

PLANETARY GEAR REDUCER SERIES CP
INSTRUCTION MANUAL

(MANUAL No. RP0000B025)

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1. SAFETY AND OTHER PRECAUTIONS

The gear unit should be handled, installed and maintained by trained technicians.

Carefully read this manual and all accompanying documents before use (installation, operation, maintenance, inspection, etc.). Thoroughly understand the machine, information about safety, and all precautions for correct operation. Maintain this manual for future reference.


Pay particular attention to the “DANGER” and “CAUTION” warnings regarding safety and proper use.



: Improper handling may result in physical damage, serious personal injury and/or death.



: Improper handling may result in physical damage and/or personal injury.

Matters described in  may lead to serious danger depending on the situation. Be sure to observe important matters described herein.

DANGER

General

Transport, installation, plumbing, operation, maintenance, and inspections should be handled by properly trained technicians ; otherwise, injury or damage to the machine may result.

When the unit is to be used in a system for transport of human beings, a secondary safety device should be installed to minimize chances of accidents resulting in injury, death, or damage to the system.

When the unit is to be used for an elevator, install a safety device on the elevator side to prevent it from falling, otherwise, serious injury, death, or damage to the elevator may result.

Installation

Never stand directly under a unit suspended by a crane or other lifting mechanism ; otherwise personal injury or death may result.

Operation

Never approach or touch any rotating parts (shaft, etc.) during operation, loose clothing caught in these rotating parts may result in severe injury and/or death.

Daily inspection and maintenance

Never approach or touch any rotating parts (shaft, etc.) when maintaining or inspecting the reducer the reducer during operation. Loose clothing caught in these rotating parts may result in severe injury and/or death.

Be sure to stop both the driving and driven machines before checking any tooth surfaces, otherwise, you may be caught in the gear engaging section, resulting in severe injury and/or death. Do not operate any units without all (safety) covers in place. Failure to do so may cause injury and/or death.

《Note》

A copy this manual should be sent to the actual user of the gear unit.

This manual should be maintained by the user.

CAUTION

General

The unit should be operated only within its design and performance specifications ; otherwise, injury or damage to a system may occur.

Keep hands and all foreign objects from the internal moving parts of the unit ; otherwise, injury or damage to a system may occur.

Damaged units should be taken off -line and not put back in operation until properly repaired. Any modifications or alterations of any kind, to the unit, will void the warranty and all subsequent claims.

Do not remove the rating plate.

Inspection upon delivery

Unpack the unit after verifying that it is positioned right side up ; otherwise, injury may result.

Verify that the unit received is in fact the one ordered. When a different product is installed, injury or damage to the system may result.

Transport

Exercise ample care not to drop the unit during transport. When a hanging bolt or hole is provided, be sure to use it. After mounting the unit on a system, however, do not hoist the entire system using the hanging bolt or hole. Before hoisting, check the weight with the rating plate, crate, outline drawing, catalog, etc. Never hoist the unit that exceeds the rating of the crane or other mechanism being used to lift it ; otherwise, injury or damage to the unit and/or lifting device may occur.

Installation

Do not place any objects that will hinder ventilation around the unit ; otherwise, cooling effect is reduced, and may lead to a possible fire hazard due to excessive heat build-up.

Do not step on or hang from the unit ; otherwise, injury may result.

Do not touch the key way at the shaft end or on the inside of the unit ; otherwise, injury may result.

When the unit is used in food processing applications vulnerable to oil contamination, install an oil pan or other such device to cope with oil leakage due to failure or limited service life. Otherwise, oil leakage may damage products.

Coupling with other machines

When coupling the unit with a load, confirm that the alignment error is within the specified limits shown in the maintenance manual, drawings, catalog, etc. ; otherwise, damage to the system may result, due to misalignment.

Correctly tighten respective bolts to the specified torque shown in the drawing, catalog, etc. ; otherwise , scattering fragments may damage the system.

