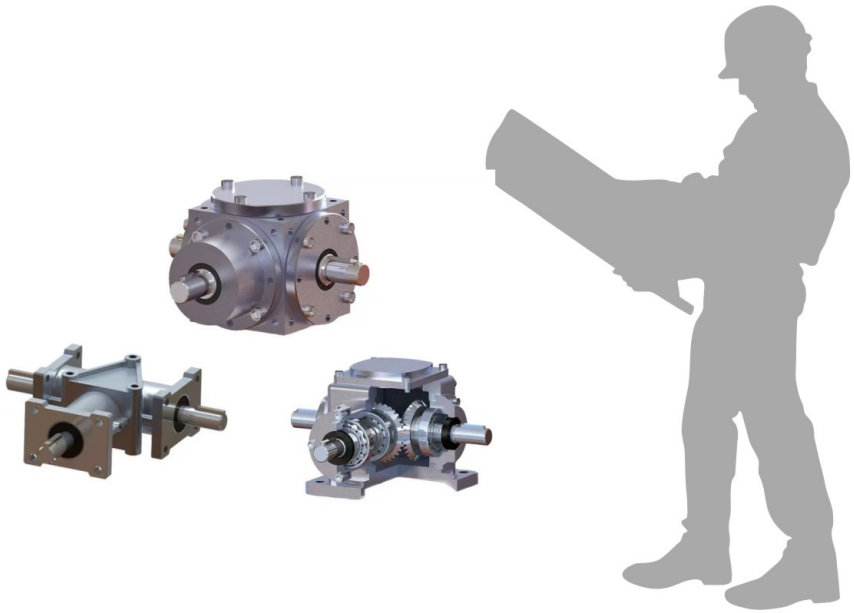
LINEAR MOTION

Lude Transmission

Spiral Bevel Gear Box
Operation & Maintenance Instructions



LINEAR MOTION

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Lude Transmission-Provide linear motion system and ideal solutions

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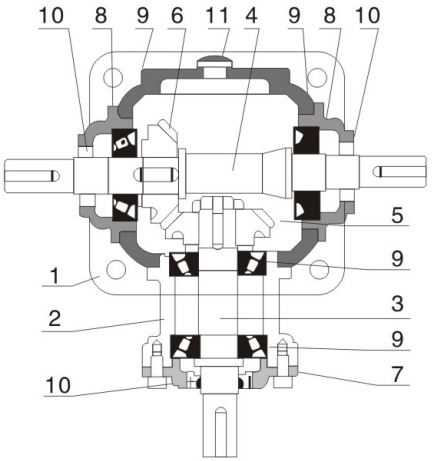

1、 Housing
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3、 Output shaft
4、 Input shaft
5、 Driven spiral bevel gear
6、 Drive spiral bevel gear
7、 Bearing seat of input shaft
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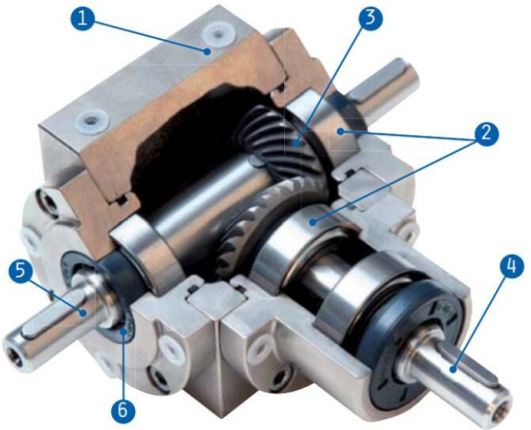
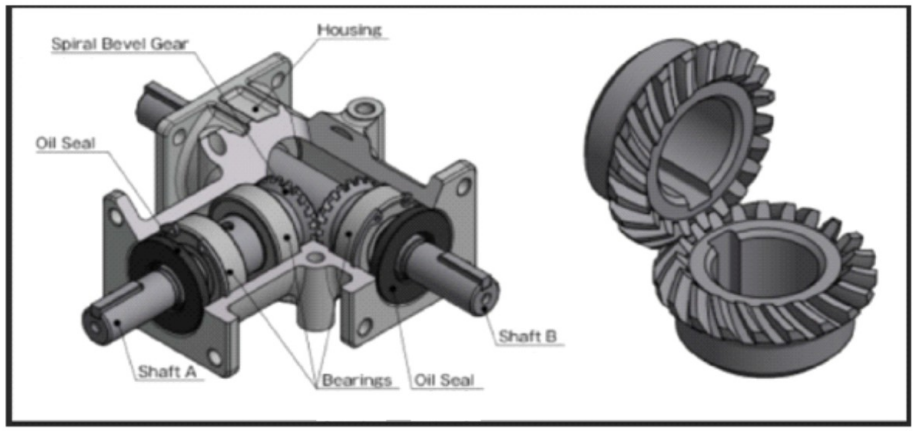


