

SCREW JACKS

Operating Instructions translated from original

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1. Health and Safety

These operating instructions contain the information necessary for the daily work of the operator responsible for handling and usage of the equipment.

The operating instructions must be available to the persons involved in the operation of the equipment.

It is important that:

- The operating instructions and other applicable documents are retained throughout the lifetime of the equipment.
- The operating instructions and other applicable document are included as part of the equipment.
- The operating instructions are passed on to all other users of the equipment.
- The operating instructions are updated following any additions or changes to the equipment.
- The operating instructions describe the methods required in the use of the equipment.

1.1. Notice about safety

Before you start to use the equipment, or to perform maintenance or servicing of the equipment, please read the relevant parts of these instructions.

Pay attention to all the Danger, Prohibition, Edict, and Note textboxes mentioned in this manual.

Serious damage to persons and machinery can occur if this information is not observed.

The machinery is intended for use by an authorised operator.

Consider all electrical equipment to be live.

Consider all the hoses and pipes to be pressurised.

During servicing and maintenance of the equipment / machine, ensure that the source of power to the electricity, pneumatics (air) and hydraulic is broken before any maintenance is performed. The machine must be vented and the safety switch should be locked.

Servicing and maintenance should only be performed by qualified service personnel.

Follow the instructions in terms of the maximum loads, and see the decal on the equipment for the technical data.


1.2. Warning devices


Annual checks of warning devices and protective devices must be implemented to maintain control of their function and status.


1.3. Warnings and cautions


The Danger, Prohibition, Edict and Note textboxes contain information that is of importance in this manual:

(see the pictures below).

	DANGER! Ignoring this information will result in immediate danger to life!!
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	PROHIBITION! Prohibited act associated with death or serious injury!
---	--

	EDICT! Correct use of personal protective equipment or other aids.
---	--

	NOTE! Information that requires extra attention!
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2. Safety of the Machinery

The machine is labelled with a CE mark, see 2.4, which means that it has been designed, constructed and described in accordance with the EU Machinery Directive 2006/42/EC.

2.1. When rebuilding the machine

If the machine is rebuilt or supplemented with other parts that are not approved by the manufacturer, the CE mark does not apply for the parts that have changed the machine's functions. Warning labels and the CE mark must be clearly visible on the machine. If the warning label for a machinery part is replaced, then the new warning label should be installed in the same place as before.

Damaged decals and CE marks must be replaced immediately.

If the machine is rebuilt or parts are added, it is very important that these instructions are immediately completed / adjusted with the necessary illustrations, photographs and texts.

2.2. Personnel requirements

To avoid damage or injuries, the operator and operating personnel must be specifically instructed or trained according to the manufacturer's instructions. Operators and operating staff may only handle those parts that they have been instructed or trained to use.

All controls and keys shall be operated by hand and should never be activated by means of another kind, unless it is otherwise provided.

2.3. Manufacturer

This machine is manufactured by:
Swedrive AB
341 51 Lagan
SWEDEN

2.4. Mark

This screw jack is supplied with the following mark:

SWEDRIVE		CE	
Type	92062101	Ratio	32:1
No	149508-09	YY/WW	17/44
Lubr	MOBIL GLYGOYLE 460		
SWEDRIVE AB, SE-34151 LAGAN			

Type of mark

The serial number is given in the "No" field.
This matches the Swedrive order number and must always be given in matters relating to the screw jack.

2.5. Working method in the event of an incident or breakdown

The screw jack is normally built into another machine and before starting up this machine, the operator and installer must be trained in the correct procedure in the event of an accident or breakdown on this machine.



If the following has happened, the screw jack should not be used, contact Swedrive before the screw jack perhaps could be put back into operation again.

- The screw jack has been driven into an external or internal stop.
- Movement between normally fixed parts can be observed.
- Temperatures above 100° C on the screw jack or spindle have been measured.

If the following can be observed, the screw jack should not be used before the cause has been investigated. If necessary, contact Swedrive.

- External damage to the screw jack or spindle can be observed.
- The spindle/spindle nut of the screw jack does not move during commissioning of the motor.
- The motor power has for a long time continuously increased during operation.
- Abnormal noise during operation.

If an electric motor/hydraulic motor is used, see the motor operating manual for working methods in the event of an accident or breakdown.

In the event of an accident with personal injury, call 112 immediately and contact healthcare.

3. Noise

This machine features a continuous A-weighted sound pressure level that is below 70 dB (A).

