INSTRUCTIONS & MAINTENANCE SHEET





HYDRAULIC CYLINDERS SINGLE- AND DOUBLE ACTING

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ESSENTIAL SAFETY REQUIREMENTS



The correct union of a pump to a cylinder via a hydraulic hose constitutes a machine designed for lifting, pulling, folding and retaining operations, etc., that, due to its high thrust capacity requires safe use in order to avoid accident risk.



Read the instruction manual carefully and practise using the equipment before application.



Choose the most suitable model for the application from the wide range available, and make sure that it will not exceed 80% of its nominal capacity and stroke during normal operation.



Use protective goggles for eye protection.



Use safety shoes for feet protection.



Use protective gloves for hand protection.



Do not modify the device (welded parts, lengthening drive levers, etc.).



Do not use the hoses for transporting the device. Use the handles on the cylinders (when appropriate) and set the pump lever to the transport position.

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When filling the pump with oil, use always BAHCO hydraulic oil. Fill only to the indicated level and remember that the cylinder piston should be retracted.



Before using a pump from other manufacturer, contact BAHCO Technical Department. Otherwise, BAHCO will not be liable for any damage that may arise.



ESSENTIAL SAFETY REQUIREMENTS



Before starting operation, check that the installation is correct, the operator position is safe and the working zone is out of bounds to all personnel.



In all cases, the operator should have received adequate training regarding the handling of the device and logical safety criteria associated with the movement of heavy loads.



Never exceed the maximum working pressure of the cylinder. Ensure that all the equipment and accessories are suitable for the maximum working pressure.

ESSENTIAL SAFETY REQUIREMENTS



Place the equipment on a flat and solid area. Define stable zones for applying the load and safety zones for operators, separating them through the use of hoses of enough length. Use our base plates if necessary.





Secure the load mechanically once the movement has been completed and avoid operating underneath them.



Center the load in the cylinder. Use the entire cylinder's useful support surface, both on the head and on the base. Use tilting saddles under side loads.



Do not expose the equipment to intense heat sources (welding), nor to temperatures above 65°C.



Remove loads before carrying out maintenance operations and always work in clean, well-lit areas.



Include control elements (pressure gauges) in the installation in order to enable the operator to monitor the pressure in the system and ensure that the equipment's nominal capacity is never exceeded. Be prepared to use safety valves and accessories if safety criteria demand it.







The cylinder controls should be activated manually, as should the connections between elements equipped with couplers.

Once you have finished using the device, check that it has not been damaged, clean it and protect it ready for storage. If there are worn or damaged pieces, replace them with new ones.

Clean the couplers before connecting and ensure the connections are perfect (first insert as far as the coupler will go and then screw it by hand). A bad connection may result in improper functioning and may even generate a safety hazard.

Install the device in such a way as to ensure that the hoses are not subjected to sharp or forced bends or thrust actions that may cause them to break. Never disconnect the hoses when the system is pressurized.

RECEIPT OF GOODS

Unpack and visually check all the components, making sure that there are no oil leaks, loose or damaged couplers, damaged threads, etc. Never use components that are damaged or appear to be in poor condition.

Ensure that all the equipment and accessories are suitable for the maximum working pressure.









SINGLE ACTING HYDRAULIC SYSTEM

The single acting hydraulic cylinders are fitted with either a coupling nipple or a screw coupling (both optional). If you have to fit the screw coupling in the cylinder, apply teflon around the 3/8" NPT male thread of the coupler. For the coupling nipple, use the provided gasket.

Assemble the device in accordance with the instructions given in the diagram, first checking that you have all the necessary material.

- Remove the dust protectors from the quick couplers and from the hose.
- Clean quick couplers, hose ends and connectors.
- The couplers only must be connected or disconnected when the hose is depressurised.
- Ensure the connections are perfectly engaged to ensure the correct function of the system.
- Bleed the cylinder. Locate the pump on a higher level than the cylinder, with the piston pointing downwards and the coupler upwards. Extend and retract the cylinder several times, until it operates properly.

SINGLE ACTING SYSTEM WITH 1 CYLINDER





START UP OF A SINGLE ACTING INSTALLATION

The cylinders can operate vertically upwards, downwards or horizontally.

Check the correct installation and perfect functioning of the device with a load, in accordance with the next procedure:

- Operate the pump to move the cylinder, following its operating instructions.
- If the cylinder needs to be fully extended, continue pumping manually until the maximum stroke end is reached.
- If any control elements (pressure gauges) are available, you will be able to see how the pressure increases along with the effort required to move the lever
- Continue pumping until you reach the maximum pressure.
 When using a manual pump, in this way you will be able to check the correct functioning of the internal safety valve and the absence of oil leaks in the installation.
- Maintain system pressure for a few minutes without pumping, in order to check the correct functioning of the pump's check valve.
- Smoothly open the pump's valve in order to protect the pressure gauge needle.
- If the cylinder has a spring return the piston will move back automatically. The return speed may be slow in some applications. In this case, we recommend the use of double acting cylinders. In the case of load return cylinders you will need to push the piston back using more or less force, depending on the size and position of the cylinder.
- In cylinders without mechanical end of stroke this type of test cannot be carried out. If you do not have a test bench, you will have to test the installation using the actual load in the application. This operation should be carried out with extreme care, by experienced personnel, and maximum safety measures should be applied.
- Repeat the processes as many times as necessary until you are comfortable handling the device.
- When using close or check valves, or working with various cylinders via flow distributors, remember to take into consideration the effect these accessories may have on the functioning of the device, and establish an operating procedure in order to avoid unwanted effects.



