

**RIDUTTORI  
EPICICLOIDALI**

**PLANETARY  
GEARBOXES**

**MAINTENANCE AND OPERATION INSTRUCTIONS**





[www.chiaravalli.com](http://www.chiaravalli.com)

Il nostro centro logistico in Cavaria con Premezzo (Cantalupa) è un insieme di funzioni informatiche dedicate allo stoccaggio dei prodotti, al loro prelevamento, al loro confezionamento ed alla loro spedizione.

Tutte le funzioni sono state automatizzate ai più alti livelli oggi disponibili.

## TRASMISSIONI STANDARD

Prodotti standard a catalogo



## RIDUTTORI & MOTORI ELETTRICI

Prodotti standard a catalogo



## MARTINETTI MECCANICI

Prodotti standard a catalogo personalizzabili



## COMPONENTI SPECIALI

Produzione di particolari meccanici di grande complessità ed altissima precisione



## DIVISIONE MOTO

Distribuzione equipaggiamento moto



La logistica Chiaravalli Group si è affermata nel tempo come elemento di comparazione e traguardo per tutte le aziende europee del settore meccanico.



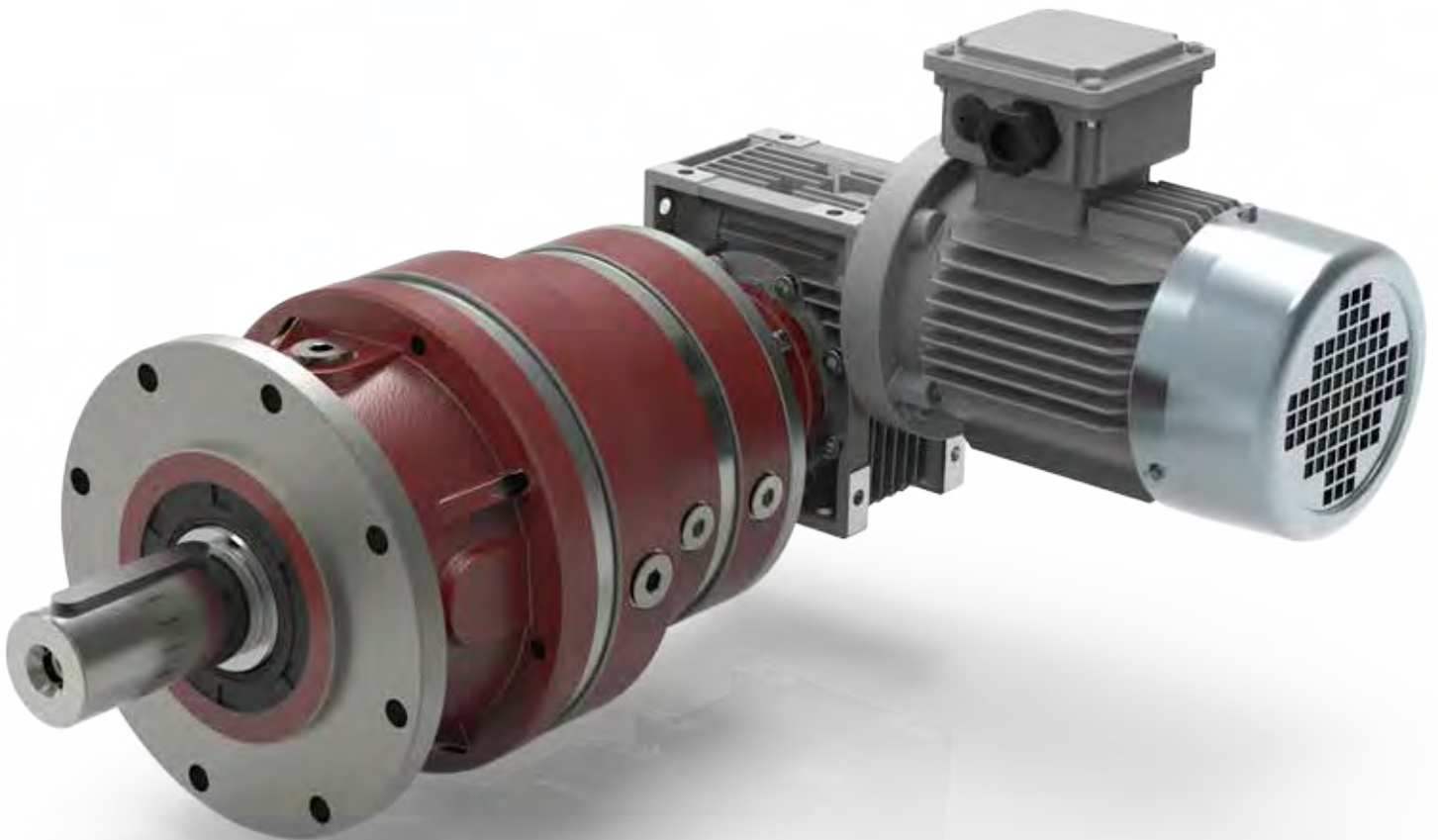
# ELECTRICAL

# MOTORS AND GEARBOXES

*A large range of motors and gearboxes developed by Chiaravalli Group SpA and managed by our Logistics in Cavarina con Premezzo (Cantalupa).*

*We are able to supply and send any item to catalogue, in over 52 countries, with a minimum lead-time from order receipt.*









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## 1.1 Important Warnings

Take into consideration the listed safety warnings and information signs below!



**ATTENTION!**

**Dangerous position and possible result**  
Slight and unimportant woundings



**NOTE!**

**Advices and necessary informations for the user**



**DANGER!**

**Harmful position and possible result**  
Damage in gear unit and environment



**DANGER OF ELECTRICITY!**

**Danger of electrical shock and possible result**  
Death and heavy woundings



**DANGER!**

**Danger possible result**  
Death and heavy woundings





### 1.2 General Information

This user guide is prepared by our firm to provide information about safety transportation of gear unit/gear unit with motors, storage, installation / mounting, connection, operating, maintenance and repair processes. All the purchase and technical data are positioned at product catalogues. Beside engineering applications, the information which is placed in this instruction, should be well read and applied. The documents must be protected and to get ready for controlling by authorized person. The information about electrical motor could be found by guidance which is prepared by motor-producing firm.

### 1.3 Correct Use

Chiaravalli The products are designed to use in commercial plants and are operated convenient to the current standards and directions. Technical data and allowed usage conditions are placed in product's power tab and usage guidance. Should be conformed to all the values.

This usage guidance is prepared by our firm according to 2006/42/AT The European Union Machinery Safety Instructions and is not to be placed 94/9/EC 'The direction about tools used in possible explosive environment and protective systems.

### 1.4 Safety Information

In gear units / gear units with motors and motors, there could be pieces subjected to voltage, movable pieces and hot areas. During all the works to be done; transportation, storage, placing, mounting, connection, operating, maintenance - repair processes could be implemented by qualified employees and responsible managers.

All the processes to be implemented during the working period;

- Related usage and maintenance instructions
- Warning and Safety Tags in gear unit/gear unit with motor
- Instructions and Requirements related to the system
- Local and International requirements for safety and accidental protection

**Our Firm is not responsible where the listed items are implemented below:**

- Violation of work health and safety rules in gear unit/gear unit with motors,
- Improper usage (The usage which is stated out of bounds in guidance and all the usages except tag/catalogue values especially usage in high moment and different cycle) and mismounting and misuse of gear unit / gear unit with motor in plant,
- Extremely dirty and maintenance free of gear unit/gear unit with motor,
- Unlubricated usage,
- Usage out of product, tag/catalogue values,
- Wrong motor selection,
- Take out of the necessary protective plugs,
- Disuse of original pieces in gear unit/gear unit with motor,
- The using, mounting, maintaining and taking place of the uneducated, unauthorized and unqualified persons.

## 1.5 Transportation

### 1.5.1 Transportation And Freightage;

- Take into consideration of the article stated on package during the product delivery.
- During the delivery, product should be controlled about possible damages in carrying period.
- The firm should be informed about possible damages.
- The damaged products should not be put into use.
- Lifting flanged eyebolts must be tightened. These flanged eyebolts sized to carry the weight of only gear unit/ gear unit with motor. The additional weight should not be added. The flanged eyebolts suitable to the DIN 580 norm.
- If there are 2 lifting flanged eyebolts in gear unit with motor, both of them could be used in carrying process upon the size of gear unit and motor. In necessary situations, the suitable and adequated-size carrier should be used.
- Carrying safeties should be removed before the start of operating.
- The weights of the movable gear units/gear units with motors are placed in product catalogues.
- The dangerous area should be got into the secure to prevent damage to the persons.
- During the carrying process, to stand under the gear unit could cause danger of death.
- The damage of gear unit must be prevented. The crushes to the free input shafts could damaged into the gear unit.

### 1.5.2 Package Transportation;

- There could be no loads on packages or the shelved surfaces should be prepared.
- The necessary carrying equipments should be prepared.
- The carrying and lifting equipments should be larged - enough to the sufficient capacity.
- The calculations should be made to the connection points and center of gravity.
- If necessary, this information should be written on the package.
- The carrying equipments (steel rope, belt, chain etc.) must be robust and suitable to the applied weight.
- During the carrying process, the load centering could be done without oscillation.

### 1.5.3 Equipment Transportation

- The connection carrying point should be appointed.
- The carrying equipments (hook, chain, belt) must be prepared. To the alternative, pallet must be used for the load-lifting.
- If the Crane will be used, it could be lifted perpendicular from inside to the outside of the package.
- If the forklift or palletized carrying equipment will be used, the product which removed from package should be placed on the pallet.
- The fork of the equipment should be carried out the way that gripped the pallet.
- The weight must be lifted with slowly and constant speed and must take measure to the sudden oscillation.



#### ATTENTION!

During the carrying process, the fixings like the lifting lug, hook, belt, rope, locked hook must be sufficient to the load and have conformity certificate. The weights of the movable gear unit/gear unit with motor have given in product catalogue.



#### NOTE!

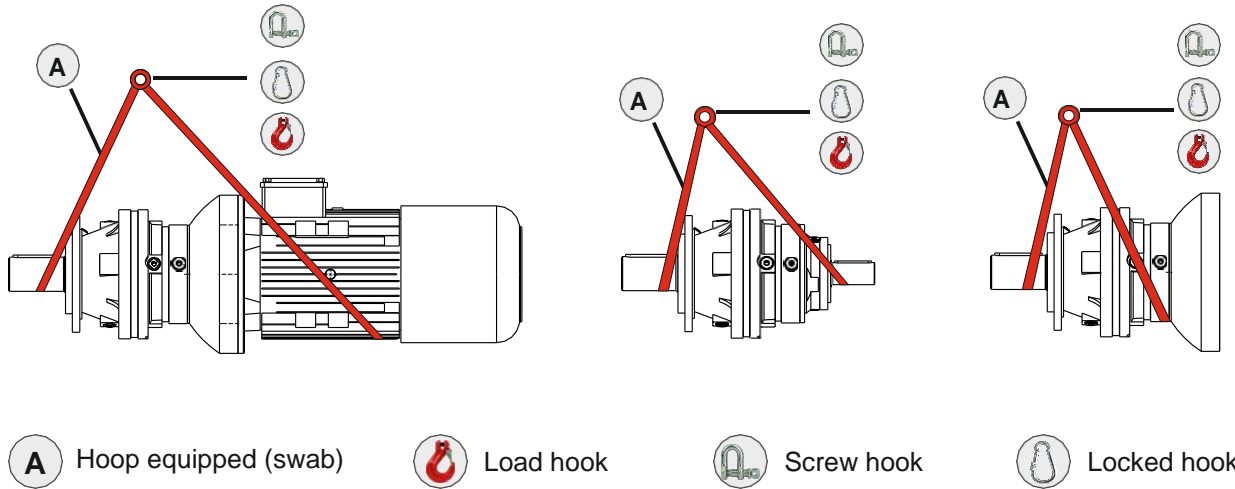
In all carrying processes, there should be avoided both sudden movements and sudden liftings.



