.

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1 INFORMATION ON THIS DOCUMENTATION

1.1 Documentation validity

This documentation is valid for the hydraulic cylinders produced by Fluid System.
This documentation is intended for system manufacturers, installers, users, service technicians and system operators.
It contains important information to transport in an appropriate and safe manner, to store, install, operate, use, to disassemble the product and to carry out its maintenance and disposal.
Before using the product, read this documentation in its entirety, in particular chapter 2 "Safety warnings".

1.2 Additional documentation

Only operate the product if in possession of the documentation "Use and maintenance of hydraulic systems", document no. FS/PD-mi-11/14 if it has been understood and the indications have been respected.

1.3 Safety warnings

In this documentation, the safety warnings precede a series of operations for which there is a danger of damage to persons or property. The measures described to avoid hazards must be observed.
The safety warnings are structured as follows:

DANGER

Type and source of danger
- Consequences in case of non-observance.
- Measures to avoid the dangers.

- Warning sign: it draws attention to the dangers
- Key word: it indicates the severity of the danger
- Type and source of the hazard: it indicates the type or origin of the hazard
- Consequences: it describes the consequences in case of non-compliance
- Protection: it indicates how to avoid the danger

Hazard classes according to ANSI Z535.6-2006

DANGER	It identifies a dangerous situation that, if not avoided, could case death or serious bodily injury.
WARNING	It identifies a dangerous situation that, if not avoided, can result in death or serious bodily injury.
ATTENTION	It identifies a dangerous situation that, if not avoided, can cause mild to moderate bodily injury.
NOTIFICATION	Material damage: the product or the environment may be damaged.

2 SAFETY WARNINGS

2.1 Information on this chapter

The product was built according to the normally recognised technical rules. Despite this, there is a risk of damage to persons and property if this chapter and the safety warnings contained in this documentation are not complied with.
- Read this documentation carefully before using the product.
- Keep this documentation in a place that is always accessible to all operators.
- Always provide any third party with the product together with the necessary documents.

2.2 Intended use

This product is a component for hydraulic systems.
According to EU Directive 2006/42 / EC and UNI EN ISO 4413 this hydraulic cylinder is a component that is not intended for direct use and has been designed exclusively for installation in a machine or in a system.
The product can only be used for assembly in a machine or system. The hydraulic cylinders are therefore not included in the machine directive.
According to the Pressure Equipment Directive (PED), hydraulic cylinders are not classified as pressure vessels, but rather as hydraulic actuators because the essential factor for the structure is not pressure, but resistance, internal stability and stability against static and dynamic operating stresses.
The product is only intended for industrial use and not for private use.
The product can only be used in the context of the data and specifications shown in the valid technical tables.

2.2.1 Intended use in areas at risk of exposure

Hydraulic cylinders without the EX marking cannot be used and operated in explosive atmospheres. Only hydraulic cylinders with EX marking (see section 5.2 "Product identification") are suitable for use in potentially explosive areas. The products are specified by group and category according to EU directive 2014/34/UE. They can be used in an EX area depending on the group and the category shown here.
For use and maintenance, request specific documentation.

2.3 Improper use

Any use other than that described in the intended use is to be considered non-compliant and therefore is not permitted.
Fluid System declines all responsibility for damage due to improper use. The risks of improper use are solely the responsibility of the user.
Improper use of the product also includes the use of hydraulic cylinders:
- with operating pressures greater than what is specified in the technical data sheets or in the installation diagrams
- with hydraulic fluid not corresponding to the specifications in the data sheets
- with different environmental and operating conditions

2.3.1 Improper use in areas at risk of explosion

The hydraulic cylinder can reach high temperatures during operation. The addition of a protective structure, for example by painting, can only take place with thicknesses of approximately 80/100 microns.
Failure to observe this indication can result in exceeding of the maximum temperature limits of the product being tested according to the EX directives.

