

Read the operating instructions carefully before you start working the unit.

# **CO-NELE Mixing Gearbox Operating Instructions**

## **CMP1000**



## **CO-NELE**

**Qingdao CO-NELE Machinery Co., Ltd**

## Perface

Dear customers:

Thanks very much for selecting our products!

Adhering to operating instructions is a prerequisite for fault-free operation and the fulfillment of any right to claim under warranty .You should therefore read the operating instructions carefully before you start operating CO-NELE mixing gearbox.

The operating instructions should be kept available in a right place, ensure that persons responsible for the system and its operation, can obtain it timely if there is any fault .

The copy right of operating instructions for our customer, is belongs to Dalian Huarui Heavy Industry Group Co.Ltd .Wihout our authorization, any reproduction, modification, distribution or unintended use, in whole or in part, is prohibited.

Plese save the manual of the products appropriately during the life time .

The manual which is just for CO-NELE mixing gearboxes, has several sections, as follows :

- 1.General Information;
- 2.Safety Note;
- 3.Installation and Testing;
- 4.Use and Operation;
- 5.Maintenance and Repairs;
- 6.Other Aspects.

If you are unclear about any of the information in this documentation or require further information, please contact us, and we will help you with pleasure!

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## 1. General Information

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# 1.General Information

## 1.1 Products Features

CO-NELE mixing gearboxes, has a series of highlights such as small volume, light weight, large transmission rate, high efficiency and precise manufacture etc. Our products, which are optimized on the basis of domestic and exotic similar products, are designed, researched and manufactured by us independently.

## 1.2 Prime Use and Scope of Application

The series of gearboxes, which are applied to the mixing machinery, are prime driving componnets ensuring the transmission product work ordinarily.



**Warnings** Without permission, gearboxes mustn't be used for other equipments, and we willn't be responsible for this consequence.

## 1.3 Technique Features

Prime Performance and Parameters, see Tab 1

**Tab 1 .Technique Features**

Parameter	Requirement		
Drawing Num	XMG1001		
Weight (Kg)	1360		
Electromotor Size	Y2-225S4-V1 (37kW, 4level, 50Hz)	Y2-225M4-V1 (45kW, 4level, 50Hz)	Y2-225M4-V1 (45kW, 4level, 60Hz)
Rotation Direction	Looking from Electromotor to output shaft, output shaft's rotation direction is clokwise.		

Refer to assembly drawing for dimensions of gearboxes, and see profile drawings 1.



**Attention** Drawings here are only for reference.If any discrepancy found between the drawing and actual product, the actual product shall govern.