1. Housing 2. Bearings 3. Spiral Bevel Gearing
4. Input 5. Output 6. Seals



2. T SERIES:

2.1 Installation and maintenance

General

Be sure that the structure on which spiral bevel gear box is fitted is plane,levelled and sufficiently dimensioned in order to assure fitting stability and vibration absence, keeping in mind all transmitted forces due to the masses, to the torque, to the radial and axial loads. Position the spiral bevel gear box so as to allow a free pas-sage of air for cooling.

Avoid: any obstruction to the air-flow; heat sources near the spiral bevel gear box that might affect the temperature of cooling-air and of spiral bevel gear box for radiation; insufficient air re-cycle or any other factor hindering the steady dissipation of heat. Mount the spiral bevel gear box so as not to receive vibrations.

When external loads are present use pins of locking blocks,if necessary.

When fitting spiral bevel gear box and machine it is recommended to use locking adhesives such as LOCTITE on the fastening screws (also on flange mating surfaces).

For outdoor installation or in a hostile environment protect the spiral bevel gear box with anti corrosion paint. Added protection may be afforded by water-repellent grease(especially around the rotary seating of seal rings and the accessible zones of shaft end). spiral bevel gear boxes should be protected wherever possible, and by whatever appropriate means, from solar radiation and extremes of weather; weather protection becomes essential when high or low speed shafts are vertically disposed.

For ambient temperatures greater than 40℃ or less than 0℃ consult us.

If overloads are imposed for long periods of time, or if shocks or danger of jamming are envisaged, then motor-protections, electronic torque limiters, fluid couplings, safety couplings, control units or other suitable devices should be fitted.

Warning: Bearing life, good shaft and coupling running depend on alignment precision between the shafts.Carefully align the spiral bevel gear box with the motor and the driven machine (with the aid of shims if need be), interposing flexible couplings when ever possible.

Whenever a leakage of lubricant could cause heavy damages, increase the frequency of inspections and/or envisage appropriate centrol devices.

In polluting surroundings, take suitable precautions against lubricant contamination through seal rings or other. Fitting of components to shaft ends.

It is recommended that the bore of parts keyed to shaft ends is machined to H7 tolerance; G7 is permissible for high speed shaft ends D≥55 mm, provided that load is uniform and light; for low speed shaft ends tolerance must be K7 when load is not uniform and light.

Before mounting, clean mating surfaces thoroughly and lubricate against seizure and fretting corrosion

Assembly and removal operations should be carried out with pullers and jacking screws using the tapped hole at the shaft butt-end; for H7/m6 and K7/j6 fits it is advisable that the part to be keyed is preheated to a temperature of 80~100℃

2.2 Lubrication

Gear pairs are oil-bath lubricated;《for life》lubrication with synthetic grease or oil only for sizes T8 ~T16.Bearings are either oil-bath or splash lubricated,with the exception of top bearings which are lubricated by a pump or,《for life》grease-lubricated, as in grease-lubricated spiral bevel gear boxes(with or without NILOS rings according to running speed).

Oil-lubricated spiral bevel gear boxes are supplied without oil; before putting into service. fill to the specified level with mineral oil(AGIP Blasia, ARAL Degol BG.BP-Energol GR-XP, SSO Spartan EP, IP Mellana oil, MOBIL Mobil gear 600. SHELL Omala, TEXACO Meropa, TOTAL Carter EP, Great wall).Capacity is indicated in the table.

When it is required to increase oil change interval (《for life》), the ambient temperature range, and/or reduce oil temperature, use synthetic oil .Capacity is indicated in the table.