2.4 Personnel qualification

The activities described in this documentation require basic knowledge in the mechanical, electrical and hydraulic fields as well as knowledge of the corresponding technical terminology. To ensure safe use, these activities must therefore only be carried out by a competent technician or by a person instructed and directed by a competent technician.
A competent technician is someone who, thanks to professional training, notions, experience and knowledge of

the provisions in force on this subject, is able to assess the work entrusted to them, to recognise the possible dangers and is able to adopt the necessary safety measures. A competent technician must comply with the specific technical regulations in force.
The product must only be used by personnel who are qualified and trained:
- to carry out the transportation
- to carry out assembly and disassembly of the hydraulic and mechanical parts
- and to start up systems and hydraulic units

2.5 General safety warnings

- Respect the current regulations on the prevention of accidents and environmental protection.
- Comply with the safety provisions and regulations of the country in which the product is being used.
- Only use Fluid System products if they are in a perfect technical condition.
- Follow the instructions on the product.
- The personnel assigned to assembling, using, disassembling or maintaining Fluid System products must not be under the influence of alcohol, other drugs or medicines that could affect their ability to react or which could impact on their judgement.
- Only use accessories and spare parts authorised by the manufacturer to exclude risks to persons due to unsui table replacement parts.
- Comply with the technical data and environmental conditions indicated in the product documentation.
- When installing or using unsuitable products in particularly delicate applications in terms of safety during use, unexpected operating conditions could occur that may cause damage to persons and / or property. Therefore, only use a product in particularly sensitive applications in terms of safety if such use is expressly specified and permitted in the product documentation. For example in areas with explosion protection or in parts of a safety-re lated command (functional safety).
- Only operate the product if it has been ascertained that the final product (e.g. a machine or system) in which the Fluid System products are installed complies with the provisions, safety directives and specific operating regulations of the respective country of use.

2.6 Safety warnings regarding the product and the technology

With the installation of the hydraulic cylinders in the machine there may be risks of interaction between the hydraulic cylinders and the entire machine, which can only be detected and reduced with an assessment of the risks of the machine or system. In particular, the effect of hydraulic and electrical controls on the hydraulic drives that generate mechanical movements makes it necessary to perform a risk analysis as well as requiring the presence of a user manual.

WARNING

Pressurised system!
- Danger of death, risk of injury, serious bodily injury due to operation of the system when it has not stopped!
- Damage to property!
- Make sure that the hydraulic cylinder is not pressurised.
- Do not loosen tube connections, couplings and components while the hydraulic cylinder is under pressure.
- Deactivate all power transmission components and connections (electrical, pneumatic, hydraulic) according to the manufacturer's instructions and secure the system against re-ignition.

Oil mist release due to defective or improperly fitted seals!
- Danger of fire, danger of explosion danger of allergic reactions, pollution of the environment!
- Only perform welding operations with the hydraulic cylinder depressurised.
- Keep naked flames and sources of ignition away from the hydraulic cylinder.
- Make sure that the earthing (welded electrical circuit) during the welding operations to the system is not carried out by means of a hydraulic cylinder.

WARNING

Danger to life in an explosive area.

- The earthing must always be connected to avoid electrostatic charges.

ATTENTION

Hot surfaces on hydraulic cylinders! Danger of injury! Danger of burns!

- Only touch the surfaces of the hydraulic cylinder with protective gloves or do not work with hot surfaces.
- Temperatures during or after operation may exceed 60°C (140°F) depending on the operating conditions.
- Before accessing the hydraulic cylinder, allow it to cool sufficiently.
- Observe the safety measures of the final machine manufacturer.

Hydraulic fluid is escaping uncontrollably from the hydraulic cylinder! Danger of fire! Danger of injury!

- Deactivate the system immediately (emergency switch).
- Identify and remove the cause of the sealing defect.
- Never try to eliminate the sealing defect or stop the oil jet with a cloth.
- Avoid direct contact with the jet of spray oil. It could escape at high pressure.
- Perform visual inspections regularly to check the seal of the hydraulic cylinder and the oil conduction components.

Danger of slipping due to oily surfaces! Danger of injury!

- Secure and mark out the danger area.
- Immediately remove any leaked hydraulic oil.
- Use oil binders to collect any leaked hydraulic oil.
- Remove and dispose of the contaminating oil binding agent (see section 13 "disposal").
- Wear the protective equipment prescribed for the activity.

3 GENERAL INDICATIONS TO AVOID DAMAGE TO PROPERTY AND TO THE PRODUCT

NOTIFICATION

Danger due to improper handling!

Damage to property!

- The product can only be used in accordance with paragraph 2.2 "Intended use".
- Do not bump into surfaces (e.g. surface of the piston rod, fastening surfaces) and components (e.g. end-of-stroke switch and screw coupling) that are relevant for functionality.