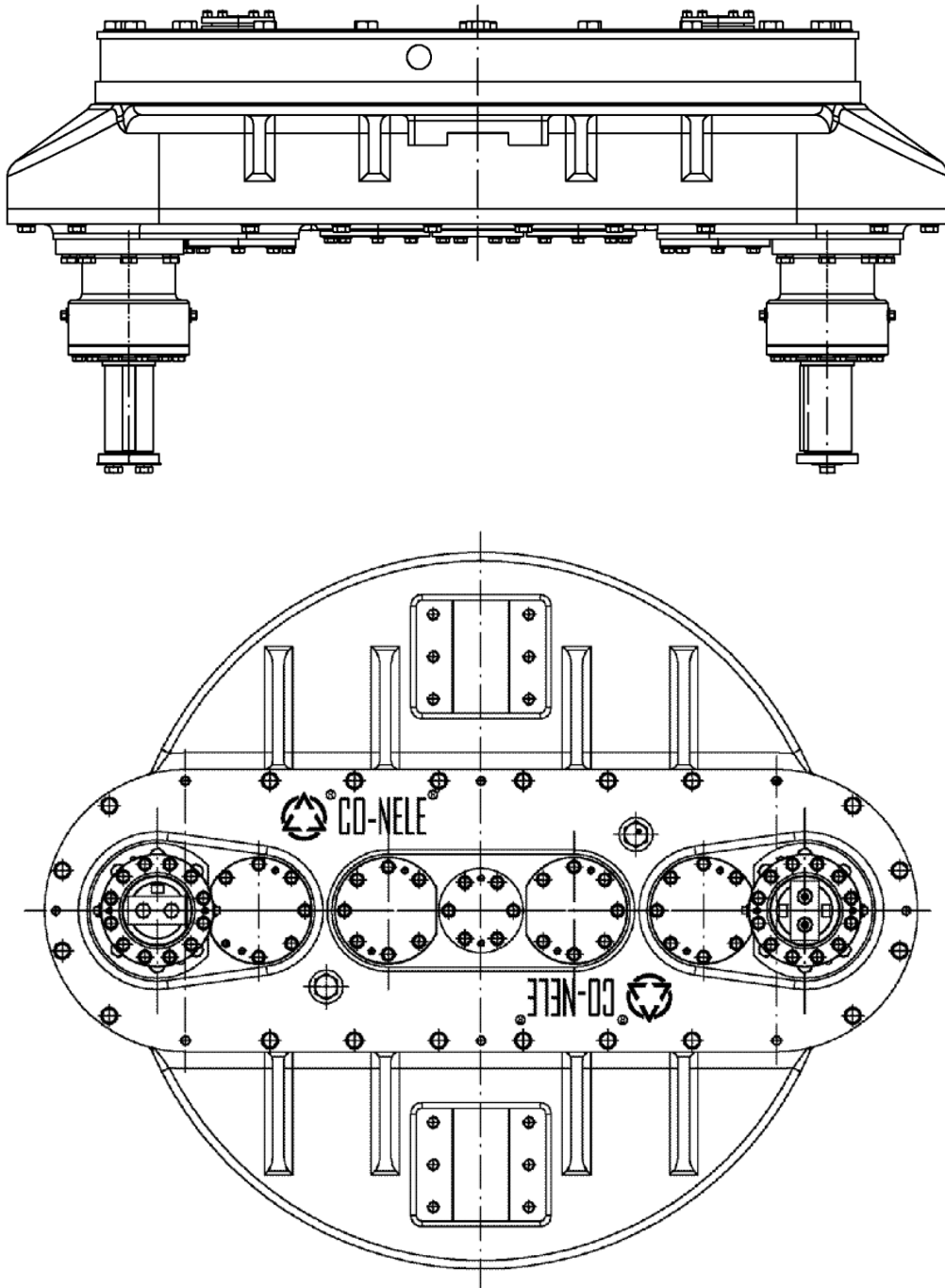


Fig1. XMG1001 Profile Figure

#### 1.4 Application ambient conditions



Attention

In principle, gearboxes shouldn't be exposed in the air. In order to be free from wearings

and erosion of gears and bearings, such as dusts, granules, smoke, water vapour should be prevented into gearboxes.

Application ambient conditions of gearboxes should observe the following values:

#### **1.4.1 Working Temperature**

Working natural environment temperature  $-10^{\circ}\text{C}\sim+40^{\circ}\text{C}$

#### **1.4.2 Cleanliness**

High consistence of dust.

#### **1.5 Working conditions**

Under the conditions as follows , the gearbox could run normally, otherwise is forbidden.

- Make sure the working condition be in normal range;
- Make sure there is no error in gearbox and gear unit and the gear pairs run smooth;
- Make sure that the inner gear and the rotative gear can be lubricated sufficiently, the type of lubrication is L-CKD220;
- Make sure installation of the gearbox correct;
- Make sure no danger in the working area.



**Attention** If not in line with above mentioned regulations, forbid using.

#### **1.6 Influences on environment and energy**

##### **1.6.1 Harmful Substances**

The gearboxes won't produce harmful substances such as dusts, granules, smoke, water vapour when they are working..

##### **1.6.2 Noise**

Gearboxes make noises when they are working in the condition of rated power, load, rotation speed, lubrication, temperature.If there are no reflectors, noise are measured up to about 85 DB by one meter distance from the earth. The noises don't influence the environment and workers.

##### **1.6.3 Vibration**

Gearboxes vibration is not harmful to workers. But, if there are faults which will influence the reliability of gearboxes, we should prevent in time.

##### **1.6.4 Radiation**

Gearboxes don't send out high frequent electromagnetic waves or any other harmful substances when they are working.



### 1.6.5 Lubrication Oil

If there is any lubrication oil leaks out when gearboxes are working or lubrication oil is renewed, Please clean up timely in order to prevent the lubrication oil from polluting soil and water source.

## 1.7 Structure characters and working Principle

### 1.7.1 The whole structure and Vulnerable part list

The Structure of CO-NELE Mixing Gearbox (XMG1001) See Fig 2,the vulnerable part list See Tab 2.

