

SURKON[®]

INTERNATIONAL

INSTRUCTIONS & MAINTENANCE SHEET

HYDRAULIC CYLINDERS



INDEX	PAG.
Index	2
Warranty	2
Essential safety requirements	3
Receipt of goods	5
Single acting hydraulic system	5
Start up of a single acting installation	6
Double acting hydraulic system	7
Start up of a double acting installation	8
Operation	9
Maintenance	9
Breakdowns and repairs	10

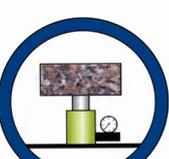
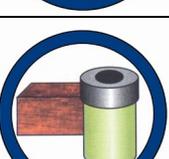
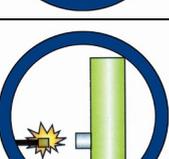
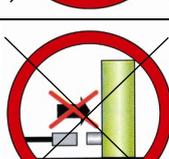
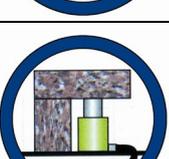
WARRANTY

SURKON guarantees its products against all design and manufacturing defects for two years from the date of purchase. This guarantee does not include the ordinary wear of both metal and non-metal parts, abuse, using the equipment beyond its rated capacity and any wear or damage incurred as a result of using a hydraulic fluid which is not recommended by **SURKON**

Please note that if the equipment is disassembled or serviced by anyone other than an authorized service dealer or by **SURKON**, this guarantee is rendered null and void.

In the event of a warranty claim, return the equipment to **SURKON** or the authorized dealer which sold you the hydraulic equipment. **SURKON** will repair or replace the faulty equipment, whichever is deemed most appropriate.

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 practice 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.
	When filling the pump with oil, use suitable hydraulic oil. Fill only to the indicated level and remember that the cylinder piston should be retracted.
	A pump and hose should be used within the appropriate pressure range. Otherwise, SURKON will not be responsible for possible damages.
	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.

RIGHT	ESSENTIAL SAFFETY REQUIREMENTS	WRONG
	<p>Place the equipment on a flat and solid area. Define stable zones for applying the load and safety zones for operators, separating them using hoses of enough length. Use our base plates if necessary.</p>	
	<p>Secure the load mechanically once the movement has been completed and avoid operating underneath them.</p>	
	<p>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.</p>	
	<p>Do not expose the equipment to intense heat sources (welding), nor to temperatures above 65°C.</p>	
	<p>Remove loads before carrying out maintenance operations and always work in clean, well-lit areas.</p>	
	<p>Include control elements (pressure gauges) in the installation 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.</p>	
	<p>The cylinder controls should be activated manually, as should the connections between elements equipped with couplers.</p>	
	<p>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.</p>	
	<p>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.</p>	
	<p>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.</p>	

**Apply 2 rounds of teflon around all 3/8" NPT male threads of the system, in the thread direction, leaving the first wire of the thread without covering to prevent the tape breaking.
Tightening Torque: 100 Nm.**

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 one female quick coupler. If you have to fit the coupler in the cylinder, apply Teflon around the 3/8" NPT male thread of the coupler.

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.
- Screw the male coupler to the hose. For that, apply Teflon around the 3/8" NPT male thread of the hose.
- Connect the other hose end to the pump. For that, apply Teflon around the 3/8" NPT male thread of the hose.
- Connect the hose end with the male coupler to the cylinder, tightening completely the couplers (first insert as far as the plug will go and then screw it by hand). The couplers only must be connected or disconnected when the hose is depressurised. For safety, as option, a manually operated check valve can be mounted into the cylinder, that when is closed, allows oil flow in one direction only, holding the load.
- 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



SINGLE ACTING SYSTEM WITH 2 CYLINDERS



START UP OF A SINGLE ACTING INSTALLATION

SURKON 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 is equipped with a mechanical end of stroke capable of withstanding the maximum device pressure, continue pumping until the end of stroke 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 (700 kg/cm²). 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, to check the correct functioning of the pump's check valve.
- Smoothly open the pump's valve to protect the pressure gauge needle. In hand pumps, do not force the drive screw when open, the cylinder will not move back more quickly if the screw is looser. One turn is sufficient.
- 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.

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 female quick couplers. If you must fit the couplers in the cylinder, apply Teflon around the 3/8" NPT male thread of the coupler.

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

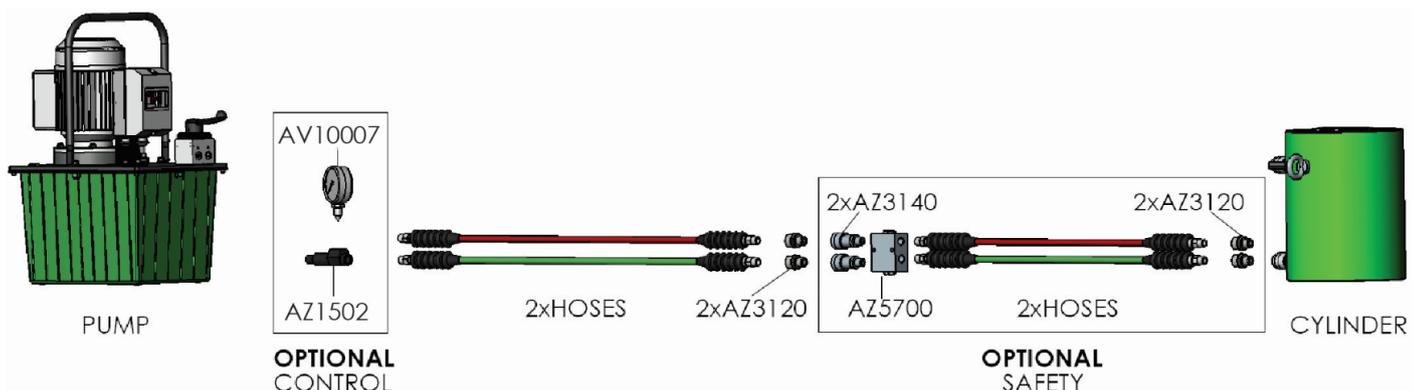
- Remove the dust protectors from the quick couplers and from the hoses.
- Clean quick couplers, hoses end and connectors.
- Screw the male couplers to one end of each hose. For that, apply Teflon around the 3/8" NPT male thread of the hose.