Mixture of hydraulic fluids!

Damage to property!

- The mixture of hydraulic fluids of different manufacturers or of different types of the same manufacturer is generally not permitted.

Contamination due to fluids and foreign bodies!

Premature wear and faults!

Adopt the following measures for protection of the hydraulic cylinder:

- During assembly, perform cleaning to prevent impurities such as weld seams or metal shavings from entering the hydraulic pipes that would cause wear and failure for the product.
- Ensure that the connections, hydraulic pipes and components (e.g. measuring devices) are clean and free from chips.
- For the removal of lubricants and other contaminants, use industrial cloths that leave no residue.
- Perform cleaning operations on the hydraulic cylinder only with the hydraulic connections closed
- Before commissioning, make sure that all the hydraulic and mechanical connections are correctly performed.

Improper cleaning!

Damage to property!

- Close all openings with adequate protective screws so that no detergent can penetrate.
- Check that all the seals and the closures of the electrical plug-in connections are well positioned so that no detergent can penetrate.
- Do not use any aggressive cleaning detergent. Clean the cylinder with a liquid product for adequate cleaning.
- Do not use any high pressure cleaner.
- For cleaning, do not use compressed air on the functional interfaces, such as for example. pivot bearings, oscillating pin bearing, piston rod and seal.

Operation with insufficient hydraulic fluid!

Damage to property!

- Follow the instructions of the system manufacturer shown in the Technical Dossier "Use and maintenance of hydrodynamic systems".

NOTIFICATION

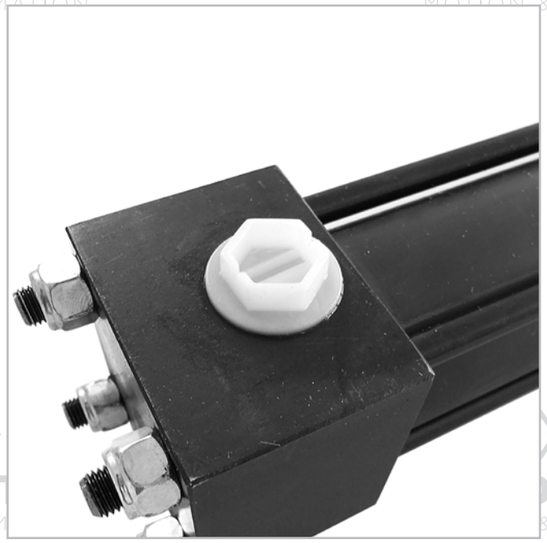
Spillage or pouring of hydraulic fluid.

Environmental pollution and contamination of groundwater!

- Use oil binders to collect the leaked oil.
- For oil filling and draining always place a collection tank under the cylinder.
- Observe the information given in the oil safety data sheet and the instructions of the system manufacturer.

4 EQUIPMENT

The cylinder connections are supplied with locking caps or cover plates. They are used exclusively for protection against contamination of the cylinder during transportation.



Detail of the closing cap

Detail of the plate

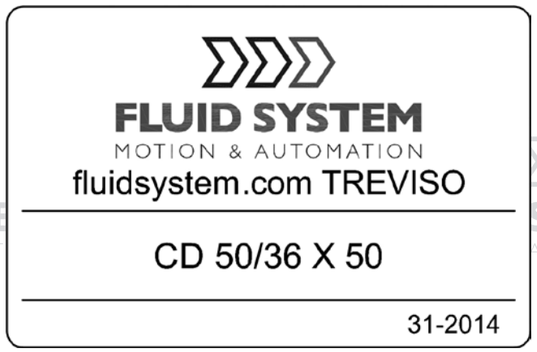
5 INFORMATION ON THE PRODUCT

5.1 Performance description

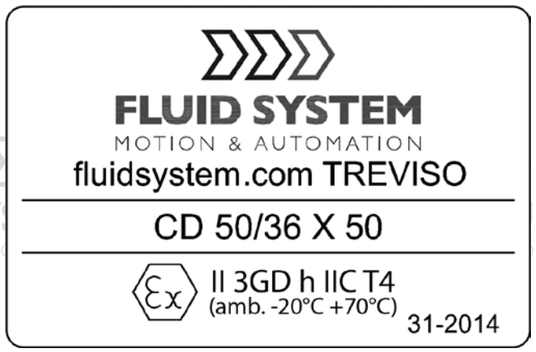
An hydraulic cylinder converts hydraulic energy into a linear movement. The driving force is determined by the hydraulic pressure in the cylinder chamber, thrust section and pull section.
Radial loads that gravitate on the rod are generally not permitted.