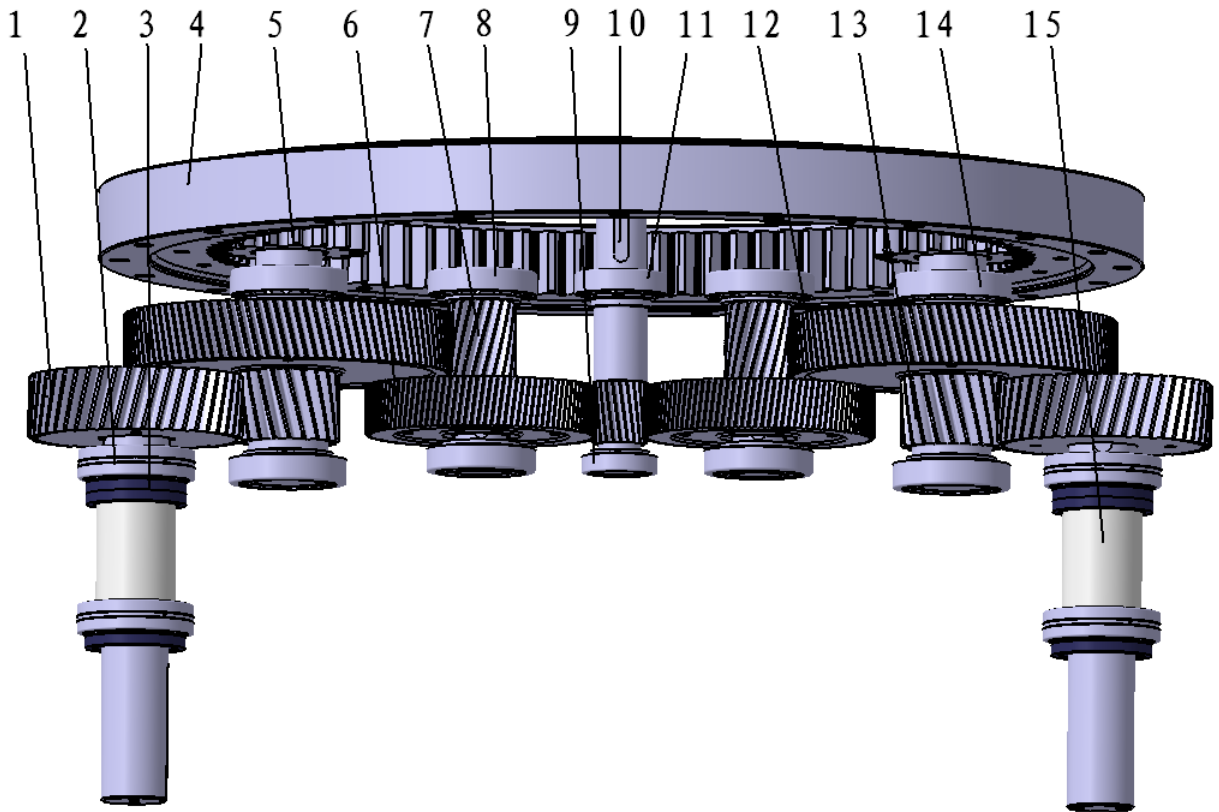


Fig 2 . CO-NELE mixing gearbox

Instructions—CO-NELE Mixing Gearbox

Tab2. Vulnerable Part List

Code	Name	Size	Number	Item Weight (Kg)	Total Weight (Kg)	Annex
1	Gear three		2	23.2	46.4	borrow , MG1000-11
2	Bearing	22216C/W33 (80×140×33)	4	2.1	8.4	
3	Rotary Seal	TRAA00950 (95×120×12)	6	0.2	1.2	
4	Inner Gear		1	279	279	borrow , MG1000.03
5	Rotative Gear		2	8.6	17.2	XMG1001-14
6	Gear one		2	22	44	borrow , MG1000-4
7	Gear shaft two		2	6.3	12.6	XMG1001-4
8	Bearing	30312 (60×130×33.5)	4	2	8	
9	Bearing	32210 (50×90×24.75)	1	0.6	0.6	
10	Input Gear shaft		1	7.5	7.5	XMG1001-1
11	Bearing	32212 (60×110×29.75)	1	1.26	1.26	
12	Gear two		2	53.1	106.2	XMG1001-6
13	Gear shaft three		2	16.5	33	XMG1001-15
14	Bearing	32216/YB2 (80×140×35.25)	4	2.1	8.4	
15	Planetary Shaft		2	20.1	40.2	XMG1001-8



Attention

**Drawing here is only for reference. If any discrepancy found between the drawing and actual product, the actual product shall govern.**

### 1.7.2 Structure, function and working principle of prime components and function units

Please refer to Fig. 2. The gearbox consists of founding housing, parallel axis helical gears, output shaft, and rolling bearings. The structure can be described as follows:

#### —Founding housing:

The founding housing of our gearbox has the form of separation. After the housing has been founded, it will be annealed to relieve stress and strengthen its rigidity.

#### —Involute cylinder gear pairs

The transmission system adopts involute cylinder gear pairs which used material by carburized, quenched and grinded. The gears accuracy is six degree according to Standard GB/T10095

#### —Bearings

The bearings used in the gearbox adopts rolling bearings.

#### —Seal

All seals used in gearboxes are rotary shaft seal.

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There are only one kind of rotary shaft seal in the gearbox, it is TRAA00950 (95×120×12).  
Totally, there are three seals used on output shaft .the location is under the bearings.

## **2 Safety Note**

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## **2.1 Compliance matters**

### **2.1.1 Customers' responsibility**

**2.1.1.1** Ensure that person which is responsible for installation operation and maintenance, have read through the operating instructions completely and understand them, and must comply with the information in the instructions. We assume no liability for injury to person or damage to equipment or property resulting from non-observance of these operating instructions. In such cases , any liability for defects is exclude.

**2.1.1.2** All the work related to transportation, assembly,installation, disassembly, operation and maintenance must be carried out by qualified specialists under strict observance of the pertinent detailed safety and environment.

**2.1.1.3** All mechanical work must be carried out by qualified specialists only.

**2.1.1.4** Ensure that person operating, maintaining and repairing , must be cautions all the time, should always work carefully and properly consider the safety notes.

**2.1.1.5** All the mechanical work must be carried out when the gearbox is not running , and the drive device must be prohibited for the power on suddenly .Making a note on power button of “On work”.

**2.1.1.6** The naked rotation driven part( such as joints, gears ,belt driven device and so on),must be protected or be tagged with caution plate obviously, for avoiding being contacted suddenly or any injury these take .

**2.1.1.7** Pay attention to the running system, and switch off the drive device if in doubt whenever changes occur in normal operation (e.g. increased temperature or unconventionally noise .).

**2.1.1.8** The exposed transmission components , such as couplings, gears , belt, should be protected by coverings or be marked by warning mark., so that it will prevent accident harm.In special case of uncovering to inspect or repair, operator should keep the gearbox original with no tools and any other matters left in.

**2.1.1.9** Whenever, the mark, indication and warning should be kept clean

**2.1.1.10** Don't neglect fire. Ensure distinguishers should be kept in position, and operators should know them where they are and can use them fluently.

### **2.1.2 Proper use**

**2.1.2.1** The advanced technology make sure the delivered gearbox can be used reliably. Any modify that results the gearbox in insecurity or fallibility is prohibited.

**2.1.2.2** The gearbox can only be used when the performance characteristics and conditions are

accordance with the required in the contract, overloading is forbidden!



**Warnings** If customers neglect our regulations and cause accidents, we are not responsible.

## 2.2 Warning mark's and Note label's definition and position

The follow notations as in tab3 appears usually, which are used in gearbox instructions.



**Attention** Operators should be familiar with all notations. When the notations appear, operators should note.

Tab 3

Notations	Defination
 <b>Attention</b>	If this notation appears, related personels are warned that they should obey regulations for installation,test use and maintenance, so that they will avoid accident.
 <b>Warnings</b>	If this notation appears, related personels are warned that they should obey regulations for installation,test use and maintenance, it may cause danger to themselves even for death.