4. Safety Instructions

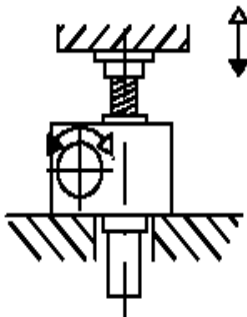
- The machine may only be used by trained personnel and when the user has read and understood the contents of the current operating instructions.
- The machine may only be used for its predetermined purposes and only with the installed protection devices. All applicable safety regulations must be observed.
- Daily maintenance work must be performed by trained personnel.
- Electrical work must only be performed by trained personnel.
- Work on live electrical parts is not permitted.
- Rebuilds, repairs and modifications to the machine may only be performed under the applicable safety regulations.
- When repairs are performed, it is only permitted to use the original spare parts.

5. Screw Jack Description and Maintenance Instructions

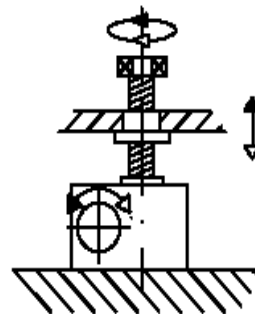
5.1. Product description

The screw jack Type A (trapezoidal spindle) and Type AK (ball spindle) consist of a gearbox (worm gear) that transfers the rotational motion to an axial motion. The gearbox's worm gear is fitted with an internal nut which, when rotated, causes the spindle to move axially when it is screwed into the load. The axial load that rotates the worm wheel is affected by the axial bearings, with one for each load direction. In the design of the Type AL and Type AKL screw jack, the spindle is fixed to the jack's worm wheel. By rotating the spindle and fix the external nut into the load, it is then possible to move the external nut axially.

Type A, AK
Axial moving spindle



Type AL, AKL
Rotating spindle with a nut



5.2. Drawing

If the field "Type" on the machine plate starts with no. 9, contact Swedrive for correct drawing. For other screw jacks, see drawings in Swedrive's screw jack catalogue.

5.3. Usage

Screw jacks are intended to use force in order to move loads horizontally (push / pull) or vertically (raise / lower). Only the axial forces should affect the jack. Therefore, the load must be guided so that no radial forces will affect the spindle (see Section 2 of the Installation Instructions).

If there is a risk of personal injury or if unwanted damage to the machinery could occur, the jack must be fitted with a special safety nut. In this way, if the trapezoid in the worm gear is worn out, the safety nut will catch the load. For the maximum wear, see the description in section 5.7

Maintenance.

Other uses of the screw jack than those described above may only be done with the permission of the manufacturer.



Warning! If the jack is assembled in such a way that people are at risk of coming in contact with the spindle when it is in motion, the builder of the machine is responsible for ensuring that the spindle is touch-protected. Spindle protection can be fitted according to special orders.

None of Swedrive's screw jacks are completely dynamic self-locking. Screw jacks type A, AL are good static self-locking. When demanding absolute static self-locking or using screw jack type AK, AKL, supplement the screw jack with a brake. In case of uncertainty about self-locking, contact Swedrive.

Use a screw jack of the right size – if in doubt, check the specifications in our screw jack catalogue or contact Swedrive.



WARNING:

The screw jack alone is not a safety device. In cases where there is a risk of personal injury, the screw jack should be supplemented with an alternative safety system.

5.4. Handling

When unpacking and installing the screw jack, the weight of the screw jack and the motor must be taken into consideration. See the screw jack catalogue for information about the weights.

5.5. Storage and Transport

The screw jack must be stored or transported in a way that will prevent exposure to rain, high temperatures, ozone or solar radiation which can cause premature aging of the rubber components. The relative humidity should be kept below 50% to minimise condensation on the screw jack. At storage the ambient temperature should be in the range of 0 to +30° C. Long spindles must be stored so that they do not become crooked due to their own weight. If a prolonged storage time, storage or transport with relative humidity above 50%, storage or transport in difficult conditions is necessary, please contact Swedrive for further information, also see storage and transport instruction SW3046.

5.6. Installation instructions

1. The mounting plane of the screw jack, and the pendulum cradle if it is used, must be stable, flat and clean so no stresses are built into the gear house during the assembly. If the pendulum cradle is not used, ensure that the mounting plane is at an absolute right angle to the direction of the spindle.



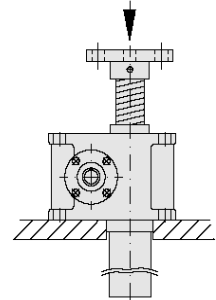
2. The spindle forces must be free from any side forces. Side loads must be controlled with a guidance system, or similar, so that only the pull or push loads will affect the spindle.