When a belt is used for coupling the unit with another machine, check that the belt tension and the parallelism of the pulley are within the specified limits. When the unit is directly coupled with another machine, check that the direct coupling accuracy is within the specified limits ; otherwise, the system may be damaged, due to misalignment.

Install appropriate guard devices around rotating parts ; otherwise, injury may result.

Remove the key temporarily attached to the output shaft of the unit when the shaft is free-rotating (i.e. not loaded) ; otherwise, injury may result.

Confirm the direction of rotation before coupling the unit with its driven machine. Difference in the direction of rotation may cause injury or damage to the system.



CAUTION

Operation

The reducer will get very hot during operation. Do not touch or come in contact in any way with the reducer ; otherwise, you may suffer burns.

If the reducer is operating in an abnormal way, stop the unit immediately ; otherwise, injury may result.

Do not operate the reducer in a manner that exceeds its rating criteria ; otherwise, injury or damage to the system may result.

Do not remove any covers or open the reducer during operation ; otherwise, splashing lubricant may cause burns.

Do not loosen the oil filler plug during operation ; otherwise, splashing lubricant may cause burns.

For a system in which a lubricant motor pump is provided separately, switch on the pump motor prior to switching on the reducer motor. This will enable proper lubrication of the bearings prior to start-up. Failure to do so may damage the unit.

When reversing the direction of rotation, first bring the unit to a complete stop, then commence reverse rotation ; otherwise, the system may be damaged.

Identify and provide appropriate corrective action in a timely fashion for any abnormal operation characteristics according as the maintenance manual. Do not operate the unit until corrective action has been taken.

Daily inspection and maintenance

Change lubricant according to the maintenance manual , and use only those recommended lubricants ; otherwise, the system may be damaged.

Do not change the oil during operation or soon after operation has ceased ; otherwise, the hot oil may cause burns.

Disassembly and reassembly

Repair, disassembly, and reassembly should be handled by properly trained technicians ; otherwise, the system may be damaged.

Disposal

Dispose the reducer and lubricant as industrial waste.

2. CONSTRUCTION

- (1) The reduction gear unit, as shown in the attached drawing is a simple planetary gear with floating carrier system.
- (2) For all bearings, anti-friction bearings are used.
- (3) Extreme care is taken to prevent oil leakage by installing liquid packings at gear box mating surface and cover mounting surface, and D,S type oil seal in the shaft rotating portion.
- (4) The reduction gear unit is provided with an oilfiller, oil drain plug and oil level gauge.

3. INSTALLATION

- (1) The reduction gear unit is designed for horizontal or vertical or vertical up (axial direction) flange or foot mounting.
- (2) The reduction gear unit must be securely installed on the flat and rigid foundation to prevent any stresses on the unit.
- (3) Conduct dowel pin setting, when vibration or shock loading effect on the gearbox.
- (4) When couplings or similar are fitted to shafts, handle with care to prevent damage to bearings and gear box.
- (5) The alignment of the reduction gear unit with a driving motor and other machines must be made as accurately as possible.
Observe misalignment allowance suggested by coupling maker.

4. OPERATION

4-1. On starting initial operation

- (1) Make sure to fill the gearbox with proper amount of lubricant before running (Refer to 5(1)).
Gearbox is shipped drained with lubricant.
- (2) On initial operation, please check rotation direction and start running -in operation.
Increase the load gradually.
- (3) For selection of lubricant, please refer to Table-1 attached.

4-2. Daily Inspection

- (1) Inspect oil level by oil level gauge. The proper oil level may not sink below the center of oil gauge at standstill.
- (2) The gearbox may be warmed up to max. 80 measured on the casing (dependent on the load condition).
- (3) If any of the followings occurs stop and check the unit.
 - Excessive temp. rise is inspected. (Check oil level)
 - Excessive noise or vibration occurs suddenly.