TYPE	T2	T4	T6	T7	T8	T10	T12	T16	T20	T25
WEIGHT (Kg)	2	10	21	32	49	78	124	188	297	488
CAPACITY (liter)	0.2	0.35	0.95	1.5	1.9	3.5	7	10	11	18

2.3 Installation and maintenance
Lubrication ISO viscosity grade
Mean kinematic viscosity [cst] at 40℃

Speed n_2 min^{-1}	Ambient temperature[1] [℃]		
	mineral oil		synthetic oil
	0-20	10-40	0-40
> 710	150	150	150
710-280	150	220	220
280-90	220	320	320
< 90	320	460	460

1) Peaks of 10℃ above and 10℃(20℃ for synthetic oil)below the ambient temperature range are acceptable.

IMPORTANT.When oil temperature is low(40~60℃)it is advisable to increase the values given in the table of one or two ISO viscosity degrees.

Whenever there is continuous duty with n2≥710 min-1 and where a gear(or pinion), due to the particular mounting position,is completely plunged in oil, the use of synthetic oil is recommended.

An overall guide to oil-change interval is given in the table and assumes pollution-free surroundings. Where heavy overloads are present, halve the values.

Oil temperature [℃]	Oil-change interval [h]	
	Mineraloil	synthetic oil
≤65	8000	25000
65÷80	4000	18000
80÷95	2000	12500
95÷110	-	9000

Never mix different makes of synthetic oil; if oil-change involves switching to a type different from that used hitherto, then give the gear reducer a thorough clean-out.

Seal rings: duration depends on several factors such as dragging speed, temperature,ambient conditions,etc.; As a rough guide; it can vary from 3150 to 25000 h.

Warning: for spiral bevel gear boxs sizes T8~T16,before unscrewing the filler plug with valve (simbol —○—) wait until the unit has cooled and then open with caution.

3. HD SERIES:
3.1 General Assembly Instructions
The transmissions should always be installed according to the fitting position that has been ordered. The gear unit should be set up on appropriate solid foundations or mounted as a flange drive directly on the machine to be driven. The shaft ends have to be aligned very carefully for quiet running and safety during operation. To compensate for minor mounting inaccuracies we recommend the use of elastic couplings. The couplings must be warm or must be mounted with the aid of D-centring and a screw. Do not hammer! This will avoid damage to the tooth profile,rolling bearings and locking rings,

Plug-in transmissions can be fitted directly onto the shaft of the driven machine.For flange gears it is important that the attachment surface is it exact right angles to the machine shaft's axis.Otherwise the bearings will suffer too much stress and might be damaged.

The reaction torque corresponding to the output torque can be supported with a torque converter bearing. The bar should be mounted on the gears' machine side in order to prevent additional bending stresses. Do not mount the gears directly on a foundation plate when the machine shaft is bedded near the gears. For hollow shafts with a shrunk-on flange, please additionally refer to our assembly instructions for shaft-hub connections.

The tolerances of the four assembly sides correspond to the DIN ISO 2768-mH standard.

Attention!
The lubrication nipples must always be accessible during operation.

Attention!
Do not hammer the shaft end or the hollow shaft when aligning the Bevel gear boxes.

3.2 Commissioning
Prior to commissioning it must be checked whether:
- The lubricant has been filled in.
- All bolts/nuts have been tightened and rotating parts have been secured against loosening.
- The coupling of the input and output shafts does not generate any impermissible transversal forces or torques.
- Monitoring and protective devices must not be bypassed.
- If a vent filter was intended it must be checked whether it has been installed.

If possible, perform a test run without load, while checking the running noises and temperature development.
Caution! Rotating parts may cause hazard.
The gearbox temperature must not exceed 90℃ .
Caution! Hot surfaces may cause hazards.

In case of abnormal noise or vibrations, discontinue the commissioning and contact the service department. The same applies to gearboxes that were not designed for temperatures above 90℃ but that exceed this temperature.

Cation!
- Rotating parts may cause hazards.
- Hot surfaces may be cause hazards.
- Check the motor data during the first run.