5.2 Product identification

Clear identification of the product takes place via:
- the plate
- the product specification documentation
- the delivery note and the accompanying documents



Standard cylinder plate (50x32 mm)



Atex plate (50x32 mm)

6 TRANSPORTATION AND STORAGE

6.1 Hydraulic cylinder transportation

WARNING

Uncontrolled extension of the piston rod and lifting of the hydraulic cylinder in the expansion elements (connection plates, pipes, etc.)!

Danger of injury or material damage!

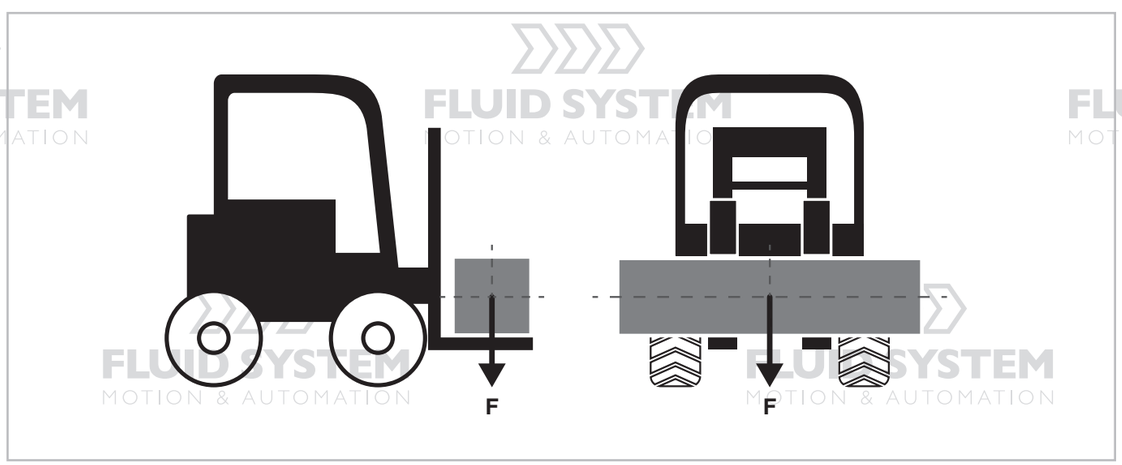
- The hydraulic cylinders must only be transported as described in this paragraph 6.1 "Transportation of the hydraulic cylinder".
- Keep the plastic plugs in the pipe connections during transportation.

Depending on the size and on the local conditions, the hydraulic cylinders can be transported with a forklift truck, a crane or a lifting device.
Observe the following guidelines when transporting and lifting the hydraulic cylinder:
- only transport the hydraulic cylinder in a horizontal position, possibly in the original packaging or on wooden blocks (wooden prism beams) which keep the hydraulic cylinder in a stable position
- make sure that during transportation of the hydraulic cylinder on wooden blocks, the components (connection plates, pipes, screw coupling, proximity switch, etc.) are free from pressure forces
- use soft lifting belts to avoid damaging the protection or paint work

With reference to the tolerance, the weight of the cylinder to be lifted could be approx. 10% higher than that indicated in the data sheets.
The Fluid System hydraulic cylinders are supplied without oil. After testing some oil may remain in the cylinder.

6.1.1 Transportation with a forklift truck

Proceed as follows:
1 - bring the forks of the forklift truck under the packing of the cylinder
2 - slightly lift the load and make sure of the position of the centre of gravity
3 - make sure that the cylinder does not move from its initial position
4 - if necessary, secure the cylinder to counter the movement of the forklift truck
5 - lift the forks with the cylinder only the distance required for handling