#### ATTENTION!

If the connection tool is coupling between electric motor and gear unit, lifting eyebolt should not be used.

CHPL / CHPLB



Manuel lifting (Weight ≤ 55 kg)  
 (ref. ILO Contract)  
 Not valid for the continuous carrying.

1.6 Storage

The certain suggestions have given about the storage conditions of the gear unit/gear unit with motor below;

- In clear and moist-airs, the storage should not be made.
- The gear unit/gear units with motor should not directly be contacted to the ground.
- The place must be moveless where the both gear unit/gear units with motors are contacted. Otherwise there could be damage during the movement.
- The gear unit should be got into the secure to the falling.
- The processed surfaces of the gear units and both solid and hallow shafts must be lubricated with protective oil.
- Gear unit/Gear units with motors must be in the place where there will be no big temperature differences between -5 and 40.
- Relative humidity must be less than %60.
- Not directly be exposed to sunlight and infrared light.
- Must be kept away from the abrasive materials which causes corrosion (dirty weather, ozon, gases, solvents, acids, salts, radioactivity, etc.) in environment.
- The protective oil SHELL ENSIS or similar product should be used on the corrodible pieces.
- If the gear unit is without oil, it must be filled with lubrication oil.

1.6.1 Long Term Storage Suggestions;

- Mineral oil and synthetic oil according to the mounting position are filled to get ready for operating. Despite this, the oil level must be controlled before operating.
- The VCI Corrosion protected tool are mixed into the gear unit's oil.
- The carrying safety of the ventilation plug must not be removed during the storage.
- The gear unit must be closed to the shape of unleaked.

	<p><b>NOTE!</b></p> <ul style="list-style-type: none"> <li>- In the long-term storage or during the short-term storage, if the excessive temperature differences occurs, the oil in the gear unit must be changed before the operating.</li> <li>- In the fully oil filled gear unit, the oil level should be reduced according to the mounting position.</li> </ul>
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**1.7 Disposal**

The valid regulations must be taken into the consideration for the waste materials.

<b>Gear unit components:</b>	<b>Material</b>
Toothed wheels, shafts, rolling bearings, parallel keys, locking rings, ...	Steel
Gear unit housing, housing components, ...	Grey cast iron
Light alloy gear unit housing, light alloy gear unit housing components, ...	Aluminium
Worm gears, bushes, ...	Bronze
Radial seals, sealing caps, rubber components,...	Elastomers with steel
Coupling components	Plastic with steel
Flat seals	Asbestos-free sealing material
Gear oil	Additive mineral oil
Synthetic gear oil (rating plate code: CLP PG)	Polyglycol-based lubricants
Cooling spiral, embedding material of the cooling spiral, screw fittings	Copper, epoxy, yellow brass

**1.8 Authorized Service**

They are skill and qualified people, which are determined by company. They have education about electrical and mechanical subject.

	<p><b>NOTE!</b></p> <p>At below; the list took in place decided by our firm, authorized service and customer (user) which is about control and maintenance criterias / applications. Must be obliged to the informations which were given in the list. To the contrary that Usage and Maintenance directions becomes invalid.</p>
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<b>No</b>	<b>CRITERIA</b>	<b>CHIARAVALLI</b>	<b>AUTHORIZED SERVICE</b>	<b>CUSTOMER (USER)</b>
1	Disassembly of geared unit	✓	✓	X
1.1	Case changing	✓	✓	X
1.2	Gear changing	✓	✓	X
1.3	Solid/shaft changing	✓	✓	X
1.4	Changing of all consumable material except sealing materials.	✓	✓	X
2	Oil cup changing	✓	✓	✓
3	Seal changing	✓	✓	✓
4	Oil changing	✓	✓	✓
5	Motor montage to IEC adapter type	✓	✓	✓
6	Motor montage to PAM type	✓	✓	✓
7	Assembly of geared unit with W cylinder type	✓	✓	✓
8	Disassembly of motor from IEC/PAM type	✓	✓	✓

✓ : **SUITABLE**  
 X : **NOT SUITABLE**

2-3 : Send to the contaminated waste disposal (licensed firm).  
 4 : Send to the licensed firm for the purpose of disposal.



2.1 Gear Unit Label



**CHPL / CHPLB (Planetary Gears)**

Abbreviations	Meaning	Planetary Reducer
<b>CHPL</b>	Coaxial gear unit	✓
<b>CHPLB</b>	Bevelled gear unit	✓
<b>CMS</b>	Mounting flange and splined shaft	✓
<b>CMC</b>	Mounting flange and keyed cylindrical shaft	✓
<b>CPS</b>	Mounting flange and heavy duty splined shaft	✓
<b>CPC</b>	Mounting flange and heavy duty keyed	✓
<b>CF</b>	Flansch und innenverzahnte Hohlwelle	✓
<b>CFS</b>	Shaft mounted	✓
<b>CCPC</b>	Foot mounted and keyed cylindrical shaft	✓
-	Direct input motor adaptor without brake	✓
-	Direct input motor adaptor with brake	✓
-	Direct input motor adaptor with brake	✓
-	Brake	✓
<b>CHYZ</b>	Pinyon	✓
<b>CHBS</b>	Spline coupling	✓
<b>CHFL</b>	Flange	✓
<b>CHFF</b>	Fixing washer	✓
<b>CHKB</b>	Spline shaft	✓
<b>CHGA</b>	Shrink disc connector	✓
<b>CM42 - CM65 – CP65</b>	Input shaft	✓
<b>IEC</b>	Adapter for mounting standard motors to gear unit	✓
<b>CHM</b>	Worm gear unit adaptors	✓

✓ : Sing is presented which designs are existed for gear units.



#### 3.1 Prerequisites Of Assembly

- Take into the consideration which listed below;
- The informations placed on gear unit with motor in accordance with current network voltage.
  - There could be no damage in the gear unit.  
At standard gear units;
  - The ambient temperature should be fitted temperature values given in the 'Lubricant' part.

	<b>ATTENTION!</b>
	<p><b>The Gear unit must not be mounted in the ambient conditions listed below.</b></p> <ul style="list-style-type: none"><li>- Explosive atmosphere, high corrosive and/or oils, acids, gases, steams, radiation</li><li>- Places directly contacted to the food</li></ul>

At special applications the configuration of gear unit/gear unit with motor are realized convenient to the ambient conditions. Output shafts, processed surfaces, corrosion preventive material on the solid shaft / hallow shaft, jerks etc. must be cleaned.

Extensive usage-solvent must be used. The solvent should not be contacted to the bearing houses and sealing components.

In the abrasive ambient conditions, both output shaft, sealing components must be protected to the wearing Connection flanges must be attached to the hallow shaft/solid shaft according to DIN 332.

The situations where the wrong direction of rotation could caused to damages and dangers, before the mounting, the test work should implemented to the gear unit so the right direction of rotation could be determined and must got into the secure for the next operating.

In the one-way locked gear units, nibs are placed at the entry and exit side of the gear unit. The ends of the nibs shows the direction of rotation of the gear unit. During the motor connection and motor-operating with the help of magnetic field, the gear unit must be operated just at the direction of rotation.

	<b>ATTENTION!</b>
	<p>In the one-way locked gear units, the gear unit must be operated at the direction of lock rotation, otherwise the damage could be occurred.</p>

Around the mounting position, there must be sured that there are not any materials fused to metal, lubricating tool or elastomers which causes corrosion or will not be emerged.



#### 3.2 Gear Unit Mounting

The lifting eyebolts screwed to gear unit must be used in gear unit mounting.

- Mounting of gear unit/gear unit with motor to the machine and selection of mounting place are crucial.
- The convenient connection points must be determined for gear unit type.
- Ventilation plug must be opened after the carrying process.
- The connection tools which attached during the mounting to the machine must be tightened convenient to the torc given at the table.
- Because of the voltage, for to avoid transferring additional forces to the gear unit, both the gear unit and driven machine shaft must be aligned.
- There should not be any welding process on the gear unit. In the welding processes, the gear unit must not be used as a bracket. Otherwise bearing and gear part could damaged.
- The gear unit/gear unit with motor only could be mounted according to determined mounting position. After the delivery, in the case of changing mounting position the change of lubrication level and other precautions could be needed. Any failures to comply to the determined mounting position could damaged gear unit. Please consult to CHIARAVALLI.
- The gear unit/gear unit with motor have to be structured to stand against motor weight and operating voltages. The machine which will be connected has to be structured to stand against the weight of the gear unit with motor and operating voltage. The surface where the gear unit is to be fixed must be straight, vibrationless and protected against torsion.
- The machine which gear unit /gear unit with motor will be connected, there must be sured that it is closed and not to be operated without intention.
- The sphere of the movable pieces out of the gear unit must be closed with the safety cabinet kit.
- The sunlight and the impact of the weather conditions must be prevented during the mountage of the gear unit to the outside machine. However the air circulation needed to be provided to the unit.
- All the bolts should be used fully according to gear unit type. Bolts must be tightened with proper tightening moments.



#### DANGER!

During the mountage, the voltage should not be emerged between the foot and flanges and allowed radial and axial forces would not be taken into consideration! Check whether if there is radial or axial leakage at the connection unit which is between IEC, PAM and output shaft.



#### NOTE!

The opportunity of the easy access must be provided to the oil level plug, drain plug and ventilation plug.

The proper oil filling should be controlled according to mounting position. (Could be viewed on 'lubricators/ oil filling quantities' part or the values written on gear unit) The necessary amount of oil has filled to the gear unit/gear unit with motor by our firm. The slight deviations in oil level plug are resulted because of the mounting position and within the production tolerances.

If there is any danger of the electro-chemical corrosion between gear unit and machine, plastic pieces (2-3 mm) must be mounted between the connections. The electrical discharge resistance of used plastic material must be <109.

Electro-chemical corrosion could be occurred between the different metals like cast iron and stainless steel. Also plastic washer should be used in bolts. The body must also be grounded. Please use grounding screws in motor.





#### 3.3 Gear Unit Ventilation

In moist places or in open air usage, the gear unit which is resistant to corrosion is recommended. The damages in paint (in ventilation plug) must soon be corrected.

The carrying safety of the ventilation plug on the gear unit is to be remove.