## 2.3 Warning mark's and Note label's definition and position

Authorized operators for gearbox, must be familiar with dangerous area.The dangerous area for gearbox are as follows:

Dangerous area	Practical area
Area intending to harm	Input/Output shafts anf couplings
Area intending to scald	Surroundings of gearbox(bearings)
Area intending to burn	Lubrication oil
Area intending to electric shock	Input end of electric motor
Area where burnable substances stacks	Surroundings of gearbox



**Warnings** If workers work in place where there are inflammable substances,

**inflammable substances must be cleaned up.**

## 2.4 Safety facilities

**2.4.1** Check all parts if are installed right, and whether they are in ordinary state.

**2.4.2** Safety facilities should be demolished in below conditions:

- Gearbox are out of electric source and running
- Gearbox are under repair by skilled workers.



**Warnings** All safety facilities must be inspected regularly.

## 2.5 Measures for danger

### 2.5.1 Electrical fault

See electric fault as tab 4

**Tab 4**

Serial number	Drawing number	Name	Measures
1	XMG1001	CO-NELE mixing gearbox	Cut down power supply, inspect motor and electric system, Substitute electric elements. Eg. Motor.

### 2.5.2 Fault in gearboxes

If there are leak, vibration, noise tooth fracture, bearings heat, hot temperature in gearbox, cut down electric source, stop running, and substitute some parts if necessary.

## 2.6 Measures for unqualified operators

In order to avoid accidents, all operators should be qualified, and work in their own responsibility. The responsibility are defined as follows:

- Operators should be trained until qualified,
- Only trained operators could operate.
- In the process of train, safety education and danger education especially important
- Certificate should be checked regularly, yearly as least.
- Operators and maintainers' responsibility are certain.
- Ensure only authorized operators could operate.
- Assigned a person who has the ability to refuse a third order which is not complying with the rules
- Allowed a training person with a supervisor can work on the product.

—Operators' responsibility are defined as tab 5 (√permitted, × prohibited)

**Tab 5**

Work Classification	Trained worker	Qualified workers	Qualified electric workers	Selling server
Equipment operators	√	×	×	×
Fault search	×	√	√	√
Mechanical fault repair	×	√	×	√
Electrical fault repair	×	×	√	√
Daily repair	×	√	√	√

## 2.7 Deals for harmful substances

After installation of gearbox, some scrapers are produced, such as steel , rubber, grease etc. Some set rubbish are also produced, such as old grease. These substance could pollute water and air, so some measures are adopted to deal them, as follows:

- Firstly, recycle and reuse should be considered.
- If demolished parts could not be reused, should be used as discarded steel.
- Demolisheed parts contain metal and rubber, should be classified and dealt.
- Rubber and plastic should be dealt according to laws.
- Dust, waste residue and waste should be dealt according to laws.
- If discarded substances couldn't be dealt in time, please kept them in proper methods.

## 2.8 Other safety measures and Note

### 2.8.1 Change of gearbox

If some safety factors change of the gearbox, please stop the gearbox and report to the person in charge for fault.

- Unauthorized unit, should not change gearbox, as follows:
- Unauthorized unit, should not change or complement gearbox
- Unauthorized unit, should not change or complement parameter of gearbox.
- Spare parts should meet to manufacturer's demand.
- Original spare parts are excellent permanent.
- We emphasize that spare parts from other supplier will influence gearbox;s performance, and will not be responsible for this.

### 2.8.2 Installation, test, maintenace, safety measures

- Operators should be trained until qualified,
- Only trained operators could operate.



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- Inspection and maintenance should be executed regularly
- Check tightness of all bolted connections and pipe connections
- Ensure replacement of spare parts are in safe environment
- Make sure you turn off the power when you check and maintain the gearbox, and make sure the others can not turn the power on.
- Don't put on tools and other materials on equipment
- Only qualified personnel could bind materials and indicate to cranes
- Protect switch from water and dust.
- Because of danger of fire and explosion, only when certain directions issue, welding are permissible.
- Note all rotation parts are dangerous to fragile.
- Do not put the other things on the product.
- When filling the oil and grease, you must comply with rules in force.
- If there are enough oil for lubrication, gearboxes are permissible to run.
- In the process of test, operators should be far from nude parts avoiding harm.



**Warnings** If lack of oil lubrication, No starting

### **3 Installation and Adjust**

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## 3 Installation and Adjust

### 3.1 Delivery and Storation

#### 3.1.1 Notes of hoisting and transport

**3.1.1.1** The integral gearbox or any component should be conveyed or transmitted by qualified operators.

**3.1.1.2** Equipments for conveying and transmitting for gearbox should have enough load carrying capacity.

**3.1.1.3** The string for carrying gearbox should be steel string with fastener. Operators should be cautious to carrying process, avoiding clash with shaft end or oil pipe.

**3.1.1.4** The gearbox should be carried with its lifting lugs tightly. The lifting lugs of covering and input/output shaft should be forbidden to use for lifting the gearbox.

**3.1.1.5** The gearbox should be carried with care with no crash and scratch.

**3.1.1.6** Ensure the integrity of the gearbox before assembling, if not please contact with the manufacture. Please pay much more attention to the illustrations as *Note, Forbidden, Important* in the manual before assembling. The assembling and application process will be go well only on basis of the integrity of the gearbox (including the attached parts) and being operated according to the manual's requirement.

**3.1.1.7** Gearbox usually convey without package by truck to customers' destinations except for special situations

**3.1.1.8** Tarpaulin should be used for conveying gearboxes , so that it will prevent rain and damp.



**Warnings** If customers convey by themselves or by other convey corporations, we won't be responsible for any consequence.