Forklift truck with the cylinder on the forks

6.1.2 Transportation with lifting equipment

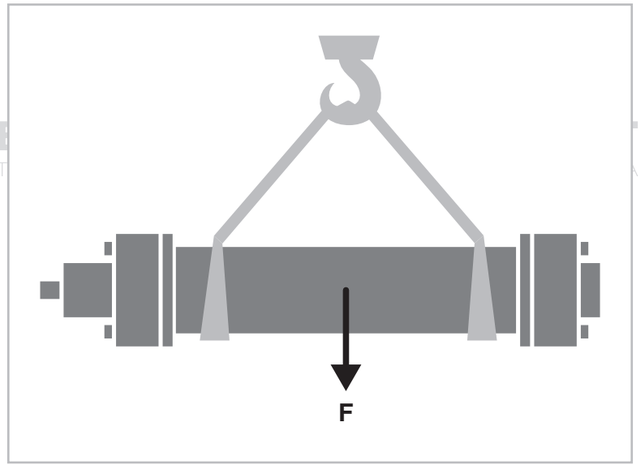
NOTIFICATION

Force due to the pressure of the lifting belt on the expansion elements (connection plates, pipes, valves)!

Damage to property!

- Fasten the lifting device taking into account that the belt does not rest on the expansion elements.

1 - Fix two lifting straps of equal length via the formation of eyelets at both ends of the cylinder of the hydraulic cylinder.
Check the pulling force of the belt being used.
2 - Lift the load slightly and check the position of the centre of gravity.
3 - Lift the cylinder only the distance required for handling.



Drawing of cylinder with belts

6.1.3 Manual transportation

If available, use appropriate auxiliary means, e.g. conveyor belt.

6.2 Preserving the hydraulic cylinders

6.2.1 Anti-corrosive protection

The Fluid System hydraulic cylinders can be supplied either with burnishing treatment or with background colour.
For both the following surfaces are not treated:
- coupling diameters and attachment surfaces
- sealing surfaces of both the pipe connection and of the flange connection
- valve attachment surfaces
- proximity switches
- position sensors
- Minimess pressure plugs
- bearings and joints

- lubrication fittings
All these untreated surfaces are protected with anti-corrosive oil.
This procedure is sufficient to guarantee good preservation in ideal environments for a short interval. Fluid System hydraulic cylinders, which are normally tested with mineral oil, therefore form a film in the inner chamber which guarantees good protection in the short term. The connections are closed with plastic caps or flanges.

6.2.2 Lengthy storage times

In case of storage of more than six months or for sea transportation, consult our technical office. We recommend carrying out internal and external inspections of the hydraulic cylinder during the storage interval:
- visual inspection of external protection, check for rust
- check internally for any oxidation of the hydraulic fluid
- inspect joints, various connections and mechanical coupling surfaces

7 ASSEMBLY

7.1 Unpacking

Remove the packaging and dispose of it in accordance with the national regulations.

7.2 Assembly conditions

The fixing surfaces on machines and systems must avoid twisting of the cylinder. Avoid side loads to the cylinder during operation.
- Fix the hydraulic cylinder so that its force acts on the cylinder axis.
- Make sure that the hydraulic cylinder and in particular the rod are not damaged during installation.
- Make sure that there is no damage to the cylinder joint when fitting the pins (if necessary, cool the pin during assembly).
- Try to avoid an excessive angle of inclination / oscillation on the pivot bearings thus avoiding the influence of abnormal forces on the fastening elements. It is advisable to keep the oscillation speed to a minimum for assembly on pins.

7.3 Hydraulic cylinder assembly

WARNING

Uncontrolled and dangerous machine movements!
Danger of injury or material damage!
- Before mounting the hydraulic cylinder, depressurise the relevant part of the cylinder. Also check that the system is free from mechanical stress.

- When the customer assembles the joints or other connecting elements on the hydraulic cylinder, screw the pivot head to the stop point of the thread.
- The cylinder attachments cannot be used to adjust the assembly differences.
- Remove the protection devices on the connections only during performing of the related connection.

7.3.1 Installation of the hydraulic cylinder within the system

For lifting and moving follow the same rules, see chapter 6.1.2.

7.3.2 Hydraulic connection of the hydraulic cylinder

The hydraulic connection must be made according to the indications of the hydraulic diagram of the system.

7.3.3 Electrical power supply connection

WARNING

Improper electrical connection in potentially explosive areas!
Danger of injury or material damage!
- Make the electrical connections in the system in a compliant and precise manner.
- The earthing must be connected.

The electrical connections, limit switches or position transducers must respect the wiring diagram.