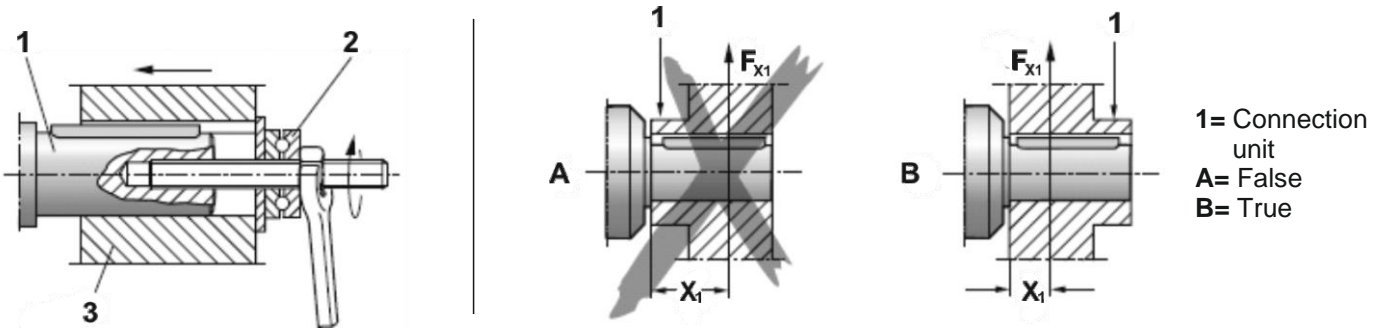
#### 3.4 Retrospective Paintwork

If you paint over all or part of the drive, please take care to mask the mask the breather valve and oil seals carefully. Remove the maskingt ape once you have completed the painting work.



**3.5 The Mountage Of The Connection Tool To The Output Shaft**

For the mountage of the output shaft tools look at the schema below.



- 1) The gear unit shaft end
- 2) The axial bearing
- 3) The connection tool

To prevent high radial forces: the gear and sprocket must be mounted as seen in shape B.

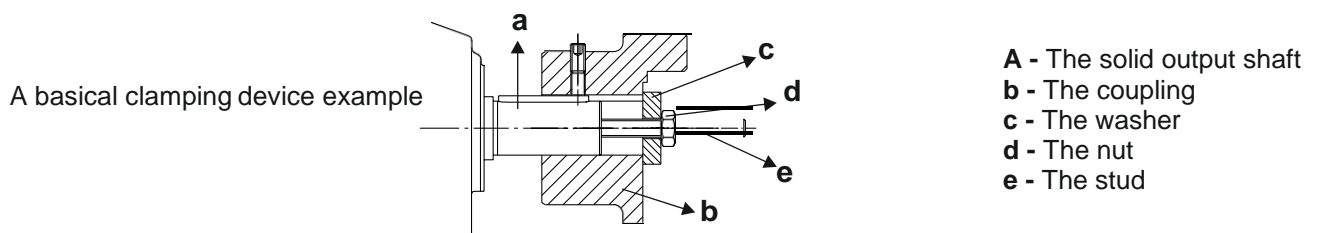
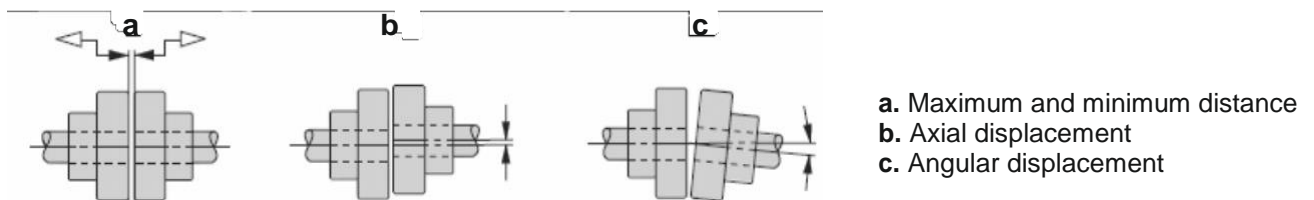
For the mounting of the connection tools only pulling device must be used. For the position adjustment the bearing strip which is at output shaft end must be used.

	<p><b>NOTE!</b></p> <p>The belt and pulleys, couplings, gears and etc. Must not be installed with hammering to the shaft end. Otherwise there could be a damage in body, bearings and shaft. In belt and pulleys, the rightness of the belt voltage must be paid attention. (suitable to the producer's data). For the not emerging of disallowed radial and axial forces, balance adjustment of the connection tool must be made.</p>
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	<p><b>NOTE!</b></p> <p>With smearing a little amount of grease or heating the connection tool in a short - time (80....100), the mounting easiness may be provided.</p>
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**3.6 The Mountage Of The Couplings**

While the couplings are mounting, it's balances must be made suitable to the datas of the producers. Must be implemented with suitable clamping device. Before mounting with the smearing of corrosion oil material to the solid output shaft/ hollow shaft, mounting and demounting processes may be easened.



	<p><b>ATTENTION!</b></p> <p>The belt-pulley, chain and gear drives must be protected from the contact of the external effects.</p>
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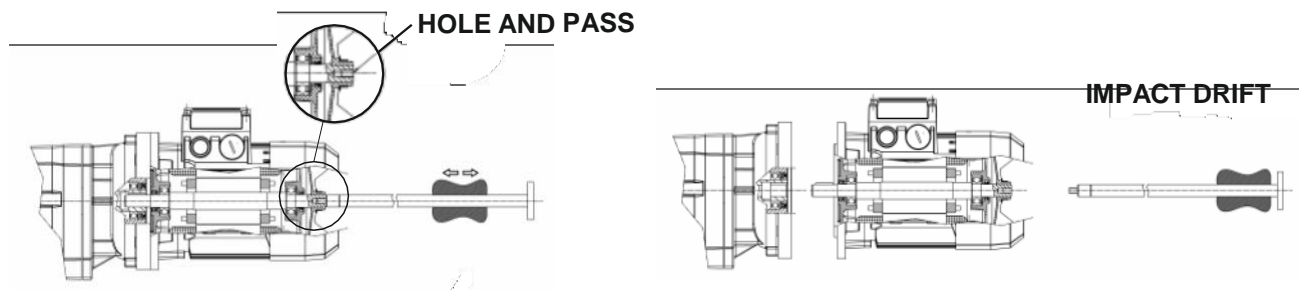


#### 3.7 The Mountage Of The Standard B5 Motor To The PAM Gear Unit

1. The motor and the solid output shaft of the motor with PAM adapted, flange surfaces must be cleaned and damage control must be made. The sizes and tolerances of the motor fixing elements must be suitable to DIN EN 50347.
2. Must be pushed till to stand to the block of motor solid output shaft.
3. If the mountage is to be done in open air and the environment is wet, it is recommended that the surfaces of the motor flange and PAM adaptor have to be isolated. Before and after the motor mounting, in the shape of flange is isolated, loctite 574 or loxéal 58-14 surface isolation material should be used to flange surfaces.
4. The motor must be installed to PAM adaptor.
5. PAM adaptor has to be mounted with suitable tightening moment.

#### 3.8 The Demountage Of The Electrical Motor (IEC, PAM)

During the operating, it is crucial that the surface of the connection tool between the motor and gear unit is not rusted, for the removal of the motor not to exercise excessive load is necessary. During the separation of motor from the gear unit without forcing, the method at the below must be implemented. Must be avoided the implementations that causes strain and harm to the gear unit.




1. By fan with drilling the motor solid output shaft, the thread cutting must be opened.
2. The impact drift has to be installed to the threaded place.
3. Motorla redüktör arasındaki bağlantı vidaları sökümelidir.
4. By the help of impact drift inertial force, the motor must be separated from the gear unit.


#### 3.9 Gear Unit Operating

- The gear unit is tested firstly at our firm. (leakproofing test, noise test, torc test)
- For the confirmation of direction of rotation of gear unit, it is needed to be operated before machine mounting.
- The mounting of gear unit to the machine is needed to be convenient to 98/37/EC and other safety standards.
- The electrical motor is needed to cover EN 60204-1 and EN 50014 standard.
- The mounting position of the gear unit should be as same as tag values.
- The datas in power units should be tolerated (plus, minus) %10 according to values specified in tag.
- There must not be any oil leakage in gear unit.
- There must not be extremely vibration and must not exceed acceptable voice decibel for gear units.
- In the situation of long-term non-usage, the storage conditions are needed to be implemented.
- The oil position must be controlled for the mounting position specified in catalogue.
- The oil level must be controlled.
- Before the operating, the carrying safety of the ventilation plug on the gear unit is needed to be removed.
- If the gear unit is dispatched without oil, the first oil filling must be loaded according to oil quantity stated in oil tables.
- It is not allowed to operate in sensitive areas against explosion. For these conditions, specific motors are available. Please consult to our firm.

## 4. CONTROL AND MAINTENANCE

### 4.1 Control And Periodic Maintenance


	<p><b>NOTE!</b></p> <p>The maintenance and periodic maintenance works are performed by qualified person/ operator who is well-educated and is sufficient in electric and mechanic issues; the rules convenient to job health and safety and specific environmental problems are performed as protected.</p>
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	<p><b>DANGER!</b></p> <p>Before the start of the maintenance work of the gear unit, gear unit should be closed at first (get into the voltage-free position), be sured service-free, needed to take measures against any accident or spinning items with the help of unexpected external load. Also all environmental safety precautions must be taken.</p>
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- Before the maintenance process, all safety equipments are needed to get ready and if necessary the outside personal should be warned. The border around the unit must be specified and must prevented equipment entrance to the area. If any failures to comply to these conditions, the situations which causes harm to health and safety could be occurred.
- Worn items only must be changed with original and unused items.
- The oil and grease must be used which is recommended by our firm.
- The leakproofing items on the gear unit must be changed with original items.
- If the bearing is needed to be changed please contact to our firm.
- After the maintenance work, we recommend to change the lubrication oil.

Our firm is not responsible for substitute product and unroutined maintenance that causes damages and woundings.

When purchasing gear unit, should be noted that it is original product and has technical informations written in catalogue.

	<p><b>NOTE!</b></p> <p>The polluted oil and rusted items must not be left to the environment after the maintenance. These items must be disposed convenient to the regulations.</p>
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Control And Periodic Maintenance Ranges	Control And Periodic Maintenance Works
Once at every 3000 work hours or once at every 6-months until the	<ul style="list-style-type: none"> <li>- Visual inspection</li> <li>- Check for running noises</li> <li>- Check oil level</li> </ul>
80 work heat. Once at every 10.000 work hours or once at least in two years (the synthetic oil is once at every 20.000 work hours or once at every four years)	<ul style="list-style-type: none"> <li>- Change the oil</li> <li>- The change of the ventilation plug</li> </ul>
At least every 10 years	<ul style="list-style-type: none"> <li>- General overhaul .</li> </ul>



### 4.2 Visual Inspection


There must be controlled whether there is leaking or not in gear unit.

There must be controlled that if there is oil filled or not in gear unit. Should be controlled that if there is any damage in gear unit's items and whether if the connection spots are rusted.

Also must be controlled that if any cracks could emerge in hose connection lines and in rubber wedges.

Leakproofing likes of dripping of gear unit's oil or dripping of cooling water and in damages and cracks, repair of the gear unit must be provided. Like these situations please get in contact with CHIARAVALLI.

Because of the storage and carrying, before the operation of gear unit and during at first operation, low amount of grease could flow out from bearing, this type of oil leak could not create any technical failure, the safety of gear unit and bearing operation could not be effected.