#### 3.1.2 Storation condition, Storation term and their notes

**3.1.2.1** The storation place , where environment temperature should be between +5°C and +40°C and humidity should be below 80%, shouldn't be open . Pay attention to water, moisture and corrsion.

**3.1.2.2** The longest storation time is six months after customers' acception.

**3.1.2.3** Tarpaulin should be used for conveying gearboxes , so that it will prevent rain and damp. The gearbox should be put on wood cushion rather than nude ground.

**3.1.2.4** In the storation, gearboxes should be kept independent and upright.

**3.1.2.5** If the gearboxes are not assembled immediately after delivery, they must be carefully stored and protected from vibration、 the ingress of foreign matter and moisture.



**Attention** If the storatation time prolongs ( > 6 months) or the storatation can't obey above mentioned terms, please consult us to take measures.

## **3.2 Opening and Checking**

### **3.2.1 Notes of Opening**

Customers' repretatives and our repretatives should attend simultaneously. Be careful to open coverings to avoid damaging gearbox.

### **3.2.2 List for Checking**

In the checking process, customers should check one by one, and check whether the equipment is complete.If gearboxes are complete and intact, the buyer and the seller will confirm and sign.After confirmation and signature, equipments will be transitted to customers, who are responsible for management and maintain.If lost and damage to the gearbox happen,the responsibility will undertake by customer.

## **3.3 Equipment base, Installations and Technique demand**

### **3.3.1 Demand for Equipment base**

**3.3.1.1** Gearboxes should be fastened to stable horizational ground, whose height tolerance is plus or minus 5 cm. In the case of gearboxes's foundation stable, guanrantee input/output shaft smooth, so that it won't influence lifetine.

**3.3.1.2** Datum reference for installation of gearbox should be interface of housing. Operators should adjust the gearbox flat with adjusting cushion, avoiding distorting hulls of instanlled gearboxes.

### **3.3.2 Installation conditions for Equipments**

Installation conditions for Equipments as follows:

- Base for installation of equipment meets above mentioned demand
- There are installation working area for gearboxes in working site.
- Gearboxes and other parts should arrive at working site.
- All operators ,who are qualified, for installation and debugging are present,
- Complete scheme for installation should be formulated.
- Operating norm and notes should be drawn up according to stipulation and laws in this instructions.

### 3.4 Installation Step, method and note

#### 3.4.1 Customers' ready work for installation



**Attention** When equipment has arrive at working site, ensure no ponding. Components with rotation function and tight fastened area should be kept dry from water and moisture. Equipment packed with box should be kept in place with canopy and be checked if package is intact.If there are some in package, repair need to be implemented. No arbitrary stacking and avoid delay of installation and economic loss.

#### 3.4.2 Installers' ready work for installation

- Before installation, installers should research technology material, such as installation drawings, installation scheme and installation technique. Also, installers should meet and cooperate with related department, such as building department, so that the installation will go on smoothly.
- Draw up construction scheme.
- Prepare tools、 set-up and convey machines
- Scheme water-proof, cold-proof, moissture-proof, rain-proof measure
- Set up professional inspection troops to ensure every project up to stanard.
- Check whether components is prensent and intact before installation.If components are deformed, operators should rectify them. If components are polluted , operators should clean them.
- The circumstances, such as convey route line, width of road, surround building, the limit height of trestle, especially for corners needs ensuring, so that we could make convey process more smoothly. Meanwhile, wo should ensure roads for convey have enough bearing capacity. If roads do not conform to the requirement, packing wood or steel plate are adopted make roads more compact.

#### 3.4.3 Installation sequence

Gearboxes which is a prime transmission component, are installed after other parts being installed. But before installation of gearbox, support and other auxiliary tools should be ready.

There are no oil in gearbox with mechanical lubrication system., so customers should put enough oil into gearbox up to middle position of oil mirror in order to make gearbox run ordinarily.

#### 3.4.4 Notes

**3.4.4.1** Ensure the integrity of the gearbox before assembling, if not please contact with the

manufacture. Please pay much more attention to the illustrations as *Note, Forbidden, Important* in the manual before assembling. The assembling and application process will be go well only on basis of the integrity of the gearbox (including the attached parts) and being operated according to the manual’s requirement.

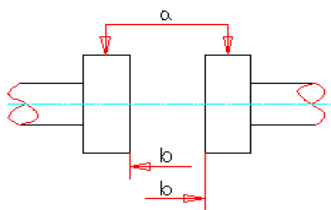
**3.4.4.2** Antirust has been painted to shaft ends and the parallel keys of the gearbox. The antirust can be scrubbed by nitril thinner (or the other suitable dissolvant). It’s forbidden to polish the antirust by sand paper.

**3.4.4.3** It’s forbidden to split the housing during the assembling process as the Loctite 755 has been applied to the contact surface and the two parts have been connected by high-strength bolt with certain tightened torque(Torque comply with Table 8).

**3.4.4.4** Heating method is used to install the input/output shaft of the gearbox with the couplings/brakes, but heating the couplings and brakes by naked flame directly is forbidden. Impacting method is forbidden as a strong blow may be result in the broken of the sealing lips、retainer rings、bearings and so on.

**3.4.4.5** Cool the collecting part (by cold water) between bearing covers and the brakes/couplings in the process of the assembling of brakes/couplings by heating method, which is for the purpose of ensuring that the shaft temperature rise not exceeding 70°C to protect the sealing lips.

**3.4.4.6** Adjust the shafts to the standard concentricity and parallelism when mounting the gearbox with the motors and working machines. The alignment accuracy of the input/output axis according to the table below.