8 COMMISSIONING

8.1 First commissioning

- All attachment surfaces including pipes must be cleaned of impurities, slag and chips.
- Follow the assembly instructions of the manufacturer of pipes and hydraulic fittings.
- Sealants such as hemp and putty are not permitted because they can pollute the oil.
- Check the tightness of the system.
- Size the connecting pipes and fittings respecting the data (pressure, flow) shown in the hydraulic diagram.

8.1.1 Operation of filling and discharge of the hydraulic cylinder

WARNING

Uncontrolled and dangerous machine movements!

Danger of death or damage to property!

• Do not completely unscrew the discharge valve.

ATTENTION

Contact with hydraulic fluid!

Danger to health. Damage to health, for example eye injury, skin damage, respiration poisoning.

•Avoid contact with oil.

•Respect, in the use of the oil, the safety indications produced by the hydraulic fluid manufacturer.

•Use own personal safety equipment (goggles, gloves, shoes, work clothes).

•If hydraulic fluid comes into contact with the eyes, with a blood vessel or is swallowed, consult a doctor immediately.

In case of uncertainty on how to proceed with the discharge and filling operations of the hydraulic cylinder, contact the Fluid System service centre.

For filling and discharge of the hydraulic cylinder, start from the removed rod position and proceed as follows:

- Use a hydraulic diagram of the system that is completely understandable.
- Collect the oil that is released from the discharge operation in a suitable container.
- Open the purge screw on the cylinder rod side without pressure (see the following figure).
- Adjust the hydraulic system to a pressure not higher than 8 bar.
- Activate the control valve so that the hydraulic cylinder tends to move very slowly. The air present is dispersed through the previously opened vent.
- As soon as oil comes out, the cylinder is purged. This only applies if the vent is at the highest point.
- Deactivate the control valve and close the purge screw.
- With the same procedure purge the push side.
- In the hydraulic cylinders without the purge valve, carry out the operations described above by slightly unscrewing the connection fittings and then reclose them all once the operation has been performed.
- The hydraulic cylinder is therefore ready for use.
- Leave the hydraulic cylinder running with minimum pressure until the purging operation is completed.
- Observe the oil level in the system tank and, if necessary, top up.

Hydraulic cylinder vent

- Open the nut with a wrench and with a hexagonal wrench unscrew two turns keeping the nut fixed.
- The air is completely expelled when the oil comes out without air bubbles.
- To close, tighten the nut well until no more oil comes out.

8.1.2 Starting the hydraulic cylinder

After installing the hydraulic cylinder in the system, filled with the appropriate oil and having purged the cylinde correctly, the hydraulic cylinder can be put into operation.
Follow the user manual specific for the product and for the system.

8.1.3 Adjustment of end-stroke damping.

WARNING

Uncontrolled and dangerous machine movements!

Danger of death, injury or damage to property!

• Do not completely unscrew the damper valve.

When operating with a dampened cylinder, to achieve an optimal damping effect, the damper valve must be closed.
For this purpose, the data shown on the cylinder plate and on the product data sheets must be considered.
The hydraulic cylinders are supplied with the maximum damping efficiency, i.e. completely closed.

With unscrewing of the damping pin the speed is increased.

To change the damper settings, loosen the nut and turn the throttle screw with a hexagonal wrench. In a clockwise direction, the damping speed is reduced, in an anti-clockwise direction, the damping speed is increased.

When the desired speed is obtained, holding the throttling screw in place, close the nut.

Cylinder damping

8.2 Washing of the system / of the hydraulic cylinder

To wash the hydraulic system, it is good practice to keep the cylinder separate from the system.
With the installation of the cylinder or its components in the machine, it must be ensured that the contamination class established for the system is not exceeded.

9 OPERATION

The data for the operation of the hydraulic cylinder is an integral part of the machine or system where they are used.
- Consult the data in the manual of the machine or system.

10 MAINTENANCE AND REPAIR

The Fluid System hydraulic cylinders are constructed with structural assumptions suitable for high functionality. They require very little maintenance but these are essential for good operation.
A high percentage of anomalies is mainly due to the purity of hydraulic fluids. The relative costs are due to the verification and implementation of the necessary measures to restore the purity of the hydraulic fluid.

10.1 Cleaning and looking after the equipment

- For all interventions ensure maximum cleanliness.
- Before disconnecting fittings and components, carefully clean the entire external environment.
- Close all pipes and fittings with caps to avoid impurities in the circuit.

