

General instructions Hydraulic cylinder

This document applies to hydraulic cylinders supplied by Arcos Hydraulik AB. The document is for purchasers, designers, technicians, maintenance personnel and logistics personnel.

1. Safety Instructions
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1 Safety Instructions.

1.1 General information.

The product is manufactured according to the established method, but there is still a risk of injury or property if you do not read and take this document into consideration. This document shall be made available to any person who may need to handle the product.

Only use a product that is in undamaged condition.

Only use spare parts supplied by Arcos Hydraulik AB.

Only assemble and use the product as intended, if in doubt, contact Arcos Hydraulik AB.

Observe environmental and work environmental regulations and accident prevention and protection.

Observe the safety regulations and regulations in the country where the product is used.

Personnel handling the product must not be under the influence of substances that may affect the ability to work safely.

A risk analysis must always be carried out of the complete machine/system before a hydraulic cylinder is put into use.

1.2 Intended use.

This product is a hydraulic cylinder which, according to the Machinery Directives 2006/42/EC and DIN EN ISO 4413, is not an independently functioning machine, the hydraulic cylinder is intended to be part of an industrial machine or system. The impact of the hydraulic cylinder on risks to people, property and the environment must be assessed by the user/integrator based on the actual conditions.

1.3 Inappropriate use.

Any use that deviates from the intended is not permitted. Arcos Hydraulik accepts no liability for damage caused by the product through inappropriate use. The user is responsible for ensuring that the product is used in the manner intended.

1.4 Explosive atmospheres.

Hydraulic cylinders supplied by Arcos Hydraulik AB must generally not be mounted or used in explosive environments. If this is a requirement, please contact Arcos Hydraulik AB.

1.5 Personal qualifications.

Any use of this product requires that the user has sufficient knowledge of mechanics, electronics, and hydraulics to be able to foresee any risks that may arise when working with the product.

1.6 Protective equipment.

When working with the product, always use protective equipment that has emerged from the risk assessment, examples of suitable personal protective equipment are:

- Goggles
- Hearing protection
- Gloves
- Helmet
- Safety footwear

1.7 Leakage.

In the event of a suspected leak from the hydraulic cylinder, the system must be stopped, depressurized and the leak located. Avoid contact with hydraulic oil and use the necessary protective equipment.

Never work with a pressurized hydraulic cylinder or system that is not safely stopped, as this could be fatal.

2 Transportation and storage.

2.1 Transportation.

Use lifting equipment that can safely lift the hydraulic cylinder, use multiple attachment points. Built-on equipment such as feed pipes/sensors, etc. must not be used as a lifting point.

Wear protective equipment (see chapter 1.6) and never walk or stand under a lifted load. The product must be secured against rolling or falling during handling and storage.

2.2 Storage.

The cylinder must be stored in the condition in which it is delivered in a manner that does not adversely affect the cylinder. The space should be dry and dust-free, free from corrosive substances, fumes, and other environmental influences.

Do not remove cover plugs.

Storage should take place indoors with a controlled humidity (<65%), no condensation and temperature above 7 degrees Celsius. If this cannot be met, the current storage conditions must be assessed locally, and specific measures taken to ensure that the cylinder is not adversely affected.

Table 1: Storage conditions:

Designation	Area
Temperature range	+7 °C to +35 °C
Relative humidity (no condensation)	Not more than 65 %
UV protection	100%
Condensation	No
Additional ozone impact near storage site	No

Storage periods as shown in Table 2

According to the values given in Table 2 "Storage times", the internal protection shall be achieved by testing/flushing or topping up with anti-corrosion oil.

When storing a hydraulic cylinder filled with oil, a pipeline between the + and – side connections must be fitted. Hydraulic cylinders filled with oil must not be exposed to direct sunlight or other heat sources as the pressure in the hydraulic cylinder is affected by the ambient temperature. To prevent this, a pressure accumulator should be fitted if necessary.

Table 2: Storage times:

Storage conditions	Packaging	Preservatives	Max. storage time in months	
			Testing with protective agents	Filling with protective agents
Storing in dry Rooms with constant temperature	For transport abroad	A	12	24
	Not for transport abroad	A	9	24
Outdoor storage Protected against damage, exposure to sunlight and water ingress	For transport abroad	B	12	24
		A	6	12
	Not for transport abroad	B	9	24
		A	-	12
		B	6	24
Pressure testing with protective agents		A = mineral oil		
Filling with preservatives		B = anti-corrosion oil		

When stored for more than six months, the surface of the hydraulic cylinder must be coated or treated with anti-corrosion oil. Unprotected parts such as mounting surfaces or mechanical interfaces must be protected with anti-corrosion oil.

- Protect the plain bearings and mounting surfaces from moisture.
- When stored with anti-corrosion oil, drain the hydraulic cylinder completely before commissioning.
- Since deformations of seals cannot be excluded, check, and initiate the replacement of the seals if necessary.
- Contact Arcos Hydraulik AB for guidance on conservation and commissioning of the hydraulic cylinder if it needs to be stored for a longer period of time than stated in table 2 "Storage times".