	<b>NOTE!</b>
	Must be suered that there is not air in hydraulic circuit.

### 4.3 Check for Running Noises


The emerge of unusual operation voice or vibrations in gear units could mean damages. In this type of situations, the gear unit must be stopped and overall revision must be made.


### 4.4 Control of the Lubricant and Lubricant Level

- Regular oil level controlling must be made.
- The electrical connection of motor must be cut and must got into safety form to prevent for reactivating.
- Must be waited until the gear unit got cooled.
- If the mounting position is changed, the section of 'the mounting of gear unit' must be got into attention.
- A little amount of oil must be taken out of the oil drain plug. The quality of oil must be controlled.
- The oil must be changed when the sign of extremely oil pollution is seen.

### 4.5 Changing The Oil

To prevent the emergence of the danger of burning, must be waited until the gear unit got cooled. The oil level, draining and position of ventilation plugs are dependent on mounting position. For the mounting position, related pages from catalagoue could be seen. When the oil-changing process, the gear unit should be at operating temperature. The electric connection of motor driving unit must be cut and got into safety for re-activation.

	<b>NOTE!</b>
	Because of the coldness of oil will affected the flowing and venting, the gear unit must not be cooled fully.

	<b>NOTE!</b>
	Above articles must be done respectively during in the oil change of the hydraulic brakes. Because the oil of the hydraulic brake is different from the gear unit.(ISO VG 32)

If the gear unit mounted vertical,the oil change must absolutely made from the expansion tank which is attached to gear unit.

After 100 hours,first oil change must be made



### Changing The Oil;

- Oil level plug, oil draining plug and ventilation plug must be removed.
- Both the oil is completely drained and the cleaning of gear unit must be made with proper solvent.
- The leakproofing elements on gear unit must be changed with original items.
- The oil draining plug must be put back to it's own place again.
- If the oil draining and level plug's gear part are damaged, instead of these, the new plug must be used.
- Before putting on the plugs, the sticky must be applied to the gear part like Loctite 242. If the aluminum washer is damaged, the new one must be used.
- The aluminum washer must be put lower and oil draining bolt must be bolted with proper moment.
- The oil according to mounting position must be filled from the vent hole with the proper draining device to the amount which is shown in catalogue. ( could be filled from hole which is on the oil level ). If the oil type is changed. Must be consulted to our firm.
- After the filling process, all plugs should be closed.
- 30 minutes after the oil filling, oil level must be controlled.

At high temperatures or at hard working conditions (high humidity, corrosive environment or high temperature fluctuations), the oil changing ranges must be reduced by half.

### 4.6 Change Of The Ventilation Plug

In excessive pollution situations, ventilation plug must be dismantled and got cleaned or with aluminum washer, the new ventilation plug must be mounted.

### 4.7 Change Of The Oil Seal And Oil Cover

- The electric connection of motor drive unit must be cut and got into safety for mistakenly re-activation.
- At the time oil seal is changing, the sufficient amount of grease must be found between leakproofing lips and should be paid attention that the surface is not dirty and dusty.
- When the double seal is used, 3/2 of the part which remained between two seal must be filled with grease convenient to the oil type inside the gear unit.
- During the change of the oil seal the proper devices must be used for not to harm the body and shaft.
- During the change of the oil seal and oil filler cup, the original product must be used.

### 4.8 The Bearing Greases

To the bearings of gear unit with motor, the greases must used which is given in grease table by our firm.



### 4.9 General Overhaul

The gear unit must fully be dismantled and works written below have to be done respectively.

- All parts of the gear unit must be cleaned.
- The damage control must be done to all parts of the gear unit.
- The damaged parts must be changed.
- All roller bearings must be changed.
- If there are, locks must be changed.
- All oil seals and nilos caps must be changed.

All plastic and elastomer parts of the motor coupling must be changed.

	<p><b>NOTE!</b></p> <p>The general revision should be made by the qualified personnel with considering the international laws and regulations in the plants which has the required equipments. We recommend that the general revision has to be made at the CHIARAVALLI service.</p>
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### 4.10 The Maintenance Of The Motor

Our firm in greased bearings recommends to change the grease when the oil is changed.

Before the start of motor maintenance, the operator should closed the unit, must be sured that it is out of service and must taken all the measures against any accident or unexpected load.

- To prevent overheating, if there is, the dust coat on it must be cleaned.
- The bearings must be dismantled, cleaned and greased.
- By 1/3 of bearing, the grease must be used.
- The proper grease must be selected from the oil tables.
- Motor oil seals must be changed.

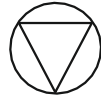


**5.1 Symbols In Usage**

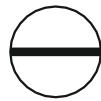
The explanations of the used symbols;