10.2 Inspection

It is advisable to document all the results of the inspections:
- to adjust inspection intervals to the actual operating conditions
- to promptly detect faults by comparing the documented data

10.3 Maintenance plan

- In this regard, it is advisable to consult the system manufacturer's maintenance program.

10.4 Maintenance

After commissioning an hydraulic system, it is good practice to carry out checks paying attention to:
- possible oil leakage near the connections
- checking for signs of sliding or mechanical damage to the rod. These traces may indicate the presence of contaminated oil or of loads not in axis
- damage to the cladding
- possibility of losses from the heads
- extreme temperatures that can reduce the life of the system. Consult the use and maintenance manual of the hydraulic system and the hydraulic fluid table
- the seal and bushing replacement intervals depend on use, on the conditions of use and on the temperatures. No fixed expiry dates are established
- leaks around the rod require immediate replacement
- the lubrication intervals at joints and articulated points must be defined during the machine design phase

WARNING

Risk of ignition of hydraulic cylinders with EX marking due to insufficient maintenance or repair!

Danger of death! Danger of injury!

- regularly check that the layer of dust deposited on the cylinder is less than 5mm. It must be eliminated regularly so that there is no danger of ignition in an explosive environment.
- verify that the earthing is always connected. There is a danger of ignition due to electrostatic charge.

Perform preventive maintenance:
- clean the rods from residues of salt, sand and processing material, as well as from all other impurities present on the rod
- maintenance must only be performed on clean and dry rods
- dampen an industrial cloth with protective oil and pass it over the rod

In the event of contact with chemical agents, the above must be carried out immediately.
The maintenance described above should be carried out before initial commissioning of the hydraulic cylinder or after periods of inactivity.

10.5 Replacement of parts subject to wear

In case of questions, requests or uncertainty, always contact Fluid System. Opening of the hydraulic cylinder invalidates any warranty claims.

10.6 Repair

Fluid System presents a complete service offer for the repair of hydraulic cylinders.

10.7 Spare parts

NOTIFICATION

Machine malfunction due to inadequate spare parts!
Damage to property!
- Use only the components indicated in the specific documentation
- Use seals that have the necessary fluid resistance
- the seal material is often different, check the correct product code.

When ordering spare parts provide the cylinder identification data:
- product code and job number (identification plate).

11 DECOMMISSIONING

11.1 Preparing for decommissioning

WARNING

High operating pressure in the hydraulic cylinder and in the system!
Danger of injury or damage to property due to flying parts or oil escaping during operation!
- Deactivate all power transmission components and connections (electric, pneumatic, hydraulic) according to the manufacturer's instructions.
- Remove the pressure from any accumulators that may be present.

When decommissioning and disassembling the hydraulic cylinder, observe the following:
- For safety reasons, it is not possible to disconnect fittings and pipes under pressure. Firstly, lower the loads, switch off the system and remove the pressure from the accumulator. Secure the system against reactivation.
- Prepare the oil collection tanks.

11.2 Disassembly

Before working on the hydraulic cylinder, implement the following measures:
- obtain an assembly diagram and a spare parts list
- use clean and professional tools. Clean the entire work area
- during dismantling, avoid impurities entering the cylinder itself, seal the connections
- avoid damage to the cylinder. Place the cylinder on a stable support
- for lifting and moving; follow the same rules described in chapter 6.1

12 DISASSEMBLY AND REPLACEMENT

To replace the components, the hydraulic cylinder must be disassembled.

12.1 Performing disassembly

For disassembly proceed as follows:
- allow the hydraulic fluid to flow with the cylinder still mounted. Complete emptying is performed after dismantling
- remove the cylinder head and let the remaining oil escape from the pipe. If necessary, remove the rod from the pipe, using lifting belts and place it on specially prepared stable blocks
- if necessary, remove the locking device between the joint and the rod and then perform the unscrewing operation
- remove the head from the rod if necessary, turn it slowly
- remove the seals to be replaced and clean the slots in the head from impurities

12.2 Replacement of components

In case of questions, requests and uncertainty, contact Fluid System.

13 DISPOSAL

Dispose of each material according to the law.
- Follow the disposal instructions in the hydraulic fluid datasheets. Incorrect disposal can cause environmental pollution.

FLUID SYSTEM

MOTION & AUTOMATION

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