5. LUBRICATION

- (1) For lubrication of gears, oil bath lubrication is employed.
The proper oil level is supposed to reach the mid point of the oil level gauge.
- (2) Recommended oil listed in Table 1 should be used depending on ambient temperature.
- (3) Mixing of different oil brand shall be strictly avoided.
On changing oil brand, fill oil after thorough flushing.
- (4) Some of the upper bearings for vertical and upright type are lubricated with grease.
- (5) Refer for details to specifications sheet and outline drawings.

6. MAINTENANCE

6-1. Oil change intervals

- (1) The first oil change should be made 500 hours after operation and the oil should be changed every 2,500 hours after the first change.
- (2) Where operating conditions are severe, such as rapid rise and fall of ambient temperature, or the presence of corrosive gases in the atmosphere which will result in rapid deterioration of the oil, reference should be made to lubricant manufactures.

6-2. Extended storage of the unit

(For short period, replace oil and put into standstill)

- (1) If the unit is not operated for over a month, fill the unit with corrosion preventive oil and run after flushing.
- (2) When starting the unit again, replace with the proper amount of recommended lubricating oils.

6-3. Oil filling and drain

- (1) Fill oil through service hole located the top of the unit up to midpoint of oil gauge.
As to oil quantity for special specifications, refer to specifications sheet and outline drawing. The oil quantity shown in the catalog, etc., is not exact quantity. Use a oil gauge to check the oil level when filling.
- (2) To drain oil, remove the drain plug located near the bottom of the unit.
- (3) Oil level may sink during operation depending on the viscosity of oil. No further filling is necessary unless the level sinks under the suggested level at standstill.

6-4. Oil sealing, oil gauge

- (1) The oil seals used are JIS D,S type of nitric rubber.
- (2) Joint surface of the casing is sealed with liquid packing.
- (3) Oil gauge is circular or screw type.
- (4) Make sure not to damage oil seal and surface of collar, which may cause oil leakage.

7. DISASSEMBLY AND REASSEMBLY

7 -1. Disassembly

- (1) Disassembly the unit only after the operator made himself thoroughly acquainted with the construction of the unit.
- (2) Handle with care to prevent damage to parts.
- (3) Use care to prevent dust and dirt from entering bearing.
- (4) To restore to original assembly, put mark on planetary gear, bearing and carrier pin.

7 -2. Reassembly

- (1) Care should be exercised to prevent entry of foreign material into gearbox.
- (2) Make sure that the spacer is correctly placed.
- (3) Thoroughly remove waste liquid packings from gearbox mating surface, the area where casing and cover were mounted. After cleaning, apply new liquid packing.
- (4) Securely tighten bolts and nuts, applying "Lock Tight 262" or equivalent on the thread. Suitable securing torque for the bolts are as follows:

M8 - 31.0 ~ 34.8 N·m,	M10 - 61.3 ~ 69.0 N·m
M12 - 107 ~ 120 N·m,	M16 - 265 ~ 298 N·m
M18 - 365 ~ 411 N·m,	M20 - 518 ~ 583 N·m
M24 - 896 ~ 1010 N·m,	M30 - 1373 ~ 1540 N·m

TABLE 1 RECOMMENDED OIL

(Equivalent to SP Type Industrial High Pressure Gear Oil or JIS K2219 No.2 Industrial Gear Oil)

Ambient Temp	Gulf Oil	Exxon Mobil	Shell Oil	Caltex Oil	BP Oil
-10 to 25	EP Lubricant HD 150	• Mobil gear 629 • Spartan EP 150 (ISO VG 150)	Omala Oil 150	Meropa 150	Energol GR XP 150
10 to 40	EP Lubricant HD 220	• Mobil gear 630 • Spartan EP 220 (ISO VG 220)	Omala Oil 220	Meropa 220	Energol GR XP 220
30 to 50	EP Lubricant HD 320	• Mobil gear 632 • Spartan EP 320 (ISO VG 320)	Omala Oil 320	Meropa 320	Energol GR XP 320