If improperly stored, cylinder surfaces may corrode, seals may become brittle, and the anti-corrosion oil may resin.

2.3 Inspection during storage time.

In order for the hydraulic cylinder to remain in perfect condition during storage, the following conditions must be met:

- During the storage period, carry out regular thorough inspections. In particular, take note of the following when doing so:
 - Exterior preservation: visual inspection for damage and rust formation
 - Hydraulic oil: check for oxidation or acidification
 - Inspection and lubrication of bearings.
 - Inspection of mounting surfaces or mechanical interfaces
- During storage, the hydraulic cylinder should be exercised regularly to prevent the seals from gluing/vulcanizing. Depending on the results, you may need to take corrective action.

To prevent damage to the seals, Arcos Hydraulik recommends rotating the hydraulic cylinders 90° every six weeks if they are not stored vertically.

Information on packaged hydraulic cylinders

- If you open the package for inspection purposes, you must close it tightly again.
- When packing for transport abroad, enclose new desiccants.

Be careful when removing the port plugs so that no pressure has built up.

The packaging in which the hydraulic cylinder is supplied is only intended for the above-mentioned environment. If the product is to be stored in any other way, this must be stated when ordering and confirmed by Arcos Hydraulik AB.

2.4. Actual conditions.

These transport and storage instructions should be considered as a guideline, storage conditions must be assessed locally, and special measures must be taken to ensure that the hydraulic cylinder and its equipment are not adversely affected.

3 Installation.

3.1 Installation.

Check that the hydraulic system media matches the specified media on the drawing, and that the min/max operating temperature of the seals is not exceeded.

Cleanliness of the hydraulic oil shall be in accordance with ISO4406 20/18/15, or according to customer-specific technical specification.

Check that the working pressure of the hydraulic system is below the maximum working pressure indicated in the drawing.

Uneven loading and other external loads must be minimized. If supports for self-weight management is a requirement, these must be installed and adjusted to achieve the expected function.

Make sure that any other restrictions specified on the drawing are not exceeded.

Cylinder venting must be carried out during start-up at 0 pressure or "no-load pressure".

Connection of hydraulic hose/pipe must be done according to the hydraulic diagram. Components such as sensors must be connected according to the electrical schematic.

Please observe any other instructions for installation and use that may be unique to your order.

4 Usage.

4.1 Usage.

The design of a hydraulic cylinder involves compromises to some extent as the desire for properties in some cases involves a trade-off, for example the choice of seal and bearing material, corrosion protection, functions, safety, and maintenance levels, etc. The cylinder's most important functions and conditions must be specified by the customer/user before the development of the concept so that we together can discuss and decide on the most appropriate methodology based on customer expectations.

When a hydraulic cylinder is not intended for independent use, information and instructions for the end use of the complete machine must be produced by the machine/system manufacturer.

5 Maintenance.

5.1 Maintenance.

Arcos Hydraulic Cylinders are manufactured according to the best industry standards based on desideratum and requirements, but to ensure long-term trouble-free function, intervals and execution of maintenance need to be adapted to the actual conditions. Examples of areas that need to be regularly checked, cleaned, and lubricated with a suitable lubricant are Attachments such as joint bearings, plain bearings, bushings, yokes and the like.

Check the attachments and wear of the fasteners regularly, if there is too much play, the fastener bearings must be replaced. Spare parts are ordered from Arcos Hydraulik AB.

Checks of scrapers must be carried out at frequent intervals as their function is important for the life of the cylinder. If the wiper is damaged, affected or does not function satisfactorily, it must be replaced.

The surface finish of the piston rod must be checked at frequent intervals. There should be no scratches, bruises, or other damage. If the piston rod has suffered damage that affects the function, the cylinder must be sent to the factory for refurbishment, or a new piston rod must be ordered from Arcos Hydraulik AB.

The seals of the cylinder must be checked at frequent intervals.

Seals and inner bearings are wear and tear parts and must be replaced if necessary.

If the internal or external leakage becomes too large, it is recommended that the cylinder is sent to Arcos Hydraulik AB for service. Alternatively, a repair kit can be ordered. Refer to the drawing for part numbers.

Control of the impact of the external environment must be continuously checked and ensured that it does not affect the cylinder's ability to function without malfunction.

6 Warranty.

6.1 General.

Arcos's general warranty commitment is regulated through the agreement drawn up at the time of order, normally Orgalime S 2012. Generally, the customer must always first contact Arcos if they have any concerns about deficiencies in function, for consultation and decision. Arcos does not take any responsibility for costs incurred by the customer that we have not approved in advance. The cylinder may not be opened by the customer before approval by Arcos, deviation from this means forfeiture of the warranty.

Out-of-specification use of the cylinder and/or lack of maintenance will result in forfeiture of warranty.