Vent plug



Filling plug



Oil level plug



Drain plug

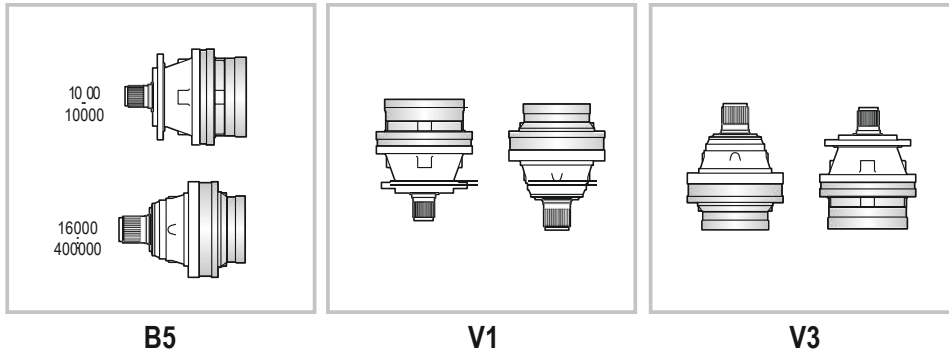




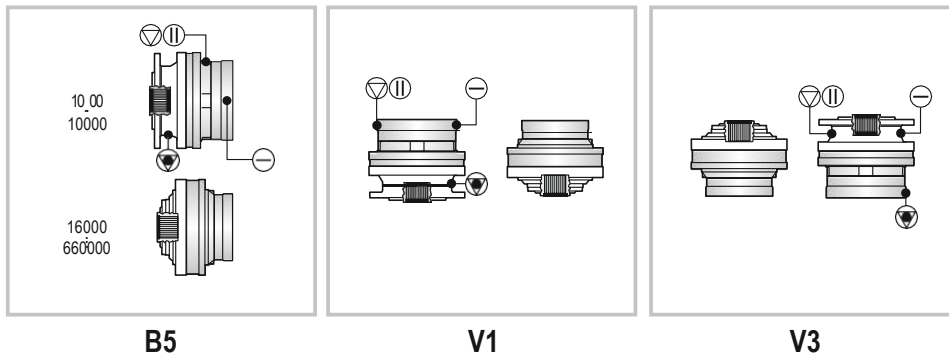
## 5. MOUNTING POSITIONS

### 5.2 Mounting Positions

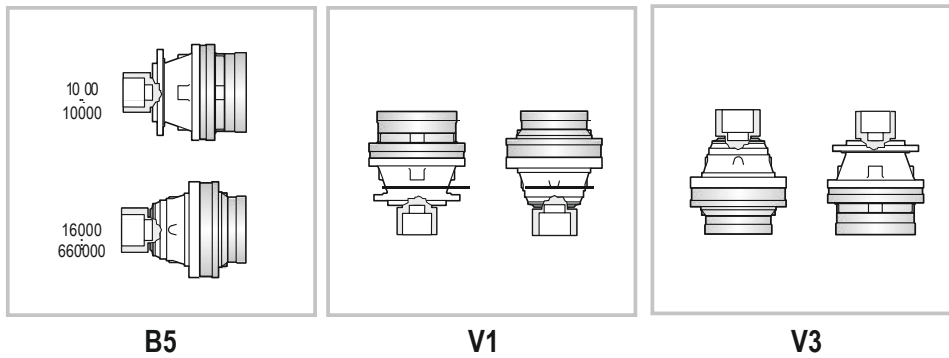
#### CM-CP



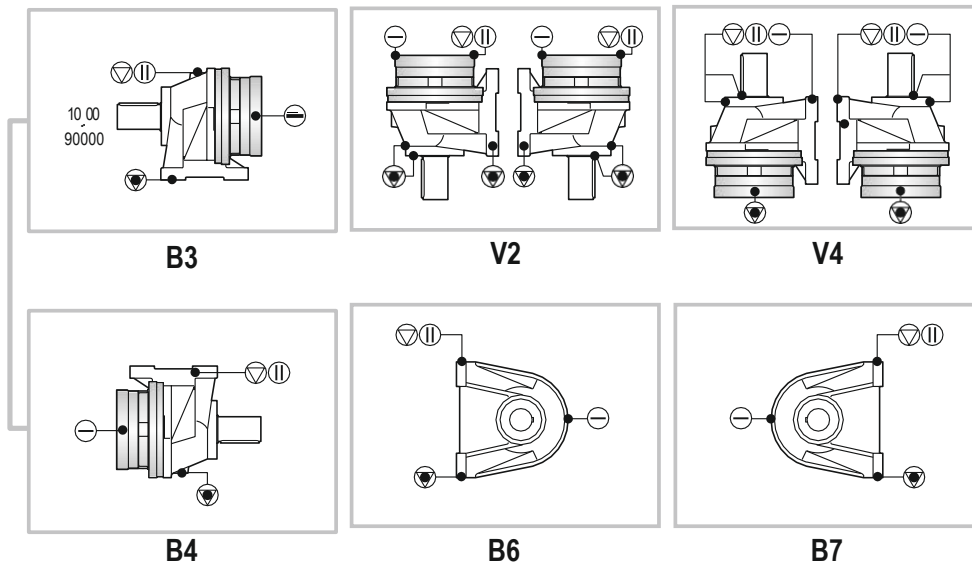
#### CF



#### CFS



#### CCPC



Vent plug



Filling plug



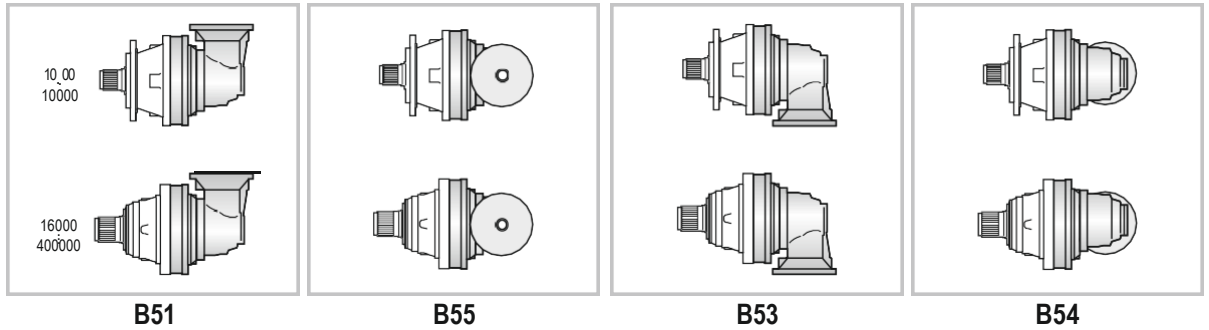
Oil level plug



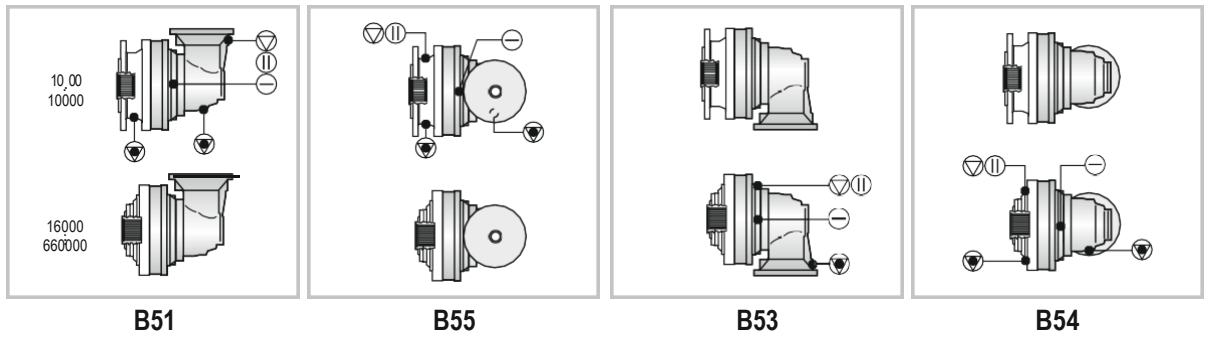
Drain plug



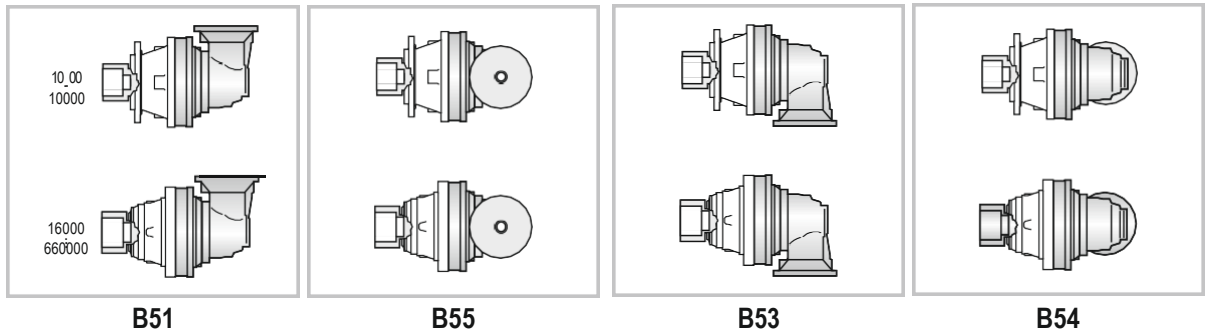
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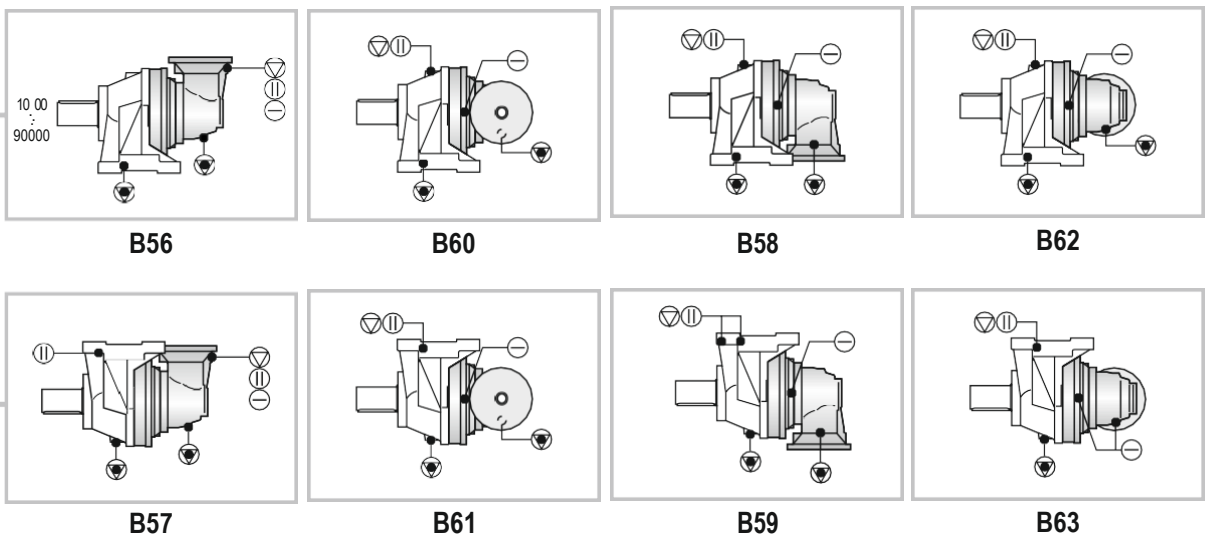
**CF**



**CFS**



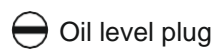
**CCPC**



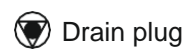
Vent plug



Filling plug



Oil level plug

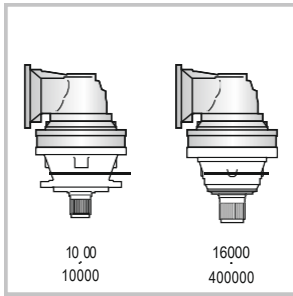


Drain plug

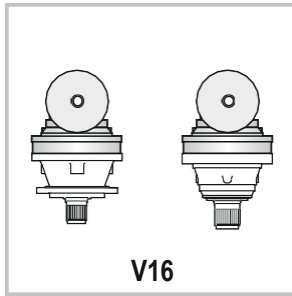


# 5. MOUNTING POSITIONS

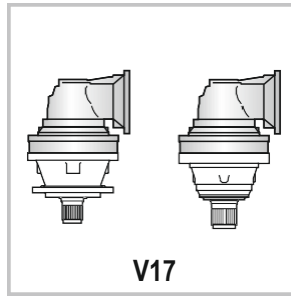
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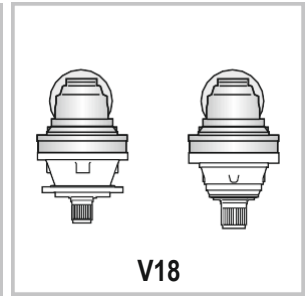
V15



V16

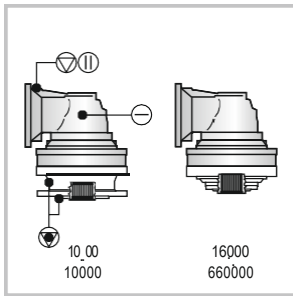


V17

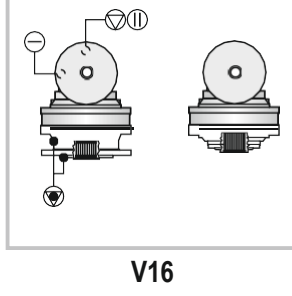


V18

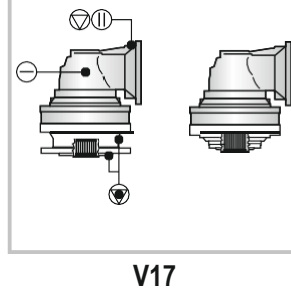
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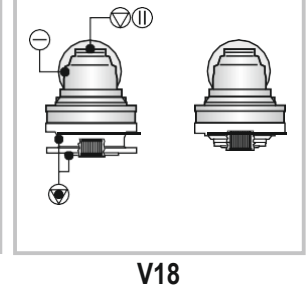
V15



V16

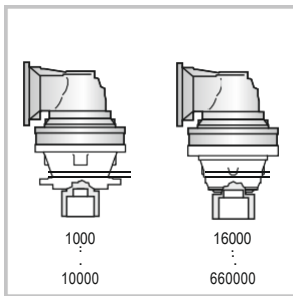


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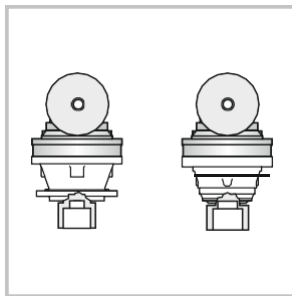


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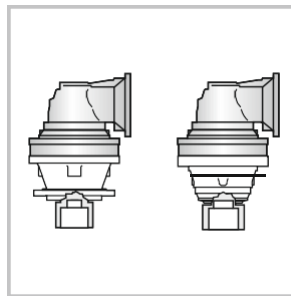
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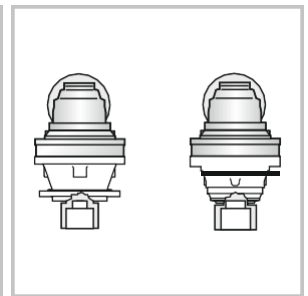
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V16

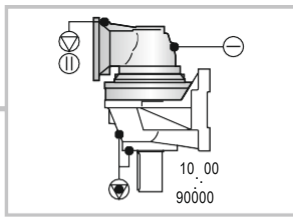


V17

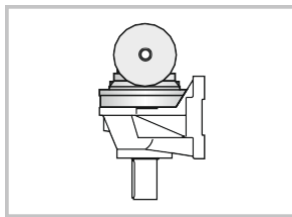


V18

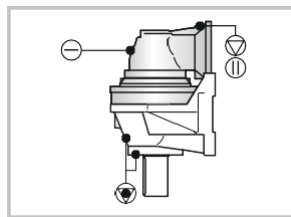
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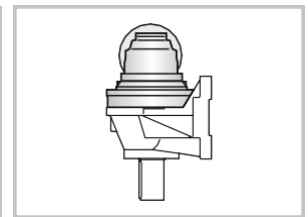
V53



