

WORM GEARS

Operating Instructions translated from original

Table of Contents

1. Health and Safety	3
1.1. Notice about safety.....	3
1.2. Warning devices.....	4
1.3. Warnings and cautions.....	4
2. Safety of the Machinery	4
2.1. When rebuilding the machine.....	4
2.2. Personnel requirements.....	4
2.3. Manufacturer.....	5
2.4. Mark.....	5
2.5. Working method in the event of an incident or breakdown.....	5
3. Noise	5
4. Safety Instructions	6
5. Worm Gears Description and Maintenance Instructions	7
5.1. Product description.....	7
5.2. Drawing.....	7
5.3. Usage.....	7
5.4. Handling.....	8
5.5. Storage and transport.....	8
5.6. Installation instructions.....	9
5.7. Commissioning.....	10
5.8. Maintenance.....	10
5.9. Lubricant.....	10

1. Health and Safety

These operating instructions contain the information necessary for the daily work of the operator responsible for the 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).

	<p>DANGER!</p> <p>Ignoring this information will result in immediate danger to life!!</p>
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	<p>PROHIBITION!</p> <p>Prohibited act associated with death or serious injury!</p>
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	<p>EDICT!</p> <p>Correct use of personal protective equipment or other aids.</p>
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	<p>NOTE!</p> <p>Information that requires extra attention!</p>
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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 machine 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 worm gear.

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

The worm gear 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 can be observed, the worm gear should not be used before the cause has been investigated. If necessary, contact Swedrive.

- External damage to the worm gear can be observed.
- The output shaft of the worm gear does not move during commissioning of the motor.
- The motor power has for a long time continuously increased during operation.
- Abnormal noise during operation.
- Temperatures above 100° C on the worm gear have been measured.
- Movement between normally fixed parts can be observed.

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

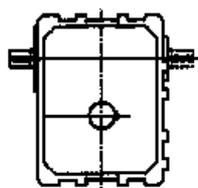
- The machine may only be used by trained personnel and when the user has read and understood the contents of the current operating instructions.
- The machine may only be used for its predetermined purposes and only with the installed protection devices. All applicable safety regulations must be observed.
- 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. Worm Gears Description and Maintenance Instructions

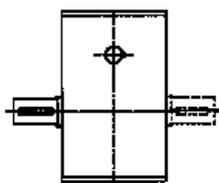
5.1. Product description

Worm gears are used primarily for transmitting the power resulting from large gear ratios. Swedrive's worm gear range includes gears where the distances between the gear centre ranges from 33 to 125 mm. We can also supply a product range of two stage gears where very low speeds are required.

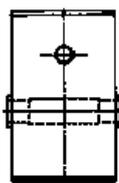
Below are some examples of the different dispositions (designs). For a complete overview of the standard usages and additional information, see our worm gear catalogue.



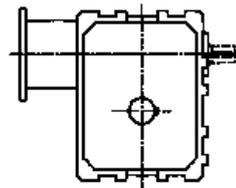
Single or double primary shaft



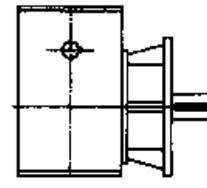
Single or double secondary shaft



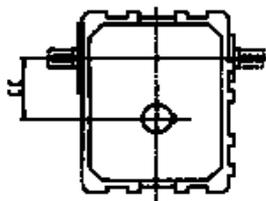
Hollow shaft



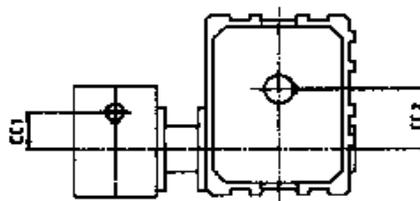
Flange for mounting the motor



Secondary flange



One stage gear



Two stage gear

5.2. Drawing

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

5.3. Usage

Worm gears that are used to drive large masses must guarantee a sufficiently long run-out time when disengaging, so as to prevent the forces entering into the gearbox from becoming too great.

Static/dynamic self-locking devices for worm gears will vary depending on the pitch angle of the worm screw (see the Swedrive worm gear catalogue). None of the Swedrive worm gears are dynamic self-locking.

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



WARNING:

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

5.4. Handling

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

5.5. Storage and transport

The worm gear 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 worm gear. At storage the ambient temperature should be in the range of 0 to +30° C. 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 attachment surface for the worm gear/motor must be stable, level and clean to ensure that no tension builds up inside the casing. An incorrect alignment may degrade the functionality of the worm gear and reduce its service life. Make sure that the worm gear is securely fastened to the surface.



2. If a chain wheel or V-belt pulley are fitted on the output shaft, check to ensure that the permitted lateral force is not exceeded. See the worm gear catalogue for information on this.
3. Wheels, pulleys or couplings that are mounted on the shaft pin should not be forced on with hard blows due to the risk of damage to the bearings. Use a rubber mallet. Or if possible, heat up the component to 100-150°C, depending on the tightness of the fit. For worm gears with a hollow shaft, it is important that you **don't apply force to the worm gear casing** when mounting attachments onto the shaft. The force should be applied onto the hollow shaft.
4. Remember to protect the moving parts against accidental access.



5. If sensor is included on the worm gear unit, think of the consequences of a mechanical failure / power failure.
6. If the worm gear 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.
7. If the worm gear is mounted in a humid environment and with long standstills. Then the worm gear, if possible should be filled with more lubricant than normal to avoid corrosion on internal details. In such cases, contact Swedrive

5.7. Commissioning

1. If an electric motor is used it should be installed and commissioned according to its operating instructions.
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.

2. Prior to start up, check that there is sufficient lubricant in the gear. If a vent plug is used, check that it is “sitting at the top” of the worm gear casing and that the ventilation hole is open. For the type and amount of lubricant, see Section **5.9 Lubricant**.
3. When starting up a new worm gear, we recommend applying a load of around 50 % in the beginning and gradually increasing the load to 100 % over the course of one hour. The oil temperature should not exceed 90°C during the operation. During the running-in phase, the temperature will usually increase a little, but will drop back after the running-in period. The final operational efficiency is achieved after the worm gear has been in service for several hours.
Normal operating temperature on the worm gear case is -30° to 80°C.
If abnormally high temperatures occur, investigate the cause and be aware of the risk of fire!

5.8. Maintenance

Swedrive's worm gears have a one-time lubrication on delivery and the lubricant does not need to be replaced during normal operations.

Use the type of lubricant specified on the plate when topping up the lubricant if necessary.



WARNING!

Disconnect the power source when performing maintenance work on the worm gear or the worm gear motor.

5.9. Lubricant

The machine plate specify the type of lubricant to be used in the worm gear.

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

Lubrication quantity(liters):

Mounting position ¹	F035	FL35	FL40	F050	FL50	F065	FL65	F075	F085	F105	F110	F125	F240	
1	0.15	0.1	0.2	0.15	0.25	0.35	0.35	0.6	1.1	1.8	0.15+0.75	1.7	2.5	
2				0.25									3.3	4.2
3														5.9
4														
5														

¹Mounting position see worm gear catalog



NOTE:

**Do not mix a synthetic lubricant with a mineral oil based lubricant.
Refill only with the type of lubricant specified on the plate!**