3. If possible, mount the jacks so that the force is directed against the mounting plane.
4. When combining multiple screw jacks with a drive motor, gearboxes and intermediate axles, these must be carefully aligned.
5. If the screw jack (or screw jacks) is correctly mounted, you will be able to rotate the incoming shaft by hand when the screw jack is unloaded.
6. Make sure that the spindle is not screwed fully into the closed position, as this may result in damage. Approximately 5 mm of the spindle thread should be visible outside the screw jack. Also, check that the length is sufficient for the given the stroke length, so that the spindle is not threaded out of the worm wheel but is fully engaged. This applies only to the Type A screw jack, as Type AK is provided with anti-slip protection. However, please note that this should not be used as a mechanical stop. This protection can also be mounted by a special order.
7. Be sure to protect the rotating parts from accidental access.



8. If a sensor is used, consider the consequences of a malfunction / voltage loss!
9. If the screw jack is mounted in a humid environment and powered by an electrical motor, on the electric motor ensure that the lowest of the drain plugs is opened.



5.7. Commissioning

1. Do not operate the screw jack unless all limit sensors or possibly safety devices are installed and working properly.



NOTE!

Never run the screw jack unless all limit sensors are installed and working properly.

2. If an electric motor is used, it should be installed and commissioned according to its operating instructions. For instructions of electric motor wiring and direction of movement see Section 6.2 Direction of movement.

Check that the actual voltage matches the specified voltage.

The staff member who connects the electricity should have the necessary skills and qualifications.



WARNING!

The staff member who connects the electricity should have the necessary skills and qualifications.

3. Prior to start up, check that there is sufficient lubricant in the screw jack. If a vent plug is used, check that it is "sitting at the top" of the gear casing. For the type and amount of lubricant, see Section 5.8 Lubricant.
4. Check that the spindle is well lubricated with the correct type of lubricant.
5. If permitted, it is advantageous to charge the screw jack with only half the load from the start. After a number of runs, you can increase this to the full load. If abnormally high temperature occurs, investigate the cause and be aware of the risk of fire!
6. Make sure that the screw jack never runs into the external or internal mechanical stops.



NOTE!

Never run the screw jack into the external or internal mechanical stops. This could seriously damage the screw jack.

7. If issues with vibrations and noise occur when running a new screw jack, make sure that the screw jack tr.spindle are sufficiently lubricated. If the vibrations and noise issues still are not resolved, then see the Section 6.1 Run-in procedure.

5.8. Maintenance

Keep the spindle free of dust and dirt. The power can be supplied to the jack with different types of spindle protection that prevent contamination. See the Swedrive screw jack catalogue for further information.

Regularly check that the spindle has a thin layer of grease. Inadequate lubrication will shorten the lifespan of the spindle and significantly increase the power requirements.

The jacks spindle is lubricated by accessing the spindle and apply lubricant to the spindle.

On jack design AL / AKL the spindle can be lubricated through the lubrication nipple located on the rotary nut. Type of lubricant see **5.9 Lubricant**.

For jacks with trapezoidal spindle, such as Type A and Type AL, the maximum wear of the nut thread is 1/4 of the single-threaded and 1/8 the double-threaded pitch.

When servicing the screw jack, the power source must be switched off.

	<p>WARNING! When servicing the screw jack, the power source must be disconnected.</p>
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5.9. Lubricant

Gear case:

The machine plate specify the type of lubricant to be used in the screw jack gear case.

The screw jack gear case has a one-time lubrication on delivery and the lubricant does not need to be replaced during normal operations.

Lubrication gear case quantity:

Screw jack size	5	15	25	50	150	250
Quantity(Liters)	0.13	0.35	0.35	0.50	1.5	3.0

Ball screw:


Ball screws should be lubricated with grease of a good quality, for example:

Shell Gadus S2 V100 2((Shell Alvania RL2))
FUCHS Cassida Grease EPS 2 (Livsmedel)
SKF LGEP 2

Trapezoidal spindle:

The trapezoidal spindle should be greased with:

Klüber Duotempi PMY45

	<p>NOTE: Never mix a synthetic lubricant with a mineral oil based lubricant. Refill only with the type of lubricant specified on the plate!</p> <p>Use only the specified grease on the trapezoidal spindle.</p>
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6. Appendix

6.1. Run-in procedure

When manufacturing the tr.spindle and the tr.nut there will sometimes be a small deviation from exactly correct form. This deviation from exact form could in rare cases in a new screw jacks result in vibrations and noise when running the screw jack. After a short run-in, the tr.nut is paired to the tr.spindle, which in most cases causes the vibrations or sounds to decrease or disappear completely.

Issues with vibrations and noise could also depend on the design of the machine in where the screw jack is built in. But even in these cases a run-in could reduce the vibrations and noise issues in the machine.