ITEM	RIGID CONNECTION
Outside diameter runout: a	0.03mm
Face runout: b	Flange diameter0.01/100

As for flexible, tooth-type, tyre, chain coupling, their assembly accuracy should obey regulation in the table below.

Diameter of coupling, mm	Tolerance of conaxality (skipping), mm	Tolerance of angle of line	Hole diameter of coupling, mm	Tolerance of conaxality (skipping), mm	Tolerance of angle of line
≤100	0.05	0.05°	>450-560	0.15	0.20°
>100-180			>560-630		
>180-250		0.10°	>630-710	0.2	0.25°

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>250-315	0.1		>710-800		0.30°
>315-450		0.15°			
<p>Note: 1. Moment of inertia should be calculated for each half coupling,so that it will complement outer circle tolerance.                  2 Percentage is adopted, as half of shown in the table.                  3.Deviation of the axis could be detected by dialgauge,or you can use the filler gauge to size the gap of the coupling.</p>					

Improper alignment maybe result in vibration, heating, noise, decreasing the bearing life, incorrect contact between gears, and even the damage of the gearbox.

**3.4.4.7** Installation with clutch should be not filled grease, so that it will be safe for transmit torque.

**3.4.4.8** Check operationg space channel whether are proper.

**3.4.4.9** Before installation of gearbox with oil pipes,should be clean up with dephosphorus.There shouldn't be corrosion and residue.

**3.4.4.10** The other assembly requirements according to JB/T5000.10-1998 .



**Attention** When gearboxes are adjusted, screws should be wrenched with spanner. Screw pre-tight torque value is shown in table 8. If necessary, the bottom of gearbox and pedestal should be fastened twice with cement.

### 3.5 Adjust Step, method and note

#### 3.5.1 Preparation and notes before testing

- Read carefully all chapters and sections about safety, and acquaint yourself with danger in the process of testing.

- Put qualified lubrication oil into gearbox accrodng to table 6.



**Attention** Before starting gearboxes, ensure that there are a lot of lubrication oil.

- Clean up assembly spot, and ensure all rubbish is removed.Ensure the passage is not blocked with equipment, which are dangerous to people.

- Electric line should be connected correctly and tested. If all line are qualified, tests are permissible.

- In the process of testing, marks and remarkable notes should be set up.

- Check if all screws are fastened tightly, and if all safe devices are in proper place.

Table 6

Serial number	Figure number	Name	Lubrication pattern (√)		Remarks
1	XMG10001	CO-NELE mixing gearbox	Oil pool lubrication	√	Make sure that the inner gear and the rotative gear can be lubricated sufficiently
			In forced concentrated lubrication		

### 3.5.2 Adjusting or testing procedure for gearboxes

When gearboxes has been assembled, rotate twice to three times.and check if there is somethings to block.Ensure there are no problems, then you could start.

#### 3.5.2.1 Gearboxes with oil forced lubrication system

As for gearboxes with oil forced lubrication system,you should make sure whether the tubes for the connection of the gearbox with the oil station gearboxes are ready,and then check the oil supply system and the bolts.The oil station should be filled with oil which is fixed brand and amount.

Above mentioned stipulation is ready, you could start lubrication system,check the lubrication point whether there is any oil,if all the lubrication system work well,then you can start the motor(If it is available,the gearbox should work with no load for a few hours).If the gearbox work well with no load,then you can increase the load about 25% per time until to the normal load.In every stage of the load,you should let it work about two hours(In order to get the balanced time),you must make sure the gearbox work well in every stage,then let it work in the next load.When the gearbox is working for test,you should record the oil temperature、 pressure and the temperature on the bearing.Refer to a gearbox working for a amount of hours,the growth temperature on the bearing should not exceed 40℃ and the temperature should not exceed 85℃.

When testing the gearbox,check the gearbox whether there is any voices and the oil leakage of the gearbox,adopt proper measures to fix the problems.

When the oil temperature is under 20℃,the gearbox should work with no load ,until the oil temperature increase to normal,then the gearbox should work in load.



**Attention** Installation, and assembly should be done by professional personels.

### 3.6 Acceptance standard and method for adjusting and testing

<Safety and sanitation design principles for equipment>, GB5083-1999;



<Acceptance normal for equipment>,JBJ23-96;

<CO-NELE mixing gearbox technique agreement>

<Assembly drawings for CO-NELE mixing gearbox >

### **3.7 Preparation for test run**

#### **3.7.1 Preparation for running**

- Check if all components and screws are fastened
- Check if lubrication oil amount could meet the requirement.
- Check if all gears and bearings are lubricated sufficiently.
- Check if there are some dangerous factor in areas where gearboxes run.

#### **3.7.2 Running method**

When gearboxes are running, ensure that there are no abnormal phenomenon, for example, noise, vibration, oil-leaking. If there are any abnormal phenomenon, then you should stop gearbox and eliminate fault.

## **4 Use and Operation**

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## 4. Use and Operation

### 4.1 Inspection before use

- Check the security of the gearboxes units and the fasteners before running test. Make sure that the oil level corresponds the mounting position. Make sure that no insecurity in the operating area of the gearboxes.
- Lubrication oil required in drawing can be added to gearbox before running. The optimum quantity of the oil is in the middle of the oil level gauge.
- Connect the input/output pipes between the lubrication system and gearbox , and inspect the reliability of the oil feeding system and fasteners.
- Fill the gearbox with sufficient approved lubricants.

### 4.2 Safety, Protection, Mark before and in use

- Users should be familiar with satisfy information before use
- Gearboxes should run according to nominal direction and load strictly. Use for other purpose is prohibited.
- Noise, heat and leaking should be dealt promptly, or it will influence gearboxes's lifetime.