SINGLE ACTING SYSTEM WITH 2 CYLINDERS



Ensure that all the equipment and accessories are suitable for the maximum working pressure.

DOUBLE ACTING HYDRAULIC SYSTEM

The double acting hydraulic cylinders are fitted with two screw couplings or coupling nipples. If you have to fit the couplers in the cylinder, apply teflon around the 3/8" NPT male thread of the coupler. For the coupling nipples, use the provided gasket.

Assemble the device in accordance with the instructions given in the diagram, first checking that you have all the necessary material.

- Remove the dust protectors from the quick couplers and from the hoses.
- Clean quick couplers, hoses ends and connectors.
- The right connection of the couplers is very important because with a wrong connection the system does not work and also can cause overpressure that can break the cylinder. Note which hose connects to the advance chamber and which one to the return chamber. Connect the hose from the return chamber and then connect the hose from the advance chamber. The couplers only must be connected or disconnected when the hoses are depressurised.



- Screw or insert the hose from the return chamber to the pump.
- Connect the other hose end to the cylinder (return chamber).
- Connect the second hose from the pump to the advance chamber, following the same procedure as with the first hose.
- Ensure the connections are perfectly engaged to ensure the correct function of the system.
- Bleed the cylinder. Locate the pump on a higher level than the cylinder, with the piston pointing downwards and the coupler upwards. Extend and retract the cylinder several times, until it operates properly.



DOUBLE ACTING SYSTEM WITH 1 CYLINDER

START UP OF A DOUBLE ACTING INSTALLATION

The cylinders can operate vertically upwards, downwards or horizontally and are fitted with a safety valve to prevent pressure intensification in the return chamber.

Check the correct installation and perfect functioning of the device with a load, in accordance with the next procedure:

- All double acting cylinders are equipped with a mechanical end of stroke capable of withstanding the nominal pressure.
- Operate the pump to move the cylinder, following its operating instructions.



- When using a hand pump, turn the lever of the valve and pump. Oil will flow through the hose connected to the opposite side that the valve lever is rotated. If the hose is connected to the cylinder's advance chamber, the piston will move forward. The oil in the return chamber will flow freely through the other hose to the pump tank. Flow is supplied by both, large and small pistons until the cylinder reaches the load.
- Continue pumping until you reach the mechanical end of stroke. Pressurize ins tallation to check for leaks.
- Stop pumping and check (preferably using a pressure gauge) that the installation maintains the pressure level.
- Turn the valve lever to the other side and pump. Oil will flow to the return chamber and the piston will move back. The oil in the advance chamber will flow freely back to the tank.
- Repeat the processes as many times as necessary until you are comfortable handling the device.
- If using close or check valves, or working with various cylinders via flow distributors, remember to take into consideration the effect these accessories may have on the functioning of the device, and establish an operating procedure in order to avoid unwanted effects.

OPERATION

- Single Acting Cylinders, without Spring Return When pressurizing the advance chamber, the piston starts moving until the pumping stops. When the cylinder is depressurized, the piston will only return by the effect of an external load.
- **Single Acting Cylinders, Spring Return** When pressurizing the advance chamber, the piston starts moving until the pumping stops. When the cylinder is pressurized, the piston returns by the effect of the spring.

Double Acting Cylinders

When pressurizing the advance chamber, the piston starts moving until the pumping stops. The return chamber must be depressurized to extend the piston.



MAINTENANCE

- Use always BAHCO oil. The use of any other liquid will invalidate the warranty.
- If the oil is dirty, replace it completely.
- Retract completely the piston after its use.
- Depressurize the system.
- When the hoses are disconnected, fit the dust protectors to the quick couplers.
- Before storing the cylinder, check that there are no damages and clean and protect it for storage.
- If there are worn or damaged pieces, replace them with original BAHCO, using appropriate tools and personal safety equipment. This work must always be done by qualified and authorized personnel.
- Grease the areas exposed to wear or oxidation.
- Before a longterm storage, fully extend and retract the piston once, storing the cylinder upside down.
- Make an annual visual inspection
- Every 12 months or when there are doubts of cylinder's safety and reliability, check that the piston extends and retracts the whole stroke.

NOTE: To order spare parts, it is necessary to provide the serial number of the equipment.

When making structural alterations, the operating permit expires!



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