Method

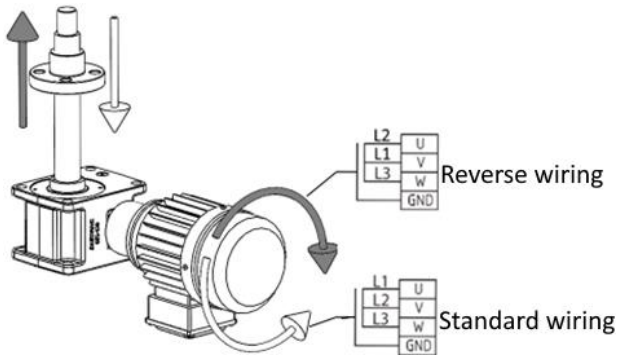
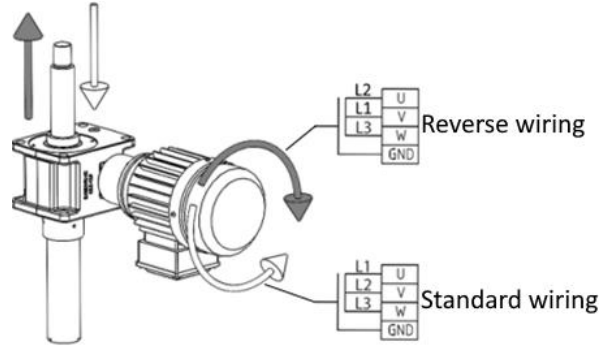
1. Run the screw jack with half of maximum load if possible. If vibrations and noise occur when running the screw jack, try to change speed or load to have a run-in without vibration and noise.
2. Run the screw jack for about 10 min. If no heat is detected the running time could be extended.
3. Let the screw jack cool down for 2 hours. If no heat is detected the cooling down time could be reduced.
4. Regrease the tr.spindle.
5. Run the screw jack at used load and speed and listen if the vibrations and noise is gone. If not, proceed to next point.
6. Look at the tr.spindle, if there are yellow material on the tread surfaces then there has been an transfer of bronze material from the tr.nut to the tr.spindle. If no transfer of bronze is to be seen, try to do the run-in procedure again and proceed to point 1, else proceed to next point. If the vibrations or noises do not disappear despite repeated running-in attempts, contact Swedrive.
7. Use a scotch-Brite pad to mechanical remove the yellow bronze material from the tr.spindle.
8. After removing bronze material from tr.spindle, clean the tr.spindle thoroughly to remove all grease and bronze particles. Use Loctite 7063 or similar product with naphtha to clean the tr.spindle.
9. Regrease the tr.spindle thoroughly.
10. Run the screw jack at used load and speed and listen if the vibrations and noise is gone. If not, do the run-in procedure again and proceed to point 1.
11. If the vibrations or noises do not disappear despite repeated running-in attempts, contact Swedrive.

**WARNING!****When working on the screw jack, the power source must be disconnected.**

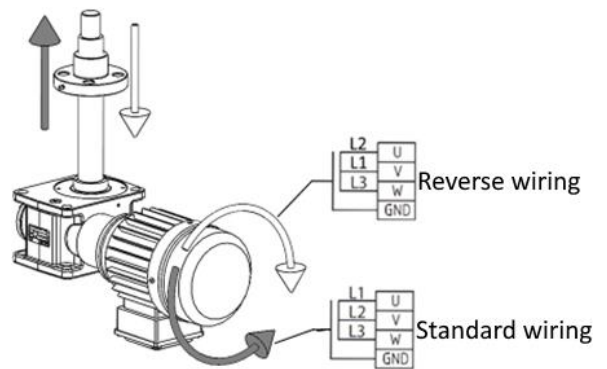
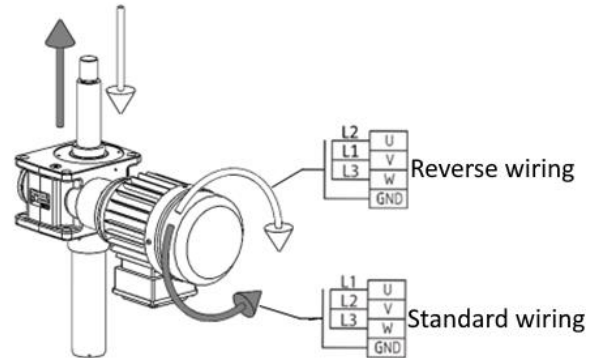
6.2. Direction of movement

When wiring an electrical motor, the wiring sequence will affect the rotation direction of the motor and there for the direction of movement of the spindle or nut, see pictures. Orientation, see the Swedrive screw jack catalogue.

Orientation: disp. 09, 12, 14, 15, 29, 32, 34, 35



Orientation: disp. 10, 11, 13, 16, 30, 31, 33, 36



WARNING!

The staff member who connects the electricity should have the necessary skills and qualifications.