### 4.3 Operation method and Notes

- Ensure there are no harmful factors to workers, if there are, it must be eliminated
- According to the CO-NELE mixing gearbox instructions, start the motor of the gearbox in turn, then the gearbox will turn into working condition.



**Warnings**    **Overload is prohibited in use.**

### 4.4 Monitoring and record in running

Users should be familiar with running information, such as oil position, noise, vibration, heat. Meanwhile, users should record these information, so that ensure gearboxes run ordinarily.

### 4.5 Procedure, method and notes for stopping running

#### 4.5.1 Ordinary stopping method

You can stop the gearbox through the button on the panel.

The gearbox can go on working until the next order.

#### 4.5.2 Urgent measures

When accident happens, urgent stopping running should be used.

If you want to understand the working condition depicted above, you can read the instructions

for electric parts

### 4.5.3 Notes

Above mentioned operations should be done by professional operators.

Make sure the security of the persons when you stop the gearbox.

## 4.6 Fault analysis and eliminate

See fault analysis and eliminate as tab 7

Table 7

Failure	Possible cause	Remedy
Abnormal noise	Gear teeth damage Excessive bearing clearance Bearing defect overloading	Contact customer service. Check gears, replace the damaged one. Contact customer service Adjust bearing clearance. Contact customer service. Replace bearing defect. Recover normal load
Larger noise at the fastened position of gearbox	Fastened parts relax	Tighten the bolts and nuts as the standard required.. Replace the damaged bolts and nuts.
Bearing hot	Oil supply vessel jams or oil insufficient when forced lubrication Lower level of the oil lubrication tank Oil aging Bearing defect	Check oil supply vessel and oil volumes, ,lager volumes if necessary.. Check oil level, fill enough oil if necessary Check last exchange time, replace the oil if necessary. Contact customer service. Check the bearing, replace the damaged bearing if necessary.
oil leaking	Airproof of house cover or combine surface defect Radical gasket defect (aging ) Airproof of uncombined mechanical inefficient, the oil not return in time  Higher pressure of oil input , too much oil	Check the airproof, ensure the airproof of the joint. Check radical airproof, replace timely if necessary. Check oil return hole of airproof cover , make the hole larger or increase oil return vessel additionally if jams. Adjust the pressure of oil lower pressure if necessary .
Running hot	Pressure of oil supply lower when forced lubrication. Higher level of the oil lubrication tank. Oil aging Oil supply system failure ,higher temperature of coolant. For the jams of filter ,volumes of oil through condenser too small	Check oil supply pressure, increase it appropriately if necessary. Check oil level, adjust it if necessary. Check last change time, replace the oil if necessary. Please contact the manufacturer refer to lubrication system. Clean filter
Pressure gauge of forced lubrication in gearbox warning	Oil pressure<0.1Mpa Oil pressure >0.4Mpa Oil pressure gauge damage	Check the oil supply system, whether leaking. Check the filter of oil system, clean it if necessary. Check all the oil supply position, whether plugged, exclude it if necessary. Change the pressure gauge.
Gearbox stop	Power lower Motor damaged Gear box drive gear damaged Couplet damaged	Check the electrical system. Check the motor, change it if necessary. Replace the drive gear. Check couplet ,replace it if necessary.

## **4.7 Safety measures and accidents dealings**

### **4.7.1 Safety apparatus and Notes**

If coupling's safety covering is loose, stop running to fasten it.

Any safe apparatus must't be demolished unless permission.

### **4.7.2 Measured and methods for fault**

When fault appears, repair it as soon as possible. If users can't repair, please contact us in time. We are responsible for maintenance in serve period. If gearboxes are out of serve period, we advise you to contact our service department .



**Warnings** When gearboxes are in fault, you should stop running the gearbox and make a warning mark on the power button ,then repair it as soon as possible.

## **5.Maintenance and Repair**

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## **5.Maintenance**

### **5.1 Daily Maintenance and Calibration**

Gearbox usually works in extremely severe environment, such as high temperature, dust, corrosion gas, vibration. In order to make gearboxes work normally and play their role perfectly, not only daily maintenance and mandatory maintenance rules are necessary, but also operators should execute this maintenance rules.

#### **5.1.1 Inspections for lubrication system of gearboxes**

Refer to a gearbox with forced lubrication system, you must connect the pressure gauge to the gearbox before starting the gearbox. Firstly you must check the pressure, the rate of flow and the oil temperature.

Refer to a gearbox with oil sump lubrication system, you can check the oil level. If you need to fill the oil to the gearbox, you can pour the oil into it through the inspection cover or the breathing valve.

#### **5.1.2 During the service period, some items as following should be inspected everyday.**

1. check the oil level, temperature and pressure , and make sure these are normal
2. check the combine surface ,end of input (output ) shaft, and the joints for leakage
3. check bearing temperature and running sound

if there is anything abnormal , please eliminate it immediately

**5.1.3** Wash the breath valve after removing the filter net every three months at least with gently gasoline or other solvent similar ,and then dry it by airing or compress air .

**5.1.4** Inspect the bolts of gearbox at certain period, if discover the bolts have relaxed, please screw the bolts as the information showed in table 8.

**5.1.5** Perfectly system of inspection and repair should be set up during the service time. Customer should register the details of using and maintenance, contact the manufacturer if necessary.