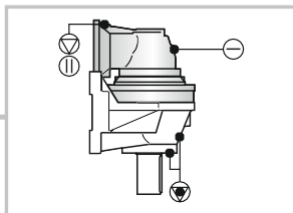
V52



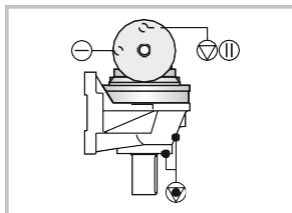
V54



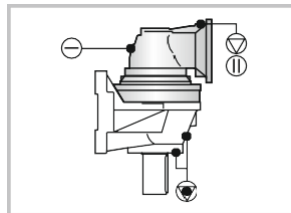
V55



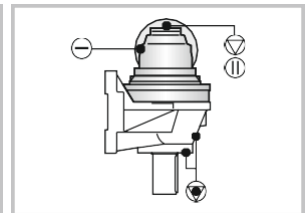
V49



V48



V50



V51



Vent plug



Filling plug



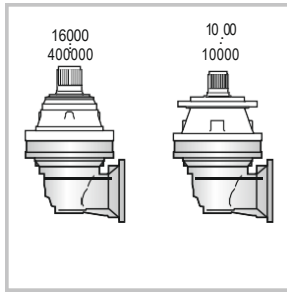
Oil level plug



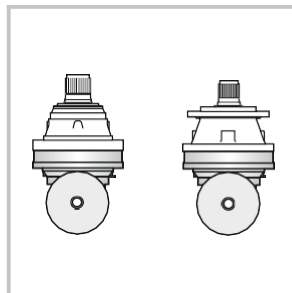
Drain plug



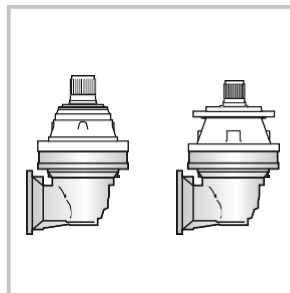
**CM-CP**



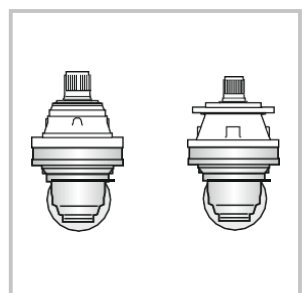
V35



V36

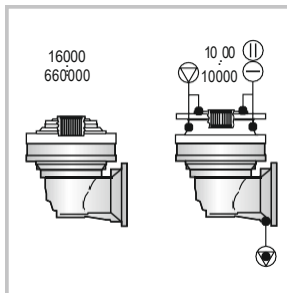


V37

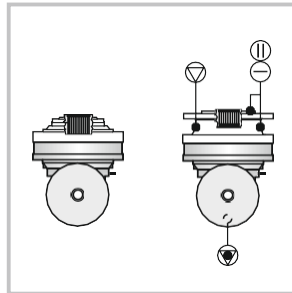


V38

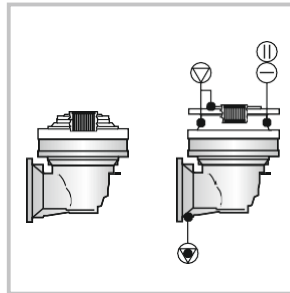
**CF**



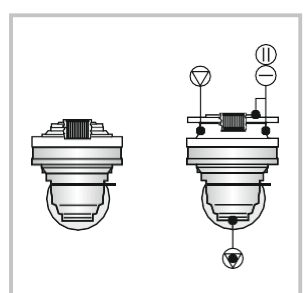
V35



V36

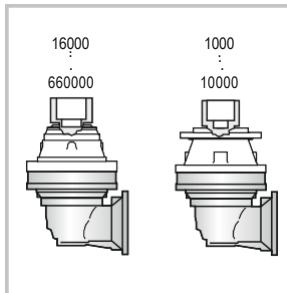


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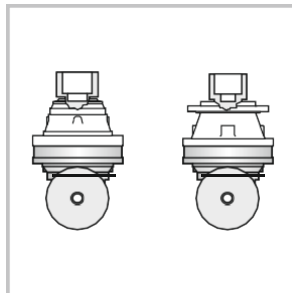


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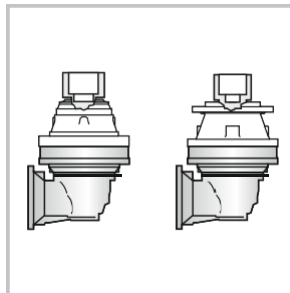
**CFS**



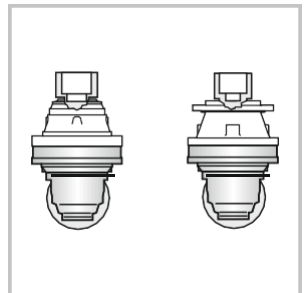
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V36

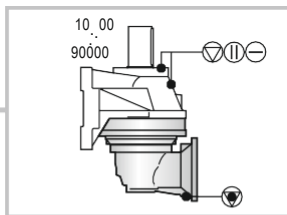


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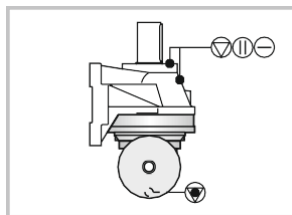


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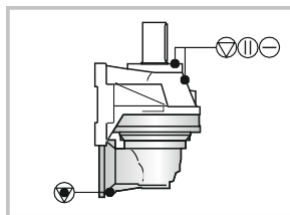
**CCPC**



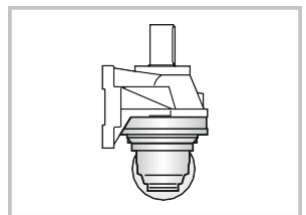
V42



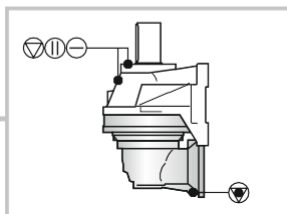
V40



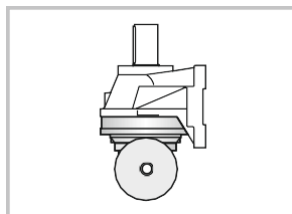
V41



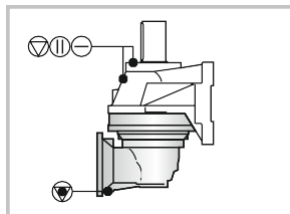
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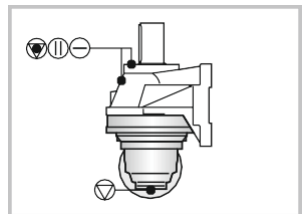
V46



V44



V45



V47



Vent plug



Filling plug



Oil level plug

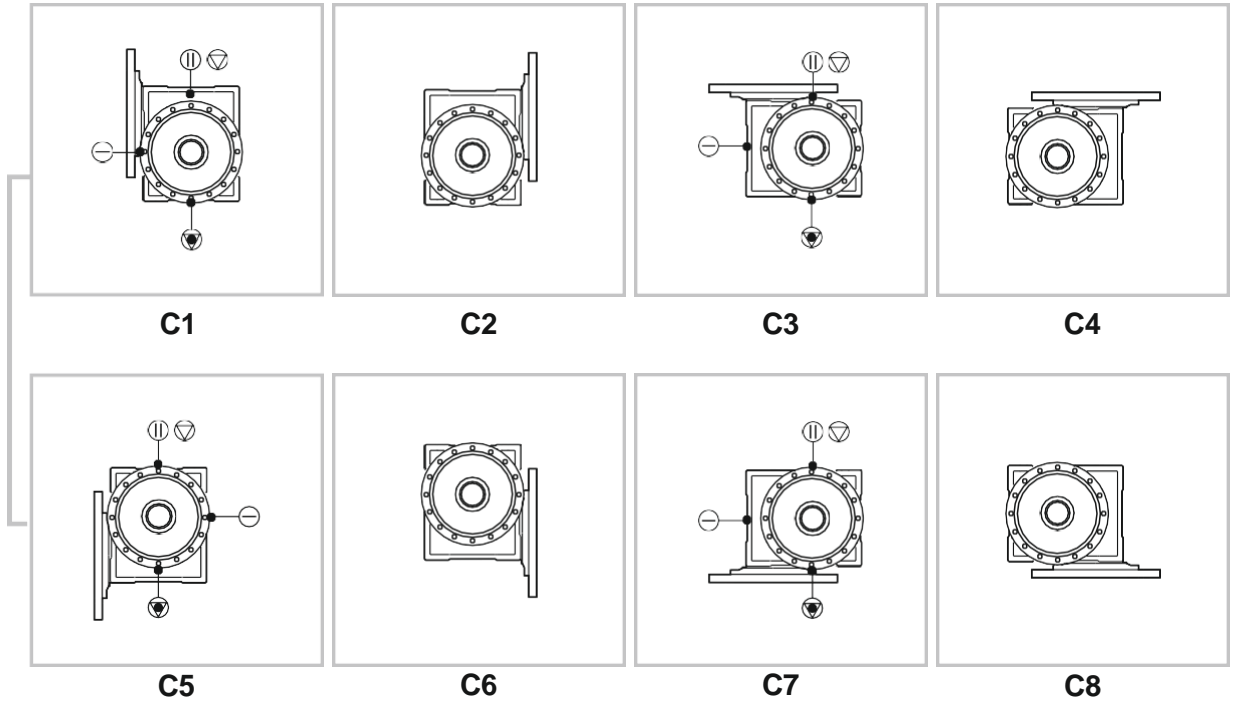


Drain plug



## 5. MOUNTING POSITIONS

CF  
CM  
CP  
CFS






### 6.1 Lubricant

CHPL/CHPLB series are lubricated with gear unit rinsing.

ISO VG 220 - viscosited and EP mixed mineral oil must be used. The oil types which could be purchased from the oil producers are given at the table below.

During the operating, the exterior surface temperature must not be over 80. If the temperature exceeds this, must be contacted with CHIARAVALLI technical service. For ensuring the smooth running of the gear unit, the correct lubricating is essential; therefore at the mounting stage the following situations must be controlled.

- In compliance with the mounting position stated at order, must be controlled that whether the plugs are inserted correctly in pursuant of given informations.
- If the gear unit is mounted horizontal, must be filled at half, regardless of it's linear or angular position. With dismantling of the plug which is at or over that area, the oil level must be eye-controlled.
- At the bevel gear unit orders (angular gear unit) with holding both pieces (only if they are same) at the intended mountage position, having the oil filling on the ground is recommended. Thus the filling will be getting fast and at the same time, as the time flows while passing from one division to another you would know that you have put the oil at the right quantity.
- If the gear unit is mounted vertical, by using of elbows and expansion tanks which sent with the gear unit, the oil must be filled from above. Using the expansion tank at these positions is recommended by CHIARAVALLI.

	<b>NOTE!</b>
	In continuously operating gear units because of the oil in it, it may be exposed to overheating. In these situations the use of lower viscosited oil is recommended by CHIARAVALLI.