The right connection of the couplers is very important because with a **wrong connection the system does not work and 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.

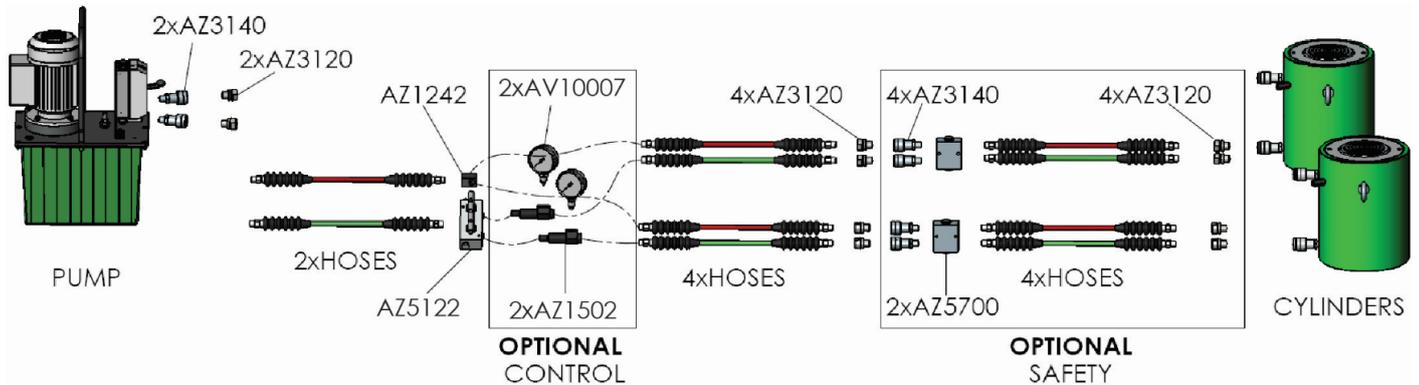
For safety, as an option, a pilot operated check valve can be mounted to hold the load until the pressure in the return line actuates the valve.

- Screw the hose from the return chamber to the pump. For that, apply Teflon around the 3/8" NPT male thread of the hose.
- Connect the other hose end to the cylinder (return chamber), tightening completely the couplers (first insert as far as the plug will go and then screw it by hand).
- 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



DOUBLE ACTING SYSTEM WITH 2 CYLINDERS



START UP OF A DOUBLE ACTING INSTALLATION

SURKON 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 SURKON 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 de load.
- Continue pumping until you reach the mechanical end of stroke. Pressurize installation 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, LOAD 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 retract the piston.

MAINTENANCE

- Use always SURKON oil. The use of any other liquid will invalidate the warranty. Use DIN ISO 6743-4: ISO HM32 for pumps and jacks, and ISO HM46 for powerpacks.
- 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 SURKON, 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 long-term storage, fully extend and retract the piston once, storing the cylinder upside down.
- Make an annual visual inspection.
- Every 3 years 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.

BREAKDOWNS AND REPAIRS

The cylinders must always be handled and repaired by qualified personnel.

PROBLEM	POSSIBLE CAUSE	SOLUTION
Cylinder will not advance when pumping.	Oil level in pump is low.	Check level.
	Incorrect coupler connection.	Check connections.
	Pump malfunctioning.	Check pump instructions.
	Pump release valve open.	Close the valve.
	Load exceeds the capacity of the system.	Use appropriate cylinder.
	Cylinder seals leaking.	Replace seals with new ones.
Cylinder will not advance properly.	Oil level in pump is low.	Check level.
	Incorrect couplers connection.	Check connections.
	Pump malfunctioning.	Check pump instructions.
	Air in the hydraulic system.	Bleed the circuit
	Blocked hose.	Check connections and no bends on hose.
	Cylinder seals leaking.	Replace seals with new ones.
	Leaking connection.	Check connections.
Cylinder will not reach or hold pressure.	Pump malfunctioning.	Check pump instructions.
	Leaking connection.	Check connections.
	Cylinder seals leaking.	Replace seals with new ones.
Cylinder will not retract.	Pump tank over-filled.	Check level.
	Pump release valve closed.	Open the valve.
	Incorrect coupler connection.	Check connections.
	Blocked hose.	Check connections and no bends on hoses.
	Damaged cylinder.	Repair or replace the cylinder with a new one, by qualified personnel or by SURKON or SURKON's Technical Services.
Cylinder leaks oil.	Faulty seals.	Replace seals with news.
	Loose connections.	Check connections.
	Damaged cylinder.	Repair or replace the cylinder with a new one, by qualified personnel or by SURKON or SURKON's Technical Services.
Safety valve leaks oil.	Incorrect couplers connection.	Check connections.
	Faulty coupler.	Replace with a new one.
Coupler leaks oil.	Faulty coupler.	Replace with a new one.
Hose leaks oil.	Faulty hose.	Replace with a new one.

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