### **5.2 Maintenance during running period**

**5.2.1** After operating 100~150 hours for the first used ,the lubrication must be changed or be detected by professionals who can prove the oil is stilled be used. The time should be shorter if the ambient terrible. Replace oil after the gearbox stopped. Drain the oil before it cool down, then wash the impurities left in gearbox with the same type oil(if the oil is so viscosity to be washed , please worm up the oil to 60~80°C first.) Please change the oil with the same type every time, mixing different types oil together is prohibited.



**Attention** Please use the same oil when you change the oil in the gearbox, you should never use the different oil in the same gearbox, if you must change the lubrication oil, you should clean out the gearbox with new lubrication oil, then pour in the new lubrication oil. You must use gloves when you change the oil because of the high temperature. If there is any oil splashed out of the gearbox, please clear out the oil at once. You should use different lubrication oil according to different surrounding temperature.

**5.2.2** For a long period of service time, the seals used for airproof at the ends of the input/output shafts in the gearbox should be replaced with the same type for leakage happened at shaft end.

**5.2.3** Pay attention to the combine surface of the up/down box, when open the gearbox, for gasket cement coated there. Clean the left gasket cement, then recoat the surface with new high quality gasket cement lightly and equally prior to close the gearbox. After close the gearbox, tighten the high strength bolts via torque spanner, the tightening torque should meet the information showed in table 8, and then clear off the spilled gasket cement .

Table 8 Mount the up box and down box with the following bolt tightening torques

specification	Size d mm												
	M6	M8	M10	M12	M16	M20	M24	M30	M36	M42	M48	M56	M64
	拧紧力矩 TA N.m												
5.6	3.3	8.5	16.5	28.7	70	136.3	235	472	822	1319	1991	3192	4769
8.8	7	18	35	61	149	290	500	1004	1749	2806	4236	6791	10147
10.9	9.9	25.4	49.4	86	210	409	705	1416	2466	3957	5973	9575	14307
12.9	11.8	30.4	59.2	103	252	490	845	1697	2956	4742	7159	11477	17148
A2-70	5	12.8	24.9	43.3	105.8	205.9	355	713	1242	1992	3008	4822	7204

specification	Size d mm							
	M72×6	M80×6	M90×6	M100×6	M110×6	M125×6	M140×6	M160×6
	Tightening torque N.m							
5.6	6904	9573	13861	19327	25756	37733	53263	80383
8.8	14689	20368	29492	41122	54799	80284	113326	171027
10.9	20712	40494	41584	57982	77267	113200	159790	241148
12.9	24824	34422	49841	69496	92610	135680	191521	289036
A2-70	10429	14461	20939	29197	38907	57002	80461	121429

Note 1: The data according to JB/T5000.10-2007.  
 2: The data is available to coarse bolts.  
 3: The deviation to the tightening torque is about ±5%.  
 4: Friction value  $\mu=0.125$ .  
 5: The value of the data is to the bolt with lubrication, refer to the bolt without lubrication is about 133% of the value in the schedule.

### 5.3 Maintenance Period

Gearbox general maintenance and time interval of gearbox, see table 9:

Table 9 Remedy and time interval



Instructions—CO-NELE Mixing Gearbox

Remedy	Time interval	remark
Check oil temperature	Once a day	
Check abnormal noise in gearbox	Once a day	
Check oil level	Once a day	
Check gearbox for leakage	Once a day	
Check concentration of water in the oil	After 400 operating hours ,once a year at lest	Information of water volumes please contact manufacturer of lubrication
First change oil after operating	After 100~150 operating hours	
Change oil later	Every 10 months or after 2000 operating hours	Also according to the condition of the lubrication oil
Clean oil filter	Every three months	
Clean the breather valve	Every three months	
Check the tighten of fixed bolt	After first change oil ,then every second changing oil	
Check the gearbox thoroughly	About every 2 years ,when changing oil and largely repairing	

Note :the intervals could change to the using condition.

## 5.4 Maintenance Procedure

Maintenace procedure for mechanical fault

- Fault reason anslysis and maintenance plan
- Spare parts and fragile parts purchase(refer to the latest Bill of Materials.)
- Make out safe maintenance procedure and steps
- Prepare maintenance tools which is suitable for parts to be repaired.Prohit operating against regulations
- Assign qualified operators
- If the area is dangerous(dust, explosion), the harmful substance must be clean up ,and keep open for ventilation.. If the area is extremely hot or poisonous, face mask is necessary.
- Put gearboxes in maintenance place.
- Prime power source should be cut and the center control be locked until indication is issued from serviceman.

## 5.5 Maintenance for longtime storage

If storage lasts longtime(>1 month), excute obeying procedure as below:

- Demolish gearboxes and place them in position, but ban putting stack on top of each other.
- Cut down power source, and stop running gearbox
- Prevent gearboxes from water, moisture, corrosion.
- If gearboxes are in cold environment longtime(under 0°C), please let the gearbox work in no load condition for hours until the bearing having sufficient lubrication.

## **6 Other things**

<b>6.1 Other thing to be told to users</b>	<b>31</b>
<b>6.2 Spare parts and fragile parts</b>	<b>31</b>

## 6. Other things

### 6.1 Other thing to be told to users

**6.1.1** This use instructions should be kept in dry place so that it will be protected and be used anytime..

The instructions' lifetime should be as long as the gearbox.

**6.1.2** If customers are not known about this instructions, please contact us for consult.

### 6.2 Spare parts and fragile parts

Customers should store some spare parts in order to use for maintenance. When the users book parts, please refer to spare parts list.



**Warnings** If customers purchase the spare parts, which are not produced by us, or are not qualified by us, it will usually cause some influence to gearboxes. We will not be responsible for this consequence.

**Please note, we provide spare parts, which are up to the newest professional stanard.**