### 6.2 Lubricant Table

Ambient Temperature				
ISO 3448	-20 °C / +5°C -IV 95	+5 °C / +40°C -IV 95	+40°C / +55°C -IV 95	-30°C / +65°C -IV 165
	VG 100	VG 150	VG 320	VG 150-200
<b>MOBIL</b>	Mineral oil	Mobilgear XMP 150	Mobilgear XMP 320	
	Synthetic oil PEO,EP, ISO VG 220	Mobilgear SHC XMP 220		
<b>AGIP</b>	Balasia 100	Balasia 150	Balasia 320	<b>Balasia S 320</b>
<b>ARAL</b>	Degol BG 100	Degol BG 150	Degol BG 320	Degol GS 220
<b>BM MACH</b>	GR XP 100	GR XP 150	GR XP 320	Energyn HTX 220
<b>CASTROL</b>	Alpha SP 100	Alpha SP 150	Alpha 320	Alpha SN 150
<b>CHEVRON</b>	non leaded gear compound 100	non leaded gear compound 150	non leaded gear compound 320	
<b>ESSO</b>	Spartan EP 100	Spartan EP 150	Spartan EP 320	<b>Glycolube 320</b>
<b>Q8</b>	Goya 100	Goya 150	Goya 320 EI	Greco 228
<b>IP</b>	Mellana 100	Mellana 150	Mellana 320	Telesia Oil 150
<b>SHELL</b>	Omala oil 100	Omala oil 150	Omala oil 320	<b>Omala S4WE 320</b>
<b>TOTAL</b>	Carter EP 100 N	Carter EP 150	Carter EP 320 N	
<b>KLUEBER</b>	Gem 1-100	Gem 1-150	Gem 1-320	Gem 1-220
<b>ELF</b>	Reductelf SP 100	Reductelf SP 150	Reductelf SP 320	Reductelf SP 220
<b>FINA</b>	Giran 100	Giran 150	Giran 320	Giran 220

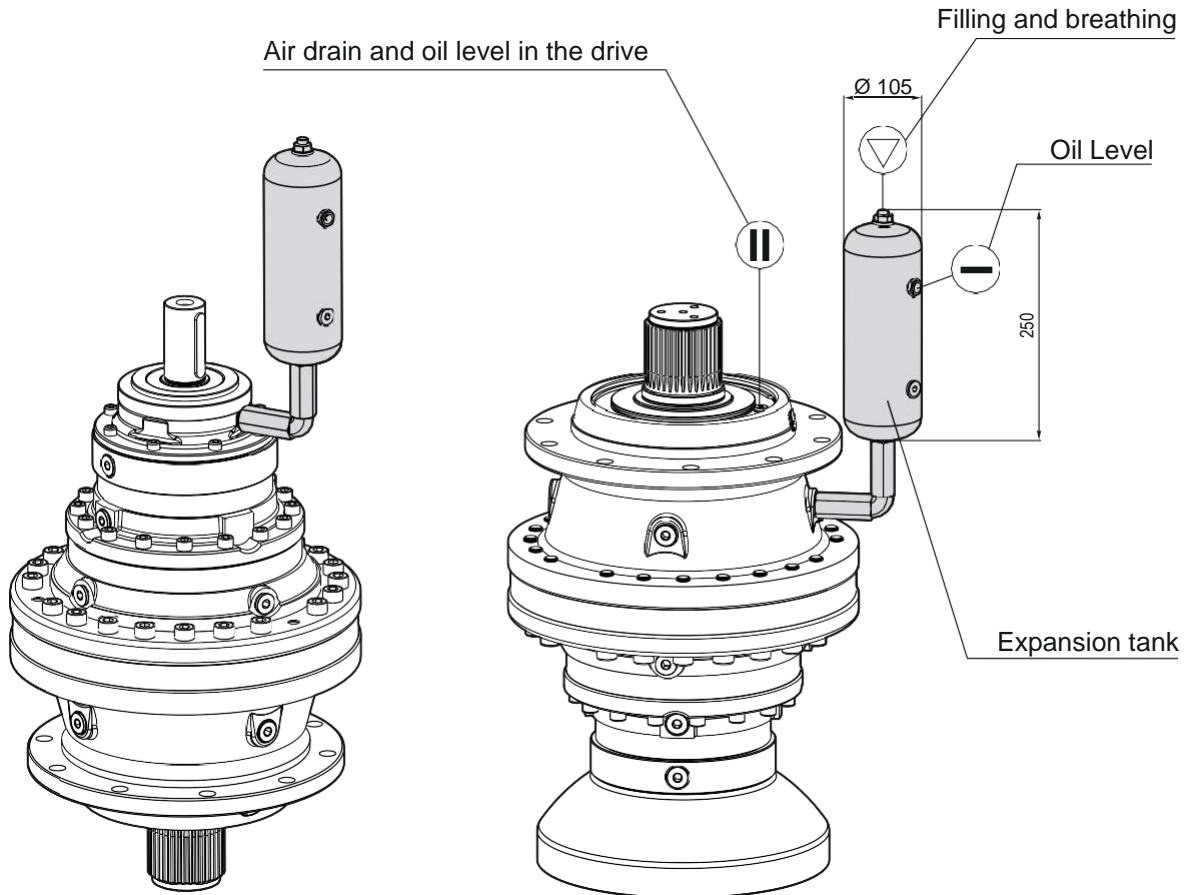
*It is forbidden to use different kind of oil without the approval of the CHIARAVALLI technical service*



### 7.1 Expansion Tank

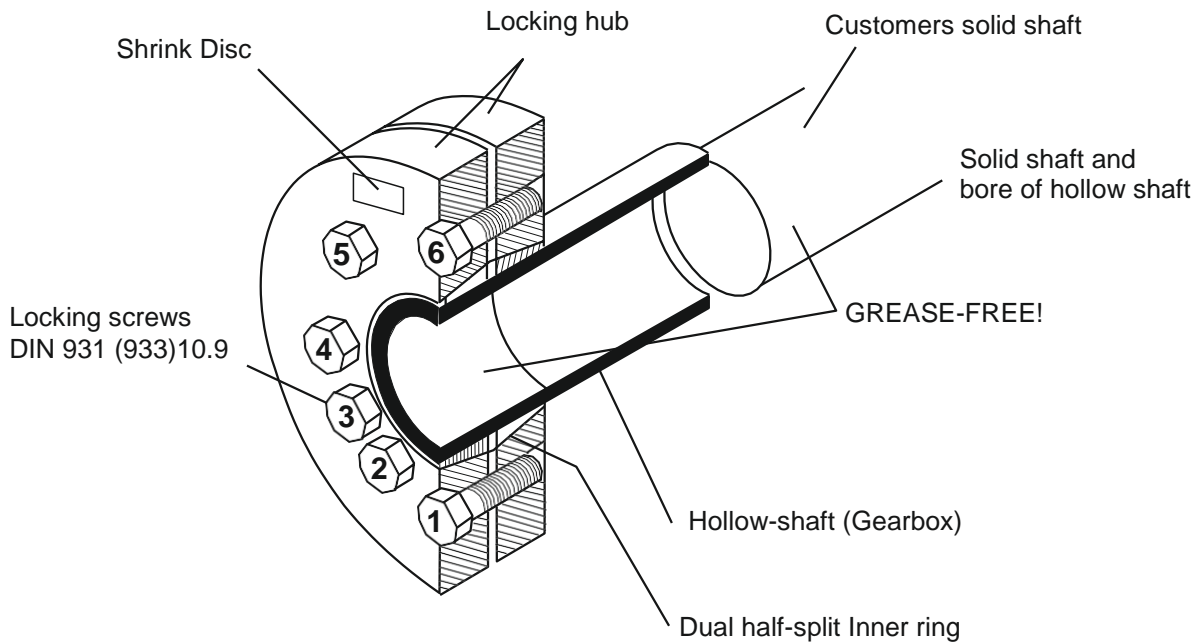
At the vertical mountages, using expansion tank at higher than the peak point of the gear unit is recommended by CHIARAVALLI.

It's duty is to retain oil expansion and providing to make the oil support to unreachable points. This appurtenance is sent separately from the gear unit upon request





7.2 Shrink Disc



	<p><b>NOTE !</b></p> <p>Shrink - discs are supplied ready for installation and should not be taken apart before mounting.</p>
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7.2.1 Mounting Position Of The Shrink Disc

- If there is, the shrink disc must be removed from the package.
- The clamping bolts are loosened but must not be removed. Must be squeezed with the help of hand until to get the space out of between the flanges and inner loop.
- The external clamping flange connected to the gear unit's shaft, shrink disc must be pushed on to the output shaft. Soft grease must applied to the hole at inner ring. (for easing the pushing process).
- The soft grease must be applied to the spacer side of customer applications solid shaft. The oil must not be touched the compressed side of the shrink disc. For not creating that kind of risk, the grease should not be applied directly on the spacer.
- The grease both on the gear unit's shaft and customer's application shaft must be fully cleaned and be ungreased.
- The Customer's applications solid shaft must be mounted completely to the hallow shaft to the shrink disc's shrinking area.
- To positioned the shrink disc, the clamping bolts must slightly tightened.
- The clamping bolts must be tightened at clockwise a few times respectively (approximately ¼ bolt tour per tour). Never be tightened diagonally.
- After tightened the clamping bolts, there should be an equal space between the clamping bolts. If this space is not ensured, the gear unit must be dismantled and the sensibility of the external tightened flange of the shrink disc must be controlled.





**7.2.2 Demounting Position Of The Shrink Disc**

- The clamping bolts must be loosened respectively a few times. ( approximately ¼ bolt tour per tour) But clamping bolts must not be fully removed.
- The shrink disc should not be seperated from the gear unit's shaft.
- The gear unit must be removed from customer's applications solid shaft.

	<b>ATTENTION!</b>
	If the shrink disc are mounted and dismantled incorrectly, the wounding danger could exist.

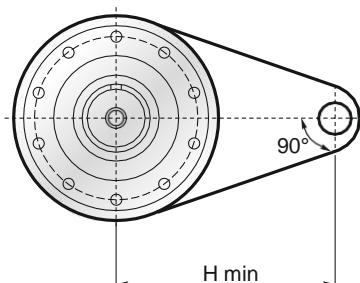
**7.2.3 Cleaning Of The Shrink Disc;**

- Dismantled shrink disc before remounting, is not needed to subject the cracking process.
- Only the polluted surfaces of the shrink disc must be cleaned.
- The conical surfaces must be lubricated with one of the the solid material lubricants listed below.

Lubricant (Mo S2)	Type
Molykote 321 (Slippery lac)	Spray
Molykote Spray (Powder spray)	Spray
Molykote G Rapid	Spray or paste
Aemasol MO 19P	Spray or paste
Aemasol DIO - setral 57 N (Slippery lac)	Spray

For the lubricating of clamping screws Molykote BR 2 or similar material must be used.

**7.3 Torque Arm**




SEE CATALOG

The torc arms in the CFS type exits are the appurtenances used together with the shrink disc. If these torc arms are single supported, it is signifiant to take care of the Hmin value and 90 angle specified in the catalogue. Before to fasten the torc arm clean the moutage and hole faces and refine from the oil.



### 7.4 Backstop

Change of the lock and direction of the movement of machine incorrectly is prevented. In case of the use of lock, it is operated only the direction specified before.

NOTE!	
	<p>The action of the motor in locking direction could cause fracturing of the lock.</p> <ul style="list-style-type: none"><li>- The motor absolutely must not rotated to the direction of locking. To provide specified direction of rotation, it must be careful that the motor is supplied by direct current.</li><li>- For the purpose of controlling gear unit's output solid shaft/gear unit's output hallow shaft could be operated by half tour to the opposite direction of locking once.</li></ul>

The allowed direction of rotation is marked on the gear unit.

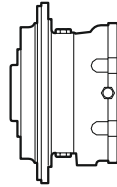


### 7.5 Input Accessories

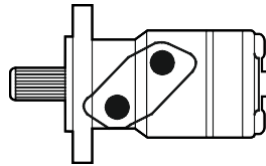
CHIARAVALLI reduction gears can be supplied with different input options.

By means of the input flanges with and without brake, the following accessories can be mounted:

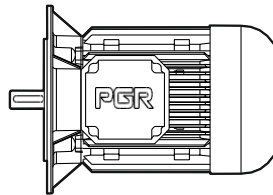
- Negative modular brakes



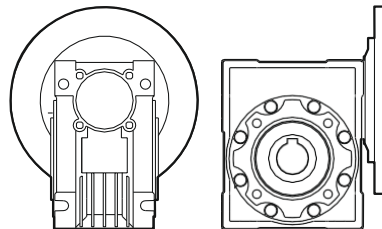
- Hydraulic motors



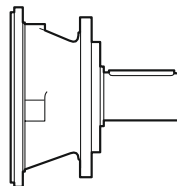
- Electric motors



- Worm gears



- Input shafts





### 8.1 Electrical Motor And Brake Connection

The connections must be made according to electric connection schema (If there is brake, it must be made according to brake connection schema).