3.3 Maintenance
All LUDE drives require only a minimum of maintenance.For gearboxes with lifetime lubrication, maintenance is reduced to regular checks for lubricant loss due to leakage,to visual status inspection of the sealings, and temperature measurements if appropriate.

Please note that any warranty claim will expire by opening of the gearboxes. Therefore the gearboxes should only be opened at a LUDE factory or after consent by LUDE.

Cation!
Please note that any warranty claim will expire by opening of the gearboxes.

3.4 Lubricants and Fill Quantities
Lubricant type: Castrol Alphasyn GS220
Please contact LUDE for technical data sheet or safety data sheet.

Lubrication:
Please observe any guidance notes on the identification plate of the gearbox.
Permanently lubricated gearboxes have been factory-filled with the required lubricant quantity and are maintenance-free under normal operating conditions.
In case of extreme requirements or increased service life demands we recommend an oil change.
Operating temperature: < 60℃ lifetime lubrication.
Operating temperature:>60℃ and < 90℃ oil change after 15,000 h.
An oil change will also be required if a larger lubricant amount has escaped due to leakage.
You may inquire the oil quantity and the oil grade from our service. You will need the serial number of the gearbox for this.

Fill quantities:
Special fitting position and higher rpm than 1500 need other fill quantities.
The following can be taken as a rough guidance value of the flling quantity for bevel gear boxes:

TYPE	HD09	HD11	HD14	HD17	HD21	HD24	HD28
WEIGHT (Kg)	6	10	20	32	60	75	115
CAPACITY (liter)	0.2	0.3	0.4	1	2	2.5	3

In addition to our factory lubricants,other equivalent brand lubricants may also be used. This only applies if they are compared to the data sheets of the above manufacturers.

To much grease increases friction and therefore causes an increase in temperature.

3.5 Malfunctions
Service: Should malfunctions occur during operation,first try to identify the manner of the malfunction with the table below and to repair it.If it is a malfunction you can't repair, please contact our technical service (see last page).

Malfunction	Cause	Remedy
Unusual, constant running noises.	▷ Rolling/grinding: Bearing damage ▷ Tapping: Irregularity in gearing	Check oil fill level. Consult the technical service.
Unusual, irregular running noises.	Foreign object in the oil.	Check oil fill level. Stop drive. Consult the technical service.
Unusually high temperature at the housing.	▷ Not enough oil. ▷ Defective gearing or bearing.	Check and correct oil filling. Consult the technical service.
oil exists at the shaft seal ring.	Defective sealing.	Consult the technical service.
Oil exists at the shaft seal ring and at the screw.	Too much oil in the gear.	Check and correct oil fill level. Consult the technical service.
The shaft does not tum.	The connection between the driving shaft and the shaft or the gearing is broken.	Have the gear repaired.

4. ARA SERIES:

4.1 INSTALLATION
- Confirm shaft rotation before mounting.
- Unit should be mounted using all three mounting holes.
- Accurately align all shafts.

4.2 LUBRICATION
Should relubrication be required, use Exxon Nebula EP-O or equivalent.
Caution: excessive amounts of grease will cause the unit to overheat.

TYPE	ARA0	ARA1	ARA2	ARA4
WEIGHT (Kg)	1	1.5	3.3	5.3
CAPACITY (liter)	0.1	0.15	0.2	0.4

4.3 REPAIR INSTRUCTIONS

● Disassemble:

1. Remove all bearing lock nuts using spanner wrench.

2. Remove driveshaft. Due to cavity between the two bearing support areas, care should be taken to maintain alignment while removing.

3. Remove driven shaft in the same manner as above.

● Reassemble:

1. Thoroughly clean all internal bearing lock nut threads in housing.

2. Insert driven shaft.

3. Insert driveshaft. Note: Bottom front bearing on shoulder.

4. Thoroughly clean all bearing lock nut threads.

5. Assemble bearing lock nut on drive leg using Loctite screw lock #242 or equivalent.
Note: Excessive sealant in threads may migrate to and cause bearings to seize. Snug bearing lock nuts – DO NOT force. Excessive force will preload bearings and reduce life expectancy.

6. Assemble bearing lock nuts to driven leg using thread sealant as above. Use lock nuts to adjust and properly mesh gears.

7. Allow sufficient time for lock nuts to seal then check using spanner wrench.