- Must be sured that the supply voltage and frequency are the same as tag values.
- Both the protective tag values and connection must be controlled.
- If the motor is operated at the opposite direction, two stages must be changed.
- Unused cable entries should be closed.
- Not to have excessive load and stage failures, the protector must be used (stage protection or thermic etc.).
- The motor protection must be set to the nominal current.
- The gear unit and motor must be grounded against potential differences.
- The electrical motor and/or brake connections must be made by the experienced electric technicians.



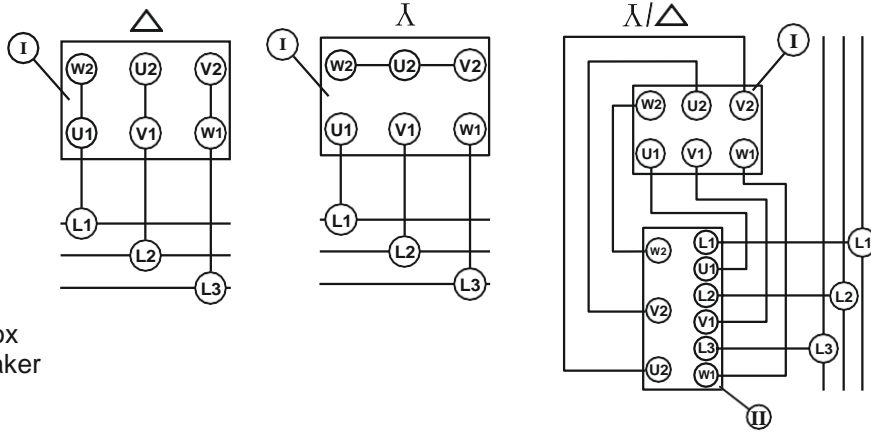
#### ATTENTION!

Wrong voltage or connection would harm to electrical motor or environment.

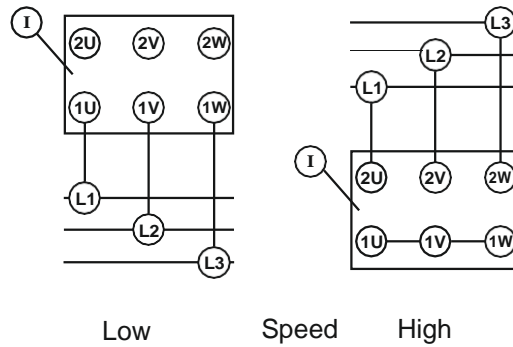


### 8.2 The Electrical Motor Connection Schema

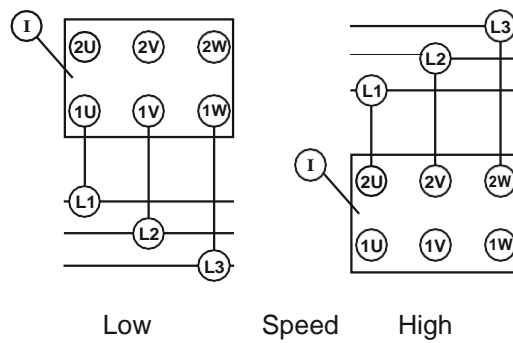
Three phase squirrel - cage motor



Three phase squirrel- cage motor. Dahlander connection.



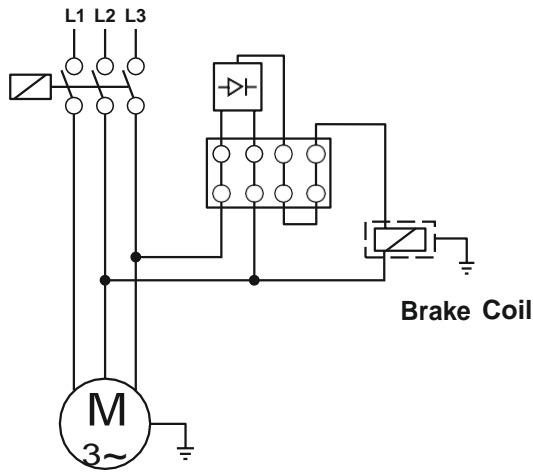
Three phase squirrel - cage motor. Dahlander connection.



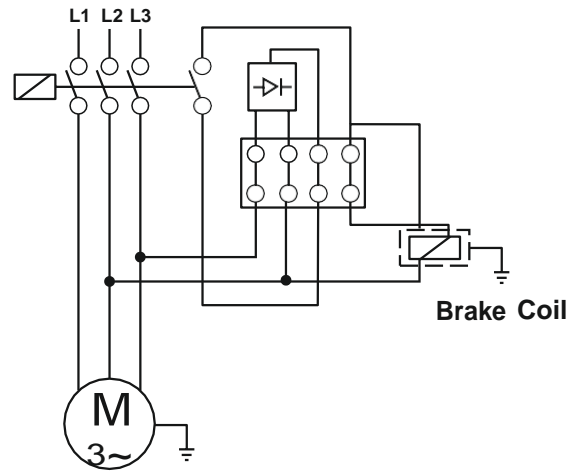


8.3 Standard Type Brake Anchorage Schema

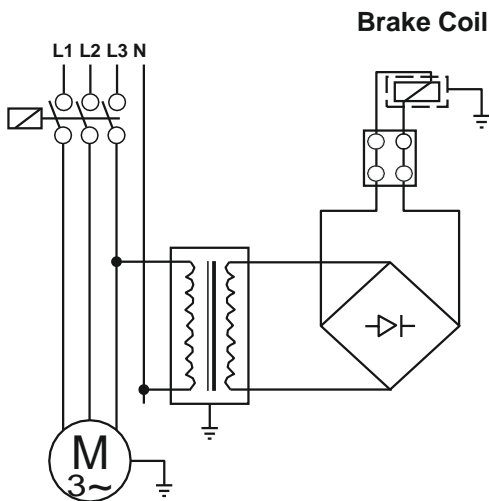
Delayed Running Brake (400V)



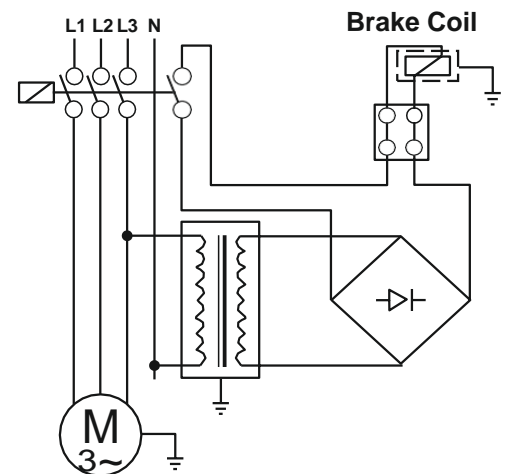
Sudden Brake (400V)



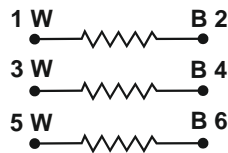
Delayed Running Brake 4 (24V)



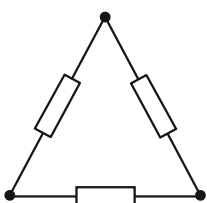
Sudden Brake 4 (24V)



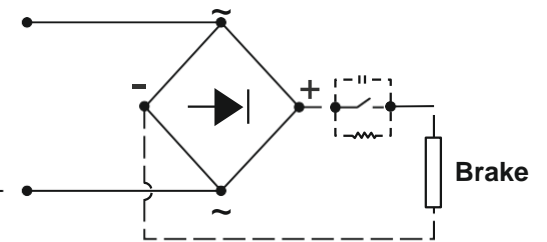
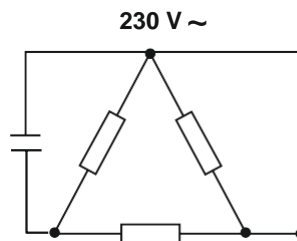
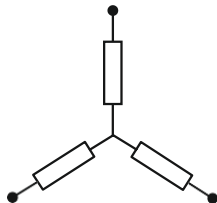
Please check brake coil by using a tester.



**DELTA CONNECTION**  
Δ 230 V



**STAR CONNECTION**  
Δ 400 V





### 9.1 Product Disposal

Dismantle the machine, separating the parts following the instructions given in this manual.

You must group the parts according to the materials they are made of: iron, aluminium, copper, plastic and rubber.

The parts must be disposed of by the relative centres in full compliance with the laws and force on the matter of dismantling and demolishing industrial waste.

**Waste Oil:** to dispose of waste oil abide by the laws for protecting the environment and the laws in force in the Country where the machine is used.

### 9.2 Troubleshooting

Abnormality	Probable Reason	Solution
The oil leakage from the seal,	<ol style="list-style-type: none"> <li>1. The stiffening of the seals due to longtime storage.</li> <li>2. The seals are damaged or corroded.</li> </ol>	<ol style="list-style-type: none"> <li>1. The area must be cleaned, after several hours operating, it must be controlled that whether there is leakage or not.</li> <li>2. Consult to the technical service.</li> </ol>
Vibration and / or excess noise,	<ol style="list-style-type: none"> <li>1. Inner abnormality.</li> <li>2. The gear unit is not mounted correctly. (non-fixed)</li> </ol>	<ol style="list-style-type: none"> <li>1. Control the fixing.</li> <li>2. Consult to the technical service.</li> </ol>
If it stopped due to the located/assembled brake connection discontinuity,	<ol style="list-style-type: none"> <li>1. Not pressure at the brake.</li> <li>2. Disc is squeezed because of the located period (damaged).</li> <li>3. Brake seals are out of order</li> </ol>	<ol style="list-style-type: none"> <li>1. Brake connection must be controlled.</li> <li>2. Implement pressure and exercise motion to the brake entrance.</li> <li>3. Consult to the technical service.</li> </ol>
Overheating,	<ol style="list-style-type: none"> <li>1. The oil is insufficient</li> <li>2. The brake is not completely open</li> <li>3. High thermic power.</li> </ol>	<ol style="list-style-type: none"> <li>1. Add oil.</li> <li>2. Opening pressure must be controlled.</li> <li>3. Consult to the technical service.</li> </ol>
Activated/Operated motor's failure of to rotate the gears of the gear unit,	<ol style="list-style-type: none"> <li>1. Motor moutage error.</li> <li>2. The brake is locked.</li> <li>3. Inner abnormality.</li> </ol>	<ol style="list-style-type: none"> <li>1. The connection between motor and gear unit must be controlled.</li> <li>2. Brake system must be controlled.</li> <li>3. Consult to the technical service.</li> </ol>
If the located brake is locked,	<ol style="list-style-type: none"> <li>1. Circuit residual pressure.</li> <li>2. Discs are corroded.</li> </ol>	<ol style="list-style-type: none"> <li>1. Hydraulic circuit must be controlled.</li> <li>2. Consult to the technical service.</li> </ol>

If there are problems or malfunctions different to the ones described here contact a CHIARAVALLI Assistance Centre.

# SHIPPING SERVICES



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Satellite position: coordinates N 45° 41.394 · E8° 48.726